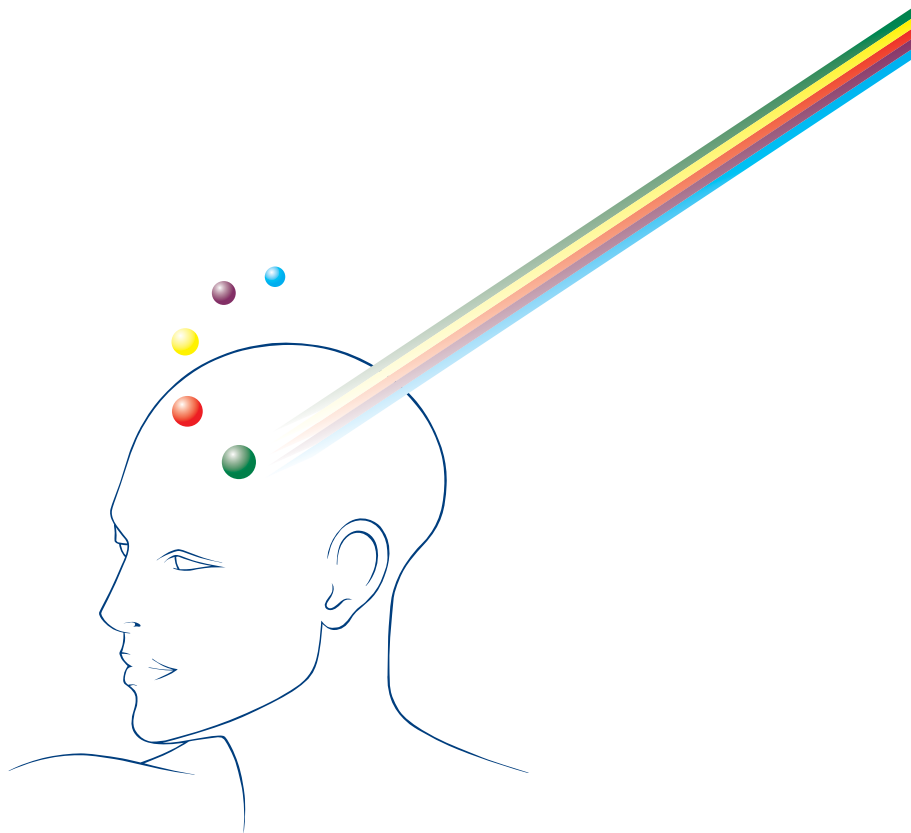


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**Bolsas de  
Investigação Científica**  
*Bursaries for  
Scientific Research*  
**1994 - 2014**

F U N D A Ç Ã O

**Bial**

Instituição de utilidade pública

*Institution of public utility*

**Bolsas de  
Investigação Científica**  
*Bursaries for  
Scientific Research*  
**1994 - 2014**

O livro “Bolsas de Investigação Científica. Bursaries for Scientific Research 1994-2014” contém informação acerca dos projetos concluídos e em curso, nas áreas da Psicofisiologia e da Parapsicologia, financiados pela Fundação Bial, de 1994 a 2012. Esta edição foi especialmente organizada para a comemoração dos 20 anos do Programa de Bolsas de Investigação Científica da Fundação Bial.

A informação acerca dos projetos está disponível em [www.fundacaobial.com](http://www.fundacaobial.com).

*The book “Bolsas de Investigação Científica. Bursaries for Scientific Research 1994-2014” includes information regarding the finished and ongoing projects in the areas of Psychophysiology and Parapsychology supported by the Bial Foundation from 1994 to 2012. This edition was specially organized to celebrate the 20 years of the Bial Foundation Fellowship Programme.*

*Information regarding the projects is available at [www.fundacaobial.com](http://www.fundacaobial.com).*

Foi publicado em 1ª edição pela Fundação Bial com uma tiragem de 500 exemplares.

*It was published as 1st edition by Fundação Bial with a print run of 500 copies.*

Design gráfico / *Graphic Design*: 

Execução gráfica / *Printed by*:

Eigal - Indústria Gráfica SA.

Depósito Legal N.º / *Legal deposit No.*:

372794/14

ISBN: 978-989-8483-04-1

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## ÍNDICE GERAL / TABLE OF CONTENTS

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\* **NOTA:** O campo “Indexed papers” contém até três artigos, de entre os mais recentes, indexados nas bases de dados SCOPUS ou ISI Web of Science.

**NOTE:** The item “Indexed papers” contains up to three of the most recent papers indexed by SCOPUS or ISI Web of Science databases.

INTRODUÇÃO  
*INTRODUCTION*

## **The first twenty years**

The present collection of summaries of results sent to the Bial Foundation by the fellows of the projects concluded between 1994 and 2010 was prepared by Drs. S. Marinho, H. Topa, Assunção Júdice and Paula Guedes, at the request of the Board of the Foundation. We had two aims in mind:

1. Seeing and letting others see the projects the Foundation has supported in the fields of Parapsychology and Psychophysiology, separately (Parapsychology 175, Psychophysiology 223) or jointly (63) in a total of 461 projects.
2. From that observation conclude, or at least try to conclude, what improvements become obvious both in form of presentation of the results and substance of new fields to pursue.

## **The twenty years between 1994 and 2014**

The twenty years between 1994 and 2014 saw some notable moments in the History of Biomedical Research: the presentation of the Human Genome Project in 2000, the progress in imaging with the development of nuclear magnetic resonance, the appearance of a new infectious disease, the Acquired Immunodeficiency Syndrome (AIDS) and the discovery of the Human Deficiency Virus (HIV 1) as its cause, the introduction of specific gene modification in mice by the use of embryonic stem cells, the involvement of *Helicobacter Pylori* in the genesis of gastritis and stomach cancer, the involvement of the Human Papilloma Virus in cancer, to highlight a few acknowledged with Nobel Prizes between 2003 and 2008<sup>1-4</sup>. In addition to the enormous advances in technologies that permit noninvasive brain imaging, significant advances have taken place in the Neurosciences, resulting not only from the understanding of how the brain functions in the context of the whole body but also from the possibility of introducing gene modifications in mice that permit the study of behavior, memory, neurodegenerative and cognitive diseases. The attentive reader will no doubt enter this collection wondering how such advances touched the researchers in the fields preferentially funded by the Foundation and as any reader of scientific literature will want to see the Fellows' publications resulting from the funding attributed.

## **The Form**

Each process includes starting and finishing date, the summary of the results sent by the Fellow (that can also be seen in the Foundation's website), and three publications in indexed journals. In cases, where the Fellow asked for extension of the finishing date, results are not available (N/A), or the projects were included

under the section Ongoing, the projects funded in 2012 are not yet concluded and therefore no summary of results are available. It becomes evident as the reader goes through the collection that there is an extreme variation in the form of the presentations. That is not the Fellow's responsibility but the responsibility of the Foundation that never gave detailed instructions of how the Summaries should be presented or how a list of abbreviations was necessary. Some more experienced researchers describe objective, methods, results, conclusions and list of publications, others do not. Because the teams and the addresses are always included, however, one can get some idea of the numbers of people and variety of countries that the Foundation touched with its funding: 301 Principal Investigators (PIs) over 1000 others involved in research teams from 27 countries.

### **The content**

From the analysis of many projects it becomes also evident how the entry of techniques of imaging, electroencephalography and magneto encephalography in the fields funded by the Foundation, have transformed the possibilities of the questions and of some of the answers, when combined with things of the mind, such as for example meditation, personal or social behavior and more recently using animal models enabling to enter realms such as memory.

But even the most sophisticated brain imaging techniques and the most advanced mouse or fly, or fish, molecular genetics will not help us to elucidate phenomena such as Psychokinesis or Telepathy or some of the other exclusively human phenomena approached by researchers in the field of Parapsychology falling in a kingdom that may not lie just within the brain, as some believe<sup>5</sup>.

### **Caveat**

In an attempt to reconcile these various kingdoms I have recently felt the need to reread the book by Sir Peter Medawar "The Limits of Science"<sup>6</sup>. Medawar shared the Nobel Prize in Physiology and Medicine for his work on immunological tolerance in 1960. The book was published in 1984.

Medawar wrote then:

*"It is not to Science, therefore, but to metaphysics, imaginative literature or religion, that we must turn to questions to do with first and last things. Because these answers neither arise out of nor require validation by empirical evidence, it is not useful or even meaningful to ask whether they are true or false. The question is whether they bring peace of mind in the anxiety of incomprehension and dispel the fear of the unknown."*



As Member of the Board for the last 4 years I have come to see Parapsychology between the kingdom of Perceptive and Cognitive Anomalies as described by Ed May and the kingdoms of life beyond death and before birth as “main stream” Science, within its limits, has some difficulty in seeing them

As the reader will find out it is admirable how many projects in parapsychology dare, however, to seek empirical evidence for isolated phenomena that undoubtedly take place. In experiments well controlled, in many instances results are presented that turn out to be, or not, significant statistically.

I return to Medawar’s book on the change in the Spanish Royal family coat of arms, we read:

*“Before Columbus set sail across the Atlantic, the coat of arms of the royal Family of Spain has been impresa, depicting the Pillars of Hercules, the Straits of Gibraltar, with the motto, **Ne Plus Ultra**. There was no more beyond.*

When Columbus made his discovery, Spanish Royalty thriftilly did the only thing necessary: erased the negative, leaving the Pillars of Hercules now bearing the motto, **Plus Ultra. There was more beyond.**”

I do not doubt that immense surprises, as could not be imagined by Medawar, await us in the next one hundred years beyond the kingdoms of Parapsychology and the Neurosciences.

1. Paul C. Lauterbur and Sir Peter Mansfield 2003 Nobel Prize in Physiology and Medicine “for their discoveries concerning magnetic resonance imaging”
2. Barry J. Marshall and J. Robin Warren 2005 Nobel Prize in Physiology and Medicine “for their discovery of the bacterium *Helicobacter pylori* and its role in gastritis and peptic ulcer disease”
3. Mario R. Capecchi, Sir Martin J. Evans and Oliver Smithies 2007 Nobel Prize in Physiology and Medicine “for their discoveries of principles for introducing specific gene modifications in mice by the use of embryonic stem cells”
4. Harald zur Hausen 2008 Nobel Prize in Physiology and Medicine “for his discovery of human papilloma viruses causing cervical cancer” and Françoise Barré-Sinoussi and Luc Montagnier “for their discovery of human immunodeficiency virus”
5. Portela, L. 2013 Ser Espiritual. Da Evidência à Ciência. Gradiva.
6. Medawar, PB 1984 The Limits of Science. Harper and Row. Pgs 60 and 63.

Maria de Sousa  
February, 2014

PROJETOS CONCLUÍDOS  
*FINISHED PROJECTS*

### **1994/95 Projects**

- Project:** 1994-07
- Title:** Abordagem intergeracional da organização bio-comportamental e representacional da vinculação em mães e filhos: Estudo preliminar
- Duration:** 1994/12 – 1996/09
- Researcher(s):** Prof. Isabel Soares, Dr. Pedro Lopes dos Santos, Dr. Maria Carolina Costa e Silva
- Institution:** Centro de Medicina Desportiva do Norte, Porto (Portugal)
- Results:** This study aimed to assess the quality of the attachment relation between infant-mother ( $N = 31$  dyads) during the Strange Situation and to examine their heart-rate (through the Holter – Mortara, PR, 4) during this experimental procedure. Fourteen infants were classified as secure (B pattern), 10 as insecure-avoidant (A group) and 7 as insecure-resistant (C group). This distribution is similar to those found in other studies with middle class and low risk samples. No significant differences were found among the attachment patterns in terms of the infant's cardiac baseline. However, significant differences were found between secure and insecure groups in terms of their heart-rate during the Strange Situation: the ambivalent babies (C group) showing an increase especially in the two separation episodes (5 and 8). In general, similarities were found between insecure-avoidant and secure babies (for instance, a decrease of their heart-rate - in episode 7 - when they are together with the stranger and after being alone in episode 6) but the former showed an increase in their heart-rate during the second reunion with their mothers (episode 8). No relations were found between the mother's and infant's heart-rate and the attachment patterns.
- Keywords:** Psychophysiology; Attachment
- Indexed papers:** N/A

- Project:** 1994-09
- Title:** Processo cognitivo durante o sono: psicofisiologia e neurofisiologia dos sonhos
- Duration:** 1994/12 – 1997/12
- Researcher(s):** Prof. Teresa Paiva, Dr. Erica Guimarães, Prof. Agostinho Cláudio da Rosa, Dr. Eduardo Ducla Soares
- Institution:** Centro Estudos Egas Moniz / H. Sta. Maria, Lisboa (Portugal)
- Results:** Project results can be summarized as follows:
- 1) The contents of REM and NREM dreams were different. REM reports were longer and more vivid than NREM reports. The visual, emotional and motor components were higher in REM reports, while abstract thoughts were commoner in NREM reports. The reports grammatical composition was also different: REM reports had significantly higher percentages of nouns, verbs and adjectives.
  - 2) The dream contents varied across successive sleep cycles: dreams in the beginning of the night had higher diurnal residuals related with daily activities, when compared with those in the end of the sleep episode.
  - 3) The contents of dream reports of normal subjects were significantly correlated with spectral contents of the Electroencephalogram (EEG) measured in derivation C4.
  - 4) Emotional contents were correlated with a decrease in low EEG frequencies in the theta and delta bands, while abstract thoughts were positively correlated with them.
  - 5) Furthermore abstract thoughts were described with fewer words in contrast with dreams presenting higher emotional contents.
- Project conclusions:  
The positive correlations observed between dream contents and EEG frequency components in normal subjects represent an important initial step within the psycho and neurophysiological evaluation of dreams.
- Keywords:** Psychophysiology; Sleep and dreams; Electroencephalogram (EEG)
- Indexed papers:** N/A

**Project:** 1994-14  
**Title:** As vozes do Medium  
**Duration:** 1994/12 – 1998/03  
**Researcher(s):** Dr. Vítor Rodrigues, Dr. José Paulo Castro, Dr. Maria da Graça Margarido  
**Institution:** Faculdade de Psicologia de Lisboa (Portugal)  
**Results:** N/A  
**Keywords:** Parapsychology; Survival after bodily death; Mediumship  
**Indexed papers:** N/A

**Project:** 1994-20  
**Title:** Previsiologia de fenómenos estocásticos, ondas cerebrais e fractalimos  
**Duration:** 1994/12 – 1998/03  
**Researcher(s):** Eng. António Cacho, Dr. Raul Berenguel  
**Institution:** Universidade Moderna, Porto (Portugal)

**Results:** In the area of Parapsychology, the experiences of Prof. Rhine were decisive, as well as the one of Pratt and Woodruff. The study of certain individuals having the ability to foresee stochastic events, were studied intensely in its statistical slope. This Project of Investigation sought to repeat the classical tests, introducing a new study element: the variations of the cerebral waves Alpha, Beta and Theta (7,9/13 Hz - 3,9/7,9 Hz - 13/20 Hz), and the use of disturbance factors: a generator of high-frequency electric field (Tesla type), a radio-frequency generator and an audio-frequency generator. 237 validated experiments were taken, with a margin of experimental error estimated in 6,5%. This study suggests that special phenomena of foreseeing don't exist, if the subject doesn't surpass a rate of successes of 40%. The introduced disturbance factors didn't have relevance in the aspects of radio-frequency and audio, not representing the distributions, private variations. On the other hand, the generator of electrical field shows

that the subject can be driven to a state of “confusion” that turns him unable to obtain normal results. In this matter, the curve without interference’s possesses a maximum at 20% of successes, and with the interference, it possesses a maximum in 8% of successes.

These findings reveal an unsuspected probability of a “psi-missing” factor in the presence of an electrical alternate field (30 KV/10 KHz at 1 m).

Keywords: Psychophysiology and Parapsychology; Extrasensory perception (ESP); Precognition

Indexed papers: N/A

**Project: 1994-23**

Title: Fenómenos de carácter premonitório e situações de crise

Duration: 1994/12 – 1997/12

Researcher(s): Prof. Amílcar Rodrigues Augusto, Dr. Maria Piedade Baltazar, Ms. Maria Alice Rato, Dr. Nuno Cabral, Dr. António José Pinto Ribeiro, Ms. Felicidade Alves

Institution: Centro de Saúde da Foz do Douro, Porto (Portugal)

Results: N/A

Keywords: Parapsychology; Extrasensory perception (ESP); Precognition

Indexed papers: N/A

**Project: 1994-24**

Title: Estudo experimental da relação entre a activação emocional subliminar e a actividade fisiológica durante o reconhecimento implícito ou explícito

Duration: 1994/12 – 1997/01

Researcher(s): Prof. Pedro Barbas de Albuquerque, Dr. Teresa Freire, Dr. Mário Gonçalves

- Institution:** Laboratório de Psicologia da Universidade do Minho, Braga (Portugal)
- Results:** The aim of this study was to analyse the relationship between the subliminal activation of emotional stimuli (facial expressions and verbal expressions) and the peripheral physiological activity enhanced during two implicit memory tasks (fragment completion and forced choice phrase completion) and two explicit memory tasks (free recall and forced choice recognition). The theoretical framework that oriented this research was the discussion that characterizes the memory as a system where there is no discontinuity between implicit and explicit memory and, on the other hand, their opponents that emphasize the distinction (structurally and process-wise) between implicit and explicit memory. This last theoretical position postulates the impossibility of subliminal activation producing behavioural answers in explicit memory performance. And, on the other hand, it is not possible that supraliminal/attention oriented tasks cannot produce implicit memory changes. The processes of retrieval are the base for those postulations. Results showed that: (1) emotional stimuli presented subliminally induced a clear priming effect in implicit memory tasks (fragment completion and forced choice phrase completion); (2) this effect is independent of the stimuli category (emotional verbal words or emotional facial expressions); (3) the peripheral physiological activity presented in the memory tasks is positively correlated with the task difficulty; (4) there are no statistical differences between the physiological activity and the valence of the stimuli (positive versus negative); (5) implicit memory performance and explicit memory performance are dissociated.
- Keywords:** Psychophysiology; Cognitive processes; Memory; Emotion
- Indexed papers:** N/A
- Project:** **1994-27**
- Title:** Prática psicoterapêutica e aumento da percepção
- Duration:** 1995/01 – 1998/03

Researcher(s): Dr. Ana Paula Moita, Dr. António Martins da Costa, Dr. Manuel Domingos

Institution: Centro das Taipas, Lisboa (Portugal)

Results: With this work we tried to evaluate a hypothetic increase of paranormal capacities (clairvoyance, telepathy and precognition) among psychotherapists considering that their clinical practice might be a kind of training for such capacities. We also tried to find an association between such capacities and changes on brain electrical activity. For this purpose a group of 23 psychotherapists was evaluated and compared with a control group. Both groups were evaluated for clairvoyance, telepathy and premonition. Results seem to adjust to what should be expected if subjects answered randomly. Subjects showed no consistent results in the different experimental tasks. Results showed no significant difference between both groups in what concerns the parapsychological phenomena under evaluation. No important EEG changes were found. No evidence was found suggesting that psychotherapeutic practice might be a valid training for telepathy, clairvoyance or premonition. About 80% of subjects said having experienced or having been testimonies of some kind of paranormal occurrence.

Keywords: Parapsychology and Psychophysiology; Extrasensory perception (ESP); Precognition; Telepathy; Clairvoyance; Electroencephalogram (EEG)

Indexed papers: N/A

**Project:** 1994-30

Title: Physiological responses to spiritual stimuli; prayer and healing

Duration: 1994/12 – 1997/08

Researcher(s): Prof. Joseph Conboy

Institution: Universidade Ciências Exactas e Humanas, Faro (Portugal)



- Results:** Student volunteers from a Portuguese university ( $N = 217$ ) completed two inventories: Personal Belief System and Attitudes towards Meditation. A subset ( $N = 78$ ) completed a laboratory study of physiological response to meditative prayer. Half of the subjects meditated with a neutral, sub-vocal, mental device, and then shifted to a mental device consistent with the individual's belief system. Half reversed the order. EEG and skin conductance data were recorded as well as subjective reaction to the meditation.
- It was theorized, following the work of Benson (1996) that the use of a belief system-consistent device would elicit states of repose more profound than those elicited with a neutral device. In the second half of the experiment, the group using the belief system-consistent device showed a marked increase in alpha activity. Both subjects with strong religious and non-religious components in their personal belief systems reported more positive feelings toward the meditation experience. Correlational evidence suggests an individual difference factor: A possible trait of high and low alpha-emitting groups emerges after a period of 8-9 minutes in the relaxed state brought on by the Benson technique. The high alpha group displayed externality of causality and a greater religious component in their belief systems.
- The evidence suggests that the technique of meditative prayer may be a useful therapeutic tool to assuage the cognition-emotion-stress link. The existence of a strong personal belief system—religious or non-religious—seems fundamental to the efficacy of this coping mechanism. Major limiting factors may include the necessity to practice the technique and a possible trait predisposition for the benefits of the technique.
- Keywords:** Parapsychology and Psychophysiology; Spiritualism; Religious beliefs/experiences; Altered states of consciousness; Meditation; Electroencephalogram (EEG)
- Indexed papers:** N/A
- Project:** 1994-34
- Title:** Indicadores biológicos de eventos psíquicos cognitivos e semânticos

Duration: 1994/12 – 1997/01  
Researcher(s): Prof. José Luís Simões da Fonseca, Dr. Maria da Purificação Horta, Dr. Isabel Barahona da Fonseca  
Institution: Instituto de Psicologia da Faculdade de Medicina de Lisboa (Portugal)  
Results: N/A  
Keywords: Psychophysiology; Brain; Cognitive processes; Emotion; Electroencephalogram (EEG)  
Indexed papers: N/A

**Project: 1994-41**

Title: Estados modificados de consciência: 1. Psiconeurofisiologia da terapia pelo imaginário vivencial regressivo personalizado (TIVRP) 2. Valor terapêutico da terapia, em duas sessões  
Duration: 1994/12 – 1998/03  
Researcher(s): Prof. Mário Simões, Dr. Maria Teresa Pimentel, Dr. Paula Esperança, Dr. François Gysin, Dr. José Correia  
Institution: Instituto de Psicologia da Faculdade de Medicina de Lisboa (Portugal)  
Results: 1. Psychoneurophysiology (placebo/suggestion versus therapeutic/ interactive technique):  
a) EEG  
– There was a significant decrease of the alpha/ theta ratio in the placebo sessions compared to the therapeutic sessions (increasing theta activity in both hemispheres, with compensatory decreasing alpha amplitude).  
– There are no significant differences in the left/ right hemisphere relation in both sessions  
– It seemed that cure depends on the amount of theta activity during the session (at least 30% of the total).  
– Comparing alpha/ beta ratio between both types of sessions no significant differences were found

- b) Skin conductance - no significant differences found
- c) Superficial muscle activity (EMG) - no significant differences found
- d) Plethysmography
  - No significant differences concerning pulse frequency;
  - There is significant increase of pulse amplitude during therapeutic sessions
- e) Placebo and therapeutic sessions are clearly separated from a neurophysiological point of view and both differentiate from sleep and dream
- f) Though clusters of patients were not found in either session, patients neurophysiologically resemble each other in the therapeutic sessions

## 2. Therapeutic results

Evaluated six months after the end of the treatment a third of the patients had completely stopped using daily analgesics as they did before. Other third significantly reduce headache frequency and intensity. The remaining showed no differences to the former state. It was felt that two therapeutic sessions were not enough in order to have better results.

Keywords: Psychophysiology and Parapsychology; Altered states of consciousness; Intervention: Electroencephalogram (EEG)

Indexed papers: N/A

## **1996/97 Projects**

**Project:** 1996-04  
**Title:** Influence of the mind on a moving robot  
**Duration:** 1997/01 – 2000/08  
**Researcher(s):** Dr. René Peoc'h  
**Institution:** Institut de Psychophysique, Nantes (France)

**Results:** We studied the action of the mind on a robot moving at random on the floor.  
 Usually the robot moves only at random when it is alone in a

room. But when an observer looks at it, its path changes. We studied the action of young chicks on the path of a robot.

The random number generator is located 23 kilometers away, far from the chicks. The robot is driven via telephone line by the random generator.

The chicks are in a cage near the robot. The aim of the experiment is to know if chicks are able to influence the random generator so that the robot moves towards their cage. Chicks are interested in the robot because it is bearing a candle as the unique source of light in the room. They don't like darkness.

80 groups of 7 chicks were used to test their ability to influence the trajectory of the robot bearing the candle.

When chicks are present, the robot moves preferentially towards them (67% out of 80 trials). This is significantly different from the non-specific displacement of the machine in the absence of chicks and observer ( $p < 0.00001$ ). When the robot is alone without chicks, it moves only at random.

The random generator being the source of movement, this suggests that chicks are able to influence it over a long distance.

Keywords: Parapsychology; Psychokinesis (PK); Animal psi

Indexed papers: N/A

**Project: 1996-06**

Title: Comportamento de terapeutas e clientes face ao sobrenatural

Duration: 1997/01 – 1999/03

Researcher(s): Dr. José P. Martins

Institution: Centro de Estudos Educação e Psicologia, Universidade do Minho (Portugal)

Results: The author, through an inquiry made to three populations (psychotherapists, clients and population in general), tries to achieve possible influences of the supernatural, mainly the religious, with mental health in general and psychotherapy in particular.

The results confirm the high rate of Portuguese religiosity, when it is understood in a traditional way (extrinsic religios-

ity). This doesn't happen when religiosity complies with bigger authenticity criteria (intrinsic religiosity). It also confirms the increasing tendency of living the belief in a spirituality context rather than in an official religious context.

Concerning to the supernatural/mental health interaction, it was verified that when psychotherapists and clients speak in a self-way there is a tendency to undervalue the supernatural influence in the health context. When they speak by others, they agree that the supernatural means are the most questioned, chiefly the religious ones in chronic situations.

In the religion/psychotherapy binomial, the results expose the importance of the religious context verbalization, and, on the other hand, suggest that that doesn't happen frequently. The religious interference in crucial moments of the therapeutical process, such as decision, choice of the psychotherapist, and the alliance's establishment, is undervalued in global terms, but overvalued by the minority who identifies themselves with the "intrinsic religiosity" kind.

The author ends his work with few questions suggested by the results of the present investigation and finishes saying that it is no longer licit to talk globally about religiosity versus mental health, but "kinds of religion" versus mental health and psychotherapy.

Keywords: Parapsychology; Spiritualism; Religious beliefs/experiences; Intervention

Indexed papers: N/A

**Project:** 1996-07

Title: Human sensitivity to environmental energy fields - considering the role of electromagnetic fields as noised-based stressors and their relationship to psi phenomena

Duration: 1997/01 – 1998/10

Researcher(s): Dr. Paul Stevens, Dr. Robert Morris

Institution: Department of Psychology, The University of Edinburgh (UK)

**Results:** The first study (Stevens, 1997) looked at conscious responses to changes in 50 T magnetic fields (MF) at frequencies below 40 Hz, but found they did not appear to correlate with the field's presence. Feedback training attempts to improve accuracy were also unsuccessful. However, skin conductance (SC) levels showed an overall increase when any of the MFs were present. There were also suggestive trends indicating that the magnitude of MF-related SC increases was positively correlated to Field Dependency and success at rule-based pattern matching and negatively correlated to reports of previous ESP or PK experiences. The second study (Stevens, 2001) investigated the idea that the emotion associated with visual stimuli would be altered during concurrent exposure to a MF (50 T, 20 Hz). Although in the predicted direction, neither SC nor arousal ratings showed statistically significant changes. The affective content rating did show a significant difference ( $p = 0.041$ ), with images viewed under MF exposure having a more positive affect rating. Post-hoc analysis also showed individual differences in subjects' SC profiles, with 48% showing lower SC during MF exposure 34% showing no apparent reaction, and 17% showing an increased SC. Overall ratings given by each of the groups appeared to relate to these profiles. Finally, data was also used in a third study (Stevens, 2000) which found an overall scale-invariant pattern in DMILS data that was comparable to that seen in the MF exposure data, possibly indicating similarities between DMILS and magnetic response mechanisms.

**Keywords:** Parapsychology; Magnetic field

**Indexed papers:** Stevens, P. (2003). An investigation into alleged 'hauntings'. *British Journal of Psychology*, 94(2), 195-211. doi: 10.1348/000712603321661886

Stevens, P., Wiseman, R., Watt, C., Greening, E. & O'Keeffe, C. (2002). An investigation into the alleged haunting of Hampton Court Palace: Psychological variables and magnetic fields. *Journal of Parapsychology*, 66(4), 387-408.

Stevens, P. (2001). Effects of 5s exposures to a 50  $\mu$ T, 20 Hz magnetic field on skin conductance and ratings of affect and arousal. *Bio-electromagnetics*, 22(4), 219-223. doi: 10.1002/bem.44

**Project:** 1996-08  
**Title:** The search for a Psi-mediated event-related desynchronization  
**Duration:** 1997/01 – 1997/12  
**Researcher(s):** Dr. Edwin May  
**Institution:** Laboratories for Fundamental Research, Cognitive Science Laboratory, Palo Alto (USA)

**Results:** As part of our ongoing search for neurons in the central nervous system that are specialized for sensing anomalous cognition (AC), we conducted an experiment to detect event-related desynchronizations (ERD's) resulting from an AC stimulus. An ERD is the abrupt and momentary decrease of alpha power as a reaction to an external stimulus or an internal cogitative or motion-initiating trigger. Three receivers (i.e., experiment participants) contributed a total of 70 trials during which both AC and EEG data were collected. The AC data, which have been blind judged by the usual rank-order method, yielded independently significant results for two of the three receivers, and the overall AC result was significant at  $p = 0.006$  ( $ES = 0.303$ ). Using a cross correlation technique, which was twice as sensitive as standard signal averaging, we did not observe any evidence for an ERD in response to an AC stimulus. Our analysis technique was sensitive enough to detect a 20% decrease of prestimulus alpha power. We provide a number of potential arguments to understand this result and suggest an experiment using positron emission tomography to continue the search for an AC correlate in the central nervous system.

**Keywords:** Parapsychology and Psychophysiology; Extrasensory perception (ESP)

**Indexed papers:** N/A

**Project:** 1996-09  
**Title:** Estudo electroencefalográfico em estados ampliados de consciência induzidos pela terapia regressiva vivencial Peres

- Duration: 1997/01 – 2000/04
- Researcher(s): Dr. Maria Julia Prieto Peres, Dr. Ivana Prates de Oliveira, Dr. Joana El-Afiouni, Dr. Juliane Prieto Peres, Dr. Dionísio Azevedo Jr.
- Institution: Instituto Nacional de Terapia de Vivências Passadas de São Paulo (Brazil)
- Results: Traumatic memories are frequently associated with psychogenic symptoms and to the origin of belief systems responsible for dysfunctional behavior patterns. It is advisable, when treating sufferers of traumatic memories, to make use of procedures based on assisted therapeutic exposure, with the objective of not only removing the feeling of extreme vulnerability, but also rebuilding the basic beliefs acquired during the traumatic event.
- This study examined whether quantitative electroencephalography (QEEG) could descry differences in brain function in sufferers of traumatic memories submitted to a standardized psychotherapeutic session which includes relaxation, retrieval of traumatic memory, conscience of automatic thoughts & emotion, cognitive redecision and finalization.
- Electroencephalograms (20-channel) were recorded from 20 patients with recurrent traumatic memories (accident, sexual violence and robbery) acting as determinants for the affected behavioral patterns. QEEG recordings were performed during the course of the psychotherapeutic session and the data were compared to the baseline condition. Both absolute and relative amplitudes were simultaneously analyzed at delta (0,5 –3,9 Hz), theta (4-7,9 Hz), alpha (8-11,9 Hz) and beta (12-18 Hz) frequencies.
- The present study showed significant changes in the cerebral electrobiogenesis associated with the retrieval and reconstruction of traumatic memories during the standardized psychotherapy session. It is assumed from the electroencephalographic findings that the psychotherapeutic approach applied conducts the individual through consistent neurophysiologic changes that suggest amplified states of consciousness, which facilitate the psychotherapeutic process.



Keywords: Parapsychology and Psychophysiology; Intervention; Altered states of consciousness; Electroencephalogram (EEG)

Indexed papers: N/A

**Project: 1996-11**

Title: Precognition - possibilities, probabilities and events

Duration: 1997/01 – 1998/12

Researcher(s): Dr. Fiona Steinkamp, Dr. Robert Morris, Dr. J. Milton

Institution: The University of Edinburgh, Scotland (UK)

**Results:**

Literature Review:

This paper details a research program for determining whether precognition is of a fixed or a changeable future.

Meta-analysis of experiments comparing clairvoyance and precognition:

The 22 studies yielded significant evidence for both clairvoyance and precognition with no difference in effect size (*ES*) between clairvoyance (*ES* = .009) and precognition (*ES* = .010). Thus the meta-analysis yielded no evidence that precognition is explicable through a clairvoyance and inference model.

Survey:

167 first-hand precognitive experiences were submitted by respondents. People who acted on their premonitions fell into two distinct groups. One group acted as if they foresaw events that could be prevented (e.g., a car crash). The other group scored low on the neuroticism scale and acted on their experience irrespective of the type of event foreseen. The majority of respondents were women and the experiences were usually about men, regardless of the respondent's sex. Most experiences were dreams. The study replicated a previous finding that women over 45 who reported having had their first precognitive experience early on in life were significantly more likely to have fewer children than those who did not report having had their first precognitive experience until later.

Postal Experiment comparing clairvoyance and precognition:

Overall the results were at chance. However, when the clairvoyance and precognition trials were considered separately, the

clairvoyance condition yielded significant results ( $N = 60$ ,  $p = .05$ ) whereas the precognition one was at chance ( $N = 59$ ,  $p = .5$ ). The difference between the two conditions was significant ( $p = .01$ ). Thus this experiment yielded no evidence for precognition.

Keywords: Parapsychology; Extrasensory perception (ESP); Precognition; Clairvoyance

Indexed papers: Steinkamp, F. (2000). Does precognition foresee the future? A postal experiment examining the possibility of true precognition. *Journal of Parapsychology*, 64(1), 13-18.

Steinkamp, F. (1999). Testing clairvoyance and precognition by manipulating probabilities: A conceptual assessment of the experimental literature. *Journal of Parapsychology*, 63(2), 99-130.

Steinkamp, F., Milton, J., Morris, R. (1998). A meta-analysis of forced-choice experiments comparing clairvoyance and precognition. *Journal of Parapsychology*, 62(3), 193-218.

**Project: 1996-14**

Title: É possível a comunicação telepática com os doentes em coma?  
- Um estudo exploratório

Duration: 1997/01 – 2002/05

Researcher(s): Dr. Irene Ferreira

Institution: Universidade de Ciências Médicas de São Paulo (Brazil)

Results: N/A

Keywords: Parapsychology; Extrasensory perception (ESP); Telepathy; Altered states of consciousness; Survival after bodily death; Near-death experience

Indexed papers: N/A

**Project: 1996-21**

Title: Experimental investigation of physiological response to distant mental healing

Duration: 1997/01 – 1997/12  
 Researcher(s): Dr. Dean Radin, Dr. Jeanine Rebman, Dr. Wellington Zangari  
 Institution: Harry Reid Center for Environmental Studies, University of Nevada, Las Vegas (USA)

Results: Two double-blind experiments explored the effects of healing intention directed towards a distant person. The distant person's respiration, heart rate, fingertip blood volume, and spontaneous electrodermal activity were continuously monitored during 20 randomly counterbalanced oneminute "treatment" and control epochs. The first experiment examined the effects of a group's healing intention directed in real-time at volunteers isolated 200 meters away. The second experiment studied the effects of Umbanda mediums who directed their healing intentions from Sao Paulo, Brazil, towards volunteers who were monitored two months earlier in Las Vegas, Nevada. The first study showed that the groups' healing intention was associated with an increase in breathing rate ( $p = 0,053$ , two-tail) and a decrease in electrodermal activity ( $p = 0.055$ , Two-tail) in the distant volunteers. The second study showed that despite a separation of 6,000 miles in space and two months in time, the mediums' healing intention was associated with an increase in fingertip blood volume ( $p = 0.013$ , Two-tail) and an increase in electrodermal activity ( $p = 0.031$ , Two-tail) in the distant volunteers. Possible alternative explanations for the reponed effects are considered, and the experimental outcomes and methodological implications are discussed.

Keywords: Parapsychology and Psychophysiology; Healing; Healing and praying

Indexed papers: N/A

**Project:** 1996-25  
 Title: Crises pseudo-epiléticas: um estudo psicofisiológico  
 Duration: 1997/06 – 2002/04  
 Researcher(s): Prof. Maria Sande e Lemos, Dr. António Martins, Dr. Ana Martins Farinha

Institution: Laboratório de EEG / Faculdade de Medicina de Lisboa (Portugal)

Results: N/A

Keywords: Psychophysiology; Diseases/Injuries; Epilepsy

Indexed papers: N/A

**Project: 1996-26**

Title: The gradient of Shannon's entropy as an intrinsic target property

Duration: 1997/01 – 1998/03

Researcher(s): Dr. Edwin May

Institution: The Laboratories for Fundamental Research, Palo Alto (USA)

Results: We invited five experienced receivers (i.e. experiment participants) to contribute 15 trials each. The target pool consisted of 300 carefully chosen digital images from a set of 20,000 pictures from the Corel Stock Photo Library of Professional Photographs. The trial protocol was controlled by email and feedback was provided on the World Wide Web. A figure of merit was based upon a fuzzy-set encoding of the targets and responses. The primary hypotheses were that a significant correlation would be seen between the figure of merit quality assessment and the gradient of Shannon's entropy for the associated target, and that the correlation using the rating assessment would be consistent with earlier findings. A secondary hypothesis was that the figure of merit quality would not correlate with the entropy of the associated target. All hypotheses were confirmed. The correlation of the figure of merit with the entropic gradient was significant (Spearman's  $p = 0.212$ ,  $df = 73$ ,  $p = 0.034$ ). The Spearman's  $p$  for the correlation with the entropy was  $0.042$ ,  $df = 73$ ,  $p = 0.361$ . The combined correlation using the rating assessment for the static targets in the previous studies led to a Spearman's  $p = 0.161$ ,  $df = 41$ ,  $p = 0.152$ ; where as in this study  $p = 0.183$ ,  $df = 24$ ,  $p = 0.188$ .

- The consistency with our earlier rating correlation and the robustness with the figure of merit assessment are surprising given that there was little evidence overall in the study for AC as measured by the rank-order method (i.e. *mean rank* = 2.93, *ES* = -0.005, *z* = -0.041, and *p* = 0.484).
- Keywords:** Parapsychology; Anomalous cognition/experiences; Superior psi ability; Assessment tools
- Indexed papers:** May, E., Spottiswoode, J., & Faith, L. V. (2000). The correlation of the gradient of Shannon entropy and anomalous cognition: Toward an AC sensory system. *Journal of Scientific Exploration*, 14(1), 53–72.
- Project:** 1996-27
- Title:** Investigação teórica e experimental de processos perceptivos cognitivos e afectivos e estruturas da personalidade e aplicações em psicopatologia e reabilitação em baixa visão
- Duration:** 1997/01 – 2001/10
- Researcher(s):** Prof. José Luís Simões da Fonseca, Prof. Luísa Figueira, Prof. Carmen Araújo, Prof. José Manuel Félix da Costa, Prof. Maria da Purificação Horta, Dr. Isabel Barahona Fernandes Simões da Fonseca, Dr. Sílvia Ouakinin, Dr. José Barahona da Fonseca
- Institution:** Faculdade de Medicina de Lisboa (Portugal)
- Results:** N/A
- Keywords:** Psychophysiology; Brain; Cognitive processes; Emotion; Electroencephalogram (EEG)
- Indexed papers:** Barahona da Fonseca, J., Barahona da Fonseca, I., Araújo, C., Simões da Fonseca, J. (2000). A quantum theoretical approach to information processing in neural networks. In D. M. Dubois (Ed.), *Computing Anticipatory Systems* (Vol. 517, pp. 330-344). Melville: Amer Inst Physics.
- Simões da Fonseca, J. (1998). A medical prescription for a mind. In D. M. Dubois (Ed.), *Computing Anticipatory Systems* (Vol. 465, pp. 65-71). Melville: Amer Inst Physics.
- Barahona da Fonseca, J., Barahona da Fonseca, I., Simões da Fon-

seca, J. (1997). Cognitive processes in social interactions - A neural networks' approach. In J. Mira, R. MorenoDiaz & J. Cabestany (Eds.), *Biological and Artificial Computation: From Neuroscience to Technology* (Vol. 1240, pp. 660-667). Berlin, Germany: Springer-Verlag Berlin. doi: 10.1007/BFb0032526

**Project:** 1996-31  
**Title:** Indução de emoções em contextos artificiais: análise das representações fisiológicas e cognitivas  
**Duration:** 1997/06 – 2000/08  
**Researcher(s):** Prof. Pedro Barbas de Albuquerque, Dr. Ângela Maia  
**Institution:** Laboratório de Psicologia da Universidade do Minho, Braga (Portugal)

**Results:** The aim of this study was to analyse the relation between emotion induction in artificial settings (e.g., laboratory) and the self-report measures and physiological activation. The problem that we tried to answer was that it is very difficult to study emotions in natural settings. Due to that fact, literature shows that the majority of studies apply several emotion induction procedures (mental imagery, Velten technique, immersion, etc.) despite very poor evidence that those procedures effectively produce emotional states. We use pictures to produce emotional states.

Results showed:

(1) aversion (versus sadness and happiness) is the emotion that is more intensively induced in laboratory, and that intensity was measured through physiological activation (GSR, HR, EMG orbicularis); (2) sadness and happiness had a very basal peripheral activation; (3) sadness is the emotion that was self-reported with more intensity; (4) there is no relation between the physiological activation and the self-report of the emotional experience; (5) memory congruence, one of the techniques to study the emotional inducing reliability shows that sadness is the emotion that produces better results (memory congruent hypothesis).

The results of that study revealed that the emotional induction in artificial settings is not reliable to all emotions. In fact, hap-

piness is very difficult to produce in those contexts, and sadness is the emotion that results in more consonance between processing of information, self-report evaluation and peripheral activation.

Keywords: Psychophysiology; Emotion; Cognitive processes; Memory

Indexed papers: N/A

**Project: 1996-33**

Title: Noção do tempo e parâmetros dos ritmos psicofisiológicos

Duration: 1997/04 – 2000/07

Researcher(s): Prof. Carlos Fernandes da Silva, Prof. Simon Folkard, Dr. Jorge Silvério, Dr. Anabela Pereira, Dr. Ana Allen Gomes

Institution: Laboratório de Psicologia da Universidade do Minho, Braga (Portugal)

Results: In an experimental study, with 23 indifferent diurnal type male students, we tested the association between amplitude of the biological rhythms and the Time Awareness Questionnaire (TAQ) values.

The participants followed a structured life time table for 13 days. On the 14th day they did not go to bed until 9.30 a.m. of the 15th day (phase inversion).

Only core body temperature, heart rate and blood pressure show a relationship with time awareness: the time awareness increases with the amplitudes of circadian rhythms of the core body temperature ( $r = 0,66$ ;  $p = .000$ ), of the heart rate ( $r = 0,61$ ;  $p = .000$ ) and of the blood pressure ( $r = 0,51$ ;  $p = .000$ ). We found that only the sleep complaints ( $t = -2,940$ ;  $df = 21$ ;  $p = .008$ ) and fatigue ( $t = -3,886$ ;  $df = 19$ ;  $p = .001$ ) increase significantly after the night without sleep, and it is the group with strong time awareness that show more increasing.

The actigraph monitoring show that in the phase inversion, participants with strong time awareness presented poorer sleep quality than individuals with weak time awareness when they slept during the diurnal phase of the 15th day, and better wakefulness than the individuals with weak time awareness when they do not sleep during the night.

In an ex post facto study, with 100 Portuguese textile male shift workers, working in a weekly rotate system (midnight-8 a.m.; 8 a.m.-4 p.m.; 4 p.m.-midnight) during 20,97 years (mean;  $SD = 2,72$ ), aged between 36 and 54 years ( $M = 45$ ;  $SD = 3,12$ ), we found that the participants with strong time awareness had less cardio-vascular and gastro-intestinal complaints, better physical and mental health, when compared with the participants with weak time awareness.

Keywords: Psychophysiology; Cognitive processes; Perception

Indexed papers: N/A

**Project: 1996-34**

Title: Correlatos psicofisiológicos da percepção visual de movimentos simultâneos

Duration: 1997/03 – 2000/06

Researcher(s): Prof. Jorge Almeida Santos, Prof. Carlos Fernandes da Silva, Dr. Paulo Machado, Prof. Pedro Barbas de Albuquerque, Dr. Miguel Velhote Correia, Dr. Manuel Domingos

Institution: Laboratório de Psicologia da Universidade do Minho, Braga (Portugal)

Results: N/A

Keywords: Psychophysiology; Cognitive processes; Perception; Assessment tools

Indexed papers: N/A

**Project: 1996-35**

Title: Observatório nacional de fenómenos paranormais e afins

Duration: 1997/03 – 2001/07

Researcher(s): Prof. Carlos Fernandes da Silva, Prof. Stanley Krippner, Dr. Sérgio Razente, Dr. Manuel Domingos, Dr. Constança Azevedo

Institution: Laboratório de Psicologia da Universidade do Minho, Braga (Portugal)



## Results:

This experimental research on psi effect considers the outcome in Random Event Generator (REG) such as a high extrachance score of the extra sensory perception (ESP) test, can be associated with a causal random process. We tested 62 individuals, group A, of both sexes. They chose 200 times five symbols test (like Rhine zener cards). Group B was obtained by computer programme and had the same 62 virtual subjects. We correlated group A with group B to obtain group C, and 1981 combinations were done for each group. One way that we wanted to show that there is a causal random process, is the following: If the algorithm of the computer (pseudo-random generator) can produce high extrachance scores in B, then the psi effect in A and C can also be a result of the same process. There were many people who got extrachance scores (55 to 60 hits) and the computer did obtained the same outcome, in accordance with our predicted model.

GROUPS	Correlation ( <i>bits</i> )						Total
	<i>P=0.01</i> 55 <i>bits</i>	56 <i>bits</i>	57 <i>bits</i>	58 <i>bits</i>	59 <i>bits</i>	<i>P=0.00047</i> 60 <i>bits</i>	
A	16	10	11	8	2	2	49
B	14	7	9	0	4	2	36
C	5	7	6	3	2	2	25
<b>Total</b>	35	24	26	11	8	6	<b>110</b> $\chi^2 = 9.86$

A, B and C are stochastic independent events which were maintained in the category of randomness by  $\chi^2 = 9.86$  ( $p > 0.10$ ). Nevertheless, there is a widely spread fluctuation of the hits. All Groups showed  $p$  - values between 0,01 and 0.00047. The probability to obtain 60 hits is 1 in 2128 combinations while we found 2 in 1981. In conclusion: any stochastic process can be a factor to increase correlated scores in ESP test; therefore, as in Psychology, in Parapsychology we have a great problem with the decisions about  $p$  - values.

## Keywords:

Parapsychology; Anomalous cognition/experiences; Paranormal belief

## Indexed papers:

N/A

**Project:** 1996-41  
Title: Psicofisiologia das memórias afetivas em toxicodependência  
Duration: 1997/01 – 2004/04  
Researcher(s): Dr. José Correia, Dr. José Manuel Pinto de Pádua, Dr. Gláucia Lima Correia, Dr. Carla Scherer  
Institution: AREA Lisboa (Portugal)  
Results: N/A  
Keywords: Psychophysiology; Cognitive processes; Memory; Mental health; Substance-related disorders; Emotion; Motivation  
Indexed papers: N/A

**Project:** 1996-42  
Title: Aspetos psicofisiológicos do transe mediúnico  
Duration: 1997/01 – 2005/05  
Researcher(s): Dr. Gláucia Lima Correia, Dr. José Correia, Dr. Carla Scherer  
Institution: AREA Lisboa (Portugal)  
Results: N/A  
Keywords: Parapsychology and Psychophysiology; Mediumship; Altered states of consciousness; Trance  
Indexed papers: N/A

**Project:** 1996-43  
Title: Abordagem intergeracional da organização bio-comportamental e representacional da vinculação em mães e filhos - 2ª fase: Estudo com suporte num sistema de informação multimédia  
Duration: 1997/01 – 1999/04  
Researcher(s): Prof. Isabel Soares, Prof. João Paulo Silva Cunha, Prof. Maria Carolina Costa e Silva, Prof. Ovídio Costa, Prof. Pedro Lopes dos Santos

- Institution: Centro de Medicina Desportiva do Porto (Portugal)
- Results: We developed a multimedia system, a full digital solution, named BioBeAMs – Bio-Behavioral Attachment Multimedia System – that enables the synchronous collection of video and audio information and ECG signals during the Strange Situation, an experimental procedure aimed to assess the quality of the attachment relation between the infant and his/her attachment figure.  
A camcorder is connected to a digital video acquisition board plugged into a PC computer bus. This board enables the digital acquisition of video and audio data to the PC hard disk at up to 30 frames per second with a compression rate up to 20:1 provided by a dedicated video processor corresponding to a throughput of 800 Mb/hour approximately. The bio-signal is acquired by portable units attached to the participants that send the digitized signals to the PC through standard serial ports. BioBeAMs permits multimedia reviewing and editing procedures.  
After the multi-integrated acquisition of video and the bio-signals, the researcher can visualize in real-time all the informations: the video is displayed in a window and the corresponding bio-signal is displayed on another window, where a dynamic cursor shows the bio-signal sample that corresponds to the video frame played at that moment. The researcher can then stop, watch frame by frame, set episode's boundaries, add event labels or write notes to the scene being analyzed, using the mouse which is a very convenient way for users. BioBeAMs provides also score sheet dialog boxes for rating, one for the final result and three for individual raters, allowing several raters to evaluate the instance or the episode independently. It also provides a dialog box for processing the results, e.g., grouping the cases, saving to file and exporting to MS Excel.
- Keywords: Psychophysiology; Attachment; Assessment tools
- Indexed papers: Zhan-Jian L., Soares, I., Silva, C. F., Pinho, A., Neves, L, Costa, O. & Cunha, J. P. (1998). A multimedia system for assessment of attachment organizations and heart rate. In H. K. Chang & Y. T. Zhang (Eds.), *Proceedings of the 20th Annual International Conference of the Ieee Engineering in Medicine and Biology Society: Biomedical Engineering Towards the Year 2000 and Beyond* (Vol. 20, pp. 1226-1229). New York: IEEE.

**1998/99 Projects**

- Project:** 1998-02
- Title:** Biological and psychological features of anxious symptoms in children
- Duration:** 1998/12 – 2000/12
- Researcher(s):** Prof. Jerome Kagan, Prof. Nancy Snidman, Prof. Mark McManis
- Institution:** Harvard University, Cambridge (USA)
- Results:** A group of 237 children were seen at 11 years of age. These children had been followed from 4 months to 11 years. Some of the children had been categorized at 4 months as high reactive and some as low reactive. The high reactives, compared with the low reactives, were more likely to show at age 11 greater activation of the right hemisphere, a larger evoked potential from the inferior colliculus, greater magnitude of waveforms in the event related potential to discrepant scenes, and greater activation of the sympathetic nervous system. These data imply that the high reactive infants preserved an inherited excitability of the amygdala and its projections from infancy to early adolescence. Furthermore high reactives were very shy and had anxious symptoms. These results point to the stability of temperamental biases favoring shy/avoidant vs, bold/sociable behavior.
- Keywords:** Psychophysiology; Developmental psychology; Psychosocial development
- Indexed papers:** Kagan, J. (2001). Biological constraint, cultural variety, and psychological structures. *Annals of the New York Academy of Sciences*, 935(1), 177-190. doi: 10.1111/j.1749-6632.2001.tb03480.x  
Kagan, J., & Snidman, N. (1999). Early childhood predictors of adult anxiety disorders. *Biological Psychiatry*, 46(11), 1536–1541. doi: 10.1016/S0006-3223(99)00137-7

- Project:** 1998-06
- Title:** A descriptive and correlational study of persons claiming spontaneous psi experiences
- Duration:** 1998/12 – 2001/12
- Researcher(s):** Dr. Daniel Montanelli, Dr. Alejandro Parra
- Institution:** Instituto de Psicología Paranormal, Buenos Aires (Argentina)
- Results:** Over two thirds of the sample ( $N = 432$ ) reported telepathy experiences, ESP dreams, out-of-body experiences, and many forms of spiritual contacts. Two thirds indicated that their experiences had been conflictive, although also indicated never to have consulted. Those who did pointed out that relatives and friends were the persons most consulted. We compared them with a sample of students ( $N = 392$ ) using the t test. An average significantly greater of experiences in our sample than the one for the students ( $Mean = 6.12$  vs.  $3.19$ ,  $p_{dif} < .0001$ ). We also found that they felt more spiritual than that of the students ( $U$  of Mann-Whitney,  $p < .0001$ , one tail), but that it does not influence the experiences in our sample. The students' spirituality correlates positively and significantly with the report of experiences such as perception of lights/energies, and out-of-body experiences ( $p < .0001$ ).  
The emotional reactions towards anomalous experiences were explored in two studies using sub-sample of the first sample. The first one, three third parts ( $N = 32$ ) put emphasis on many types of fear. Wonder, perplexity, well-being, and anxiety also were reported. The score of conflictivity decreased significantly (4.85 to 1.70). The group activity enhanced their personal or spiritual development; others found a new meaning for their psi experiences, or feeling emotionally better, better interpersonal relationships, and new meaning in their life. The second one reports the results of psychometric tests. The results did not indicate abnormal traits or dissociation. The sample is emotionally stable and introverted. As sample, they obtained a high-scored schizophrenia and hypochondriasis (code 8-1) and maniacal over schizoids defense mechanisms.
- Keywords:** Parapsychology; Anomalous cognition/experiences; Spontaneous cases

Indexed papers: Gómez Montanelli, D., & Parra, A. (2005). ¿Las Experiencias Paranormales son psicológicamente perturbadoras? Una encuesta comparando estudiantes universitarios y aficionados a temas paranormales. *Revista Interamericana de Psicología*, 39(2), 285-294.

**Project: 1998-11**

Title: Investigation of animal-human telepathy

Duration: 1998/12 – 2000/11

Researcher(s): Prof. Rupert Sheldrake, Dr. David Jay Brown, Dr. Jane Turney

Institution: The Seven Experiments Project, London (UK)

Results: N/A

Keywords: Parapsychology; Extrasensory perception (ESP); Telepathy; Psychokinesis (PK); Remote staring/Being stared at; Animal psi; Animal & Human Psi

Indexed papers: Brown, D. J., & Sheldrake, R. (2001). The anticipation of telephone calls: A survey in California. *Journal of Parapsychology*, 65(2), 145-156.

Sheldrake, R. (2000). The “sense of being stared at” does not depend on known sensory clues. *Rivista Di Biologia-Biology Forum*, 93(2), 237-252.

Sheldrake, R., & Smart, P. (2000). Testing a return-anticipating dog, Kane. *Anthrozoos*, 13(4), 203-212.

**Project: 1998-13**

Title: The connection between psi and volitional competence in a non-western culture

Duration: 1998/12 – 2000/12

Researcher(s): Prof. Hoyt Edge, Prof. Luh Ketut Suryani, Prof. Deborah Delanoy

Institution: Rollins College, Florida (USA)

Results: We focused on two aspects of Balinese culture in this study: 1) an understanding of the Balinese notion of volition, and 2) an understanding of their psychic beliefs.

We created the Balinese Volitional Competency Questionnaire, an 82 question instrument based on a 5 point Likert scale, which 385 Balinese completed. A factor analysis did not yield sufficiently robust factors, but when analyzing only the 66 questions also used in the Edinburgh Volitional Competency Questionnaire, we found four factors in the Balinese sample matching four factors in the Edinburgh sample. These were: Persistence/Initiative (10 questions), Helping/Influencing Others (10 questions), Positive Self-image/Self-confidence (14 questions), and Handling Outside Influences (7 questions). Additionally, Prof. Suryani interviewed 10 people using a semi-structured format, and these reinforced the importance of the four factors, as well as supplied additional information. For instance, most of the high volitional subjects described significantly challenging life circumstances that were formative in developing their volition.

The second part of the study concerned the Balinese view of psychic phenomena. We collected 533 surveys containing questions about their psychic beliefs. These revealed a high level of belief in the ubiquity of psychic phenomena. For instance, over 75% of the respondents marked positively to the questions of whether ESP and PK exist. Interestingly, while belief in psi seems to be widespread in Bali, less than a quarter of them said that they could demonstrate these abilities. This finding is attributed to their view that psi abilities are possessed only special individuals and not by the general population.

Keywords: Parapsychology; Paranormal belief; Assessment tools

Indexed papers: N/A

**Project: 1998-15**

Title: Postmortem survival: A reappraisal of the evidence

Duration: 1999/01 – 2001/09

Researcher(s): Prof. Stephen Braude

Institution: University of Maryland Baltimore County (USA)

Results: For more than a century, researchers have studied cases suggesting the persistence of personal consciousness after bodily death. Some of these can be explained in terms of normal or abnormal processes. But that still leaves a significant residue of cases, which apparently can only be explained in terms of one of two strictly unfalsifiable hypotheses:

- 1) the survival of a purposeful and distinctive personal psychology, or
- 2) motivated, and apparently refined and extensive, psychic functioning among the living (presumably disguised unconsciously to present the appearance of survival)

These two hypotheses are traditionally called, respectively, the survival and super-psi hypotheses. Many books have already surveyed intriguing cases suggesting survival. But the literature on survival is plagued by several nagging problems which not even the best works address successfully.

No previous work has adequately evaluated the limitations of appealing to unusual or abnormal processes (e.g., dissociative pathologies, rare mnemonic gifts, extreme or unprecedented forms of savantism, or equally rare latent creative capacities). And no book has adequately assessed the power and scope of the super-psi hypothesis. Both failings, but especially the latter, result from ignorance of the data and deep confusions which this book tries to address. Accordingly, this book takes a fresh look at some of the most puzzling cases suggesting survival, and it considers how we might distinguish evidence for an afterlife from evidence for exotic things (normal and paranormal) done by the living. It assumes (if only for the sake of argument) that psychic functioning occurs, and to a greater degree than laboratory experiments suggest. It explores previously ignored issues about dissociation, creativity, linguistic skills, and the nature and limits of human abilities generally. And it considers why we have some reason, finally, for preferring the survival hypothesis over the super-psi hypothesis.

Keywords: Parapsychology; Survival after bodily death; Mediumship; Out-of-body experience (OBE); Reincarnation; Superior psi ability



- Indexed papers: Braude, S. E. (2009). Perspectival awareness and postmortem survival. *Journal of Scientific Exploration*, 23(2), 195-210.
- Braude, S. E. (2005). Personal identity and postmortem survival. *Social Philosophy and Policy*, 22(2), 226-249. doi: 10.1017/S026505250505209X
- Braude, S. E. (2000). Dissociation and latent abilities: The strange case of patience worth. *Journal of Trauma & Dissociation*, 1(2), 13-48. doi:10.1300/J229v01n02\_02

**Project:** 1998-18  
**Title:** Investigations of psychopraxia  
**Duration:** 1999/01 – 2001/12  
**Researcher(s):** Dr. Michael Thalbourne, Dr. Lance Storm  
**Institution:** University of Adelaide (Australia)

**Results:** A series of four parapsychological experiments were conducted to test Thalbourne's (2002) theory of psychopraxia. (1) The I Ching Experiment: Evidence was found that the I Ching (an ancient Chinese form of divination) may involve a paranormal component not explainable exclusively as either ESP or PK, and therefore more preferably referred to as exosomatic psychopraxia (i.e., the psychopractic function working outside the mind/body complex). (2) The Gambling Experiment: A significant negative relationship was found between outcomes on two paranormal tasks, suggesting that 'compliant' and 'non-compliant' pro attitudes are incompatible (the pro attitude is an orientation of the self towards a specific and preferred outcome or goal). (3) The Skeptics Experiment: So-called 'converted' skeptics produced psi-hitting after conversion to belief in psi, suggesting that the pro attitude is mutable. (4) The Vision-Impaired Experiment: No evidence was found that the vision-impaired had a compensatory advantage over sighted participants in a free-response task. There was suggestive evidence that the totally blind performed better than all other participants. Some 'necessary conditions' were found, which ostensibly facilitate psychopraxia, including high scoring on four 16PF personality factors, and scoring high on transliminality (the tendency to experience psychological material coming into, and going out of consciousness). The theory of psychopraxia is

important to the field of parapsychology because it offers (i) a philosophical critique on taken-for-granted assumptions about the nature of the paranormal, (ii) relatively unambiguous terminology, and (iii) a process-oriented approach to investigations of the paranormal.

Keywords: Parapsychology; Psychopraxia; Transliminality

Indexed papers: Storm, L., & Thalbourne, M. A. (2005). The effect of a change in pro attitude on paranormal performance: A pilot study using naïve and sophisticated skeptics. *Journal of Scientific Exploration*, 19(1), 11-29.

Storm, L., & Ertel, S. (2001). Does psi exist? Comments on Milton and Wiseman's (1999) meta-analysis of ganzfeld research. *Psychological Bulletin*, 127(3), 424-433. doi: 10.1037/0033-2909.127.3.424

Storm, L., & Thalbourne, M. A. (2001). Studies of the I Ching. I: A replication. *Journal of Parapsychology*, 65(2), 105-124.

**Project: 1998-20**

Title: Relação entre vivências induzidas e evocadas sob estados modificados de consciência e respostas neurovegetativas e neuroendócrinas

Duration: 1999/01 – 2001/03

Researcher(s): Prof. Luís Sobrinho, Prof. Mário Simões, Dr. João Filipe Cancela dos Santos Raposo, Dr. Lurdes Barbosa, Eng. Pedro Lobo Fernandes

Institution: Instituto Português de Oncologia Francisco Gentil, Lisboa (Portugal)

Results: The purpose of our study was to provide answers to the following questions:

- 1) Do sessions of psychotherapy with an emotional content have more hormonal surges than relaxation-only sessions?
- 2) Are surges of different hormones associated?
- 3) Are hormonal responses related to the intensity, type, or mode of expression of the emotions?

**Methods:**

Thirteen volunteers and 12 patients with minor emotional difficulties were studied under hypnosis. There were two types of sessions - "blank and "free associations" (FA).

**Results:**

Sessions of FA had more hormonal surges than "blank". This was true for cortisol (8/17 v. 3/24;  $p < 0.03$ ), prolactin (PRL) (7/17 v. 3/24;  $p < 0.05$ ) and growth hormone (GH) (9/17 v. 4/24;  $p < 0.02$ ). During the 55 sessions of FA there were 32 surges of cortisol, 18 of PRL and 28 of GH. Cortisol and PRL surges were negatively correlated ( $p < 0.03$ ). GH was not associated with either cortisol or PRL. Intense emotions were associated with GH surges ( $p < 0.05$ ). But not with cortisol or PRL. Cortisol surges were correlated positively with evocations of real events ( $p < 0.01$ ) and with the unexpected re-enacting of long-forgotten traumatic experiences ( $p < 0.02$ ). PRL correlated with memories of humiliating experiences ( $p < 0.07$ ).

**Conclusions:**

Cortisol, PRL and GH respond to psychological stress in humans. Cortisol and PRL surges are alternative responses to specific emotions. Neither relates to the intensity of the evoked emotion. Cortisol surges occur when a connection between the emotion and its cognitive component is established. Prolactin surges may be adaptive to unavoidable suffering. GH surges depend on the intensity of the emotion, probably as a consequence of the associated muscular activity.

**Keywords:**

Psychophysiology; Psychoneuroimmunology; Endocrinology; Altered states of consciousness; Hypnosis

**Indexed papers:**

Sobrinho, L. G., Simões, M. R., Barbosa, L., Raposo, J. F., Pratas, S., Fernandes, P., Santos, M. A. (2003). Cortisol, prolactin and growth hormone responses to emotions elicited during a hypnoidal state. *Psychoneuroendocrinology*, 28(1), 1-17. doi: 10.1016/s0306-4530(01)00100-7

**Project:**

**1998-24**

**Title:**

International collaboration to plan the next proof-oriented meta-analysis and accelerate process-oriented research in the Ganzfeld

Duration: 1999/01 – 1999/09  
Researcher(s): Dr. Julie Milton, Prof. Robert Morris  
Institution: The University of Edinburgh, Scotland (UK)

Results: N/A  
Keywords: Parapsychology; Extrasensory perception (ESP); Assessment tools; Ganzfeld studies

Indexed papers: Milton, J. (1999). Should Ganzfeld research continue to be crucial in the search for a replicable PSI effect? Part I. Discussion paper and introduction to an electronic-mail discussion. *Journal of Parapsychology*, 63(4), 309-333.  
Schmeidler, G. R., & Edge, H. (1999). Should Ganzfeld research continue to be crucial in the search for a replicable PSI effect? Part II. Edited Ganzfeld debate. *Journal of Parapsychology*, 63(4), 335-388.

**Project: 1998-25**  
Title: The limits of precognition  
Duration: 1999/01 – 1999/08  
Researcher(s): Dr. Fiona Steinkamp, Prof. Robert Morris  
Institution: The University of Edinburgh, Scotland (UK)

Results: An earlier postal experiment by Steinkamp (Bial 11/96) examined whether true precognition was possible by comparing 2 conditions. In the clairvoyance condition, targets were selected by a pseudorandom number generator before participants did the trials at home; in the true precognition condition, targets were selected using an algorithm on prespecified stock market and temperature figures on a prespecified future date. It was thought unlikely that participants could use either psychokinesis or other real-time psi to perform successfully in the true precognition condition. Results were significant in the clairvoyance condition ( $p = .04$ ,  $1 - t$ ) and only at chance in the true precognition one. The difference in performance between the 2 conditions was significant ( $p = .01$ ,  $1 - t$ ). This article presents 2 replication studies using different settings. The 1st, in the laboratory, gave almost significantly high scores in the

precognition condition ( $p = .06$ ,  $2 - t$ ) but only chance scores in the clairvoyance condition, with no significant difference between the 2 conditions. The 2nd, conducted over the World Wide Web, produced scores tending toward psi missing in the precognition condition ( $p = .08$ ,  $2 - t$ ), chance scores in the clairvoyance condition, and an almost significant difference between the 2 conditions ( $p = .07$ ,  $2 - t$ ).

Keywords: Parapsychology; Extrasensory perception (ESP); Precognition; Clairvoyance

Indexed papers: Steinkamp, F. (2001). Does precognition foresee the future? Series 2, a laboratory replication and series 3, a World Wide Web replication. *Journal of Parapsychology*, 65(1), 17-40.

**Project: 1998-27**

Title: Comparing psi and psychophysiology between classically trained musicians and non-musicians

Duration: 1998/12 – 2001/09

Researcher(s): Prof. Marilyn Jean Schlitz, Prof. Stephen LaBerge, Prof. Kathy S. Dalton

Institution: Institut of Noetic Sciences, Petaluma, CA (USA)

Results: This study involved 25 ganzfeld telepathy sessions with musicians (including people with five years or more of musical training) and 25 psi sessions with non-musicians (those with less than five years of training). The experiment made use of a “sender” and “receiver” model in which the receiver of psi information was placed in a sensory restricted environment and asked to describe a randomly selected target viewed by a sender in another location. EEG data were collected using a 28-channel electrode-cap connected to NeuroScan SynAMP digital amplifiers. Data were recorded on disk and analyzed offline using NeuroScan SCAN 4.0 software. Skin conductance data were also recorded. Both subjects and experimenters served as judges.

There were three hypotheses: There would be an overall psi effect across subjects, musicians would score higher than non-musicians in the psi task, and musicians would display a dis-

tinctive psychophysiological profile as compared to non-musicians.

While we did not find overall significant evidence of psi, the effect size was within the range expected for ganzfeld studies with unselected subjects (30% hit rate for subject judging and 35% for experimenter judging).

No significant difference was found between musicians and nonmusicians, with a reverse trend identified, and no distinctive psychophysiological profile was found for musicians. A significant gender difference was found, with women scoring significantly better than men. Additional analyses are under way with the EEG and skin conductance data.

Keywords: Parapsychology and Psychophysiology; Extrasensory perception (ESP); Telepathy; Ganzfeld studies; Electroencephalogram (EEG)

Indexed papers: N/A

**Project: 1998-28**

Title: Psychological characteristics of children who speak of previous-life memories: An extended study and replication in Lebanon

Duration: 1999/01 – 2001/07

Researcher(s): Dr. Erlendur Haraldsson, Dr. Majd Abu-Izzedin, Dr. Caroline Kordahi

Institution: University of Iceland, Reykjavik (Iceland)

Results: Various explanations have been put forward why the alleged memories develop in children who speak of previous-life memories. These explanations range from reincarnation to 'therapeutic resource'. This project puts to test the role of some psychological characteristics and the circumstances in which the children live, such as fantasy, suggestibility, social isolation, dissociation, and attention-seeking.

Thirty children in Lebanon who had persistently spoken of past-life memories, and 30 comparison children claiming no such memories, were administered relevant tests and questionnaires. As in an earlier study in Sri Lanka the target group obtained higher scores for daydreaming, attention-seeking and

dissociation, but not for social isolation and suggestibility. The level of dissociation was much lower than in cases of multiple personality and not clinically relevant. There was some evidence of post-traumatic stress disorder-like symptoms. Eighty percent of the children spoke repeatedly of past-life memories of circumstances leading to a violent death (mostly accidents, also war-related deaths and murder) and some had phobias related to these memories. Apparently this imagery that the child experiences as memories of a previous life serve as a stressor and causes the post-traumatic stress disorder-like symptoms. The contents of the alleged memories of four of these children were intensively investigated and attempts made to verify them by searching for a potential “previous personality”, and examine in how far the child’s memories corresponded to facts in the life of the previous personality. In some of the cases a high correspondance was found, in others only slight or no fitting person could be traced.

**Keywords:** Parapsychology; Survival after bodily death; Claimed memories of previous lives; Personality factors

**Indexed papers:** Haraldsson, E. (2003). Children who speak of past-life experiences: Is there a psychological explanation? *Psychology and Psychotherapy: Theory Research and Practice*, 76(1), 55-67. doi: 10.1348/14760830260569256

Stevenson, I., & Haraldsson, E. (2003). The similarity of features of reincarnation type cases over many years: A third study. *Journal of Scientific Exploration*, 17(2), 283-289.

Haraldsson, E., & Abu-Izzeddin, M. (2002). Development of certainty about the correct deceased person in a case of the reincarnation type: The case of Nazih Al-Danaf. *Journal of Scientific Exploration*, 16(3), 363-380

**Project:** 1998-29

**Title:** Psychic pets – Inquérito sociológico em Portugal

**Duration:** 1999/03 – 2001/02

**Researcher(s):** Dr. Carla Alexandra Lobo

**Institution:** Laboratório de Psicologia da Universidade do Minho – Braga (Portugal)

**Results:** Research about “psi” relations between humans and animals has been done to find out changes of animal behaviour and the types of beliefs associated with it. There isn't any study describing regional differences. For this purpose, we used in Portugal the same questionnaire of Sheldrake and Pamela (PSYCHIC PETS), with 1014 individuals originated from five different regions. In our study we didn't confirm many questions reported by Sheldrake et al. The most important result of our investigation shows that a majority of individuals with pets recognise that animals know they're going to leave home before showing some psychical sign they're going (question 5). Second, there are regional differences, and the telepathy as psychic experience has been less related than in previous investigations. The majority of the 536 individuals with pets, [264 (49, 3%)] agree with question 5, against 186 (34, 7%) who disagree. The remaining 86 (16%) individuals don't know. When we analyse the data by region, in Lisbon the majority of people agree 66 (55%), on the coastline the majority [77 (44, 3%)] disagree ( $p < 0,001$ ).

In question 3, among those who don't noticed the pet getting agitated before a family member has arrived home, predominate those who don't agree on Q5 or Q6 ( $\chi^2 = 261,626$ ,  $df = 4$ ,  $p = 0.000$ .  $Eta(Q5) = 0,60$ .  $Eta(Q6) = 0,67$ .  $Cramer's V = 0.65$ ). But, those who noticed in Q3, agree at the same time that the animal knows someone is going out before showing any physical signs of doing so (Q5) ( $\chi^2 = 65,254$ ,  $df = 4$ ,  $p = 0.000$ ,  $Eta(Q5) = 0,40$ ,  $Eta(Q6) = 0,44$   $Cramer's V = 0.39$ ), and agree that the animals respond to their own thoughts or silent command (Q6) ( $\chi^2 = 16,000$ ,  $df = 2$ ,  $p = 0.000$ ,  $Eta(Q5) = 0,90$   $Eta(Q6) = 1,00$ ,  $Cramer's V = 1.00$ ).

**Keywords:** Parapsychology; Animal psi; Animal & Human Psi; Paranormal belief

**Indexed papers:** N/A

**Project:** 1998-30

**Title:** Caracterização neurofisiológica e psicofisiológica de disfunções cerebrais utilizando estudos qEEG/ERP. Metodologia e aplicações



- Duration: 1999/06 – 2004/04
- Researcher(s): Prof. António Martins da Silva, Prof. Denisa Maria Vasques Mendonça, Dr. João Manuel Carmona Ferreira Lopes, Dr. Maria Regina Pinto Brito Aguiar Andrade, Dr. João Eduardo Paiva Ramalheira, Prof. João Paulo Trigueiros Silva Cunha, Eng. Miguel Oliveira e Silva, Dr. Teresa Temudo, Dr. Óscar Gomes, Dr. Óscar Alves
- Institution: Hospital Sto. António, Porto (Portugal)
- Results: The Project Objectives included the organisation of a brain signal data bank from healthy people to be used to define the normal cerebral response as a function of evoked or event related responses. We used electroencephalogram (EEG) and evoked potentials (EP) to record brain activity. The quantitative analysis of such signals includes the parameterisation of variation of signal EEG changes previous to and consecutive to motor tasks (simple finger movements, fast and slow). The method we identify as the most convenient was the calculation of the EEG desynchronisation (ERD) previous to movement and EEG synchronisation (ERS), post movement. A normal response was defined and the methodology is now in reliable condition to be used to assess the brain function of patients (patients with cognitive impairment or other cerebral dysfunctions). Changes on cerebral function were also assessed using evoked responses. The P300 response was elicited by using the odd ball paradigm and we studied the stability of the responses in a short time interval of one week, in similar daily rhythm (morning/afternoon).  
The results confirm the stability of the response and the methodology used to health people will be used on the same patients groups.
- Keywords: Psychophysiology; Brain; Diseases/Injuries; Brain dysfunction; Electroencephalogram (EEG)
- Indexed papers: Vilhena, E., Paiva, I., Rodrigues, H., Martins da Silva, A., & Mendonça, D. (2005). Physiological variations in ERP300 auditory brain potentials in young adults. A sequential analysis. *Revista de Neurologia*, 41(10), 633-635.

**Project:** 1998-32  
**Title:** Hypnotic susceptibility as a predictor of anomalous cognition performance  
**Duration:** 1999/01 – 2000/09  
**Researcher(s):** Dr. Edwin May  
**Institution:** Laboratories for Fundamental Research, Cognitive Science Laboratory, Palo Alto (USA)

**Results:** The main goal of this experiment was to see if an earlier laboratory anecdote could be confirmed with a naïve population of subjects. That is, a high percentage of LFR's experienced remote viewers scored 6 or above on the Stanford Hypnotic Susceptibility Scale (SHSS).  
One hundred students from a Budapest, Hungary, "new age" college participated in the study. A random half were measured by hypnotic techniques for their SHSS scores before participating in the anomalous cognition (AC) part of the study. The remaining half of the students was measured on the SHSS after their AC participation. Each subject was asked to contribute four AC trials at a rate of approximately one per week.  
By rank-order assessment, we found little AC in this population. We observed a mean rank ( $n = 400$  trials) of 2.998 corresponding to an effect size of 0.002 ( $p = 0.482$ ). There was weak support for some of the students (i.e., 34) who produced possible evidence for AC (i.e.,  $ES \geq 0.38$ ) where 30 would be expected ( $p = 0.22$ ).

**Keywords:** Parapsychology; Altered states of consciousness; Hypnosis; Anomalous cognition/experiences

**Indexed papers:** N/A

**Project:** 1998-34  
**Title:** A random number generator test of the Gradient of Shannon Entropy  
**Duration:** 1999/01 – 2000/09

- Researcher(s): Dr. Edwin May, Prof. Richard Broughton, Dr. Robert Bourgeois, Dr. Laura Faith
- Institution: Laboratories for Fundamental Research, Cognitive Science Laboratory, Palo Alto (USA)
- Results: The main expectation of this experiment was to explore the binary random number generator hit rate region above 60%. Given the strong and stable correlation of AC with the gradient of Shannon entropy and given the evidence that RNG results arise from AC rather than some force-like interaction, we thought that high gradient binary sequences would be “easier” to obtain in a psi-mediated selection task.  
Fourteen subjects participated in formal trials in this study and contributed a total of approximately 4,600 individual trials of 200 binary bits each. We found that the selection of high entropy sequences was no more likely than for low entropy sequences. Thus the initial hypothesis was not confirmed.  
However, this experiment indicated an exciting path for a future experiment. In the AC studies that do show a correlation with the gradient of Shannon entropy, the main feature is that feedback to the subject also has the gradient information embedded in the display. We noticed, too late for the experiment, that the feedback of even high gradient sequences was a display whose visual gradient was always quite low. That is a “wiggly” line graph has low visual display gradient regardless of the gradient of the underlying driving sequence. If individuals make psi-like decisions on the bases of the gradient they experience, then we would expect the observed null result.
- Keywords: Parapsychology; Anomalous cognition/experiences
- Indexed papers: N/A
- Project: 1998-38**
- Title: O sonho e a imagem em invisuais: abordagem biofísica e neurofisiológica
- Duration: 1999/01 – 2001/02

- Researcher(s): Prof. Teresa Paiva, Dr. Hélder Manuel Ferreira Utacílio Bértolo, D. Rosa Maria Capelo dos Santos
- Institution: Centro Estudos Egas Moniz / Hospital Sta. Maria, Lisboa (Portugal)
- Results:
- 1) Research  
The results obtained were very promising. We discovered that dream reports of congenitally blind subjects present visual content and these are strongly correlated with the EEG alpha rhythm. Alpha attenuation is considered as a very good indicator of visual activation in sighted subjects so the results point to the possibility of visual imagery in blind subjects in the absence of visual perception. The blind subjects were also able to graphically represent the scenes they described in their dreams and when compared to the representations of sighted subjects quantified through Goodenough and Quoc Vu tests they present no differences.
  - 2) Academic degrees  
Master Thesis - a Master of Science degree in Biophysics was conferred upon Dr. Helder Bértolo with the work done within the project Ph.D. Thesis – Dr. Helder Bértolo began his Ph.D. work with data from the project.
  - 3) Education  
Monograph for degree in Psychology – Dr. Lara Pessoa wrote a thesis: “Oneiric Reports: Speech and Graphical Representations” to get her degree in Psychology. This study was oriented by Dr. Helder Bértolo and achieved 19 values in a 0-20 scale.  
Clinical Research Residency – Two medical students did their residency in clinical research within the scope of the project and obtained the maximum classification.  
Engineering Projects – Several students from the Instituto Superior Técnico of Lisbon developed projects for Biomedical Engineering within the project.  
Seminars – Prof. Teresa Paiva and Dr. Helder Bértolo gave several lectures and seminars to Engineering students and Master degree students.
  - 4) Awards  
Dr. Helder Bértolo and Prof. Teresa Paiva received the Portuguese Society for Health Psychology Award 2000.

**Keywords:** Psychophysiology; Sleep and dreams; Diseases/Injuries; Congenital blindness; Electroencephalogram (EEG)

**Indexed papers:** Bértolo, H., Paiva, T., Pessoa, L., Mestre, T., Marques, R., & Santos, R. (2003). Visual dream content, graphical representation and EEG alpha activity in congenitally blind subjects. *Cognitive Brain Research*, 15(3), 277-284. doi: 10.1016/S0926-6410(02)00199-4

**Project: 1998-39**

**Title:** Realidade virtual no tratamento da acrofobia

**Duration:** 1999/03 - 2005/01

**Researcher(s):** Prof. Jorge Silvério, Prof. Mário Martins

**Institution:** Laboratório de Psicologia da Universidade do Minho, Braga (Portugal)

**Results:** Recently virtual reality has been used to treat acrophobia through the simulation of phobic situations. The majority of these studies doesn't have control groups, are single case studies or had used virtual reality before real exposition. For the acrophobia treatment we replicate in virtual ambience a real local (a building with 8 stories in Braga – Portugal). 10 subjects have been submitted to virtual reality exposition and the other 5 to a real ambience exposition. As the subjects approach the balcony, claim stores or report lower levels of subjective discomfort units the therapist offers verbal orientation and encouragement to the subjects (in the real and the virtual environments). The subjects are continually instructed and encouraged to explore the environment, look at the ground and stay as long as possible in each situation until their anxiety diminishes. In what concerns the virtual reality group instead of the short exposition the subjects after the treatment are able to claim more steps with less anxiety. In a follow-up year they are able to maintain these gains. Both groups didn't show significant differences in what concerns the behaviour performance (number of steps claimed in a fire ladder) and the attitude towards heights and the acrophobia questionnaires. The treatment time has been very different between both treatments. The average treatment time for the virtual reality group has been 22,3 minutes and

for the reality group has been 51,7 minutes. We can't assume that the treatment with virtual reality is better or worse than the treatment with real environments, but we can say that the virtual reality treatment has real benefits and these are maintained in one-year time.

**Keywords:** Psychophysiology; Mental health; Anxiety disorders; Intervention

**Indexed papers:** Coelho, C., Santos, J., Silvério, J., & Silva, C. F. (2006). Virtual reality and acrophobia: one year follow up and case study. *CyberPsychology and Behavior*, 9(3), 336-341. doi: 10.1089/cpb.2006.9.336

**Project: 1998-41**

**Title:** Indicadores psicofisiológicos e psicossociais da eficácia de um programa de gestão de stress para profissionais de saúde

**Duration:** 1998/12 – 2003/04

**Researcher(s):** Prof. Teresa McIntyre, Prof. Scott Elmes McIntyre, Dr. António Melo, Dr. Fátima Faria, Prof. Derek Johnston

**Institution:** Laboratório de Psicologia da Universidade do Minho, Braga (Portugal)

**Results:** This project aims at investigating the efficacy of a multimodal stress management program for health professionals using both psychophysiological and psychosocial indicators. The data collection has three phases. In Phase 1, a General stress diagnosis was offered to the entire staff of a central hospital ( $N = 705$ ). Using the GHQ-12, a higher prevalence of stress was found in the health professionals than in other comparable international studies.

In Phase 2, subjects with high levels of stress were given the opportunity to participate in an in depth stress diagnosis consisting of psychosocial, clinical and psycho-physiological measures. Results show that Social support, coping style and intensity of job demands are related to many self-reported stress responses such as Denial, Pressure, Anxiety, Depression, Guilt, Anger and Loss of Control.

In Phase 3, a Stress Management Intervention was given to half

of the subjects and the other half to a control group (wait list). The Experimental group had a 8-session group intervention with Evaluation times for E and C groups at Pre-test, Post-test, and at a 2 month follow up. Due to a difficulty in maintaining the subjects throughout the project, the third phase had a small sample size, and, although tentative, the data points to the effectiveness of the intervention in terms of diminishing physiological stress reactivity, negative emotional responses to stress and in increasing social support, a crucial stress coping mechanism. These changes seem to be maintained over the 2-month follow-up.

The products of this project are the development of a rigorous stress protocol, as well as a detailed stress management program manual.

**Keywords:** Psychophysiology; Stress and health; Occupational stress; Intervention

**Indexed papers:** N/A

**Project:** 1998-44

**Title:** Psicofisiologia das emoções: Aprendizagem não consciente

**Duration:** 1999/01 – 2002/12

**Researcher(s):** Prof. Francisco Esteves, Dr. Maria Paula Carneiro, Dr. Patrícia Ferreira, Prof. Anders Flykt

**Institution:** Unidade de Estudos e Investigação em Psicologia, Lisboa (Portugal)

**Results:** Emotional processing of food-related pictures was studied in a series of experiments, comparing participants that revealed unhealthy attitudes toward food, dieting and body shape, with a control group. All subjects were female, and responses to pictures of caloric and healthy food were compared to responses to other emotional stimuli. A subliminal presentation, using a backward masking procedure in order to investigate automatic, non-conscious processing, was also used. Verbal ratings of the pictures and psychophysiological responses (skin conductance and heart rate) were recorded.

The results showed that, in general, food pictures were processed in the same way as other emotional material, both verbally and psychophysiologicaly. Verbal ratings showed that food pictures can be considered, in general, pleasant stimuli and are not especially arousing.

However, some tendencies to a differentiation on processing between groups indicate that participants, selected for being more worried about food, can be more reactive to food cues.

Specifically, increased skin conductance responses to food slides could be observed in this group. Concerning the masked presentation, the general pattern was an absence of subliminal effects, however, there were some weak effects that showed that heart rate changes could be modulated by the participant attitudes toward food and body shape, i.e., increased heart rate was observed in the “worried” group to food pictures.

Keywords: Psychophysiology; Emotion

Indexed papers: N/A

**Project: 1998-46**

Title: Assessing the role of precognition in practical intuition

Duration: 1998/12 – 1999/12

Researcher(s): Prof. Dr. Richard Broughton, Dr. Robert Bourgeois

Institution: Rhine Research Center, Durham (USA)

Results: The purpose of this project was to develop a computer-based test of precognitive intuition that would be suitable for identifying intuitively talented individuals. An engaging stock market simulation was created and thoroughly tested. Using this tool 77 participants were screened for intuitive talent.

Overall results demonstrated significant above chance performance ( $p < .02$ ) for the group as a whole. Several methods of talent identification were explored. Using the most rigorous method, two individuals were identified, one of whom is a successful “day trader” (a type of stock trader) and the other a successful businesswoman.

Taggart’s Personal Styles Inventory (PSI) was used to assess information processing modes of the participants. Although



the individual PSI factors did not correlate significantly with performance, the group of participants classified as “Intuitive” ( $N = 56$ ) performed significantly better than chance ( $p < .05$ ) while those classified as “Rational” were close to chance. A US patent has been applied for to cover the computer-based intuition testing tool.

Keywords: Parapsychology; Extrasensory perception (ESP); Precognition; Intuition; Assessment tools

Indexed papers: N/A

**Project: 1998-49**

Title: Examining the conceptual mechanisms of DMILS effects: PK or ESP?

Duration: 1999/01 – 2004/04

Researcher(s): Prof. Deborah Delanoy, Dr. Claire Brady, Dr. Alison Roe

Institution: The University of Edinburgh, Scotland (UK)

Results: N/A – Inconclusive Project

Keywords: Parapsychology; Extrasensory perception (ESP); Psychokinesis (PK); Direct mental interactions with living systems (DMILS)

Indexed papers: N/A

**Project: 1998-51**

Title: The transfer potential: A test of a model using entangled quantum states

Duration: 1999/01 – 2001/04

Researcher(s): Prof. Christopher Clarke, Prof. Peter Fenwick, Dr. Terry Hewitt

Institution: Priory Hospital, London (UK)

Results: The study set out to validate the previous work of Jacobo Grinberg-Zylberbaum. It had been previously shown that when two people were emotionally involved with each other a transfer of

brain activity between the two people was possible. We set out to confirm this finding by looking at a group of subjects who had meditated together before testing, the active group, and a group of subjects who sat apart from each other and did not interact, the control group. For each pair, two experimental rooms separated by a corridor were used. One was used by the subject whose brain was to be stimulated by a series of tone pips, at randomized times, heard through headphones, and the other was used by the subject whose brain was to respond to those pips, who wore headphones playing white noise. For both, EEG electrodes were applied according to the 10/20 International system at C3, Cz and C4. The EEG data for the subject who heard only the white noise were then analysed to see if there was a significant difference between brain activity before and after the times at which pips were heard by the other subject.

Contrary to the findings of Grinberg-Zylberbaum, no effect was seen in the group of meditators. A small apparent effect was seen at the Cz electrode for the control group ( $p = 0.03$  or  $0.06$  depending on whether the measure of brain activity was the peak-to-peak amplitude or the mean power in the lower beta frequency range). Taking into account the number of different parameters being examined in the experiment, this was not regarded as significant.

We had originally intended to continue the experiment to test a quantum mechanical model, but the absence of any significant effect precluded this.

Keywords: Parapsychology and Psychophysiology; Extrasensory perception (ESP); Telepathy; Altered states of consciousness; Meditation; Electroencephalogram (EEG)

Indexed papers: N/A

**Project:** 1998-58

Title: Efeito de placebo: mecanismos psicofisiológicos e factores influenciadores

Duration: 1999/01 – 2005/12

Researcher(s): Prof. Cristina Sampaio, Dr. Ana Macedo, Prof. Maria Sande Lemos, Dr. Mário Miguel Rosa, Dr. Joaquim José Ferreira, Dr. Sofia Nunes

Institution: Centro Estudos Egas Moniz / H. Sta. Maria, Lisboa (Portugal)

Results: N/A

Keywords: Psychophysiology; Neurodegenerative disorders; Parkinson's disease

Indexed papers: N/A

**Project: 1998-59**

Title: Estudo da relação entre memória de curto prazo e percepção subjectiva de tempo, usando como modelo da doença de Parkinson

Duration: 1999/01 – 2002/06

Researcher(s): Prof. Isabel Pavão Martins, Dr. Joaquim José Ferreira, Dr. Miguel Vilhena Soares Coelho

Institution: Centro Estudos Egas Moniz / H. Sta. Maria, Lisboa (Portugal)

Results: Studies on temporal perception lack a validated method and a consensual “gold-standard” to measure time perception. Evidence suggests deterioration of timing with aging. This study aimed to develop and validate a neuropsychological tool to measure time perception and to study temporal perception along aging.  
Eighty-six healthy subjects, aged 15-90 years-old, were prospectively asked to verbally estimate and produce empty intervals signaled by auditory beeps, of 7, 32 and 58 seconds duration. Two tests were used as “gold standards”: estimating the duration to draw a clock (“clock time”) and estimation of the duration of neuropsychological evaluation (“global time”). Results showed a correlation between estimation and production ( $p < .01$ ), and a correlation between estimation or production and “global time” ( $p < .01$ ). A correlation between either estimation or production and age ( $p < .01$ ), indicating faster inter-

nal clocks with aging. Comparison between three age groups (15-40 yrs-old; 41-64 yrs-old; 65-90 yrs-old), showed a trend toward overestimation and underproduction with older age, reaching significance between the extreme age groups ( $p < .05$ ). The proposed test seems a good tool to measure subjective duration and the results showed an acceleration of internal clock with aging.

**Keywords:** Psychophysiology; Cognitive processes; Memory; Perception; Neurodegenerative disorders; Parkinson's disease; Developmental psychology

**Indexed papers:** Coelho, M., Ferreira, J., Dias, B., Sampaio, C., Martins, I. P., & Castro-Caldas, A. (2004). Assessment of time perception: The effect of aging. *Journal of International Neuropsychological Society*, 10(3), 332-341. doi: 10.1017/S1355617704103019

**Project: 1998-64**

**Title:** Os efeitos da oração: Um estudo parapsicológico e psicofisiológico da evolução de quadros clínicos de pacientes em unidades hospitalares

**Duration:** 1999/01 – 2001/09

**Researcher(s):** Dr. Telmo Baptista, Dr. Miguel Henrique Guerra Gonçalves Farias, Dr. Cláudia Carvalho de Matos Teixeira Coelho, Dr. Isabel Maria Mousinho de Almeida Galriça Neto

**Institution:** Faculdade de Psicologia e Ciências da Educação, Lisboa (Portugal)

**Results:** This study presents the results of an indirect replication of the studies by Byrd (1988) and Harris et al. (1999) that suggested that intercessory prayer had a positive influence on the evolution of clinical outcomes of coronary heart disease patients. A measure of patients' religious/spiritual concerns, practice and beliefs was added.

We attempted to contribute to this body of research, by studying: a) the effects of distant intercessory prayer by others on the evolution of clinical outcomes of coronary by-pass surgical patients and b) the association between the patients' spiritual and

religious concerns (including the practice of personal prayer) and the evolution of the patients' own clinical outcome.

A total of 74 surgical coronary by-pass patients participated in this study. The patients were randomly assigned to two groups, prayed for group and not prayed group by an external experimenter. All patients suffered from coronary artery disease and had clinical indication for bypass surgery. Thirteen intercessors were recruited from two organised prayer groups. All intercessors committed themselves to, at least, one daily prayer period of individual prayer for "the improvement of patient's X health condition". Participants, doctors and experimenter in the Cardio-Thoracic Surgical Ward were kept blind to the assignment to either one of the groups during the length of the trial.

The results suggest that there were no significant differences between the prayed for and not prayed for groups on the evolution of clinical outcomes. Also, there seems to be no association between patients' scores on a scale of religiosity/spirituality and clinical outcomes.

Keywords: Parapsychology; Healing; Healing and praying; Spiritualism; Religious beliefs/experiences

Indexed papers: Howard, G. S., Hill, T. L., Maxwell, S. E., Baptista, T. M., Farias, M. H., Coelho, C., ... Coulter-Kem, R. (2009). What's wrong with research literatures? And how to make them right. *Review of General Psychology*, 13(2), 146-166. doi: 10.1037/a0015319

### **2000/01 Projects**

**Project:** 2000-01  
**Title:** Investigation and psychological testing of U.S. children who claim to remember previous lives  
**Duration:** 2001/05 – 2003/05  
**Researcher(s):** Dr. Jim Tucker, Dr. Ian Stevenson  
**Institution:** University of Virginia Health System (USA)

- Results:** Fifteen children between the ages of 3-6 years who had reported memories of previous lives were evaluated using the Stanford-Binet Intelligence Scale: 4th edition, the Survey Form of the Vineland Adaptive Behavior Scales, the Achenbach Child Behavior Checklist, the Child Dissociative Checklist, and the Children's Apperception Test, and the Family Questionnaire. On the Stanford-Binet Intelligence Scale, the children's composite scores were significantly above average, with verbal reasoning and abstract/visual reasoning in the above average range and quantitative reasoning in the superior range. On the Vineland Adaptive Behavior Scales, the children scored significantly above average in daily living skills, motor skills, and on the overall composite score. The Child Behavior Checklist averages were all well below the score of 70 that indicates clinically significant problems. Most of the children scored low on the Child Dissociative Checklist, indicating few symptoms. The Children's Apperception Test results showed no unusual themes, and the families did not show any distinct patterns of functioning on the Family Questionnaire. In summary, children who reported past-life memories demonstrated above average intelligence, and their reports did not appear to arise from psychopathology.
- Keywords:** Parapsychology; Survival after bodily death; Claimed memories of previous lives; Developmental psychology

**Indexed papers:** N/A

**Project: 2000-02**

**Title:** Indicadores psicofisiológicos e psicossociais do impacto do relacionamento conjugal no desenvolvimento pessoal e relacional dos filhos na fase adulta

**Duration:** 2001/01 – 2005/06

**Researcher(s):** Prof. Maria da Graça Pereira Alves, Dr. Vera Araújo-Soares

**Institution:** Universidade do Minho, Braga (Portugal)

**Results:** The results show important differences between the positive and negative assessment moments. In reaction to positive emotions

parental relationship has a direct impact on self-differentiation meaning that a good parental relationship allows the individual to differentiate and an indirect effect on avoidance coping strategies. This path does not show up in reaction to stressful situations in which less differentiation is related to using less attention strategies as one might expect.

Parental relationship has also a direct impact on distress and physical morbidity both in reaction to negative and positive emotions and an indirect impact through social support and social intimacy.

As a conclusion we might say that Parental Relationship has an effect upon both psychological and physiological perceived health; this effect is complex and at least partially mediated by other psychosocial variables, namely coping strategies, self-differentiation and social support.

Physiological reactivity, as it was measured in this study, although it may be influenced by psychosocial variables, does not mediate its effects upon health problems.

The perception of health problems is mostly determined, at least in this data set, by Psychological Distress, highlighting the importance of negative affectivity (depression, anxiety and psychological morbidity).

Social Intimacy has the only consistent effect upon health problems, apart from that of Psychological Distress, probably indicating an alternative mediating path, possibly of physiological variables not measured in this study (e.g., immune system variables).

According to results, there is a need to intervene with children from problematic families in order to minor the intergenerational risk of parental relational problems on young adults' physical and mental health.

Keywords: Psychophysiology; Parenthood; Conjuality; Mental health; Emotion

Indexed papers: N/A

**Project:** 2000-03  
**Title:** Psychophysiology of transliminality

Duration: 2001/01 – 2004/06  
Researcher(s): Dr. James Houran  
Institution: SIU School of Medicine, Springfield (USA)

Results: Transliminality refers to the tendency of psychological material to cross thresholds into and out of consciousness. This study examined transliminality in several contexts. It was shown that major correlates of the construct are syncretic cognitions (the fusion of perceptual qualities in subjective experience), so the author presented a hyperconnectivity hypothesis that specifies transliminality as enhanced interconnectedness between brain hemispheres, as well as among frontal cortical loops, temporal-limbic structures, and primary or secondary sensory areas and/or sensory association cortices.

Study 1 showed that Revised Transliminality Scale (RTS) scores tap the same boundary construct as Hartmann's Boundary Questionnaire (BQ) and that the BQ factors concerning experiential-syncretic phenomena are most predictive of RTS scores.

Study 2 established that the boundary construct is significantly related to the apparitional experience, a phenomenon that likely derives from syncretic and somatization processes. However, a relationship between bilaterality and the boundary construct was not confirmed.

Study 3 corroborated and extended these basic findings by replicating positive associations among apparitional experiences, transliminality, and paranormal belief, as well as establishing that these variables positively correlate with measures of somatic-hypochondriacal tendencies.

Study 4 tested the predictive validity of these relationships in vivo by studying participants' experiences at an alleged 'haunted' site. Patterns of participants' haunt experiences and their scores on psychological measures hinted that syncretic and symbolic cognition were operating. Transliminality was positively associated with both types of cognition, which parallel established attentional mechanisms. These results suggest that transliminality involves cognitive disinhibition involving lower sensory thresholds.

Study 5 tested this idea via a quasi-experimental test of vibratactile sensitivity. High- and low-transliminality groups



(HT & LT) completed threshold testing while listening to competing auditory stimuli of varying intensity and complexity. The HT group compared to the LT group exhibited lower sensory thresholds and quicker performance times. Further, introducing a high intensity stimulus increased the thresholds of the HT group. The HT group also reported more aberrations in memory.

These findings indicate that high transliminality reflects disrupted attentional processes and/or screening functions. It was consequently concludes that the hyperconnectivity hypothesis is a parsimonious explanation for the cumulative pattern of results in the literature and in the original research constituting this research program.

**Keywords:** Parapsychology; Transliminality; Paranormal belief; Apparitions/Haunting; Cognitive processes

**Indexed papers:** Houran, J., Navick, S., & Zerrusend, K. (2005). Boundary functioning in celebrity worshippers. *Personality and Individual Differences*, 38(1), 237–248. doi: 10.1016/j.paid.2004.04.014  
 Thalbourne, M. A., & Houran, J. (2005). Patterns of self-reported happiness and substance use in the context of transliminality. *Personality and Individual Differences*, 38(2), 327–336. doi: 10.1016/j.paid.2004.04.011  
 Houran, J., Thalbourne, M. A., & Lange, R. (2003). Methodological note: erratum and comment on the use of the Revised Transliminality Scale. *Consciousness and Cognition*, 12(1), 140-144. doi: 10.1016/S1053-8100(02)00025-9

**Project:** **2000-04**

**Title:** Mapeamento do córtex envolvido nos processos de decodificação da linguagem oral e escrita em voluntários alfabetizados na infância e voluntários alfabetizados na idade adulta utilizando magnetoencefalografia

**Duration:** 2000/12 – 2003/10

**Researcher(s):** Prof. Alexandre Lemos de Castro Caldas, Dr. Maria Vânia da Silva Nunes, Dr. Beatriz Dias, Prof. Andrew Papanicolau, Prof. Thomas Ortiz Alonso, Dr. Fernando Maestú

- Institution:** Centro de Estudos Egas Moniz, Lisboa (Portugal)
- Results:** Previous work demonstrated that there were differences between literate and illiterate subjects. These differences were found in the performance on several tests and on patterns of activation on PET and fMRI. In the present study subjects that learned to read and to write in adulthood (being previously completely illiterate) were compared with subjects that learned in school in the proper age. Magnetoencephalography (MEG) was done while subjects were reading words. Results showed that although the reading performance was the same in both groups the pattern of font distribution was different between groups. There were more late fonts in right temporoparietal areas of recent literate compared to old literate and later fonts in left inferior frontal cortex in old literate subjects. It is concluded that learning to read in adulthood is a process supported by different brain structures from the ones used when learning occurs in the proper age. This contributes to the understanding that the same task can be similarly performed relaying on diverse functional brain anatomic networks.
- Keywords:** Psychophysiology; Cognitive processes; Learning; Language; Brain; Magnetoencephalogram (MEG)
- Indexed papers:** Castro-Caldas, A., Nunes, M. V., Maestú, F., Ortiz, T., Simões, R., Fernandes, R., ...Gonçalves, M. (2009). Learning orthography in adulthood: A magnetoencephalographic study. *Journal of Neuropsychology*, 3(1), 17-30. doi: 10.1348/174866408x289953  
Nunes, M. V., Castro-Caldas, A., Del Rio, D., Maestú, F., & Ortiz, T. (2009). The ex-illiterate brain. The critical period, cognitive reserve and HAROLD model. *Dementia & Neuropsychologia*, 3(3), 222-227.
- Project:** **2000-09**
- Title:** Psychological, phenomenological and parapsychological evaluation of the anomalous/paranormal detection using objects-target utilizing specially selected subjects
- Duration:** 2001/02 – 2003/02

- Researcher(s): Prof. Alejandro Enrique Parra, Dr. Juan Carlos Argibay  
 Institution: Instituto de Psicología Paranormal, Buenos Aires (Argentina)
- Results: The term “psychometry” describes a type of anomalous cognition (or extrasensory perception, ESP) which permits a psychic (sensitive or seer) to receive impressions using a physical object as inductor to express the information perceived. A sample was recruited by us, that is people who say they possess such abilities, such as persons who have had spontaneous extrasensory experience, and persons who believe although they had not had those experiences.  
 The psychological evaluation included: Sixteen Personality Factors, Dissociative Experiences Scale, Eysenck Personality Inventory, Anomalous Experiences Inventory, and Paranormal Beliefs Scale to correlate their psychological characteristics. Subjects who reported high scored Experiences measured by AEI were indicative of high DES scores and high Extraversion’s EPI scores. Besides, four parapsychological tests were administered. Objects-target were used in order to obtain statements and all other information relevant during the session.  
 We obtained psi-hitting in the free-response test (no-object). We believe that this was the most comprehensible of the four ESP tests. This test adds emotional and motivational additional, as compared with the psychometric tests, that may facilitate the ESP. Almost half of the sample (56.3%) manifests not to have control over psi. In addition, 65.2% of the sample manifests not to have attempted ever to control psi, not even once in their lives. The purpose of a quantitative evaluation of the psychics’ statements is to establish if these statements are more accurate than expected by chance when compared to other two groups (non-psychics claimants). Analysis post hoc will be published elsewhere.
- Keywords: Parapsychology; Extrasensory perception (ESP); Psychometry; Paranormal belief; Personality factors
- Indexed papers: Parra, A., & Argibay, J. C. (2006). Interacción entre susceptibilidad hipnótica y experiencias disociativas en una población que reporta experiencias anómalo/paranormales. *Revista Interamericana de Psicología*, 40(2), 233-240.

**Project: 2000-10**

**Title:** Psychological and phenomenological investigation of anomalous cognition applying the Ganzfeld technique: Correlational analysis under the condition Ganzfeld vs non-Ganzfeld, psi-belief vs non-psi-belief, and different types of visual and musical targets

**Duration:** 2001/02 – 2003/02

**Researcher(s):** Prof. Alejandro Enrique Parra, Dr. Jorge Villanueva

**Institution:** Instituto de Psicología Paranormal, Buenos Aires (Argentina)

**Results:** Ganzfeld stimulation is associated with increased attention to internal mentation. Investigators suggested this association to develop an experimental hypnagogic technique to facilitate the study of hypnagogic imagery. This experiment studied a psi-conducive state (ganzfeld) comparing with a GESP telepathy focused technique in a free-response GESP test. One hundred thirty-eight subjects attended two trials of GESP. The first author (AP) was the experimenter and second author (JV) was the unaware sender to the entire sample. A CDR contained 3,500 high resolution color pictures was used as image-targets. Also, ganzfeld non-ganzfeld conditions were randomized. The difference between both condition was also significant (expected= 25%; ganzfeld= 41.3%,  $p < .001$  vs. non-ganzfeld = 27.5).

Also, this report studied the relationship between personality factors with ESP scores using ganzfeld technique. Two personality inventories (Eysenck Personality Inventory and Sixteen Personality Factors) were administered. Though this study did not show significant results, such as N or E scores with direct ESP scores, psi-hitting was found by Sanguine female and Choleric male subjects personality profile, which rise from N and E scores combination. Significant difference between ESP hits and the 16PF factors were not found. We also reported a study to compare auditory with visual stimuli via ESP. Musical styles were chosen as targets. Fifty four subjects attended two GESP sessions. A CDR contained high-resolution color pictures and other CD contained 112 themes on mp3 format were used each subject.

Both experiments, musical- ( $p < .008$ ) and visual-target condition ( $p = .001$ ) in a positive direction for the visual target condition, scored psi-hitting.

Keywords: Parapsychology; Extrasensory perception (ESP); Telepathy; Ganzfeld studies; Personality factors

Indexed papers: N/A

**Project: 2000-11**

Title: Disturbances of binding phenomenon in schizophrenia

Duration: 2001/07 – 2003/01

Researcher(s): Dr. Valeria Strelets, Prof. A. M. Ivanitsky, Dr. V. Y. Novototsky-Vlasov, Dr. J. V. Golikova, Dr. R. A. Magomedov, Dr. M. V. Magomedova

Institution: Institute of Higher Nervous Activity and Neurophysiology, Moscow (Russia)

Results: The project was aimed at the study of the “binding” phenomenon – exact temporal synchronization of the high frequency EEG activity (20-40 Hz) and its disturbances in schizophrenic patients. 100 sec EEG traces were recorded and subsequent analysis of selected 50 sec fragments free from artifacts was done using the brain mapper. The connectivity study was performed using coherence and typical connections methods, the latter being elaborated in our laboratory and enabling the detection of the exact frequency at which the connections were established. The results obtained by the coherence method showed that during the cognitive task on visual imagination in the normal controls there were 8 interhemispheric connections while in both groups of patients – with the predominance of positive as well as with negative symptoms interhemispheric connections were absent. The results obtained by the “typical connections” method revealed that in the normal controls during the task performance interhemispheric connections were established at the frequency 38 Hz, coinciding with the other authors’ data on binding phenomenon. In patients with positive symptoms there were no interhemispheric connections; in patients with negative symptoms there was a set of connections established at the lower frequency – 29 Hz, which we considered as

pathological compensation leading to the irreversibility of the symptoms.

Thus we revealed the phenomenon of functional hemispheric disconnection in patients at the high frequency EEG activity during the cognitive task, this phenomenon being the part of Gestalt principle and functional clustering disturbances schizophrenia.

Keywords: Psychophysiology; Mental health; Psychotic disorders; Brain; Electroencephalogram (EEG)

Indexed papers: Strelets, V. B., Novototsky-Vlasov, V. Y., Garakh, Z. V., Zeligovsky, V. A., & Kaplan, A. Y. (2007). The multipleparameter combinatory analysis of EEG rhythms in norm and at schizophrenia. *Zhurnal Vyshei Nervnoi Deyatelnosti Imeni I P Pavlova*, 57(6), 684-691

Strelets, V. B., Novototsky-Vlasov, V. Y., & Golikova, J. V. (2002). Cortical connectivity in high frequency beta-rhythm in schizophrenics with positive and negative symptoms. *International Journal of Psychophysiology*, 44(2), 101-115. doi: 10.1016/s0167-8760(01)00196-9

**Project: 2000-14**

Title: Psychokinesis and telepathy with animals and human

Duration: 2000/12 – 2003/04

Researcher(s): Prof. René Peoc'h

Institution: Institut de Psychophysique Français, Nantes (France)

Results: A – Telepathy:

We have made some experiments between two rabbit sisters living in the same cage for 6 months. During the experiments, they are separated in two different cages at 23 kilometers of distance from each other.

Both rabbits are connected to a plethysmograph to record blood flux variations. When one rabbit is afraid by a bell noise, we study if the second rabbit sister is also afraid in less than 5 seconds at 23 kilometers. The two plethysmographs are connected together by phone and internet.

We compared the two plethysmograms with rabbit controls not living together in the same cage and not having the same mother. The difference is statistically significant  $p < 0.01$  %.

With male rabbits the results are not significant because males don't like each other in the presence of other male.

This kind of experiment can be reproduced easily by other laboratories.

B - Psychokinesis with animals and human:

1 - Psychokinesis with men sleeping :

We studied the impact of 12 men sleeping near a robot to observe if there is a difference in the path of the robot compared with the usual path when the robot is alone in the room. The robot alone moves always at random in all the directions. We did 360 trials during two hours. The results are very significant. The sleepers change the path of the robot. The movements in straight lines are very different of the control trials without sleepers,  $p < 0.001$ . The sleepers try to stop the robot to decrease the noise produced when it moves. This noise disturbed the sleep. The sleepers have an unconscious and great action on the random number generator of the robot.

2 - Psychokinesis with animals: Chicks' distant psychokinesis (23 kilometers)

Eighty groups of 7 chicks were used to test their ability to influence the trajectory of a robot bearing a candle as the unique source of light in the room. The robot is driven via telephone line, by a random generator located 23 kilometers away.

When chicks are present, the robot moves preferentially into their direction (66.25 % out of 80 trials). This is significantly different from the non-specific displacement of the machine in the absence of chicks and observer ( $p < 0.00001$ ).

The random generator being the source of movements, this result suggests that chicks are able to influence it over a long distance.

Keywords: Parapsychology; Animal psi; Psychokinesis (PK); Extrasensory perception (ESP); Telepathy

Indexed papers: N/A

**Project:** 2000-15

Title: Investigation of telepathy in animals and humans

Duration: 2001/01 – 2003/03  
Researcher(s): Prof. Rupert Sheldrake, Dr. Pamela Smart, Dr. Aimee Morgana,  
Dr. Katy Barber  
Institution: Centre for the Seven Experiments Project, London (UK)

Results: 1. Many people claim to have thought about someone for no apparent reason, who then called on the telephone. Pamela Smart and I carried out experiments to test whether people really could tell who was calling. Each participant had four potential callers, and when the telephone rang had to guess who was calling. By chance the success rate would have been 25%. In a total of 842 trials, involving 66 participants, the overall success rate was 42%. This effect was hugely significant statistically ( $p < 1 \times 10^{-20}$ ). We ruled out the possibility of cheating by videotaping the participants continuously. Success rates did not fall off even when callers were 18.000 km away. With familiar callers the success rate was 61% ( $p = 1 \times 10^{-13}$ ). With unfamiliar callers the success rate was at chance levels. When they were confident about their guesses, participants were indeed more successful than when they were not confident.

2. Aimée Morgana and I continued our studies of her language-using African Grey parrot, N'kisi, who seemed to respond to her thoughts and intentions telepathically. In a series of trials, Aimée and the parrot were in different rooms, on different floors, both videotaped continuously. At the beginning of each trial, Aimée opened an envelope containing a photograph correspond to one of 19 prespecified key words, and looked at it for two minutes.

N'kisi said key words in 71 trials. He scored 23 hits: the key words he said corresponded to the target pictures far more than expected by chance (by a Randomized Permutation Analysis (RPA),  $p < 0.0003$ ). N'kisi repeated key words more when they were hits than when they were misses. These findings support the hypothesis that N'kisi was reacting telepathically.

Keywords: Parapsychology; Extrasensory perception (ESP); Telepathy; Animal psi; Animal & human psi

Indexed papers: Sheldrake, R., & Morgana, A. (2003). Testing a language-using parrot for telepathy. *Journal of Scientific Exploration*, 17(4), 601-615.



Sheldrake, R., & Smart, P. (2003). Videotaped experiments on telephone telepathy. *Journal of Parapsychology*, 67(1), 147-166.

Brown, D. J., & Sheldrake, R. (2001). The anticipation of telephone calls: A survey in California. *Journal of Parapsychology*, 65(2), 145-156.

- Project:** 2000-16
- Title:** Ganzfeld e não Ganzfeld: Testando a eficiência da técnica em si e em relação a outros factores psi-condutivos
- Duration:** 2001/01 – 2002/08
- Researcher(s):** Prof. Fábio Eduardo da Silva, Dr. Margareth Aparecida Bleichwel, Ms. Sibebe Aparecida Pilato, Dr. Maurício Yanez Alves da Silva, Mr. Celso Côrtes Cordeiro
- Institution:** Faculdades Integradas Espírita, Centro Integrado de Parapsicologia Experimental, Laboratório de Pesquisa Ganzfeld, Curitiba (Brazil)
- Results:** In this double-blind exploratory study 74 subjects participated forming 37 couples (sender/receiver). The sender watched a video and tried to send it to the receiver, who was located 120 meters away. At the end of the sending/receiving period (28 min.) the receiver watched four videos and tried to identify which one had been sent. There were two experimental conditions. In the Ganzfeld (GZ) condition the researchers and subjects heard a 20-minute relaxation induction. The receiver's eyes were covered with halved Ping-Pong balls, upon which two red lights were projected, and they listened to "white noise" during the experimental session. In the non-Ganzfeld (NGZ) condition, neither the Ping-Pong balls nor the "white noise" were used and there was no relaxation induction. From July of 2001 to March of 2002, 108 trials (54 GZ and 54 NGZ) were carried out. There was no overall significance (hit rate 25,93%),  $Z = 0.11$ ,  $\pi = 0.51$ . The NGZ and GZ hits (18,52%,  $Z = -0.94$ ,  $\pi = 0.41$  and 33,33%,  $Z = 1.26$ ,  $\pi = 0.60$  respectively) did not reach significance. However the GZ hits were in the direction of the findings reported in the Ganzfeld meta-analysis by Bem and Honorton (1994). The difference between the GZ and NGZ hits was significant,  $p$

= .0228 one-tailed. We also found that the targets that were hit were evaluated by receivers (in terms of personal preference and personal meaning) higher than the targets that were not hit. Analysis of the qualitative content of hits and misses suggested that in future studies the qualitative results should be considered along with the conventional methodology of hits vs. misses. These results seem to be similar to the qualitative findings found by Parker.

Keywords: Parapsychology; Extrasensory perception (ESP); Telepathy; Ganzfeld studies

Indexed papers: N/A

**Project:** 2000-17

Title: Sonhos e Cérebro: para uma topografia do sonho em cegos e normovisuais

Duration: 2001/02 – 2003/03

Researcher(s): Prof. Teresa Paiva, Dr. Helder Manuel Ferreira Utalício Bértolo, Dr. Lara Pessoa, Mr. Tiago Mestre, Ms. Raquel Marques, Ms. Rosa Santos

Institution: Núcleo de Lisboa do ISTEEL e Laboratório EEG - Centro de Estudos Egas Moniz – Lisboa (Portugal)

Results: Before discriminating several scientific indicators we would like to stress some aspects showing the relevance of the work and its international visibility.

The publication of the paper “Visual dream content, graphical representation and EEG alpha activity” in Cognitive Brain Research proves the scientific quality of the work and its acknowledgment by the scientific peers. This journal is considered very important with an impact factor of 2.88. The fact that the research team is exclusively Portuguese makes the publication even more important.

The acceptance for an oral communication at the “16th Congress of the European Sleep Research Society” was an important step in the international recognition of our scientific production. Moreover this communication received the

“Young Scientist Award”.

Once again an oral communication “Neurophysiological correlates of dream recall and dream content in blind and sighted” was accepted at “11th European Congress of Clinical Neurophysiology”.

1) Research

The results regarding alpha attenuation with visual activation in congenitally blind subjects were confirmed. Topographic differences in EEG derivations were also found for several EEG components.

The study also comprised evaluation of EEG spectral components and Rapid Eye Movements (REMs) and their relation with dream recall. The dream recall index was identical for blind and sighted subjects, however blind presented a lower REMs density. We also found important relations between recall and no-recall and specific EEG rhythms.

2) Academic degrees

Master Thesis – Dr. Tiago Mestre began his Master degree in Neurosciences.

Ph. D. Thesis – Dr. Helder Bértolo finished the experimental part of his Ph.D. work.

3) Awards

Dr. Tiago Mestre received the “Young Scientist Award” for the work:

Mestre T; Bertolo H; Paiva T: Dream recall, REMs and spectral EEG components in blind and sighted. Presented at the “16th Congress of the European Sleep Research Society”, Reykjavik, 2002.

**Keywords:** Psychophysiology; Sleep and dreams; Diseases/Injuries; Congenital blindness; Electroencephalogram (EEG)

**Indexed papers:** Bértolo, H., Paiva, T., Pessoa, L., Mestre, T., Marques, R., & Santos, R. (2003). Visual dream content, graphical representation and EEG alpha activity in congenitally blind subjects. *Cognitive Brain Research* 15(3), 277-284. doi: 10.1016/S0926-6410(02)00199-4

**Project:** 2000-19

**Title:** The Go/No Go Contingent Negative Variation (CNV): Relationships with alcohol abuse and criminal recidivism

Duration: 2001/06 – 2007/12  
Researcher(s): Dr. Richard Charles Howard, Dr. John Lumsden, Dr. P. J. McCullagh, Dr. Peter Fenwick, Dr. H. G. McAllister  
Institution: Broadmoor Hospital, Crowthorne, England (UK)  
Results: N/A  
Keywords: Psychophysiology; Mental health; Substance-related disorders; Antisocial personality disorders

Indexed papers: Howard, R., & Menkes, D. (2007). Brief report: changes in brain function during acute cannabis intoxication: preliminary findings suggest a mechanism for cannabis-induced violence. *Criminal Behaviour and Mental Health: CBMH*, 17(2), 113-117. doi: 10.1002/cbm.646  
Lumsden, J., Hadfield, J., Littler, S., & Howard, R. (2005). The prevalence of early onset alcohol abuse in mentally disordered offenders. *Journal of Forensic Psychiatry & Psychology*, 16(4), 651-659. doi: 10.1080/14789940500205930

**Project: 2000-20**  
Title: Neuropsychological bases of reality monitoring deficits in schizophrenic patients with hallucinations  
Duration: 2000/12 – 2002/07  
Researcher(s): Prof. Gildas Brébion, Dr. Anthony David  
Institution: Institute of Psychiatry, King's College, London (UK)  
Results: Several tests of frontal lobes functions were administered: Wisconsin Card Sorting Test, Tower of London, visual working memory task, and verbal fluency. Other tests assumed to rely on temporal lobe function were administered as well: verbal paired-associates and visual recognition.  
The measure of verbal reality-monitoring deficit was strongly associated with hallucinations. It was also correlated with measures of frontal deficit (Wisconsin perseverative errors:  $r = .32, p < .08$ ; perseverative errors in visual search:  $.37, p < .05$ ; planning errors in the Tower of London:  $r = .42, p < .025$ ). By contrast, the measure of verbal memory efficiency that did

not involve any reality-monitoring function was not correlated with any of these frontal measures, which shows the specificity of the association with reality-monitoring deficit, rather than memory deficit. The measure of verbal reality-monitoring deficit was also associated with one measure of temporal lobe deficit (visual recognition:  $-0.43$ ,  $p < .025$ ).

The measure of visual reality-monitoring deficit was associated with visual hallucinations. It was not correlated at all with any frontal measure. However, it was correlated with one measure of temporal lobe deficit (visual recognition:  $r = -0.39$ ,  $p < .05$ ). By contrast, the measure of visual memory efficiency that did not involve any reality-monitoring function was not correlated with this temporal lobe measure. This suggests that it is actually the confusion between reality and imagination that is involved in this association with temporal dysfunction, rather than a mere deficit in visual memory.

**Keywords:** Psychophysiology; Mental health; Psychotic disorders; Altered states of consciousness; Hallucinations; Cognitive processes

**Indexed papers:** Brébion, G., Bressan, R. A., Ohlsen, R., & David, A. S. (2013). A model of memory impairment in schizophrenia: Cognitive and clinical factors associated with memory efficiency and memory errors. *Schizophrenia Research*, *151*(1), 70-77. doi: 10.1016/j.schres.2013.09.009

Brébion, G., Ohlsen, R., Bressan, R. A., & David, A. S. (2012). Source memory errors in schizophrenia, hallucinations and negative symptoms: A synthesis of research findings. *Psychological Medicine*, *42*(12), 2543-2554. doi: 10.1017/S003329171200075X

Brébion, G., Bressan, R. A., Pilowsky, L. S., & David, A. S. (2011). Processing speed and working memory span: Their differential role in superficial and deep memory processes in schizophrenia. *Journal of the International Neuropsychological Society*, *17*(3), 485-493. doi: 10.1017/S1355617711000208

**Project:** 2000-21

**Title:** High hit-rate random number generator experiment with high gradient of Shannon entropy feedback

**Duration:** 2001/01 – 2003/02

**Researcher(s):** Dr. Edwin May, Dr. Dean Radin

**Institution:** Laboratories for Fundamental Research, Palo Alto (USA)

**Results:** The one “star” participant from an earlier study was asked to contribute 100 trials over a relatively long (3 months) time. All data were logged and saved for later analyses. We could consider this study as a 100 trial, single bit pseudo random number generator experiment. That is, one half of the available sequence lengths were 0.5 and half were larger. From this perspective the single participant produced 60 sessions with a selected hit rate greater than 0.5 (Binomial  $p = 0.0284$ , effect size = 0.190). We also computed the z-score for excess binary ones above the generator bias ( $z = 1.60$ ,  $p = 0.055$ , effect size = 0.160). We conclude, therefore, that this participant produced strong evidence of PSI in this study, and we have a definitive test of the entropy hypothesis. Although there was significant evidence for pseudo random number generator PSI, the participant’s ability was not dependent upon either the gradient of the underlying binary sequence or the gradient of the entropy of the feedback display.

**Keywords:** Parapsychology; Extrasensory perception (ESP); Superior psi ability

**Indexed papers:** N/A

**Project:** **2000-24**

**Title:** Developing a digital autoganzfeld testing system

**Duration:** 2001/05 – 2003/05

**Researcher(s):** Prof. Mathew D. Smith, Dr. Jezz Fox, Prof. Carl Williams

**Institution:** Liverpool Hope University College, England (UK)

**Results:** We proposed to develop a digital autoganzfeld testing system in order to replicate and extend parapsychological research employing the ‘ganzfeld’ procedure. In this procedure, two participants typically take part in any one trial. One participant, the receiver, is isolated in a ganzfeld environment (a mild form of sensory isolation) and is asked to report imagery that comes

to mind, whilst the other participant, the sender, is shown a target film clip in a separate room. A judging procedure makes it possible to assess the degree of correspondence between the receiver's imagery and the target film clip.

In this project, we developed a system, DigiGanz, that is flexible and low-cost so as to encourage other researchers to attempt to replicate and extend previous research using the ganzfeld procedure. The DigiGanz software may be run on computers running Mac OS 9, Mac OS X, and Microsoft Windows. We also conducted two exploratory studies as part of the development and testing of this system. We now plan to continue conducting studies using this system as well as making the software available to other researchers wishing to conduct ganzfeld studies.

Keywords: Parapsychology; Assessment tools; Ganzfeld studies; Extrasensory perception (ESP); Telepathy

Indexed papers: N/A

**Project:** 2000-25

Title: True precognition

Duration: 2001/07 – 2003/06

Researcher(s): Dr. Fiona Steinkamp, Prof. Robert Morris

Institution: The University of Edinburgh, Scotland (UK)

Results: Both experiments assessed the possibility of "true precognition". Before a participant took part in either study, 5 stocks were randomly selected and stored by computer. The closing prices of these stocks on a prespecified future date provided an entry point into a random number table to determine the future target. Hence participants would have to use precognition, rather than any other form of psi, to perform better than chance.

Postal study:

Participants tried to gain impressions at home about a picture they would later receive through the post and mailed their impressions to the experimenter. The experimenter then sent

them a random set of 4 pictures. Participants rated each picture out of 100 as to its likeness to their impressions and returned their pictures and ratings. Two days later, the experimenter looked up the closing prices of the relevant stocks to determine which picture the participant should receive. The results were at chance ( $N = 80$ ,  $z = 0$ ,  $p = .5$ ), indicating that participants were unable to use precognition.

WWW study:

Participants tried to gain impressions at home about a picture they would later see over the WWW. After gaining their impressions, participants went to a website with 4 pictures in random order. Participants entered by each picture a description of any similarities between that picture and their impressions and also submitted a percentage rating as above. Two days later, the experimenter looked up the closing prices of the relevant stocks to determine which picture the participant should see. The experimenter emailed the participant the WWW address of the target picture. The results were at chance ( $N = 159$ ,  $z = -0.28$ ,  $p = .78$ ), indicating that participants were unable to use precognition.

Keywords: Parapsychology; Extrasensory perception (ESP); Precognition

Indexed papers: Steinkamp, F. (2005). Does precognition foresee the future? Series 4: A postal replication. *Journal of Parapsychology*, 69(2), 341-351.

**Project:** 2000-26

Title: Criação de falsas memórias: Contributos para o estudo de algumas características individuais de ocorrência

Duration: 2001/01 – 2004/10

Researcher(s): Prof. Emanuel Pedro Barbas de Albuquerque, Dr. Josefa das Neves Simões Pandeirada, Prof. Teresa Margarida Moreira Freire Barbas de Albuquerque, Eng. Paulo Joaquim Fonseca da Silva Farinha Rodrigues, Dr. Marta Costa Freitas

Institution: Universidade do Minho, Braga (Portugal)



- Results:** Memory is usually thought of as the ability to recollect past events and to bring learned facts and ideas to mind. Defined in that way and lived as we live it, we can say that memory is one of the most reliable cognitive mechanisms of human processing. But, instead of that reliability there are many problems that can occur during the acquisition, storage and retrieval of information.
- The study of false memories inside the laboratory was clearly developed after the Roediger & McDermott (1995) paper. In that paper, the authors showed that the presentation of lists of words related to a critical non-presented lure, produce false recall and false recognition of the critical word (DRM paradigm). In our study we used DRM paradigm to study several variables.
- The results of our study showed: (1) a clear false recall and false recognition of the words that were not presented but related to the words studied; (2) the response time is strongly correlated with the answer correctness (hit or rejection), episodic access (clear remembering of the word presentation), and memory certainty (evaluated in a 4 point scale); (3) there are no individual differences (gender, personality traits, anxiety state) that can explain results; (4) physiological peripheral measures showed no differences as a function of type of answer (correct or incorrect), contextual retrieval (clearly episodic or fuzzy familiar) or response time (long or short); (5) hit (detection of words studied in the learning phase) and false alarms for critical lure (detection of “special” words that were not presented) did not differ in any measure considered.
- Keywords:** Psychophysiology; Cognitive processes; Memory; Personality
- Indexed papers:** N/A
- Project:** **2000-28**
- Title:** Newborn predictors of reactivity at 4 months
- Duration:** 2001/01 – 2002/05
- Researcher(s):** Prof. Jerome Kagan, Prof. Nancy Snidman
- Institution:** Harvard University, Cambridge (USA)

**Results:** A large group of healthy newborns were filmed while being administered a Brazelton examination and these infants were seen again at 4 months when they were shown a battery of visual, auditory and olfactory stimuli.  
The newborns that cried intensely and were difficult to console were most likely to display at 4 months of age vigorous activity of limbs and crying to the stimuli. This result suggests that this group was born with a temperament that rendered them easily aroused to stimulation. These infants are biased to become inhibited children.

**Keywords:** Psychophysiology; Developmental psychology; Psychosocial development

**Indexed papers:** Kagan, J. (2002). Childhood predictors of states of anxiety. *Dialogues in clinical neuroscience*, 4(3), 287-293  
Kagan, J. (2001). Emotional development and psychiatry. *Biological Psychiatry*, 49(12), 973-979. doi: 10.1016/S0006-3223(01)01115-5  
Kagan, J., Snidman, N., McManis, M., & Woodward, S. (2001). Temperamental contributions to the affect family of anxiety. *The Psychiatric Clinics of North America*, 24(4), 677-688. doi: 10.1016/S0193-953X(05)70257-4

**Project: 2000-29**

**Title:** The study of psi-performance in the digital Ganzfeld: Experimentation towards theory development

**Duration:** 2000/12 – 2002/10

**Researcher(s):** Prof. Adrian Parker, Prof. Joakim Westerlund, Dr. Anneli Persson, Prof. Annkatrin Puhle, Dr. Annehilt Haller

**Institution:** University of Gothenburg (Sweden)

**Results:** Two studies have carried out to validate the use of the digital ganzfeld using recordings of the mentation report in real-time with the film clips. The technique also makes use of bookmarks in order to evaluate correspondences between the content of the mentation of that of the film.  
Recording impressive hits as bookmarks using the visual basic program enables these to be evaluated by an external judge. Two

target film clips along with their sets were randomly chosen from the digitalised film library contained in the computer hard disc.

The first study involved 64 double session trials ( $N = 128$ ). All the sessions were evaluated by an external judge obtaining first rank hits close to the 25% chance expectancy. Half the sessions were also judged by the receiver giving a 14% direct hits ( $p = .05$ , two-tailed). Using only the bookmarks, the external judge raised his hit rate from 25% to the 33%. Comparing the receiver's judgements with the external judge's showed the external judgments to be significantly higher ( $p < .05$ ). When judge and receiver disagreed on which was the target film, the external judge was more likely to be correct ( $\chi^2 = 4.51, p = .03$ ). Receivers who brought a friend to serve in the role of sender (N022) gave a 46% hit rate ( $p = .03$ ). Senders rated the affect of the film target significantly higher for hits than for misses.

The second study carried 37 double session trials ( $N = 74$ ) and obtained a first rank hit frequency of 32.4% and a small-medium effect size: 0.17 ( $z = 1.48, p = .09$ ) The trials with one session per day ( $N = 38$ ) gave a 45% hit frequency ( $p < .05$ ) while those with two sessions ( $N = 36$ ) gave a 19% hit rate. The difference in hit rate between one versus maximum two sessions per day was also significant ( $p = .05$ ).

Keywords: Parapsychology; Extrasensory perception (ESP); Assessment tools; Ganzfeld studies

Indexed papers: Parker, A. (2003). We ask, does psi exist? But is this the right question and do we really want an answer anyway? *Journal of Consciousness Studies*, 10(6-7), 111-134.

**Project:** 2000-34  
**Title:** Experimenter effects in parapsychology: Replication and mechanism  
**Duration:** 2000/12 – 2002/01  
**Researcher(s):** Dr. Richard Wiseman, Dr. Caroline Watt  
**Institution:** The University of Edinburgh, Scotland (UK)

**Results:** Using the same participant pool and experimental procedures, the study investigated experimenter differences in results when measuring participants' paranormal belief, cognitive ability, and psi performance. Hypothesis 1: RW's participants would have a different pattern of correlation between paranormal belief and performance on the cognitive tasks, than CW's participants. Hypothesis 2: RW's participants would score differently on the psi task compared to CW's participants. Each experimenter tested 30 participants. Overall, a significant negative correlation was found between paranormal belief and syllogisms performance:  $r = -.28$ ,  $p = .03$ , 2-t. This correlation was attributable to just one of the experimenters: CW  $r = -.45$ ,  $p = .01$ , 2-t; RW  $r = -.08$ , n.s. The difference (calculated using Fisher Z transformation) is statistically significant ( $p = .03$ , 2-t). This suggests an experimenter effect for the correlation between paranormal belief and performance on the syllogisms task, and therefore confirms Hypothesis 1. Further analyses suggested that the negative belief-syllogisms correlation is due to psi-believers shifting their performance on the syllogisms task: CW's psi-believers had significantly lower syllogisms scores than RW's psi-believers ( $t = 2.16$ ,  $p = .04$ , 2-t). A similar, marginally significant, pattern was found for the Matrices task. For the psi task, CW's participants had a mean target rank of 3.0 ( $SD = 1.5$ ), compared to a mean of 2.7 ( $SD = 1.6$ ) for RW's participants. This difference was not statistically significant on a Mann-Whitney test ( $Z = -.90$ ,  $p = .37$ , 2-t). Therefore there was no indication of an experimenter difference on ESP results and no support for Hypothesis 2.

**Keywords:** Parapsychology; Paranormal belief; Extrasensory perception (ESP)

**Indexed papers:** Wiseman, R., & Watt, C. (2002). Experimenter differences in cognitive correlates of paranormal belief and psi. *Journal of Parapsychology*, 66(4), 371-385.

**Project:** 2000-35

**Title:** Psi in a relational culture: An exploratory DMILS study in a non-EuroAmerican culture

Duration: 2001/03 – 2003/03  
 Researcher(s): Prof. Hoyt Edge, Prof. Luh Ketut Suryani  
 Institution: Rollins College, Florida (USA)

Results: These two studies employ the cognitive DMILS protocol in Bali, Indonesia, first introduced by Braud, Schafer, McNeill, and Guerra (1995) and replicated by Brady and Morris (1997). The psi task consisted in a person in one room (Helper) facilitating the attention focusing meditation of a person in another room (Helpee). A computer in the Helper's room randomly selected the order of tasks for the Helper in each pair of periods, (resulting in 8 Help and 8 Control periods). During the Help periods, the Helper focused attention on a lighted candle and intended for the Helpee to increase her focus on a lighted candle in her room, while not meditation during the Control periods. The primary hypothesis, confirmed by both previous studies, was that the sum of button presses (indicating the mind had wandered) in the Control conditions would be significantly greater than in the Help condition. Two studies were carried out in Bali to see whether meditation training had a positive effect on the psi results.

In Study 1, Suryani trained 20 unpaid participants in meditation for two and a half months. Twenty untrained participants brought the total number of participants to 40. These were divided into 10 teams of 4, with two trained and two untrained participants in each group. Each session had 4 runs, one with two trained participants, one with two untrained participants, one with a trained Helper and an untrained Helpee, and one with an untrained Helper and a trained Helpee. The primary hypothesis was supported by there being fewer button presses in the Help condition than the Control condition ( $t_{(37)} = 2.151$ ,  $p < .025$ , one-tailed, Cohen's  $d = .36$ ,  $power$  (at  $\beta = .2$ ) = .33). Analysis suggested that the greatest psi success occurred with trained Helpers and high need untrained Helpees.

Study 2 used 30 unpaid participants meeting the conditions above. 60 runs were carried out, again yielding significant results,  $t_{(119)} = 3.161$ ,  $p < .005$  (one-tailed),  $d = .21$ ,  $power = .29$ . However, the significant results do not seem to have derived from using meditation as a variable.

Keywords: Parapsychology; Psychokinesis (PK); Direct mental interactions with living systems (DMILS); Altered states of consciousness; Meditation

Indexed papers: Edge, H., Suryani, L. K., Tiliopoulos, N., & Morris, R. (2002). Two cognitive DMILS studies in Bali. *Journal of Parapsychology*, 68(2), 289-321.

**Project: 2000-36**

Title: Prestimulus response with and without a Sender: Physiological evidence for precognition

Duration: 2001/01 – 2002/08

Researcher(s): Dr. Edwin May, Dr. Zoltán Vassy

Institution: Laboratories for Fundamental Research, Palo Alto (USA)

Results: Our dependent variable was the proportion of non-specific skin conductance responses (ns-SCR) that occurred before a stimulus compared to the proportion that occurred before controls.

Using electro stimulation, we found a significant increase of proportional ns-SCRs prior to shocks ( $N = 50$ ,  $Z = 3.6$ ,  $ES = 0.174 \pm 0.048$ ,  $p = 1.6 \times 10^{-4}$ ). Similarly, we found a significant effect for audio stimulation ( $N = 125$ ,  $Z = 3.27$ ,  $ES = 0.0901 \pm 0.0275$ ,  $p = 5.4 \times 10^{-4}$ ). With both stimulus types, however, retesting individuals failed to produce significant effects ( $N = 80$ ,  $Z = -0.150$ ,  $ES = -0.0010 \pm 0.025$ ,  $p = 0.556$ ;  $N = 27$ ,  $Z = 0.531$ ,  $ES = 0.070$ ,  $p = 0.298$ , respectively, for electro and audio stimulation).

We have discovered a major flaw in the previous reported success with prestimulus response that used ensemble averaging in the epoch analysis to demonstrate an effect. We found that such results are driven by the fortuitous distribution of especially large outliers in the prestimulus regions. Therefore, prestimulus response appears to manifest as skin conductance responses in the prestimulus region and not as a general skin conductance level shift.

Alternatively, in the parlance of skin conductance research, prestimulus response appears as a phasic rather and a tonic effect.

Keywords: Parapsychology; Extrasensory perception (ESP); Telepathy; Presentiment; Precognition

Indexed papers: Vassy, Z. (2004). A study of telepathy by classical conditioning. *Journal of Parapsychology*, 68(2), 323-350.  
 Spottiswoode, J., & May, E. (2003). Skin conductance prestimulus response: Analyses, artifacts and a pilot study. *Journal of Scientific Exploration*, 17(4), 617-641.

**Project:** 2000-37

Title: Mechanisms of PSI performance

Duration: 2001/01 – 2004/04

Researcher(s): Dr. Marios Kittenis e Prof. Robert Morris

Institution: The University of Edinburgh, Scotland (UK)

Results: This study combines the methodology of photic stimulation during EEG recordings with a procedure aimed to induce consciousness alterations, in order to investigate possible remote psychophysiological interactions between physically isolated pairs of participants.

An experiment was conducted with three groups of subjects; 13 related pairs (who knew each other well), 5 unrelated pairs (randomly matched strangers) and 5 single participants. Related pairs spent some time alone together before testing, while unrelated pairs did not meet each other until after the session; single participants were told they would be paired with someone (as unrelated pairs) but were not. Both participants in each pair simultaneously listened to a relaxation procedure with instructions aimed to induce a hypnagogic-like state, followed by continuous drumming; this procedure was expected to induce a similar change in conscious state in both participants. EEG was recorded from one person of the pair, while the other was stimulated with randomly timed single photic flashes.

EEG epochs were taken from the “receiver” during periods of photic stimulation of the “sender” and from periods of no stimulation. According to the null hypothesis, no difference was expected between these samples. Event-related alpha power measures showed a tendency for EEG samples from

photic stimulation periods to show larger deviations from baseline than control samples; this difference was found to be significant at  $p < 0.042$  for all three groups combined. Related and unrelated pairs demonstrated responses of similar magnitude ( $p < 0.025$  combined), while recordings from single participants (where no other person was stimulated) showed no such effects.

Keywords: Parapsychology and Psychophysiology; Psychokinesis (PK); Direct mental interactions with living systems (DMILS); Altered states of consciousness; Electroencephalogram (EEG)

Indexed papers: N/A

**Project: 2000-40**

Title: A controlled study of anomalous experience with PSI-conductive and PSI-inhibitory investigators: Part A: Anomalous cognition; Part B: Healing

Duration: 2000/12 – 2002/12

Researcher(s): Prof. David Marks

Institution: City University, London (UK)

Results: Part A: Anomalous cognition:  
This part of the project consisted of two studies. The first was a controlled replication of a remote viewing exercise by Lantz, Luke & May (1994). The original responses and targets were re-judged by two judges using identical procedures to those of Dr May. The results were passed to two intermediaries (Ray Hyman and Robert Morris). No statistically significant relationships between transcripts and targets occurred and the Lantz et al. (1994) were unrepeated.  
In the second study seven remote viewing trials were videoed. No statistically significant associations between descriptions and targets were found. However there was strong evidence of subjective validation, a process by which the participant and the judge believes that there is a correspondence between a transcript and a target regardless of the accuracy of the matching (Marks, 2000).



**Part B: Healing:**

This part contained two studies. The first study involved a practitioner of “Pranic Healing” (Mr M). The healing involves no physical contact, yet the patient reports physical sensations and pain relief. Sessions with patients were videoed over their treatment. In the second study patients were interviewed at different points in their treatment. The patients reported positive effects including bodily sensations, deep relaxation, sleepiness and analgesia. A relationship between the healing and hypnosis is suggested, the basis for further studies.

The second study analysed patients’ accounts about their treatment from the viewpoint of discourse, categories and theories employed to explain the effect of the healing. The energy concept they employed was not a metaphorical one, but a category of physical energy outside of natural science.

**Keywords:** Parapsychology; Extrasensory perception (ESP); Remote viewing; Paranormal belief; Healing; Laying on of hands

**Indexed papers:** N/A

**Project: 2000-41**

**Title:** Second sight and other exceptional mental and artistic abilities in families

**Duration:** 2009/10 - 2014/02

**Researcher(s):** Dr. Shari A. Cohn

**Institution:** The University of Edinburgh, Scotland (UK)

**Results:** N/A – Inconclusive Project

**Keywords:** Parapsychology; Extrasensory perception (ESP); Clairvoyance

**Indexed papers:** N/A

**Project: 2000-47**

**Title:** Alterações psicofisiológicas da atividade nos estados depressivos

Duration: 2001/01 – 2004/07  
Researcher(s): Dr. Frederico Cavaglia, Dr. Ana Matos Pires, Mr. David Pires Barreira, Dr. Paula Lopes  
Institution: Instituto Superior de Ciências da Saúde-Sul, Caparica (Portugal)  
Results: N/A – Inconclusive Project  
Keywords: Psychophysiology; Mental health; Mood disorders  
Indexed papers: N/A

**Project: 2000-52**

Title: Seeking the intuition response: Exploring the human electrodermal “Preresponse” as a reliable indicator of precognitive intuition

Duration: 2000/12 – 2002/08  
Researcher(s): Prof. Richard S. Broughton  
Institution: Intuition Laboratories, Durham (USA)

Results: This project was designed to replicate and extend a series of experiments, known as “presentiment” or “pre-stimulus response” experiments, that provide evidence of human emotional system response prior to aversive stimuli.  
To examine test-retest reliability 80 subjects were tested on two occasions in an experiment that monitored skin conductance while they viewed briefly exposed images from the International Affective Picture System (IAPS). Subjects also completed the Myers-Briggs Type Indicator (MBTI) and the NEO-FFI personality tests.  
With 64 subjects providing usable data, there was no overall evidence of a presentiment or pre-stimulus response, nor was there any evidence of test-retest reliability. Surprisingly, there were significant correlations between a subject’s pre-stimulus response and the MBTI Intuition factor and the NEO-FFI Openness factor, both of which have shown similar relationships in prior ESP research. No other personality factors showed any relationships.

Subsidiary analyses confirmed findings by other researchers that the evidence for pre-stimulus response is not the slow rise of tonic skin conductance levels but rather the accumulation of more non-specific skin conductance responses immediately prior to aversive stimuli. Also, analysis of the data rejected expectancy artifacts as a possible explanation for pre-stimulus response findings.

Keywords: Parapsychology; Extrasensory perception (ESP); Presentiment; Personality factors

Indexed papers: N/A

**Project: 2000-54**

Title: Effect of Galvanic Skin Response (GSR) biofeedback on seizure frequency in patients with poorly controlled epilepsy

Duration: 2001/05 – 2003/03

Researcher(s): Dr. Yoko Nagai, Dr. Michael Trimble, Prof. Peter Fenwick, Prof. Laura Goldstein, Prof. John Lumsden

Institution: Institute of Neurology, University College, London (UK)

Results: Behavioural interventions including biofeedback represent an alternative or adjunctive therapeutic axis in the management of drug refractory epilepsy. Our previous study suggested that the modulation of the peripheral state of arousal as indexed by the Galvanic Skin Response (GSR) had considerable influence on cortical excitability, indicating the possible use of biofeedback in controlling seizure activity. In the present study we investigated the effect of the GSR biofeedback training on seizure frequency in patients with treatment resistant epilepsy. Eighteen patients with drug refractory epilepsy were randomly assigned either to an active GSR biofeedback group ( $n = 10$ ) or to a sham control biofeedback group ( $n = 8$ ). Patients received a total of 12 sessions over four weeks, representing either real GSR biofeedback training, where subjects were trained to control their GSR by receiving feedback of their own GSR change on the computer screen, or sham training, where the feedback was unrelated to the subjects' GSR. Biofeedback training significantly reduced patients' seizure

frequency in the active biofeedback group ( $p = 0.005$ ), but not the control group ( $p > 0.10$ ). This was manifest as a significant between group differences in seizure reduction ( $p = 0.016$ ). Furthermore there was a correlation between degree of patients' improvement in biofeedback performance and reduction of seizure frequency ( $rho = 0.736$ ,  $p = 0.001$ ), confirming that the effect of biofeedback treatment was related to physiological change. Our findings demonstrate that a behavioural intervention, GSR biofeedback training, may be associated with a significant reduction in seizure frequency in drug refractory epilepsy, highlighting the potential therapeutic value of this method.

**Keywords:** Psychophysiology; Diseases/Injuries; Epilepsy; Intervention; Electroencephalogram (EEG); Functional magnetic resonance imaging (fMRI)

**Indexed papers:** Nagai, Y. (2011). Biofeedback and epilepsy. *Current Neurology and Neuroscience Reports*, 11(4), 443-450. doi: 10.1007/s11910-011-0201-3

Nagai, Y., Critchley, H. D., Rothwell, J. C., Duncan, J. S., & Trimble, M. R. (2009). Changes in cortical potential associated with modulation of peripheral sympathetic activity in patients with epilepsy. *Psychosomatic Medicine*, 71(1), 84-92. doi: 10.1097/PSY.0b013e31818f667c

Nagai, Y., Critchley, H. D., Featherstone, E., Fenwick, P., Trimble, M. R., & Dolan, R. J. (2004). Brain activity relating to the Contingent Negative Variation (CNV): fMRI investigation. *NeuroImage*, 21(4), 1232-1241. doi: 10.1016/j.neuroimage.2003.10.036

**Project: 2000-58**

**Title:** Are ESP and PK aspects of a unitary phenomenon? Considering the relationship between ESP and PK

**Duration:** 2001/01 – 2003/10

**Researcher(s):** Prof. Chris A. Roe, Prof. Paul Stevens

**Institution:** University College Northampton (UK)

**Results:** This project consisted of four studies that systematically explored performance at ESP and PK tasks using a common protocol.

Study 1 compared personality covariates of performance for ESP and PK tasks. The overall outcome was disappointing, with sums of ranks for finishing positions a little worse than mean chance expectation (MCE). However, there were a number of interesting internal effects that were consistent with previous findings and merited further exploration.

Study 2 considered the effects of expectancy by comparing performance in an informed condition with that in a blind condition. The overall outcome was similar to that for Study 1. However, we did find that participants performed significantly better in the blind condition, suggesting that poor performance was not due to a disenchantment effect brought about by the use of deception.

Study 3 considered the effects of arousal level upon performance by instructing participants to adopt a relaxed/passive or aroused/active strategy, and by playing rousing or calming classical music. No effects of arousal were found, though general performance was somewhat better than previously.

Study 4 focused on possible experimenter effects. RD, who had conducted all previous sessions, was experimenter for 20 trials, but CR conducted the other 20 trials. It was hypothesised that CR's participants might fare better since he is a more experienced researcher and as its main designer and fundraiser has a greater 'ownership' of this project. We also included a questionnaire that asked about aspects of the experimenter-participant interaction. There was a further improvement in the overall outcome, and CR's participants did fare better than RD's, suggestively so overall and significantly so for disguised ESP trials. A number of the interaction items correlated remarkably strongly with task performance. Further work is planned.

Keywords: Parapsychology; Extrasensory perception (ESP); Psychokinesis (PK); Psychopraxia

Indexed papers: Roe, C. A., Davey, R., & Stevens, P. (2006). Experimenter effects in laboratory tests of ESP and PK using a common protocol. *Journal of Scientific Exploration*, 20(2), 239-253.

Roe, C. A., Davey, R., & Stevens, P. (2003). Are ESP and PK aspects of a unitary phenomenon? A preliminary test of the relationship between ESP and PK. *Journal of Parapsychology*, 67(2), 343-366.

- Project:** 2000-61
- Title:** Changes in mismatch negativity during hypnosis as an indicator of susceptibility to both hypnosis and to paranormal experiences
- Duration:** 2001/01 – 2002/03
- Researcher(s):** Prof. John Howard Gruzelier, Dr. Graham Jamieson
- Institution:** Imperial College School of Medicine, London (UK)
- Results:** We examined the relation between hypnotic susceptibility and schizotypal unreality experiences. In the first study (Jamieson & Gruzelier, 2001), of the 15 schizotypy items associated with the Harvard HGSHS, 5 belonged to the unreality scale, 8 to cognitive activation and 2 to withdrawal. In a replication with the cognitively loaded Stanford SSHS, Form C, 9/12 items were associated with unreality and 3 cognitive activation. Of the 9 unreality items 6 concerned extra sensory perception in support of hypotheses. Subsequently students volunteering for stress reduction training were examined with the HGSHS. Here only 2 items involved unreality, 4 activation, while 8 were withdrawn items. Clearly while a relation with schizotypy was a consistent feature of the three studies, relations with unreality depended on the nature of the volunteer sample and on the features of hypnotisability examined, motoric versus cognitive, the latter showing strong relations with extrasensory perception (Gruzelier et al, 2004).  
In two experiments mismatch negativity waveform (MMN) was examined for possible influences of hypnosis and susceptibility on early stages of auditory processing. In one experiment hypnotisable participants showed evidence of more efficient processing of attended stimuli while unhypnotisable subjects showed evidence of distraction, in support of theory. In the second experiment MMN increased with hypnosis independent of hypnotisability, while it was only following hypnosis that the groups were differentiated. Our hypothesis that MMN would be altered by hypnosis was not supported (Jamieson et al, 2004).
- Keywords:** Parapsychology and Psychophysiology; Altered states of consciousness; Hypnosis; Personality factors; Anomalous cognition/experiences; Brain

- Indexed papers: Jamieson, G., Dwivedi, P., & Gruzelier, J. H. (2005). Changes in mismatch negativity across prehypnosis, hypnosis and post-hypnosis conditions distinguish high from low hypnotic susceptibility groups. *Brain Research Bulletin*, 67(4), 298-303. doi: 10.1016/j.brainresbull.2005.06.033
- Gruzelier, J. H., De Pascalis, V., Jamieson, G., Laidlaw, T., Dwivedi, P., Naito, A., Bennett, B., & Gruzelier, J. H. (2004). Relations between hypnotisability and psychopathology revisited. *Contemporary Hypnosis*, 21(4), 169–176. doi: 10.1002/ch.304
- Jamieson, G., & Gruzelier, J. H. (2001). Hypnotic susceptibility is positively related to a subset of schizotypy items. *Contemporary Hypnosis*, 18(1), 32-37. doi: 10.1002/ch.214

**Project:** 2000-66  
**Title:** Anosognosia - bases biológicas da unidade da consciência  
**Duration:** 2002/06 – 2004/06  
**Researcher(s):** Prof. Isabel Pavão Martins, Dr. Clara de Santos Loureiro, Prof. José M. Ferro, Dr. Tânia Fernandes  
**Institution:** Centro de Estudos Egas Moniz, Hospital Sta. Maria, Lisboa (Portugal)

**Results:** With this work we obtained normative results for the Portuguese Population on the Behavioural Inattention Test (BIT) a battery used for the diagnosis of Neglect.  
 Contrary to the norms described at the test manual we found that there is a main effect of education on the performance in this test, quite evident between the literate and illiterate populations. There were no age or gender effects.  
 This educational factor requires different cut-off points in accordance with the educational level, otherwise healthy illiterate subjects can produce false positive diagnosis.  
 The distribution of errors was also analysed. Neglect can only be diagnosed if there is an asymmetry in the distribution of the errors. A diagnosis based only on a low score (below the cut-off point) can result from an attentional impairment rather than neglect.  
 These results are original and were not specifically described in the test manual.  
 The assessment of a group of patients with right hemisphere

stroke allowed us to select the most appropriate and sensitive tests for the acute period. These results are essential for the design of a short bedside neglect screening battery.

Keywords: Psychophysiology; Cognitive processes; Attention; Diseases/Injuries; Stroke; Assessment tools

Indexed papers: N/A

**Project: 2000-67**

Title: Pain control from the brain. Novel approaches of chronic pain treatment through manipulation of supraspinal areas

Duration: 2000/12 – 2003/12

Researcher(s): Prof. Deolinda Lima, Prof. Isaura Ferreira Tavares, Prof. Armando Alberto da Nova Pinto de Almeida, Prof. Christophe Dugast, Dr. Vasco Miguel Clara Lopes Galhardo, Dr. Marta Sofia Carvalho Teixeira Pinto

Institution: Instituto de Histologia e Embriologia da Fac. Medicina do Porto (Portugal)

Results: The project was designed to evaluate the possibility of using gene therapy at the central nervous system as an analgesic tool. Pain suppression through central electrical stimulation, although effective as an analgesic tool, is impracticable since serious secondary effects occur due to stimulation of neurons involved in other brain functions. Viral vector transduction stands nowadays as a way of overcoming this problem by directing manipulation specifically to pain-control neurons. We focused on the possibility of concomitantly inhibit a pain facilitatory center (DRt) and stimulate a pain inhibitory center (VLM) by the use of multiple transduction from each site with the replication-defective herpes simplex virus (HSV-1). The migration pattern following injection of HSV-1 in the DRt and VLM was studied. In parallel, information on the membrane receptors present in the neurons to be targeted (DRt and VLM pain processing neurons) and on the neurotransmitters used by the neurons to be transduced was collected.



The results collected allowed us to conclude that HSV-1 is particularly well suited for the purpose of the project since it transduces just a few brain areas projecting to the VLM and DRt, allowing a limited but still amplified action upon each one, and areas other than the DRt and VLM that receive axonal terminations of transduced neurons are few. The neurochemical data point to the use of vectors coding for the GABAB receptor, GAD and noradrenalin at the DRt, and of vectors coding for GABAB and  $\alpha 2$  receptor antisense molecules at the VLM. Behavior and pharmacological studies aimed at elucidating the effect of appropriate drugs upon injection in the sites of termination of the transduced neurons are however still needed.

Keywords: Psychophysiology; Pain

Indexed papers: Dugast, C., Almeida, A., & Lima, D. (2003). The medullary dorsal reticular nucleus enhances the responsiveness of spinal nociceptive neurons to peripheral stimulation in the rat. *European Journal of Neuroscience*, *18*(3), 580-588. doi: 10.1046/j.1460-9568.2003.02782.x

Pinto, M., Lima, D., Castro-Lopes, J., & Tavares, I. (2003). Noxious-evoked c-fos expression in brainstem neurons immunoreactive for GABA(B), mu-opioid and NK-1 receptors. *European Journal of Neuroscience*, *17*(7), 1393-1402. doi: 10.1046/j.1460-9568.2003.02586.x

Galhardo, V., Apkarian, A. V., & Lima, D. (2002). Peripheral inflammation increases the functional coherency of spinal responses to tactile but not nociceptive stimulation. *Journal of Neurophysiology*, *88*(4), 2096-2103. doi: 10.1152/jn.00720.2001

**Project:** 2000-70

Title: Mental imagery in parasomnias: A study before, during and after treatment

Duration: 2001/03 – 2003/07

Researcher(s): Prof. Susan Wilson, Dr. Theodoros Mazarakis

Institution: University Walk, School of Medical Sciences, Bristol (UK)

Results: We studied adult patients who were suffering from rare sleep disorders such as sleepwalking, night terrors and REM behaviour disorder, which interfered with their lives and caused

them sufficient distress to prompt them to seek medical help. We recorded their sleep with brainwave measurement and video recording in their own homes, to decide which specific disorder they were suffering from, and we interviewed them in depth to try and establish what they experienced during the attacks and what effect it had on them emotionally.

The interviews revealed that although many patients had no recall of the actual episodes, they did have additional dreams and night-time anxieties which they associated with their sleep disorder, and which might have increased their fear of their episodes. These often included images of insects, or of horrific situations about to happen, and nearly always were accompanied by feelings of helplessness and loss of control. In-depth analysis of the interviews has provided a valuable body of information about these rare disorders and a basis for planning appropriate psychological treatments to complement the pharmacological approach currently employed. This additional treatment would focus on the patients' fear of the coming night and the episodes themselves, which may be aggravating or perpetuating the disorder.

Keywords: Psychophysiology; Mental health; Sleep disorders; Emotion

Indexed papers: N/A

**Project:** 2000-71

Title: Experimental enhancement of receptive Psi by transcerebral application of complex magnetic fields

Duration: 2000/12 – 2003/03

Researcher(s): Dr. Michael A. Persinger, Dr. Linda St-Pierre, Dr. Sandra Tiller

Institution: Laurentian University, Ontario (Canada)

Results: More than two dozen pairs of subjects were exposed to a stimulus and response condition. While the person in the response condition sat blindfolded within a darkened acoustic chamber and received various configurations of pulsed complex magnetic fields whose presentations were rotated in a counterclockwise position around the head, the person in

the stimulus setting in another room was given a randomly selected picture. The stimulus person was told to think of the memories associated with the person in the response condition. The greatest congruence between the content of the narratives generated by the stimulus persons and the experiences reported by the persons exposed to the fields occurred when the derivative of change for the rotating field was about 20msec. This specific magnetic configuration, when applied around the heads of the subjects in the chamber, was associated with a peak in power within the 5 Hz to 6 Hz band of individuals setting another room while quantitative electroencephalographic activity was being sampled.

**Keywords:** Parapsychology and Psychophysiology; Anomalous cognition/experiences; Brain; Electroencephalogram (EEG)

**Indexed papers:** Persinger, M. A., Koren, S. A., & Tsang, E. W. (2003). Enhanced power within a specific band of theta activity in one person while another receives circumcerebral pulsed magnetic fields: a mechanism for cognitive influence at a distance? *Perceptual and Motor Skills*, 97(3), 877-894. doi: 10.2466/PMS.97.7.877-894

Richards, M. A., Koren, S. A., & Persinger, M. A. (2002). Circumcerebral application of weak complex magnetic fields with derivatives and changes in electroencephalographic power spectra within the theta range: implications for states of consciousness. *Perceptual and Motor Skills*, 95(2), 671-686. doi: 10.2466/pms.2002.95.2.671

Persinger, M. A., Roll, W. G., Tiller, S., Koren, S. A., & Cook, C. M. (2002). Remote viewing with the artist Ingo Swann: Neuropsychological profile, electroencephalographic correlates, magnetic resonance imaging (MRI), and possible mechanisms. *Perceptual and Motor Skills*, 94(3), 927-949. doi: 10.2466/pms.94.3.927-949

**Project:** 2000-77  
**Title:** Psi reinforcement of stochastic mentation - the PRiSM model of dyadic ESP  
**Duration:** 2001/01 – 2002/12  
**Researcher(s):** Prof. Paul Stevens  
**Institution:** The University of Edinburgh, Scotland (UK)

**Results:** This study tested a proposed model wherein a receiver in ganzfeld protocol would show a mentation-reinforcing skin-conductance change when a sender decided their mentation was target-relevant. This would be seen whether the mentation heard by the sender was True-Feedback (TF) or False-Feedback (FF) i.e. the sender's decision initiated the skin-conductance change.

Based on the receiver's ranking of target video clip, there was no evidence of telepathy with only 24 direct hits ( $\pi < 0.5$ ,  $p = 0.49$ ,  $p = 0.33$ ). However, the receiver did show a skin-conductance response when the sender thought the mentation was relevant to the target. The apparent discrepancy highlights the low correlation ( $r_{ho} = -0.11$ ) between the target-relevance of the receiver's mentation and the final rank given to the target, implying that there are limitations to the standard ganzfeld protocol for producing reliable telepathy effects.

Correlations were found between variance of the local magnetic field and telepathy success (Overall: Spearman  $r = +0.122$ ,  $p = 0.12$ ; FF:  $r = +0.194$ ,  $p = 0.09$ ; TF:  $r = -0.239$ ,  $p = 0.05$ ). This was in the predicted direction overall and for the FF, but reversed for TF, possibly implying that different primary processes operate in each condition (negative correlations are more usually observed in micro-PK studies). A predicted positive correlation with magnetic field intensity was also found (Overall:  $r = -0.255$ ,  $p = 0.08$ ; FF:  $r = -0.300$ ,  $p = 0.02$ ; TF:  $r = -0.209$ ,  $p = 0.08$ ). 42 of the receivers were also measured to see their skin-conductance responses to an applied magnetic field.

Although overall they showed the expected slight increase in the variance of skin conductance, there were no significant correlations between this and telepathy success.

**Keywords:** Parapsychology; Extrasensory perception (ESP); Telepathy; Magnetic field; Psychokinesis (PK); Ganzfeld studies

**Indexed papers:** Stevens, P. (2004). Experimental evaluation of a feedback-reinforcement model for dyadic ESP. *Journal of Parapsychology*, 68(1), 65-92.

- Project:** 2000-78
- Title:** Psi and the cognitive unconscious
- Duration:** 2001/02 – 2002/03
- Researcher(s):** Prof. Robert Morris, Dr. Stuart Wilson
- Institution:** The University of Edinburgh, Scotland (UK)
- Results:** Four studies compared psi processing with “perception without awareness”. Study 1a looked at what is known as a “false recognition” effect, in which recognition memory is influenced by stimuli presented outside of conscious awareness. After an initial study list, participants took part in an “old/new” recognition task, in which they had to decide whether test words had been presented in the original list or not. Under certain conditions, it was found that presenting the test word outside of awareness could cause participants to “falsely recognise” new words (respond “old” to words they had not seen in the study list).  
 Study 1b looked for a similar effect using psi as a biasing stimulus. Following a study list, participants were given an old/new recognition task. On half of the “new” trials a sender attempted to psychically influence the participants’ recognition memory. No significant main effects were found in either the false recognition data or the response-time data. There was some indication of a gender interaction in both these dependent variables, but these effects were not significant.  
 Study 2a looked at the effect of psi on word association. A “sender” attempted to influence participants’ interpretation of homophones. The main effect fell just short of significance, though there was a suggestion of an experimenter effect and a response-bias effect.  
 Study 2b involved “subliminal” stimuli, and employed an exclusion task. The aim was to influence interpretation of homophones by means of an auditory “prime” presented outside of awareness. A variety of signal/noise ratios were used, but no significant effects were found.
- Keywords:** Parapsychology; Anomalous cognition/experiences
- Indexed papers:** Wilson, S. (2002). Psi, perception without awareness and false recognition. *Journal of Parapsychology*, 66(3) 271-291.

- Project:** 2000-79
- Title:** Assessing coherence between psychic healers and patients by simultaneous monitoring of physiological variables
- Duration:** 2001/07 – 2003/04
- Researcher(s):** Prof. Stephen B. Baumann, Prof. John Palmer, Dr. Martin Sullivan
- Institution:** Rhine Research Center, Durham (USA)
- Results:** Simultaneous EEG and ECG data was recorded from 11 healer-patient pairs during control and treatment periods and from nine pairs of non-healers who acted as controls. EEG coherence was computed between all homologous electrode leads from each pair of subjects and was generally the same between control pairs and healer-patient pairs. However, some of the treatment periods for two nationally known healers were characterized by unusual activity, but this was not consistent between healers or across different treatment sessions for each healer.
- Heartbeat data was analyzed for the healer's ECG appearing in the patient's EEG, but no evidence for this effect has been found. Ongoing analysis is continuing for possible evidence of more subtle EEG and ECG effects. One healer agreed to participate in fMRI studies, and data from three such studies has been analyzed. The first two studies indicated that eye movement may have caused substantial artifact, but a third study, which attempted to control for eye movement, showed evidence of increased frontal lobe activation during treatment periods. One of two fMRI runs from a patient treated while in the magnet approximately 30 feet from the healer indicated frontal lobe activation as well, but this was not replicated in a subsequent run or with a second patient. Further fMRI studies with better equipment are planned.
- Keywords:** Parapsychology and Psychophysiology; Healing; Laying on of hands; Brain; Electroencephalogram (EEG); Functional magnetic resonance imaging (fMRI)
- Indexed papers:** N/A

- Project:** 2000-87
- Title:** A controlled analysis of subjective paranormal experiences in temporal lobe dysfunction in a neuropsychiatric population
- Duration:** 2000/12 – 2002/02
- Researcher(s):** Prof. John A. Palmer, Prof. Vernon M. Neppe, Dr. Heidi Nebel, Dr. Stacie Magill
- Institution:** Rhine Research Center, Pacific Neuropsychiatric Institute, Durham/Seattle (USA)
- Results:** This research extended to a neuropsychiatric population findings by Neppe and by Persinger that subjective paranormal experiences (SPEs) are associated with temporal lobe dysfunction (TLD) in the brain. The sample consisted of 100 of Neppe's patients. TLD was defined by 4 diagnostic criteria: (a) symptomatology as measured by 16 TLD-specific items from Neppe's INSET questionnaire; (b) predisposing conditions (recreational drugs, brain damage); (c) anomalous electroencephalographic (EEG) activity; and (d) response to anti-convulsant drugs. SPEs were measured by questions on the INSET referring to ESP, apparitional, and out-of-body experiences. TLD criteria and SPEs were coded independently by 2 raters. 60 patients classified as having TLD had more SPEs than 27 patients who were not ( $p < .05$ , one-tailed). 13 borderline patients on TLD were removed. Supplementary regression analyses revealed that this result was due entirely to symptoms (INSET) as predictor ( $p < .001$ ). Females reported significantly more TLD symptoms and SPEs than males, but this confound did not destroy the INSET-SPE relationship. Phone interviews of 20 patients reporting SPEs confirmed that the great majority had at least one credible ESP experience. Secondary analyses using as predictors specific INSET items and EEG variables indicated that ESP experiences were positively associated with rightside lateralization (left-hemisphere dominance), and high scores on auditory/visual hallucinations and jamais vu. ESP experiences were most common among females with relatively high-frequency EEG abnormalities in the left temporal (and to a lesser degree) left frontal brain areas, but that were not generalized. This effect significantly reversed for males.

Keywords: Psychophysiology and Parapsychology; Anomalous cognition/experiences; Diseases/Injuries; Temporal lobe dysfunction; Brain; Electroencephalogram (EEG)

Indexed papers: Palmer, J., & Neppe, V. M. (2003). A controlled analysis of subjective paranormal experiences in a neuropsychiatric population. *Journal of Parapsychology*, 67(1), 75-97.

### 2002/03 Projects

**Project:** 2002-01

Title: The investigation of Telepathy and the Sense of Being Stared At in Humans and Animals

Duration: 2003/03 – 2005/04

Researcher(s): Prof. Rupert Sheldrake, Ms. Pam Smart, Dr. Kara Murray

Institution: Centre for the Seven Experiments Project, London (UK)

Results: Many people have found that they think of someone for no apparent reason, and shortly afterwards receive a telephone call or an email from that person. In tests on telephone telepathy, during my previous Bial Foundation Bursary, I found that people really could anticipate who was about to call them. My Research Associate Pam Smart and I have now completed more than 500 email telepathy tests, following a similar design to the telephone telepathy tests. Each subject has four potential emailers some of whom are familiar and nominated by the subject, while others are unfamiliar. For each test, the emailer is selected at random by the experimenter.

As in the telephone telepathy experiments there is a one in four chance of the subject guessing correctly at random. Hence the mean chance expectation of success is 25%. In an initial series of 552 trials, we tested 50 participants. The hit rate was 43%, very significantly above the mean chance expectation of 25% ( $p = 1 \times 10^{-20}$ ). The 95% confidence limits of the success rate were from 39% to 47%.

We then tested five participants under more rigorous conditions



in which they were filmed continuously. In 150 filmed trials, the hit rate was 47 ( $p = 1 \times 10^{-9}$ ).

In some of our trials the emailers were more than 10,000 kilometres away from the participants with no sign of any decline owing to distance.

An on-line version of the email telepathy experiment is now available on my website [www.sheldrake.org](http://www.sheldrake.org).

I have continued with my research on the sense of being stared at and have written an extensive review of the evidence and also a paper on its theoretical implications, due to appear in a special issue of the *Journal of Consciousness Studies* in the summer of 2005.

**Keywords:** Parapsychology; Extrasensory perception (ESP); Telepathy; Psychokinesis (PK); Remote staring/Being stared at

**Indexed papers:** Sheldrake, R., & Smart, P. (2008). Investigating Scopesthesia: Attentional Transitions, Controls, and Error Rates in Repeated Tests. *Journal of Scientific Exploration*, 22, 517-527.

Sheldrake, R. (2005). The sense of being stared at - Part 1: Is it real or illusory? *Journal of Consciousness Studies*, 12(6), 10-31.

Sheldrake, R. (2005). The sense of being stared at - Part 2: Its implications for theories of vision. *Journal of Consciousness Studies*, 12(6), 32-49.

**Project:** 2002-03

**Title:** The neural structures involved in procedural memory

**Duration:** 2003/11 – 2006/11

**Researcher(s):** Dr. Sara Cavaco, Prof. Alexandre Castro-Caldas, Prof. Steven Anderson

**Institution:** Centro de Estudos Egas Moniz, Lisboa (Portugal)

**Results:** Six new and ecologically related laboratory-controlled perceptual-motor tasks were used to explore the capacity to learn and retain perceptual-motor skills in patients with focal brain damage. Five tasks were applied in the investigation of the putative involvement of the basal ganglia in skill learning, which was inferred from the performance of 16 patients with damage in the basal ganglia. The patients showed reduced skill learning.

However, the impairment was not generalized to all tasks. The sixth task was used to examine the performance of patients with focal damage in the medial temporal area ( $N = 5$ ), the basal ganglia ( $N = 7$ ), the dorsolateral prefrontal cortex ( $N = 5$ ), and other brain areas ( $N = 25$ ). As expected patients with damage in the medial temporal area or other brain areas showed normal learning of the skill, whereas patients with dorsolateral prefrontal cortex damage showed impaired learning. The results from the basal ganglia subjects did not confirm the initial hypothesis of reduced learning of the skill. This task was also used to record the eye-movement behavior of 33 healthy subjects during the performance of the task. As expected the subjects' saccadic behavior changed during practice of the task and acquisition of the skill. The findings of these studies have important implications in the understanding of perceptual-motor skill learning as a multi-dimensional process and in the identification of the neuropsychological mechanisms underlying skill learning.

**Keywords:** Psychophysiology; Diseases/Injuries; Brain dysfunction; Cognitive processes; Learning

**Indexed papers:** Cavaco, S., Anderson, S., Correia, M., Magalhães, M., Pereira, C., Tuna, A. ... Damásio, H. (2011). Task specific contribution of the human striatum to perceptual-motor skill learning. *Journal of Clinical and Experimental Neuropsychology*, 33(1), 51-62. doi: 10.1080/13803395.2010.493144

**Project:** 2002-11

**Title:** Os efeitos dos jogos electrónicos com equipamento de Realidade Virtual na activação psicofisiológica, estruturas cognitivas, estado emocional e comportamento agressivo

**Duration:** 2003/09 – 2006/11

**Researcher(s):** Dr. Patrícia Paula Lourenço e Arriaga Ferreira, Prof. Francisco Esteves, Dr. Mara Paula Carneiro

**Institution:** Centro de Estudos de Psicologia Cognitiva e da Aprendizagem, Lisboa (Portugal)

- Results:** Using the General Aggression Model (GAM) framework, developed by Anderson and colleagues, the current experiment was conducted to analyze the short-term effects of violent electronic games, played with or without a virtual reality device, on the instigation of aggressive behaviour under provocation. Physiological arousal (heart rate), priming of aggressive thoughts, and state hostility, were measured to test their possible mediation on the relationship between playing the violent game and aggression, as is predicted by the GAM. The participants - 147 undergraduate students - were randomly assigned to four treatment conditions: two groups played a violent computer game (Unreal Tournament), and the other two a non-violent game (Motocross Madness). Among those who played the violent game, half used a virtual reality device and the remaining participants played on the computer screen. The game effects were assessed by an emotional Stroop task (using affective words) to analyze the priming of aggressive thoughts, a self-report state hostility scale to rate hostility, a BIOPAC System MP100 to measure heart rate, and a Competitive Reaction Time Task (according to Taylor Aggression Paradigm) to evaluate aggressive behaviour. The main results indicated that the effect of violent computer game on aggression may be explained by the mediation of the perceived state hostility.
- Keywords:** Psychophysiology; Social interaction/norms; Emotion
- Indexed papers:** Arriaga Ferreira, P., Esteves, F., Carneiro, P. & Monteiro, M. (2008). Are the effects of Unreal violent video games pronounced when playing with a virtual reality system? *Aggressive Behavior*, 34(5), 521-538. doi: 10.1002/ab.20272
- Project:** **2002-15**
- Title:** Bases psicofisiológicas dos fenómenos de consciência visual
- Duration:** 2003/01 – 2005/12
- Researcher(s):** Prof. Miguel de Sá Castelo Branco, Dr. Lajos Kozak, Dr. Mafalda Mendes, Dr. Vasco Forjaz, Dr. Manuela Guerreiro
- Institution:** Centro de Oftalmologia, Coimbra (Portugal)

- Results:
1. Activity in hMT+/V5 (the human motion complex) is related to the perception of real surface motion, apparent motion (AM), and illusory motion aftereffects (MAE). We have found that the network within hMT+ that creates a continuous motion percept from discontinuous inputs can interact constructively with the network that integrates real moving surfaces and destructively with MAE processing.
  2. We have found that the hMT complex directly encodes and triggers decision processes related to surface segmentation, even when perception is dissociated from veridical stimulus properties.
  3. Visual surface integration is asymmetrically modulated by contextual surround coherence: we asked observers to report whether they perceived transparent or non-transparent surface motion under multiple contexts. Surprisingly, only transparently perceived surrounds induced significant perceptually congruent central bias, thereby vetoing motion integration. These results are consistent with findings suggesting partially separable and hierarchically distinct neurophysiological substrates of pattern (non-transparent) and component (transparent) motion processes.
  4. Genetically determined neuroretinal impairment in Williams Syndrome predicts systems-level deficits independently of cortical dorsal stream integration deficits: our findings of independent mechanisms of damage in WS that explain separate sensory contrast sensitivity and local motion deficits, challenge theories that explain coherence deficits based on magnocellular impairment, such as in dyslexia.
  6. Our work separates for the first time retinal and cortical mechanisms underlying visual functional asymmetries: and shows that they are distinct in temporal and spatial vision.
- Keywords: Psychophysiology; Vision; Brain; Cognitive processes; Diseases/Injuries; Chromosomal abnormalities
- Indexed papers: Castelo-Branco, M., Mendes, M., Silva, F., Massano, J., Januario, G., Januario, C., & Freire, A. (2009). Motion integration deficits are independent of magnocellular impairment in Parkinson's disease. *Neuropsychologia*, 47(2), 314-320. doi: 10.1016/j.neuropsychologia.2008.09.003
- Kozak, L., & Castelo-Branco, M. (2008). Peripheral influences on motion integration in foveal vision are modulated by central

local ambiguity and center-surround congruence. *Investigative Ophthalmology and Visual Science*, 50(2), 980-988. doi: 10.1167/iavs.08-2094

Silva, M. F., Maia-Lopes, S., Mateus, C., Guerreiro, M., Sampaio, J., Faria, P., & Castelo-Branco, M. (2008). Retinal and cortical patterns of spatial anisotropy in contrast sensitivity tasks. *Vision Research*, 48(1), 127-135. doi: 10.1016/j.visres.2007.10.018

- Project:** 2002-20
- Title:** Psychophysiological Mechanisms of some aspects of Neurocognitive Deficit in Schizophrenic Patients
- Duration:** 2003/02 – 2004/12
- Researcher(s):** Dr. Valeria Strelets, Dr. Janna Golikova, Dr. Vladimir Novototsky-Vlasov, Dr. R.A. Magomedov, Dr. M.V. Magomedova
- Institution:** Institute of Higher Nervous Activity and Neurophysiology, Russian Academy of Sciences (Russia)
- Results:** Discovery of the role of induced high frequency EEG activity in “binding phenomenon” that possibly underlies higher nervous functions (Tallon-Badry et al., 1996; Bennet, 1997) calls for the need to study this phenomenon in schizophrenia which is the disease including the failure of the integration between different brain areas.  
We studied 50 free of medication patients diagnosed by DSM-IV and divided by SANS and SAPS almost equally to those having predominantly either positive or negative symptoms. The matched group of 30 healthy subjects was also studied; all participants gave informed consent for the experiment. We studied the spectral power of EEG-rhythms and the coherence between different brain areas in the background and during the performance of the tasks: mental arithmetic, space imagination and silent counting the hours on imaginary clock dial.  
In the controls most brain rhythms were symmetrical and there were many intra- and interhemispheric connections especially during the tasks performance.  
In both groups of patients in gamma-rhythm opposite to the norm, interhemispheric connections were absent. This

disruption of interhemispheric informational transmission in schizophrenia can be caused by corpus callosum malfunction (Downhill, Buchsbaum, 2000) or synaptic defect.

Chronic schizophrenics with positive symptoms also revealed shortened EEG microstate duration which was obtained in the study together with D. Lehmann, T. Koenig, L. Gianotti and J. Gruzelier. These data show that information processing in some classes of mental operations terminate prematurely.

Functional disconnection of hemispheres and shortened microstates could underlie some aspects of neurocognitive deficit in schizophrenic patients.

**Keywords:** Psychophysiology; Mental health; Psychotic disorders; Brain; Electroencephalogram (EEG)

**Indexed papers:** Magomedov, R. A., Garakh, Z. V., Orekhov, Y. V., Zaytseva, Y. S., & Strelets, V. B. (2010). Gamma-rhythm, positive, negative symptoms and cognitive dysfunction in schizophrenia. *Zhurnal Nevrologii I Psikhatrii Imeni S S Korsakova*, 110(1), 78-83.

Medkour, T., Walden, A. T., Burgess, A., & Strelets, V. (2010). Brain connectivity in positive and negative syndrome schizophrenia. *Neuroscience*, 169(4), 1779-1788. doi: 10.1016/j.neuroscience.2010.05.060

Strelets, V., Faber, P., Golikova, J., Novototsky-Vlasov, V. Y., Koenig, T., Gianotti, L., ... Lehmann, D. (2003). Chronic schizophrenics with positive symptomatology have shortened EEG microstate durations. *Clinical Neurophysiology*, 114(11), 2043-2051. doi: 10.1016/s1388-2457(03)00211-6

**Project:** 2002-21

**Title:** The use of an implicit grammar task and eye measurements to study the somatic marker hypothesis

**Duration:** 2003/01 – 2005/01

**Researcher(s):** Prof. Dick Bierman, Prof. Axel Cleeremans, Dr. Eveline Crone  
**Institution:** Psychology Research Institute, Amsterdam (The Netherlands)

**Results:** A new method has been developed for the assessment of several factors contributing to intuitive decisions. Technically, the method monitors the pupil dilation preceding choices made in an artificial grammar task. The analysis focuses on the acquirement of implicit knowledge related to a somatic marker.

- Results indicate that with the new method we can unequivocally show that a somatic marker preceding a decision is a driving “force” for the final choice. Thus the basic ingredient of the “somatic marker” model is supported.
- Keywords:** Psychophysiology; Cognitive processes; Decision-making; Learning; Emotion
- Indexed papers:** Bierman, D. J., Destrebecqz, A., & Cleeremans, A. (2005). Intuitive decision making in complex situations: Somatic markers in an artificial grammar learning task. *Cognitive, Affective & Behavioral Neuroscience*, 5(3), 297-305. doi: 10.3758/cabn.5.3.297
- Project:** **2002-25**
- Title:** Vinculação e regulação autonómica: desenvolvimento da versão 2.0 do BioDreAMS e aplicação a um grupo não-clínico
- Duration:** 2003/05 – 2006/09
- Researcher(s):** Prof. Isabel Maria Costa Soares, Prof. João Paulo Silva Cunha, Prof. Carlos da Silva Fernandes, Prof. Paulo Manuel Machado, Prof. Ovídio Costa, Prof. Maria Carolina Costa e Silva
- Institution:** Centro de Investigação em Psicologia, Universidade do Minho, Braga (Portugal)
- Results:** Based on recent technological advances, we developed (Bial Grant 43/96), a fully digital multimedia system named BioDReAMS (Bio Dual-channel and Representation of Attachment Multimedia System) that allows a synchronous collection of video and audio information, ECG signals and skin conductance during the Adult Attachment Interview (AAI). The present project aims: 1) to improve BioDReAMS, by developing a new version; 2) to apply BioDReAMS 2.0 to a non-clinical group of 50 young females that will be compared to a matched clinical eating disorders sample. BioDReAMS 2.0 improved at data acquisition, video, program structure, and document mode. Data from 50 females, between 15-36 years old ( $M = 21.82$ ;  $SD = 4.92$ ), from different educational and occupational backgrounds has been collected. Eleven subjects were matched,

based on social-demographical information, with 11 patients diagnosed with eating disorders. The AAI scored with Kobak's Q-Sort method was used to assess 3 attachment patterns, mega-items and deactivation-hyperactivation strategies. The relations between these attachment parameters and two physiological measures, heart rate (HR) and skin conductance level (SCL), during the AAI, were examined using BioDReAMS 2.0.

Within the non-clinical group, 33 were classified as secure, 11 as dismissing, and 6 as preoccupied. In the clinical sample, 4 patients were secure, 4 preoccupied and 3 dismissing. Compared to the non-clinical, the clinical group showed higher scores in family disruption, preoccupied, and family enmeshment mega-items. Non-clinical subjects showed increased sympathetic activity when talking about problems, separations, and deaths, compared to their resting baseline. Insecure subjects showed tendencies for highest parasympathetic activity when talking about threats. In the clinical sample, moderate to high correlations were found between deactivation and increased parasympathetic activity in the response to problems, separations, rejections, deaths, and traumatic experiences.

**Keywords:** Psychophysiology; Attachment; Mental health; Eating disorders; Assessment tools

**Indexed papers:** Dias, P., Soares, I., Klein, J., Cunha, J., & Roisman, G. (2011). Autonomic correlates of attachment insecurity in a sample of women with eating disorders. *Attachment & Human Development*, 13(2), 155-167. doi: 10.1080/14616734.2011.554005

Soares, I., & Dias, P. (2007). Attachment and psychopathology in adults: Recent contributions from research. *International Journal of Clinical and Health Psychology*, 7(1), 177-195.

**Project:** 2002-26  
**Title:** Biochemical Characteristics Associated to Rabbit Telepathy  
**Duration:** 2003/01 – 2004/06  
**Researcher(s):** Prof. Carlota Saldanha, Dr. Teresa Raquel Pacheco  
**Institution:** Instituto de Bioquímica, Faculdade de Medicina de Lisboa (Portugal)



- Results: There are sequences of events that occur under conditions of stress which can be grouped in behavioural and physical adaptations. The link between the stimulus and the responses can be mediated or modulated by the nervous system. Previously, Peoc'h and collaborators have performed experimental telepathy in rabbits and reported the presence of spontaneous fear and blood flow variations in rabbits after their separation. The phenomenon of fear transmission between rabbits might be associated to a neuronal hypersensitivity as the result of a stress stimulus. In this context, the aim of the present study was the evaluation of biochemical characteristics developed during the occurrence of rabbit telepathic transmission of fear. Telepathy experiments were performed according to Peoc'h and ten minutes after the end of the experiment, anticoagulated blood samples were collected from experimental rabbits and the following parameters were determined: free plasma cortisol and TNF- $\alpha$  levels, assessed by ELISA; erythrocyte acetylcholinesterase activity, determined by spectrophotometry; and erythrocyte membrane fluidity, analysed by fluorescence anisotropy. We could observe that rabbit erythrocyte integrity and acetylcholinesterase activity was maintained (AChE activity =  $68 \pm 20$  U/min/mg Hb, compared to control rabbits AChE activity =  $67,5 \pm 20,5$  U/min/mg Hb) and that TNF- $\alpha$ , a marker of inflammatory disturbance, was not detected as consequence of the telepathy experiments. Additionally, a bradycardia effect, induced by telepathic fear transmission was followed by a significant decrease of plasma cortisol levels ( $3,85 \pm 0,682$  ng/mL) compared to control rabbits ( $4,951 \pm 1,146$  ng/mL,  $p < 0,05$ ).
- Keywords: Parapsychology; Animal psi; Extrasensory perception (ESP); Telepathy
- Indexed papers: N/A

**Project:** 2002-27

**Title:** Anomalous/paranormal detection using psi-reading tests (Phase II): New parapsychological, psychological and neuropsychological exploration data through seven tests with selected/non-selected subjects

**Duration:** 2003/03 – 2005/01

**Researcher(s):** Dr. Alejandro Parra, Dr. Juan Carlos Argibay

**Institution:** Instituto de Psicología Paranormal, Buenos Aires (Argentina)

**Results:** From the beginning of parapsychology, it has been proposed that objects contain “psi fields,” or localized impersonal memory traces of physical and mental events, such as in the form of ESP known as psychometry or object-reading. Eleven questionnaires, such as Anomalous/Paranormal Experiences Inventory, Neo Personality Inventory–Revised, Constructive Thinking Inventory, Eysenck Personality Questionnaire, Creative Experiences Questionnaire, Seeking-Sensation Scale, Dissociation Experiences Scale, and Tellegen Absorption Scale were administered. Also, EBEA-Q was designed by us. It contains items such as thoughts or feelings at a distance, ESP “feelings” around sick people, around past place events, around token objects, around unknown people, and around token photos. Two hundred fifty nine participants were interviewed individually. Seventy four percent of them ( $N = 193$ ), both females (76%) and males (24%). Participants ranged 18 to 76 years old. A number of psi-reading tests were designed by us: (1) First ESP test was designed to be used with six of photos paired (three males and three females); (2) second ESP test used token objects into two conditions “at-a-distance” and “face-to-face” with two objects of two human-targets (male and female) in contact with them a couple of minutes; (3) third ESP test was designed used objects token of four human-targets (two male and two female) medically diagnosed (i.e. Hiatal hernia; Diabetes mellitus; Arthrosis of the knee, and Varicose veins) in comparison with four “control” objects; (4) fourth ESP test was designed with two texts containing a brief self-report written by four human-targets (two males and two females), who attended psychological interviews; (5) fifth ESP test was designed to be used with six recipients, three of them containing sand and water from “holy” places and “control” recipients. For

each test, the experimenters delivered each participant ( $N = 193$ ) the pairs (target and control), counterbalanced, and asked them to indicate their “impressions”.

Keywords: Parapsychology; Psychometry; Extrasensory perception (ESP)

Indexed papers: N/A

**Project: 2002-28**

Title: Emotional factors in placebo analgesia: Psychophysiological Experiments

Duration: 2003/03 – 2006/10

Researcher(s): Prof. Magne Arve Flaten, Prof. Oddmund Johansen, Dr. Terje Simonsen, Dr. Jan Brox, Prof. Arnstein Finset

Institution: Department of Clinical Research, University Hospital of North Norway (Norway)

Results: N/A

Keywords: Psychophysiology; Pain; Cognitive processes; Emotion

Indexed papers: Aslaksen, P., Myrbakk, I., Høifødt, R., & Flaten, M. (2007). The effect of experimenter gender on autonomic and subjective responses to pain stimuli. *Pain*, 129(3), 260-268. doi: 10.1016/j.pain.2006.10.011

Flaten, M. A., Aslaksen, P., Finset, A., Simonsen, T., & Johansen, O. (2006). Cognitive and emotional factors in placebo analgesia. *Journal of Psychosomatic Research*, 61(1), 81-89. doi: 10.1016/j.jpsychores.2005.12.004

Friborg, O., Hjemdal, O., Rosenvinge, J. H., Martinussen, M., Aslaksen, P. M., & Flaten, M. A. (2006). Resilience as a moderator of pain and stress. *Journal of Psychosomatic Research*, 61(2), 213-219. doi: 10.1016/j.jpsychores.2005.12.007

**Project: 2002-29**

Title: Psychokinesis and telepathy with hypnotised human

Duration: 2003/06 – 2006/02

Researcher(s): Prof. René Peoc'h, Prof. Chauvin  
Institution: Institut International d'Immunologie, Bouguenais (France)

Results: N/A

Keywords: Parapsychology; Altered states of consciousness; Hypnosis; Extrasensory perception (ESP); Telepathy; Psychokinesis (PK)

Indexed papers: N/A

**Project: 2002-30**

Title: Exploring the limits of human perception: The psychological and physiological detection of normal and remote staring

Duration: 2004/01 – 2005/05

Researcher(s): Dr. Ian Baker, Prof. Paul Stevens

Institution: Koestler Parapsychology Unit, The University of Edinburgh, Scotland (UK)

Results: This project represents the first piece of research to examine the possibility of the electrocortical processing of remote staring detection. This was achieved by conducting two experiments using different measures of electrocortical activity (ERP, EEG, etc), skin conductance, and questionnaire data. Participants were isolated, and an automated, double-blind, randomised and counterbalanced protocol was employed. Experiment one involved a 2 x 2 design, where 20 participants were exposed to 48 repetitions of the following stimuli: viewing a blank screen, a blank screen plus a remote stare, viewing a face on the screen, and a face plus a remote stare. This experiment found that the addition of a remote stare had no effect on the processing of a blank screen, but significantly reduced the amplitude of the global processing of faces. There was no correlation between these measures and questionnaire measures of private self-consciousness, social anxiety and paranoia. Experiment two replicated the overall 2 x 2 design of experiment one, but replaced the blank screen conditions with pictures of objects, resulting in 60 repetitions of the following: viewing an object on the screen, an object plus a remote stare,

viewing a face on the screen, and a face plus a remote stare. This experiment found that the addition of a remote stare significantly increased the amplitude of the global processing of faces and objects. There was no effect on skin conductance and no correlation with the questionnaire measures. To summarise, this project suggests that remote staring detection has a significant impact on the global processing of other stimuli, but further experimentation is needed in order to understand the nature of this effect.

**Keywords:** Parapsychology and Psychophysiology; Psychokinesis (PK); Remote staring/Being stared at; Electroencephalogram (EEG)

**Indexed papers:** Baker, I., & Stevens, P. (2013). An anomaly of an anomaly: Investigating the cortical electrophysiology of remote staring detection. *Journal of Parapsychology*, 77(1), 107-122.

**Project: 2002-35**

**Title:** Near-Death Experiences During Induced Cardiac Arrest

**Duration:** 2003/06 – 2007/03

**Researcher(s):** Dr. Bruce Greyson, Prof. J. Paul Mounsey, Dr. Martha Mercier, Dr. Janet Holden

**Institution:** Division of Personality Studies, University of Virginia (USA)

**Results:** Near-death experiences (NDEs) reported by those who have been in life-threatening situations may include a sense observing surroundings from a visual perspective outside of the physical body. Research into out-of-body perceptions during NDEs has been hindered by lack of control over the conditions at the time of the NDE.

Patients with potentially fatal cardiac illness often have implantable cardioverters/defibrillators (ICDs) surgically implanted in their chests, electrical devices that monitor the heartbeat and, in the event of a cardiac arrest, automatically administer an electrical shock to return the heart to normal rhythm. After ICD implantation, a cardiac arrest is induced to test the ICD, exposing the patient to the opportunity to experience an NDE under controlled circumstances.

We placed a computer in the operating room that displayed randomly-selected unusual visual targets visible only from a perspective looking down upon the body of the unconscious patient. In interviews with patients before and after implantation of the ICD, we determined the incidence of NDEs during induced cardiac arrest, and whether patients could report accurate observations from an out-of-body perspective.

In a series of 52 induced cardiac arrests, no patient reported having had a near-death experience, and none reported a sense of having left the physical body or observing from an out-of-body visual perspective. In retrospect, reassurance to the patients that they were not in danger may have reduced the likelihood of NDEs; the brief duration of the induced cardiac arrest may have precluded the development of an NDE; and the pre-anesthetic sedative medication used may have interfered with memory of any experience.

Keywords: Parapsychology; Survival after bodily death; Out-of-body experience (OBE); Near-death experience

Indexed papers: N/A

**Project: 2002-37**

Title: Investigating individual differences in EDA response to emotional stimuli in a DMILS paradigm

Duration: 2004/01 – 2007/01

Researcher(s): Dr. Peter Ramakers, Prof. Paul Stevens

Institution: Koestler Parapsychology Unit, The University of Edinburgh, Scotland (UK)

Results: In the course of this project three experiments were conducted, all using SC as the indicator of psi. In the first experiment IAPS pictures, mostly of mutilated bodies, erotic and neutral scenes, were presented to the sender whilst mean log SC and mean variance of SC were taken as dependent measures. There was an emotional-neutral as well as a positive-negative-neutral comparison. The results can be seen in table 1. Only for mean variance in the differential comparison was a strong trend ob-

served ( $\chi^2 = 8.197$ ,  $df = 2$ ,  $p = 0.017$ , two-tailed).

In the second experiment ( $N = 30$ ) threatening video clips of dangerous animals were used. No significant differences were observed. Post hoc, a significant correlation was found between the gender of the sender and receiver and psi performance ( $F = 9.258$ ,  $df = 1$ ,  $p = 0.005$ ) for mean log SC. A similar pattern was observed for mean variance. The interaction was such that when the gender of the sender and receiver was different psi performance was high.

The third experiment ( $N = 18$ ) compared picture and video conditions directly. Differences in all comparisons were in the predicted direction, with a strong trend for mean variance in the clip condition.

No significant gender interactions were observed, but the pattern for mean variance for clips was similar to that observed in the previous experiment. This suggests the pattern may be genuine.

On the whole, the project found only marginal evidence for psi, but this exploration into emotional picture and clip stimulus material may prove valuable to future researches. As for individual differences, no relationships between personality and psi performance were observed. Gender interaction may be confirmed by further study.

Keywords: Parapsychology; Extrasensory perception (ESP); Telepathy; Emotion

Indexed papers: N/A

**Project:** 2002-39

Title: Changes in Conscious Awareness during Autobiographical Memory and Spontaneous Self-paced movement: two tests of the "Dynamic Core Model" of consciousness

Duration: 2003/03 – 2004/04

Researcher(s): Dr. Adrian Burgess, Dr. Nicholas Cooper

Institution: Imperial College Faculty of Medicine, Department of Cognitive Neuroscience & Behaviour, London (UK)

Results: N/A  
Keywords: Psychophysiology; Cognitive processes; Memory; Consciousness

Indexed papers: N/A

**Project: 2002-42**

Title: The effects of exercise and meditation on the psychological stress level and Quality of Life of Cypriot men and women, a multimodal investigation

Duration: 2003/06 – 2006/12

Researcher(s): Dr. Michael Angastiniotis, Dr. Kypros Nicolaou, Dr. G. Panayiotou

Institution: Multidisciplinary Rehabilitation Centre - PIKA, Nicosia (Cyprus)

Results: The purpose of this study was to investigate the effects of an exercise program, meditation or both combined, on mental stress levels of Cypriot men and women. The group chosen for this study is the working population between 30 and 50 years old, relatively recently urbanised and in a situation of rebuilding their lives following war which displaced them from their traditional homes and way of life. For this group the culture of physical exercise and of deliberate relaxation techniques had not taken root.

Methods:

40 subjects were committed to participate in the study and they were assigned to: Group A, the exercise group, Group B, the meditation group, and group C, who received both exercise and meditation. A control group D was matched for age and background. All subjects were assessed for physical fitness. They were also given psychometric questionnaires assessing quality of life (WHO-Bref) and stress (STAI form X-2).

An individual exercise prescription was given to groups A and C, 3-4 times per week. Groups B and D attended a meditation session once per week, with instructions to continue the program at home. Group D was not assigned any kind of exercise.



**Results:**

The groups did not differ from each other at baseline, either on physical fitness or quality of life measurements. There was however a very high drop-out rate of 60% with very few completing their assigned program. This made it hard to draw solid conclusions concerning the effects of each type of intervention. The combined approach, exercise and meditation had a more positive effect than the other interventions.

**Comment:**

The high drop-out rate raises the question whether this working generation of Cypriots needs more preparation to comply with such a program and this merits more sociological investigation. Another question concerns the better results in those who adhered to both exercise and meditation. This group may be self-selected, having more faith and expectation from these methods.

**Keywords:** Parapsychology; Meditation; Stress and health; Well-being

**Indexed papers:** N/A

**Project: 2002-45**

**Title:** Exploring Psychomanteum as a psi-conductive state of consciousness: Psychological, neuropsychological and parapsychological research of anomalous cognition (ESP) using dynamic/non-dynamic (emotional) visual targets, observation/no-observation conditions, and psychomanteum/non-psychomanteum sessions

**Duration:** 2003/03 – 2005/01

**Researcher(s):** Dr. Alejandro Parra, Dr. Jorge Fernando Villanueva

**Institution:** Instituto de Psicología Paranormal, Buenos Aires (Argentina)

**Results:** This mirror gazing procedure termed “psychomanteum” was developed by world well-known psychiatrist Dr. Raymond Moody, which was designed to facilitate reunions with deceased individuals. However, the purpose of the modern psychomanteum tends to be to facilitate reunions; the aim is not usually to seek ESP information about the future.

Hypnagogic/hypnopompic imagery is that which occurs during the transition states between wakefulness and sleep and between sleep.

However, the hypnagogic-like imagery could be psi-conductive. The aim of this research project was explore if the psychomanteum is a psi-conductive state of consciousness above chance expectation, and it would be related to an altered state of consciousness. One hundred thirty-three participants (both 95 females and 38 males), were recruited. Each subject received seven questionnaires Pre-psychomanteum Questionnaire, Betts's Vividness of Imagery Scale, Barrett's Hallucinations Questionnaire, Neo Personality Inventory –Revised, Schizotypal Personality Questionnaire, Revised Physical Anhedonia Scale and Phenomenology of Consciousness Inventory. Two conditions, psychomanteum and non-psychomanteum condition, were performed. Under psychomanteum condition, psi-hitting was obtained (29.2%, notably above chance expected); however, under no-psychomanteum (“control”) condition, 24.6% was obtained. The results differ significantly from mean chance expectation in psychomanteum condition ( $p = .03$ ) in comparison with no-psychomanteum condition, but no significant differences were found. These interesting results seem to suggest that psychomanteum condition somehow optimizes psi-communication. A number of positive correlations were also found, for instance, subjects who scored higher Auditory ( $p = .005$ ) and Visual hallucination ( $p = .008$ ) scores tended to score psi-hitting. Sixty six participants underwent by two type of targets, video-clip (dynamic) and image-picture (no-dynamic), but no significant results were found.

Keywords: Parapsychology; Extrasensory perception (ESP); Telepathy; Altered states of consciousness

Indexed papers: N/A

**Project:** 2002-46  
**Title:** Preservation and Change in Two Temperamental Types  
**Duration:** 2003/01 – 2005/09

- Researcher(s): Prof. Jerome Kagan, Dr. Nancy Snidman  
 Institution: Harvard University Psychology Department, Cambridge (USA)
- Results: This study assessed a large group of adolescents, 15 to 16 years old, who have been members of a longitudinal sample classified originally at 4 months of age as high or low reactive to unfamiliar events.  
 The behavioural and biological features that are the expected outcomes of high or low reactivity were present. Specifically, more high than low reactive adolescents were affectively subdued while interacting with the unfamiliar examiner in the laboratory setting and in the interview at home.  
 Further, the high reactives described self as less relaxed and more worried about unfamiliar social situations than low reactives. In addition, the adolescents who had high reactive showed shallower habituation of the N400 waveform to discrepant scenes and sentences that ended with a word that rendered the sentence incongruous. Finally, the high reactives were more likely to display sympathetic tone in the cardiovascular system; more low reactives displayed greater parasympathetic tone. This evidence implies that aspects of the infant temperaments are preserved for 15 years and supports the assumption that the two groups differ in the inherited neurochemistry of the amygdala and its projections.
- Keywords: Psychophysiology; Developmental psychology; Self; Personality
- Indexed papers: Kagan, J. (2004). The limitations of concepts in developmental psychology. *Merrill-Palmer Quarterly-Journal of Developmental Psychology*, 50(3), 291-298. doi: 10.1353/mpq.2004.0019
- Project:** 2002-47  
 Title: Effects of distant emotions on the human enteric nervous system  
 Duration: 2003/01 – 2004/03  
 Researcher(s): Prof. Marilyn Schlitz, Dr. Dean Radin  
 Institution: Institute of Noetic Sciences, Petaluma, CA (USA)

- Results:**                    **Objective:**  
Investigate whether the gut feelings of one person, as measured with an electrogastrogram (EGG), respond to the emotions of a distant person.
- Design:**  
In a double blind protocol, EGG activity was recorded in an individual relaxing in a heavily shielded chamber while, at a distance, a second person periodically viewed the live video image of the first person along with stimuli designed to evoke positive, negative, calming or neutral emotions. Subjects included 26 pairs of healthy adult volunteers.
- Outcome measures:**  
EGG maximum values recorded while the distant person was exposed to emotional stimuli were compared to similar values recorded during exposure to neutral stimuli.
- Results:**  
EGG maximums were significantly larger on average when the distant person was experiencing positive ( $p = 0.006$ ) and sad ( $p = 0.0009$ ) emotions, as compared to neutral emotions. Nonparametric bootstrap procedures were employed to evaluate these differences, and the results survive correction for multiple analyses. The conclusion is that EGG activity increases in response to the emotions of a distant person, beyond the influence of ordinary sensory interactions. Relationships commonly reported between gut feelings and intuitive hunches may share a common, poorly understood perceptive origin.
- Keywords:**                    Parapsychology; Extrasensory perception (ESP); Intuition; Emotion; Electroencephalogram (EEG)
- Indexed papers:**                    Radin, D., & Schlitz, M. (2005). Gut feelings, intuition, and emotions: An exploratory study. *Journal of Alternative and Complementary Medicine*, 11(1), 85-91. doi: 10.1089/acm.2005.11.85
- Project:**                        **2002-49**
- Title:**                            Crenças em efeitos psi: caracterização social e psicológica
- Duration:**                    2003/01 – 2005/07
- Researcher(s):**                    Prof. Carlos Fernandes da Silva, Eng. Paulo Joaquim Rodrigues, Dr. José António de Souza

Institution: Centro de Investigação em Psicologia, Universidade do Minho, Braga (Portugal)

Results: N/A

Keywords: Parapsychology; Paranormal belief; Assessment tools

Indexed papers: N/A

**Project: 2002-50**

Title: An Evolutionary Approach to Anomalous Cognition

Duration: 2003/01 – 2004/05

Researcher(s): Prof. Christopher Charles French, Dr. Louie Savva

Institution: Anomalistic Psychology Research Unit, Goldsmiths College, University of London (UK)

Results: Three studies of psi-timing and a number of studies employing a death-avoidance paradigm were completed. Psi-timing experiments generally consist of a behavioural component based on the timing of a key-press, which affects a complex process resulting in a hit or miss. The first study ( $N = 50$ , 36 trials each) was an adaptation of Braud and Shafer's (1989) methodology in which the timing of two key presses each independently generated a random number and the trial was scored as a hit if the numbers matched. In the modified version, the second random number was generated by a simulated key-press, making this a test of precognition. No significant results were found. The second experiment ( $N = 30$ , 25 trials each) was an attempt to replicate without significant deviation the original Braud and Shafer (1989) study and produced significantly more hits than MCE. The third study ( $N = 50$ , 25 trials each) failed to replicate this positive result. Six experiments were also completed using a novel death avoidance paradigm (cf. Morris, 1967). Insects (ants in the initial pilot study and red flour beetles) were placed individually in the center of the chamber of a special testing apparatus. A computer was used to randomly determine whether side A or B would lead to survival or termination for the insect. After a specified time, the insect's

position was recorded and its fate, survival or death, was determined. Survivors were then placed in a safe container whereas those who were not so fortunate were placed in a container that contained acetone resulting in death. No significant deviations from MCE were found across the experiments in terms of number of survivors.

Keywords: Parapsychology; Extrasensory perception (ESP); Precognition

Indexed papers: N/A

**Project: 2002-51**

Title: Psychological and Parapsychological Investigations of Alleged Alien Abductees: Phase I

Duration: 2003/10 – 2006/01

Researcher(s): Prof. Christopher Charles French, Julia Santomauro, Dr. Michael Thalbourne

Institution: Anomalistic Psychology Research Unit, Goldsmiths College, University of London (UK)

Results: Previous research has shown that people reporting contact with aliens, known as “experiencers”, appear to have a different psychological profile compared to control participants. They show higher levels of dissociativity, absorption, paranormal belief and experience, and possibly fantasy proneness. They also appear to show greater susceptibility to false memories as assessed using the Deese/Roediger-McDermott technique.

The present study reports an attempt to replicate these previous findings as well as assessing tendency to hallucinate and self-reported incidence of sleep paralysis in a sample of 19 UK-based experiencers and a control sample matched on age and gender. Experiencers were found to show higher levels of dissociativity, absorption, paranormal belief, paranormal experience, self-reported psychic ability, fantasy proneness, tendency to hallucinate, and self-reported incidence of sleep paralysis. No significant differences were found between the groups in terms of susceptibility to false memories. Implications of the results are discussed and suggestions are made for future avenues of research.

**Keywords:** Parapsychology; Anomalous cognition/experiences; Paranormal belief; Personality factors

**Indexed papers:** French, C., Santomauro, J., Hamilton, V., Fox, R., & Thalbourne, M. A. (2008). Psychological aspects of the alien contact experience. *Cortex*, 44(10), 1387-1395. doi: 10.1016/j.cortex.2007.11.011

**Project:** 2002-52

**Title:** A Qualitative Analysis of Rapport and Alignment in Experimenter-Subject Interaction in Ganzfeld Experiments

**Duration:** 2003/07 – 2004/08

**Researcher(s):** Dr. Robin Wooffitt

**Institution:** Department of Sociology, University of York (UK)

**Results:** Building on published and anecdotal accounts which suggested that experimenter-subject relationship was important to the outcome of parapsychology experiments, this project used Conversation Analysis to examine participants' discourse in recordings of mentation review phases of ganzfeld experiments conducted at the KPU in Edinburgh.

The research examined robust verbal practices in which one participant displayed a positive or affiliative stance towards the other. For example, linguistic studies of reported speech in other contexts have found that it is a method by which a current speaker can establish their affiliation to the person whose speech is being reported. In the data it was found that reported speech was used to accomplish various interactional functions: it prompted subjects to provide further information about an item; it marked transitions between different phases of the review; and it was a device through which experimenters could tacitly orchestrate clarification or correction by the subject. The analysis also offered a categorisation of subjects' responsiveness, or reciprocity, and examined experimenters' verbal characteristics associated with the preferred high subject reciprocity.

It was found that experimenter's use of acknowledge token (such as 'mm hm') to receipt subject comments were more likely to facilitate high or expanded reciprocity. Experimenter

responses such as 'okay' were associated with verbal practices in which the likelihood of subject expansion was minimised. The project also examined instances in which experimenters departed from their institutional role or task to offer encouraging or affiliative utterances. Analysis of these and other topics continues.

**Keywords:** Parapsychology; Extrasensory perception (ESP); Ganzfeld studies

**Indexed papers:** Wooffitt, R., & Allistone, S. (2008). Participation, procedure and accountability: 'you said' speech markers in negotiating reports of ambiguous phenomena. *Discourse Studies*, 10(3), 407-427. doi: 10.1177/1461445608090225

Wooffitt, R. (2007). Communication and laboratory experience in parapsychology experiments: demand characteristics and the social organization of interaction. *British Journal of Social Psychology*, 46(3), 477-498. doi: 10.1348/014466606x152667

Wooffitt, R., & Allistone, S. (2005). Towards a discursive parapsychology - Language and the laboratory study of anomalous communication. *Theory & Psychology*, 15(3), 325-355. doi: 10.1177/0959354305053218

**Project:** 2002-54  
**Title:** Further developments and Applications of the Digital Ganzfeld  
**Duration:** 2003/02 – 2006/02  
**Researcher(s):** Prof. Adrian Parker, Prof. Joakim Westerlund  
**Institution:** Psychology Department, University of Gothenburg (Sweden)

**Results:** Recent analyses of the psi-ganzfeld as well as our earlier work indicated that the ganzfeld technique is still experimenter dependent and can produce both significant psi-missing as well as psi-hitting. Our efforts are directed at towards an understanding of what the determinants of success are. The use of the digital real time ganzfeld has enabled us to identify particularly impressive sequences of the ganzfeld imagery which correspond to and are synchronised with the content of the target film and as such which may lie behind the psi-hitting and missing. Psi missing appears to occur during the point of decision rather than in the mentation report. In collaboration with colleagues



at Stockholm University, a study has also been made of the effects of subjective validation in evaluating qualitative hits. The results suggest caution is needed in the use of qualitative hits without the accompanying clear evidence of psi-hitting. The real time technique has been used to examine learning effects, psi-conductive states, the arousing value of the target film, and the sender-receiver relationship. A successful pilot study using the real time digital ganzfeld has been conducted with biological closely related pairs (monozygotic twins) of participants. As well as evaluating the claims concerning “twin telepathy” this is enabling us extend our qualitative data bank which can be linked with potentially high scoring and possible true psi-markers. Some preliminary work has also been done on developing a remote viewing technique which will be analogous to the real time ganzfeld and on possible links between successful target material and precognitive habituation.

**Keywords:** Parapsychology; Ganzfeld studies; Extrasensory perception (ESP); Assessment tools

**Indexed papers:** Paulson, T. & Parker, A. (2006). The Effects of a two week reflection-Intention training program on lucid dream Recall. *Dreaming: the Journal of the Association for the Study of Dreams*, 16(1), 22-35. doi: 10.1037/1053-0797.16.1.22

Wasteland, J., Parker, A., Davits, J., & Hadlaczky, G. (2006). Remarkable correspondences between Ganzfeld mentation and target content – a psychical or psychological effect? *Journal of Parapsychology*, 70(1), 23-39.

Parker, A. (2003). We ask, does psi exist? But is this the right question and do we really want an answer anyway? *Journal of Consciousness Studies*, 10(6-7), 111-134.

**Project:** 2002-55

**Title:** Mapping the time course of emotional information processing in anxious and repressive/defensive individuals

**Duration:** 2003/04 – 2008/04

**Researcher(s):** Dr. Nazanin Derakshan, Prof. Ottmar Lipp

**Institution:** University of Leeds (UK) and University of Queensland (Australia)

Results: N/A  
Keywords: Psychophysiology; Emotion; Mental health; Anxiety disorders; Cognitive processes; Attention

Indexed papers: Fox, E., Derakshan, N., & Shoker, L. (2008). Trait anxiety modulates the electrophysiological indices of rapid spatial orienting towards angry faces. *Neuroreport*, 19(3), 259-263.

**Project: 2002-57**

Title: Implicit Learning and Parapsychology: Exploring the boundaries of Unconscious Processes

Duration: 2003/04 – 2005/07

Researcher(s): Dr. Stuart Wilson

Institution: Queen Margaret University College, Edinburgh (UK)

Results: Experiments investigating covariation detection in a parapsychological task found that participants could utilise (without conscious knowledge) card-size when it covaried with a particular “target”, but could not utilise speed-of-card-dealing when it existed as a cue. A surprising finding was that participants in the “random” conditions scored above chance.

Further analysis suggested that these results were artefactual, with participants actually utilising the unintentional body-language of the actor in the clips that they were shown. This in itself was an interesting finding. When the actor was removed, no significant findings emerged. No evidence was found that people could utilise facial cues to make personality judgements after having been exposed to a series of “covariations” in which (e.g.) long faces were associated with warm personalities. However, some covariations were more successful than others to a significant degree, suggesting that there are other psychological variables involved when people are asked to make personality decisions based on facial features.

Experiments into implicit sequence learning within a parapsychological context found that success was likely due to utilisation of simple heuristics rather than an implicit understanding of the sequence. When more complex sequences were devel-

oped, participants could not use these heuristics. This suggests that implicit learning is actually difficult to elicit under these conditions. Results suggestive of psimissing were not replicated in a subsequent experiment, and there were no individual differences in performance, although individual differences did play a small part in the way participants' approached the task. There was some indication that "correct" guesses in the implicit learning condition were made significantly faster than incorrect guesses, suggesting that, at an unconscious level, participants had in fact detected the pattern and were responding to it in terms of how fast they made their responses.

**Keywords:** Parapsychology; Extrasensory perception (ESP); Precognition; Cognitive processes; Learning

**Indexed papers:** N/A

**Project:** 2002-58

**Title:** Vinculação materna: dimensões hormonais envolvidas no processo inicial de vinculação da mãe ao bebé

**Duration:** 2003/01 – 2007/06

**Researcher(s):** Prof. Bárbara Fernandes Figueiredo, Dr. Raquel Costa, Dr. Alexandra Pacheco, Dr. Álvaro Ferreira Pais

**Institution:** Centro de Investigação em Psicologia, Universidade do Minho, Braga (Portugal)

**Results:** Most mothers had a moderate to high bonding toward the infant from pregnancy to 3 months after childbirth, nonetheless maternal bonding was generally better immediately after childbirth - higher positive bonding and total bonding means and lower negative bonding scores - than during pregnancy or at 3 months postpartum. During pregnancy, mood but not hormones influenced maternal bonding. Mothers with depressive mood had lower positive bonding results, higher negative bonding results as well as higher not clear bonding results. Mothers with higher anxiety levels had less positive bonding results, more negative bonding results and showed a worse total bonding.

In the first days after childbirth, both mood and hormones influenced maternal bonding. Mothers with higher cortisol levels had a better bonding toward the infant, mothers with depressive mood had lower positive bonding results and mothers with higher anxiety levels had more negative bonding results.

At 3 months after childbirth, again mood but not hormones influenced maternal bonding. Depressed mothers showed more negative emotions and not clear emotions and had a worse bonding toward the infant, as well as mothers with higher anxiety showed more negative bonding results and more not clear bonding results and a worse bonding with the infant. No differences are found regarding cortisol levels.

We conclude that psycho-physiological more than obstetrical factors seem to interfere in maternal bonding both during pregnancy and after childbirth. This fact leads us to think about the importance of attending to maternal mood in clinical context starting during pregnancy through the first months after childbirth in order to guarantee the mothers' and infants' quality of life.

**Keywords:** Psychophysiology; Attachment; Mental health; Psychoneuroimmunology; Endocrinology

**Indexed papers:** Figueiredo, B., & Costa, R. (2009). Mother's stress, mood and emotional involvement with the infant: 3 months before and 3 months after childbirth. *Archives of Women's Mental Health*, 12(3), 143-153. doi: 10.1007/s00737-009-0059-4

Figueiredo, B., Costa, R., Pacheco, A., & Pais, A. (2009). Mother-to-infant emotional involvement at birth. *Maternal and Child Health Journal*, 13(4), 539-549. doi: 10.1007/s10995-008-0312-x

Conde, A., Figueiredo, B., Costa, R., Pacheco, A., & Pais, A. (2008). Perception of childbirth experience: Continuity and changes over the postpartum period. *Journal of Reproductive and Infant Psychology*, 26(2), 139-154. doi: 10.1080/02646830801918414

**Project:** 2002-61  
**Title:** Investigation of Mediums Who Claim to Give Information about Deceased Persons  
**Duration:** 2003/10 – 2008/01

- Researcher(s): Prof. Emily Williams Kelly, Dr. Bruce Greyson, Dr. Jim Tucker, Dr. Dianne Arcangel, Prof. Edward Kelly
- Institution: Division of Personality Studies, University of Virginia (USA)
- Results: Despite the high-quality research on mediumship a century ago, this line of research has been almost entirely neglected since then. The purpose of this study was to identify contemporary mediums who can produce evidential material under controlled conditions.
- To rule out the two common normal explanations – that the medium fishes for information (“cold reading”), whether deliberately or inadvertently, or that the medium’s statements are so general or vague that they can apply to many people or be interpreted in a variety of ways – the present study was conducted using double-blind conditions. All sittings were done, not with the “real” sitters, but with a proxy sitter who knew little or nothing about the deceased persons, and, because the real sitters were not present for the readings, their judging of transcripts was blind.
- In Stage 1, 4 mediums and 12 real sitters participated; each medium did 3 readings. The results were not significant. In Stage 2, therefore, I made 3 major changes: (1) In the hope of focusing the reading on the intended deceased person, I sent photographs of the deceased to the mediums, but provided no other information; (2) to see whether the proxy might play some role in the success or failure of a reading, another experimenter and I shared the role of proxy, each doing half the readings; and (3) I simplified the evaluation method and asked the real sitters to rate and rank transcripts globally rather than item by item.
- In Stage 2, 9 different mediums and 40 different sitters participated; each medium did 4 or 6 readings. Each sitter evaluated 6 transcripts – the intended one, as well as 5 controls. 37 ratings were returned. 14 of the 37 were ranked #1; 27 were ranked in the top half. Analysis of the results with a sum-of-ranks method gives a z score of 4.09 ( $p < .00003$ ). The person serving as the proxy sitter had no effect on the results. In the 19 readings for one proxy, the sum of ranks was 46.5 ( $.005 < p < .004$ ); in the 18 readings for the other proxy, the sum of ranks was 40 ( $p < .001$ ). The difference is not significant.

Keywords: Parapsychology; Survival after bodily death; Mediumship

Indexed papers: Kelly, E., & Arcangel, D. (2011). An investigation of mediums who claim to give information about deceased persons. *Journal of Nervous and Mental Disease*, 199(1), 11-17. doi: 10.1097/NMD.0b013e31820439da

**Project: 2002-66**

Title: Considering the sender in ostensible ganzfeld ESP studies to be a PK source

Duration: 2003/01 – 2005/03

Researcher(s): Prof. Chris Roe, Ms. Nicola Holt

Institution: University College Northampton (UK)

Results: Study 1 compared success rates of 'live' receivers and an RNG analogue. During a 'standard' autoganzfeld sending period, a 'virtual' receiver (an RNG) selected from among 768 statements that described all clips in a pool of 96 videos (8 for each clip). The 8 most frequently selected were given to an independent judge as a 'virtual mentation'. The 'live' receiver correctly identified the target on 14 trials (35% hit rate; MCE = 25%), significantly better than chance (sum of ranks  $Z = 1.77$ ,  $p = .038$ ). Virtual mentations gave an encouraging 13 hits (32.5%; SOR  $Z = 1.48$ ,  $p = .069$ ). Study 2 compared sender and no-sender trials.

Receivers scored at chance, slightly better in sender trials than no sender trials (26.1% versus 23.5%). Two independent judges using the virtual mentation produced hit rates of 30.6% and 16.7%; both gave non-significantly higher hit rates for the sender trials than for the no sender trials (42.1% versus 17.6%; 26.3% versus 5.9%), indicative of a sender effect. Study 3 manipulated target lability, comparing a true RNG, the PC's pseudorandom function and a pre-generated set of random numbers. We did not recruit 'live' receivers, but accurately briefed participants about the study and gave immediate feedback. Significant psi hitting was not obtained in any single condition, but there was a predicted interaction effect between target and sender lability, ( $F_{(4, 74)} = 4.959$ ,  $p = .001$ ); 'stable'

senders gave highest psi hitting with the most labile target system, while labile senders showed the reverse. This effect was replicated in Study 4 ( $F_{(4,74)} = 2.747, p = .034$ ), which also found a trend supporting a predicted interaction between feedback and sending strategy ( $F_{(1,36)} = 3.061, p = .053$ ).

**Keywords:** Parapsychology; Extrasensory perception (ESP); Psychokinesis (PK); Ganzfeld studies

**Indexed papers:** Holt, N., & Roe, C. A. (2006). The sender as a PK agent in ESP studies: The Effects of agent and target system lability upon performance at a novel PK task. *Journal of Parapsychology*, 70(1), 49-67.

Roe, C. A., & Holt, N. (2006). The effects of strategy ('willing' versus absorption) and feedback (immediate versus delayed) on PK performance. *Journal of Parapsychology*, 70(1), 69-90.

Roe, C. A., & Holt, N. (2005). A further consideration of the sender as a PK agent in ganzfeld ESP studies. *Journal of Parapsychology*, 69(1), 113-127.

**Project:** 2002-70

**Title:** Assessing the relationship between subjective validation, personality characteristics and beliefs in the paranormal

**Duration:** 2003/01 – 2005/03

**Researcher(s):** Prof. David Marks, Prof. Robert Snowden, Dr. Nicola Gray, Dr. Lisa Evans, Dr. Anastasia Soureti

**Institution:** Department of Psychology, City University London (UK)

**Results:** Subjective validation occurs when a person maintains her/his prior beliefs when given clear and unambiguous evidence to the contrary (Marks & Kammann, 1980; Marks, 2000). This project focused upon the psychological characteristics of people who believe or do not believe in psi, independently of the issue of whether or not the phenomena are real. There were 120 participants who were interested in the paranormal and/or believed they were psychic (62% female, 38% male). To assess schizotypy, the Oxford-Liverpool Inventory of Feelings and Experiences (Mason et al., 1995) was utilized. Fantasizing was measured using the Wilson-Barber Inventory of Childhood Memories and Imaginings: Children's Form (Myers, 1983).

Vividness of visual imagery was measured using the Vividness of Visual Imagery Questionnaire (Marks, 1973), and finally, we used the Transliminality Scale, Form B (Thalbourne, 1998). A Zener Card guessing task was designed to evaluate the participants' tendency to subjectively validate their beliefs. The first block of 20 trials was arranged to enable participants to obtain double the chance rate (from 20 to 40%) of successful predictions. The second block of 20 trials was arranged to decrease the prediction rate. Subjective validation, assessed by measuring participants' confidence level during block 2, had a correlation of .64 ( $p < .001$ ) with psychic beliefs indicating that high subjective validators also have a strong tendency to proclaim personal psychic powers. A significant association also occurred between three of the schizotypy scales and beliefs in their psychic abilities: unusual experiences ( $r = .43, p < .001$ ), impulsive non-conformity ( $r = .41, p < .001$ ), and cognitive disorganization ( $r = .38, p < .001$ ). Significant correlations also occurred between psychic beliefs and fantasizing ( $r = .46, p < .001$ ) and the VVIQ ( $r = .58, p < .001$ ).

Discussion:

This study helped to identify the characteristics of people who strongly believe in personal psychic powers in spite of disconfirmation of their beliefs by actual physical events. Psychic believers have a strong tendency to subjectively validate and have personality characteristics that are linked to schizotypy, fantasizing, and vivid visual imagery. This is result which will not surprise many scientists and sceptics of the paranormal. However it is a result that should give pause to those who continue to claim the existence of powers and phenomena for which there is objective evidence.

Keywords: Parapsychology; Paranormal belief; Personality factors

Indexed papers: N/A

**Project:** 2002-76

Title: Extended Communication of Affective States: physiological and emotional responses to non-sensory stimuli

Duration: 2004/01 – 2005/05



- Researcher(s): Prof. Paul Stevens  
 Institution: Koestler Parapsychology Unit, The University of Edinburgh (UK)
- Results: Study 1 attempted to influence forced-choice behavioural responses via (a) 5 microT magnetic field (MF) modulated at 10 Hz and (b) a remote 'sender' undergoing autobiographical recall of positive affect memories . The MF stimulus did not influence the object choice (*Rosenthal pi* = .52,  $z = .3$ ,  $p = .62$ ) whereas the 'sender' did have an effect (*Rosenthal pi* = .38,  $z = -1.54$ ,  $p = .06$ ). When a target object was correctly chosen in the MF condition, Ss impressions were mostly affective (39%) or tactile (28%), the former being associated with object appearance. In the 'Sender' condition, impressions were also mostly affective (55%) or tactile (18%), the former again being object related.  
 Study 2 evaluated affective responses to 5 microT MFs modulated at EEG alpha-range frequencies. For normalised mean SC, 57% of Ss showed a non-significant decrease in arousal (*Wilcoxon p* = .41, 1-t). For EEG Global Field Power (GFP), 65% of Ss exhibited a significant decrease (*Wilcoxon p* = .03, 1-t). EEG Frontal Asymmetry (FA) suggested a less positive emotional state (non-significant), whereas Ss responses indicated a more positive emotional state (*Wilcoxon p* = .002, 2-t). There was no significant difference between the 2 MF frequency types or hemispheric difference.  
 Study 3 evaluated affective responses to a remote person undergoing autobiographical recall of affective memories. For normalised mean SC, 45% of Ss showed a decrease in arousal (non-significant). For GFP, 60% of Ss exhibited a decrease (non-significant). FA again suggested a less positive emotional state (nonsignificant) while Ss responses suggested a more positive emotional state (*Wilcoxon p* = .001, 2-t). There was no significant difference between the Sender affect types.
- Keywords: Parapsychology and Psychophysiology; Extrasensory perception (ESP); Psychometry; Emotion; Magnetic field; Electroencephalogram (EEG)
- Indexed papers: Stevens, P. (2007). Affective response to 5 microT ELF magnetic field-induced physiological changes. *Bioelectromagnetics*, 28(2), 109-114. doi: 10.1002/bem.20280

- Project:** 2002-81  
**Title:** Effects of GSM use of brain function and information processing - Phase I  
**Duration:** 2003/01 – 2003/09  
**Researcher(s):** Dr. M. W. Arns, Prof. E.L.J.M. van Luijtelaar  
**Institution:** The Brain Resource Company, Nijmegen (The Netherlands)
- Results:** The present study employs standardized data acquired from the Brain Resource International Database to study the relationship between mobile phone usage, personality, and brain function ( $N = 300$ ). Based on the frequency and duration of mobile phone usage, three groups were formed. The findings suggest a subtle slowing of brain activity related to mobile phone use that is not explained by differences in personality. These changes are still within normal physiological ranges. Better executive function in mobile phone users may reflect more focused attention, possibly associated with a cognitive training effect (i.e., frequently making phone calls in distracting places), rather than a direct effect of mobile phone use on cognition.
- Keywords:** Psychophysiology; Brain; Cognitive processes; Attention; Electroencephalogram (EEG)
- Indexed papers:** Arns, M., Van Luijtelaar, G., Sumich, A., Hamilton, R., & Gordon, E. (2007). Electroencephalographic, personality, and executive function measures associated with frequent mobile phone use. *International Journal of Neuroscience*, 117(9), 1341-1360. doi: 10.1080/00207450600936882

- Project:** 2002-82  
**Title:** Comparative study of brain processes related to space-induced and clinical oculomotor disturbances  
**Duration:** 2003/02 – 2005/01  
**Researcher(s):** Prof. Inessa B. Kozlovskaya, Ms. Elena Tomilovskaya, Dr. Anna Kirenskaya, Dr. Vladimir Novototsky-Vlasov, Dr. Vadim Myamlin

- Institution: State Research Centre RF Institute for Biomedical Problems, Moscow (Russia)
- Results: The studies included 3 groups of subjects: control group (C - 15 subjects), schizophrenic patients (S - 35 subjects), volunteers, exposed to 6-day dry immersion (DI - 12 subjects). All participants had right hand and right eye preference. Subjects performed visually-guided saccades and antisaccades. EEG was recorded from 19 standard sites. Mean amplitude of averaged potentials was assessed at 600 ms before the stimulus and at 600 to 100 ms before saccade onset. The saccade characteristics did not differ in groups C and DI. Patients exhibited in the antisaccade task delays in the performance of correct saccades ( $p < 0.05$ ) and larger number of directional errors ( $p < 0.001$ ). In control subjects the target stimulus was preceded by a vertex predominantly bilateral slow negative potential shift; left- and right-side saccades were preceded by PSN that was larger at the midline and left sites, with parietal maximum before visually-guided saccades, and with frontal and parietal maximums before antisaccades. The PSN amplitude declined significantly in the DI and Sch groups as compared with the C group. However, in immersed subjects the foci of negativity shifted to the right hemisphere so that the PSN amplitude decreased sharply in the left and increased in the right hemisphere, with significant decrease in Fz, F3, Pz and P3. Significant decline of the PSN amplitude was the most characteristic in schizophrenic patients in the sagittal frontal and central regions (Fz and Cz). The PSN shifts observed after exposure to simulated weightlessness and in schizophrenic patients could be caused by the alterations of sensory inputs' activities in weightlessness and fine frontal structural disorder of the brain in case of schizophrenia.
- Keywords: Psychophysiology; Mental health; Psychotic disorders; Brain; Electroencephalogram (EEG)
- Indexed papers: Kirenskaya, A., Kamenskov, M., Myamlin, V., Novototsky-Vlasov, V. Y., & Tkachenko, A. (2013). The antisaccade task performance deficit and specific CNV abnormalities in patients with stereotyped paraphilia and schizophrenia. *Journal of Forensic Sciences*, 58(5), 1219–1226. doi: 10.1111/1556-4029.12241

Kirenskaya, A., Myamlin, V., Novototsky-Vlasov, V. Y., Pletnikov, M., & Kozlovskaya, I. (2011). The contingent negative variation laterality and dynamics in antisaccade task in normal and unmedicated schizophrenic subjects. *Spanish Journal of Psychology*, 14(2), 869-883. doi: 10.5209/rev\_SJOP.2011.v14.n2.34

Slavutskaya, M., Kirenskaya, A., Novototsky-Vlasov, V. Y., Shulgovsky, V. & Kozlovskaya, I. (2005). Slow cortical potentials preceding visually guided saccades in schizophrenics. *Human physiology*, 31(5), 545-553. doi: 10.1007/s10747-005-0095-z

- Project:** **2002-88**
- Title:** A neuropsychological examination of orbitofrontal cortex function in eating disorders
- Duration:** 2003/03 – 2004/09
- Researcher(s):** Prof. Janet Treasure, Prof. Kate Tchanturia
- Institution:** Institute of Psychiatry, King's College London (UK)
- Results:**
- Objectives:**  
Previous neuroimaging findings implicate an orbitofrontal cortical dysfunction in the pathogenesis of anorexia nervosa (Uher 2003). The orbitofrontal cortex is necessary for practical decision-making in humans and the Iowa Gambling task (IGT) became established as an instrument for investigation of decision making and orbitofrontal function (Bechara 2002).
- Methods:**  
Using the computerised IGT, we investigated the profile of decision making performance in anorexia nervosa female patients ( $n = 29$ ), male patients with anorexia ( $n = 11$ ) long term recovered participants ( $n = 27$ ), healthy control females (29), healthy males ( $n = 25$ ). Skin conductance response during the task was measured using the PSYLAB equipment.
- Results:**  
As expected, the healthy control women made progressively more advantageous choices during the task. Patients with AN failed to show this learning effect and continued making disadvantageous choices throughout the task. Those recovered from AN, showed a normal learning curve and their performance was no worse than that of healthy controls in the IGT.

**Conclusions:**

The impairment of decision-making in AN is replication of previous findings (Cavedini 2004). However, decision-making in women recovered from AN was not previously reported and may elucidate the role of this cognitive function in the pathogenesis and course of the illness. This pattern of results may suggest that impaired decision-making is either a state marker of AN and improvement in decision-making is part of the process of recovery or it may be that decision-making capacity is a positive prognostic factor which makes it possible to attain full recovery. To distinguish between these two distinct possibilities, longitudinal investigation is warranted.

**Keywords:**

Psychophysiology; Mental health; Eating disorders; Anorexia nervosa; Cognitive processes; Decision-making

**Indexed papers:**

Roberts, M., Lavender, A., & Tchanturia, K. (2010). Measuring self-report obsessionality in anorexia nervosa: Maudsley Obsessive-Compulsive Inventory (MOCI) or Obsessive-Compulsive Inventory-Revised (OCI-R)? *European Eating Disorders Review*, 19(6), 501-508. doi: 10.1002/erv.1072

Liao, P.-C., Uher, R., Lawrence, R., Treasure, J., Schmidt, U., Campbell, I. C., ... Tchanturia, K. (2009). An examination of decision making in bulimia nervosa. *Journal of Clinical and Experimental Neuropsychology*, 31(4), 455-461. doi: 10.1080/13803390802251378

Southgate, L., Tchanturia, K., & Treasure, J. (2008). Information processing bias in anorexia nervosa. *Psychiatry Research*, 160(2), 221-227. doi: 10.1016/j.psychres.2007.07.017

**Project:****2002-90****Title:**

Brain function, creativity, paranormal ideation and risk for psychosis

**Duration:**

2003/03 – 2005/04

**Researcher(s):**

Dr. Alex Sumich, Prof. Michael Brammer, Dr. Dominic Ffytch

**Institution:**

Brain Image Analysis Unit, Institute of Psychiatry, King's College London (UK)

**Results:** Compared to healthy controls, men with recent onset psychosis (ROP) have reduced anterior N100 amplitude, enhanced left temporal and frontal N200 amplitude and reduced left temporal and posterior P300 amplitude. Insight/judgement (IJ), rapport and depression are negatively associated with N200 amplitude implicating executive mechanisms. Reduced N200 amplitude in higher-depression ROP contrasts enhanced N200 in major depression, suggesting aetiological differences for depression between diagnoses. However, lower right anterior N200 in high-depression ROP is consistent with subclinical depression in healthy men. The relationship between right anterior N200 and depression in ROP did not persist after controlling for IJ. Thus, a contribution of intact IJ to depression in ROP is supported.

Psychomotor poverty is associated with reduced N100 amplitude. Lower left P300 is associated with total psychopathology. Various mechanisms found abnormal in ROP are also implicated in paranormal ideation (PI) including enhanced anterior N200 and reduced left- and anterior- P300 amplitude. However, in contrast to ROP, high-PI is associated with enhanced N100 amplitude which may represent a compensatory mechanism protecting against the onset of psychosis. On the other hand, paranoia/suspiciousness (PS) is associated with reduced anterior N100 and enhanced N200 in healthy men, but not women, supporting an association between PS and mechanisms implicated in negative symptoms. Results suggest the existence of a continuum of psychosis which is further supported by observed sex differences in the ERP-personality relationship reflective of those previously reported in schizophrenia. PI and PS may represent distinct risk factors for psychosis.

**Keywords:** Psychophysiology; Brain; Mental health; Psychotic disorders

**Indexed papers:** Sumich, A., Kumari, V., Gorden, E., Tunstall, N., & Brammer, M. (2008). Event-related potential correlates of paranormal ideation and unusual experiences. *Cortex*, *44*(10), 1342-1352. doi: 10.1016/j.cortex.2007.10.012

Sumich, A., Harris, A., Flynn, G., Whitford, T., Tunstall, N., Kumari, V., ... Williams, L. M. (2006). Event-related potential correlates of depression, insight and negative symptoms in males with recent-onset psychosis. *Clinical Neurophysiology*, *117*(8), 1715-1727. doi: 10.1016/j.clinph.2006.04.017

Sumich, A., Kumari, V., Heasman, B., Gordon, E., & Brammer, M. (2006). Abnormal asymmetry of N200 and P300 event-related potentials in subclinical depression. *Journal of Affective Disorders*, 92(2-3), 171-183. doi: 10.1016/j.jad.2006.01.006

<b>Project:</b>	<b>2002-95</b>
Title:	“I just had this feeling...”: A Somatic Marker Approach to Understanding Intuitive Decision Making
Duration:	2003/04 – 2005/09
Researcher(s):	Prof. Richard Broughton
Institution:	The University of Northampton (UK)
Results:	<p>Two experiments examined the role of the emotional system in intuitive decision-making. The first was a replication of the Bechara-Damasio Iowa Gambling Test (IGT) experiment exploring individual differences. Fifty participants completed the MBTI and NEO-FFI and a computerized IGT while skin conductance responses (SCR) were monitored. The second experiment, with 24 participants was similar to the first except that the IGT was modified to be a test of true precognitive intuition (by randomizing card deck placement).</p> <p>In the first experiment the IGT behavioural results (card-selection) demonstrated a significant learning effect, but not as early in the run as typically seen. Anticipatory SCR results were broadly similar to that found by the Damasio team, but failed to reach significance. None of the personality factors from either test significantly discriminated IGT behavioural performance, though the NEO-FFI openness to experience factor was suggestive that participants high on openness preferred risky choices. MBTI judging-perceiving facet was significantly negatively correlated with anticipatory SCRs, especially in the earlier trials, suggesting that “judging” participants produced higher anticipatory SCRs. Overall, the IGT behavioural performance most closely represented other recent research that demonstrated university education may attenuate emotional learning in the IGT.</p> <p>The second experiment showed no overall evidence of precognitive intuition either in the behavioural or the SCR data.</p>

MBTI facets extroversion-introversion (EI) and judging-perceiving (JP) correlated significantly with the number of punishments received with the extraverts and perceiving types receiving fewer punishments than introverts and judging types, however these significances must be treated cautiously.

Keywords: Parapsychology; Extrasensory perception (ESP); Presentiment; Intuition; Emotion; Personality; Cognitive processes; Decision-making

Indexed papers: N/A

**Project: 2002-96**

Title: Face processing in 3-day-olds: an electrophysiological approach

Duration: 2003/01 – 2005/02

Researcher(s): Prof. Olivier Pascalis, Prof. de Haan Michelle, Prof. Saatchi Reza

Institution: Department of Psychology, The University of Sheffield (UK)

Results: Event-related potentials were recorded in adults, 6- and 12-month old infants during a face processing task where the participants passively viewed upright (HU) and inverted (HI) pictures of human faces. The analysis was guided towards finding evidence of developmental changes in the neural mechanisms involved in face processing. The electrophysiological signal (EEG) of interest was a negative potential peaking around 170ms (N170) after the presentation of the stimulus. The N170 is of smaller amplitude and shorter latency for HU compared to HI.

The analysis showed a classic N170 in adults and a putative “infant N170” in 6-month and 12-month old infants. The amplitude and latency difference between HU and HU was observed only in adults. The averages suggested that the infants N170 can be a broader version of the adults N170. Further analysis was performed on the averages in order to test for this apparent bandwidth difference. The EEG being a mixture of processes produced by several neural generators at the same time, we decomposed the signals into its different frequency components.



The wavelet-based multi-resolution analysis was applied to the averages and the results were compared across the 3 age groups. The N170-related brain activity was extracted mainly in the alpha band (8-13 Hz) for adults, in the delta band (0-4 Hz) for 6-month olds and in both the theta (4-8 Hz) and alpha bands for the 12-month olds. These findings suggest that 6-month olds may be slower than adults and 12-month olds at processing pictures of human faces. It can reflect infants' more limited exposure to faces and/or a physiological characteristic of infants' immature brains that makes them generally slower at processing information as a whole.

**Keywords:** Psychophysiology; Developmental psychology; Brain; Electroencephalogram (EEG)

**Indexed papers:** Milne, E., Scope, A., Pascalis, O., Buckley, D., & Makeig, S. (2009). Independent Component Analysis Reveals Atypical Electroencephalographic Activity During Visual Perception in Individuals with Autism. *Biological Psychiatry*, 65(1), 22-30. doi: 10.1016/j.biopsych.2008.07.017

**Project:** 2002-107

**Title:** Sonhos em Surdos: alterações oníricas por défice sensorial

**Duration:** 2003/03 – 2007/01

**Researcher(s):** Prof. Maria Teresa Aguiar dos Santos Paiva, Dr. Helder Manuel Bértolo, Prof. Mário Andrea, Prof. Oscar Dias, Dr. Isabel Galhardo, Dr. Alexandra Medeiros, Dr. Tiago Mestre, Dr. Pedro Miguel Rocha, Dr. Lara Pessoa, Ms. Rosa Santos, Ms. Mónica Andrea, Ms. Raquel Aires, Dr. Graça Caldeira, Dr. Cristina Ramos

**Institution:** Núcleo de Lisboa do ISTEEL - Instituto do Sono, Cronobiologia e Telemedicina (Portugal)

**Results:** N/A

**Keywords:** Psychophysiology; Electroencephalogram (EEG); Sleep and dreams; Brain; Diseases/Injuries; Congenital deafness

**Indexed papers:** N/A

**Project: 2002-109**

Title: Retrocausal Signalling with Prestimulus Response

Duration: 2003/02 – 2004/04

Researcher(s): Dr. James Spottiswoode

Institution: Geonet Technologies, Inc., Beverly Hills (USA)

Results: This project describes an attempt to apply a new psi effect, called presentiment or pre-stimulus response (PSR), to produce a reliable time reversed communication channel. In the original PSR protocol single subjects were exposed to randomly timed and chosen stimuli, either audio startles or silent controls. Skin conductance responses (SCR) were measured in the few seconds prior to the stimuli. The frequency of such responses was observed to be significantly higher in pre-audio as opposed to pre-control epochs (Spottiswoode & May, 2003). One interpretation of this result is that the audio stimuli caused subjects to have an SCR in the seconds preceding the startling stimulus. For each stimulus the probability of a subject's showing a preceding SCR is quite low, however by using many subjects simultaneously it is possible to count SCR's across the group and statistically determine whether the upcoming stimulus will be an audio or control, thus realising a retro-causal communication channel.

Six trials were performed with between 15 and 52 subjects in each. However the PSR effect did not replicate in the group setting. A total of 219 subjects contributed data and the observed per subject effect size of 0.0163 was significantly smaller than that observed, 0.106, in the single subject PSR trials. Many possible reasons exist for the failure to see the same effect with multiple as with single subjects: the changed setting of the subjects, differences in the subject population, or the possibility that the original single subject PSR results were due to an experimenter effect similar to the mechanism described in Decision Augmentation Theory (May, E. C., Spottiswoode, S. J. P., Utts, J. M., and James, C. L. 1995). This last notion has been supported by some post hoc analyses by this author.

Keywords: Parapsychology; Extrasensory perception (ESP); Presentiment

Indexed papers: Spottiswoode, J., & May, E. C. (2003). Skin Conductance Pre-stimulus Response: Analyses, Artifacts and a Pilot Study. *Journal of Scientific Exploration*, 17(4), 617-641.

**Project: 2002-111**

Title: The Pro Attitude and its Relationship to Psi in a Psychophysiological Study involving the I Ching and the ProComp+ Neuro-Biofeedback Apparatus

Duration: 2003/03 – 2004/09

Researcher(s): Dr. Michael Thalbourne, Dr. Lance Storm

Institution: Anomalistic Psychology Research Unit, Dep. Psychology, University of Adelaide (Australia)

Results: This study with the I Ching is the fourth in a series ( $N = 200$ ). There are 64 readings corresponding to so-called “hexagrams”, and the P is asked to select 16 hexagram descriptor-pairs that match the statement “Lately, or right now, I feel . . .” The P then throws three coins six times to produce an outcome hexagram. If this outcome matches one of the 16 pre-selections, then the P makes a hit. A previous finding was replicated although it only approached significance. Exploratory analyses revealed no reliably significant correlations with the three psychopractic measures (i.e., 1st-hexagram hitting, 2nd-hexagram hitting, and changing lines), but there were a number of additional psychological correlates of transluminality. Ps from the above study ( $n = 8$ ) took part in an experiment using the ProComp+ neuro-feedback apparatus. Feedback on computer was given during normal and paranormal tasks switched at irregular intervals. During normal modes, Ps were required to keep EEG alpha rhythm above threshold, and/or integrated EMG amplitude below threshold, in order to elicit positive feedback. During paranormal modes, a single frame from the animation was presented, which did not change regardless of alpha and/or EMG amplitudes. It was hypothesized that (i) video anomalies occur during paranormal modes, and (ii) EEG alpha amplitude is higher, and/or integrated EMG amplitude is lower during paranormal modes. Previous meditation and biofeedback experience had no effect on EEG alpha

amplitude or EMG. Some participants showed evidence of waveform training. Transliminality correlated with alpha and EMG in the hypothesized directions, but only approached significance in the Transliminality/alpha correlation.

Keywords: Parapsychology and Psychophysiology; Psychopraxia; Paranormal belief; Transliminality; Electroencephalogram (EEG)

Indexed papers: N/A

**Project: 2002-114**

Title: The Measurement and Characterization of Charge Accumulation and Electromagnetic Emissions from Bioenergy Healers

Duration: 2003/05 – 2005/11

Researcher(s): Prof. William Joines, Prof. Stephen Baumann

Institution: Field and Matter Interactions Research Laboratory, Duke University (USA)

Results: In this research study the subject under test is asked to focus and to direct their mental energy into a region of space. This energy may be in the form of healing intent directed toward another person, nearby or at a distance, or the subject may choose to focus or concentrate their mental energy onto one of the instruments measuring voltage or light. During the subject's directed or focused intent we measure charge build-up and decay that may occur on the skin surface. For this we use from 1 to 18 electrodes. To record even slight variations over time, the voltage or charge at electrodes arrayed on the body is measured using a very sensitive voltmeter (Keithley model 6514).

These measurements on volunteer subjects are conducted in an electrically shielded darkroom, where we also measure faint amounts of light that may be emitted from the subject. For this we use a cooled (-30 deg C) photomultiplier tube system that counts photons of light. In our study we also monitor the outputs from an argon-cooled IR camera and a gauss meter that are located near the subject.

In a pilot study conducted over a span of several months, long

before the present research project was started, we repeatedly measured charge build-up and decay, and concurrent light emission from one subject during periods of healing intent. Subsequent to our pilot study, another research laboratory has measured charge build-up and decay on the body of several subjects during periods of focused intent, but they made no attempt to measure light emission.

In the present study we have tested 35 people (10 controls and 25 healers), many of them multiple times, and we have evidence that one of the healers did something quite extraordinary twice in one testing session. This subject emitted bursts of blue/ultraviolet light and concurrent charge buildup on the body as measured by our electrodes. Also, we have recorded evidence that many of the healers produced abundant heat emission (infrared light) from their hands and faces as recorded by our infrared camera.

The testing results that we have obtained to date have been presented as an oral presentation at the 2005 Society for Scientific Exploration Conference and as a poster and an oral presentation at the 2006 BIAL Foundation Symposium.

Keywords: Parapsychology; Healing; Distant healing

Indexed papers: N/A

**Project:** 2002-117

Title: Psiconeurofisiologia comparativa entre as memórias traumáticas de vida actual e as memórias traumáticas de supostas vidas passadas: SPECT cerebral em 20 pacientes submetidos à Terapia Regressiva Vivencial Peres

Duration: 2003/01 – 2008/03

Researcher(s): Dr. Maria Júlia Prieto Peres, Dr. Júlio Prieto Peres, Dr. Regis Cavini Ferreira, Dr. Vivian Pires de Albuquerque

Institution: Instituto Nacional de Pesquisa e Terapia Regressiva Vivencial Peres, São Paulo (Brazil)

**Results:** Many studies have pointed out that the brain does not really store emotional or traumatic memories, but stores traces of information that are later used to create memories. The psychopathological signs of trauma are not static along a time-line and neither is the expression of traumatic memories. The psychotherapeutic method *Terapia Reestructurativa Vivencial Peres (TRVP)* integrates tools of Cognitive Behavioral Therapy and Altered State of Consciousness to help the patient restructure emotionally and cognitively traumatic events.

**Objective:**

The aim of this study was to compare changes in cerebral blood flow of patients during the retrieval of traumatic memories of present life and traumatic memories of supposed previous lives by using a script-driven symptom provocation paradigm adapted to Single Photon Emission Computed Tomography (SPECT). Twenty patients with partial post-traumatic stress disorder (PTSD) were examined by means of brain SPECT ( $^{99}\text{Tc-ECD}$ ). ROIs were used to semi-quantify flow. Values were generated for each ROI and normalized to the average whole brain activity and a Statistical Parametric Mapping was used for data analyses. The comparison between the baseline condition (relaxation) and the traumatic memories of present life showed significant attenuation of activity in the pre-frontal cortex ( $X = \pm 10, Y = +36, Z = -15, p < 0.001$ ), and left hippocampus ( $X = -32, Y = -9, Z = -15, p < 0.001$ ), as well as increase of activity in the left amygdale ( $X = -17, Y = -6, Z = -23, p < 0.001$ ). The comparison between the baseline condition and the traumatic memories from supposed previous life showed the same neural reciprocities. The third comparison between the traumatic memories of present life and the traumatic memories from supposed previous life, did not reach significance. These findings suggest that fantasy, false memories and confabulation are distinct cognitive processes of traumatic memories of supposed previous lives, and neural mechanisms involved in these processes may share neural similarities with those underlying the fragmented and nonverbal nature of traumatic memories in partial PTSD.

**Keywords:** Parapsychology and Psychophysiology; Survival after bodily death; Past-life regression; Brain; Cognitive processes; Memory; Mental health; Anxiety disorders; Intervention

- Indexed papers: Peres, J. F., McFarlane, A., Nasello, A. G., & Moores, K. (2008). Traumatic memories: bridging the gap between functional neuroimaging and psychotherapy. *Australian and New Zealand Journal of Psychiatry*, 42(6), 478-488. doi: 10.1080/00048670802050561
- Peres, J. F., & Nasello, A. G. (2008). Psychotherapy and neuroscience: Towards closer integration. *International Journal of Psychology*, 43(6), 943-957. doi: 10.1080/00207590701248487
- Peres, J. F., Newberg, A. B., Mercante, J. P., Simão, M., Albuquerque, V., Peres, M., Nasello, A. G. (2007). Cerebral blood changes during retrieval of traumatic memories before and after psychotherapy. *Psychological Medicine*, 37(10), 1481-1491. doi: 10.1017/S003329170700997x

**Project:** 2002-118

**Title:** Differential Responses to target vs. Non-Target Psi Stimuli: An Event-Related fMRI Study

**Duration:** 2003/01 – 2007/01

**Researcher(s):** Prof. Stephen Kosslyn, Dr. Sam Moulton

**Institution:** Harvard University Psychology Department and NMR Center (USA)

**Results:** Parapsychology is the scientific investigation of apparently paranormal mental phenomena (such as telepathy, i.e., “mind reading”), also known as psi. Despite widespread public belief in such phenomena and over 75 years of experimentation, there is no compelling evidence that psi exists. In the present study, functional magnetic resonance imaging (fMRI) was used in an effort to document the existence of psi. If psi exists, it occurs in the brain, and hence assessing the brain directly should be more sensitive than using indirect behavioral methods (as have been used previously). To increase sensitivity, this experiment was designed to produce positive results if telepathy, clairvoyance (i.e., direct sensing of remote events), or precognition (i.e., knowing future events) exist. Moreover, the study included biologically or emotionally-related participants (e.g., twins) and emotional stimuli in an effort to maximize experimental conditions that are purportedly conducive to psi. In spite of these characteristics of the study, psi stimuli and non-psi stimuli evoked indistinguishable neuronal responses –

even though differences in stimulus arousal values of the same stimuli had the expected effects on patterns of brain activation. These findings are the strongest evidence yet obtained against the existence of paranormal mental phenomena.

**Keywords:** Parapsychology and Psychophysiology; Extrasensory perception (ESP); Brain; Functional magnetic resonance imaging (fMRI)

**Indexed papers:** Moulton, S. T., & Kosslyn, S. M. (2008). Using neuroimaging to resolve the Psi debate. *Journal of Cognitive Neuroscience*, 20(1), 182-192. doi: 10.1162/jocn.2008.20.1.182

**Project:** 2002-124

**Title:** The Flexibility of Physical Body Boundaries and its Relationship to Out-of-Body Experiences

**Duration:** 2003/08 – 2004/12

**Researcher(s):** Dr. Craig Murray, Dr. Jezz Fox

**Institution:** Liverpool Hope University College (UK)

**Results:** In this project we theorised that the daily bodily experiences of people with a prior OBE and those without this experience would differ along a number of dimensions. In order to test this theory a questionnaire study was conducted. In study 1, 62 of 243 respondents reported at least one prior OBE. Six scales on different aspects of bodily experience were administered. Respondents reporting a previous OBE were found to score significantly higher on measures of somatoform dissociation ( $p < .001$ ), self consciousness ( $p = .035$ ), body dissatisfaction ( $p = .001$ ), and lower on a measure of confidence in their physical self-presentation ( $p = .02$ ) than respondents without a previous OBE. The significant findings were confirmed in a second study in which 64 people (34 of whom had had an OBE), where participants also scored significantly higher on measures of Social Physique Anxiety. OBE experiencers also reported lower levels of body awareness during use of an immersive virtual reality system than nonexperiencers. The project has also explored variables such as dissociation and absorption in relation to OBEs and the experience of presence



- within virtual reality. Other data regarding the navigational styles of OBE and non-OBE respondents in an immersive virtual reality task are currently undergoing analysis.
- Keywords:** Parapsychology; Survival after bodily death; Out-of-body experience (OBE); Body awareness
- Indexed papers:**
- Murray, C. D., Fox, J., & Pettifer, S. (2007). Absorption, dissociation, locus of control and presence in virtual reality. *Computers in Human Behavior*, 23(3), 1347-1354. doi: 10.1016/j.chb.2004.12.010
- Murray, C. D., & Fox, J. (2005). Dissociational body experiences: Differences between respondents with and without prior out-of-body-experiences. *British Journal of Psychology*, 96(4), 441-456. doi: 10.1348/000712605x49169
- Murray, C. D., & Fox, J. (2005). The out-of-body experience and body image: Differences between experiencers and nonexperiencers. *Journal of Nervous and Mental Disease*, 193(1), 70-72. doi: 10.1097/01.nmd.0000149223.77469.da
- Project:** **2002-126**
- Title:** Servindo dois lados: As características do trabalho como preditores de respostas psicossociais e psicofisiológicas ao stress em médicos e enfermeiros em posições de gestão
- Duration:** 2003/05 – 2007/09
- Researcher(s):** Prof. Scott Elmes McIntyre, Prof. Maria Teresa McIntyre, Prof. João Manuel Salgado, Dr. João Paulo Pereira, Dr. José da Costa Dantas, Prof. Derek Johnston, Prof. Martyn Jones
- Institution:** Centro de Investigação, de Formação e Intervenção em Saúde, Maia (Portugal)
- Results:** Objectives:  
1) compare managers/subordinates on stress and job characteristics, 2) test the Demand Control (DC) and Effort-Reward Imbalance (ERI) occupational stress models, 3) pilot-test the ecological momentary assessment (EMA) of stress and job characteristics with the ambulatory measure of physiological stress indicators.  
1. Hierarchical position is important in terms of stress and job characteristics. The “head doctors/nurses” show stress vulner-

ability, especially in autonomic arousal, related to work characteristics (demand, control and reward). They showed high Overcommitment, a style of coping that has negative effects on well-being and work.

2. The DC model did not predict job stress by questionnaire or self-report real time data, but predicted heart rate/systolic blood pressure. The ERI model explained job stress better by questionnaire and real time data, predicting higher stress. Reward was particularly significant for systolic blood pressure. The study of positive and negative emotions at work was an innovative contribution. Demand and Control were related to Negative Affect, and Strain predicted feeling energetic and alert. Organizational interventions which increase control and reward will reduce negative emotional responses and increase positive affect, with positive outcomes on health and work.

3. Our study has contributed two important methodological aspects. 1) Measure stress with a variety of indicators. The combination of self-report and objective measures, as well as longitudinal evaluations, should be used in future studies of job stress. 2) Pioneer the use of EMA in Portugal. This innovative methodology allows the study of links between job characteristics and psychological/biological responses.

Keywords: Psychophysiology; Stress and health; Occupational stress; Emotion

Indexed papers: N/A

**Project:** 2002-127

Title: Pursuing Psi in a Non-EuroAmerican Culture: Behavioral DMILS in Bali

Duration: 2003/03 – 2005/03

Researcher(s): Prof. Hoyt Edge, Prof. Luh Ketut Suryani

Institution: College of Arts and Sciences, Rollins College, Winter Park (USA)

Results: The grant funded two DMILS studies and a comparison of Balinese and American responses on the BVCQ.

1) One part of our grant continued our successful DMILS work from a previous grant, introducing changes to our protocol trying to understand the processes involved in behavioural DMILS. The first study compared the performance of trained meditators to traditional Balinese healers (Balian) in their ability to help a sensorily isolated person in their focus meditation. A total of 40 runs were carried out, half with Balian and half with meditators.

We found no overall difference between presses in the control condition ( $mean = 2.6, SD = 2.46$ ) and help condition ( $mean = 2.5, SD = 2.21$ ),  $t_{(39)} = 0.44$ , ns, two-tailed,  $d = .05$ ,  $power = .05$ . We also found a no significant difference in the psi scores between the meditators and Balian,  $t_{(38)} = 1.74$ ,  $p = .09$ , two-tailed,  $d = .56$ ,  $power = .39$ .

2) The second DMILS study used trained Resident Interns in Psychiatry as Helpers. We also measured heart rate variability of Helpees to determine if HRV was a more sensitive measure of psi functioning than pressing a button. 80 runs were carried out. Again, there was no significant psi effect (Control ( $M = 3.07, SD = 2.57$ ), Help ( $M = 2.91, SD = 3.04$ ),  $t_{(68)} = 0.61$ , ns, one-tailed).

3) A comparison of Balinese and American responses on the Balinese Volitional Competency Questionnaire yielded a number of differences. Most significant among these was support that the Balinese employ secondary control (the person tries to fit in with the world and “flow” with it) that is tied closely with collectivism, while American responses indicated primary agency (people attempt to change the world so that it conforms to their needs and desires) that is correlated with individualism.

Keywords: Parapsychology; Psychokinesis (PK); Direct mental interactions with living systems (DMILS)

Indexed papers: N/A

**Project:** 2002-132

Title: Ganzfeld Digital Fisiológico: em busca de uma medida mais objectiva para Psi

Duration: 2003/01 – 2009/11  
 Researcher(s): Prof. Fábio Eduardo da Silva, Ms. Sibeles Aparecida Pilato, Prof. Reginaldo de Castro Hiraoka  
 Institution: Faculdades Integradas Espírita, Centro Integrado de Parapsicologia Experimental, Laboratório de Pesquisa Ganzfeld, Curitiba (Brazil)  
 Results: N/A  
 Keywords: Parapsychology; Extrasensory perception (ESP); Ganzfeld studies  
 Indexed papers: N/A

**Project: 2002-136**

Title: Factors Affecting the Relationship Between Human Intentionality and the Hemolysis of Red Blood Cells  
 Duration: 2003/05 – 2005/03  
 Researcher(s): Prof. John Palmer, Prof. Stephen Baumann, Prof. Christine Simmonds, Dr. Colleen Rae, Ms. Anne Poole  
 Institution: Rhine Research Center, Durham (USA)  
 Results: The purpose of the experiment was to see if participants (Ps) could psychokinetically retard the hemolysis of red blood cells from a nearby room. 20 spiritual healers completed 2 sessions and 40 non-healers 1 session. Hemolysis was induced by adding 50 l of blood to 3ml of .425% physiological saline solution in a cuvette and was measured by a spectrophotometer. Each session included 2 counterbalanced test and baseline runs, each containing 8 1-min trials. Influence was attempted only on trials 4 and 5 of the test run; all other trials were control. Overall hemolysis scores were nonsignificant and did not differ significantly between healers and non-healers. Results were not directly affected by whether the manipulated DC component of the geomagnetic field (GMF) around the cuvette was present or absent. Consistent with a previous finding, ambient GMF 1 day before the test session was suggestively

higher for retardation than acceleration 1st sessions ( $p = .081$ , 1-t). Healers scored significantly higher than non-healers on the Spiritual Transcendence Scale (STS), and high STS non-healers expressed the most confidence in task success. There were 2 significant post-hoc effects in 1st sessions. Non-healers under age 31 tended to retard hemolysis while those over 34 tended to accelerate it. The 2nd finding involved the combined test and baseline runs but is a psi effect because the hemolysis tester was blind to run order. Ps who received the test run 1st significantly retarded hemolysis if the manipulated GMF was off and significantly accelerated hemolysis if the GMF was on. The effect in the GMF-off condition was significantly stronger for Ps with “thin” boundaries on a short form of the Hartmann Boundary Questionnaire.

Keywords: Parapsychology; Psychokinesis (PK); Intention

Indexed papers: Palmer, J., Simmonds-Moore, C., & Baumann, S. (2006). Geomagnetic fields and the relationship between human intentionality and the hemolysis of red blood cells. *Journal of Parapsychology*, 70(2), 275-301.

**Project:** 2002-139

Title: Experimenter effects and Psi performance using a digital auto-ganzfeld system

Duration: 2003/10 – 2008/04

Researcher(s): Dr. Matthew D. Smith

Institution: Liverpool Hope University College (UK)

Results: Sixteen experimenters conducted a total of 114 ganzfeld trials. Experimenter expectancy regarding the likely success of the experiment was manipulated so that half the experimenters were given a positive expectancy of success and half are given a negative expectancy. Experimenters' attitudes towards psi were also measured and classified as either 'high' or 'low'. The effects of these independent variables upon participants' confidence of success and actual performance on a ganzfeld-ESP task were assessed. The overall hit-rate was 34.2% (39/114 trials) and was statistically significant ( $p = 0.02$ ), although there was the potential for optional stopping.

A 2 x 2 ANOVA revealed no significant main effect of experimenter attitudes towards psi upon psi scores (measured by Z-scores),  $F_{(1, 113)} = 0.32, p = 0.58$ . Nor was there a significant main effect of experimenter expectancy,  $F_{(1,113)} = 2.35, p = 0.13$ . No significant interaction was found between experimenter attitudes towards psi and experimenter expectancy,  $F_{(1,113)} = 0.08, p = 0.78$ .

A 2 x 2 ANOVA revealed no significant main effect of experimenter attitudes towards psi upon Receivers' confidence scores,  $F_{(1, 105)} = 1.64, p = 0.20$ , or Senders' confidence scores,  $F_{(1, 103)} = 3.09, p = 0.08$ , although it approached significance for Senders' confidence. Whilst there was also no significant main effect of experimenter expectancy upon Receivers' confidence,  $F_{(1,105)} = 0.23, p = 0.64$ , there was a significant effect of experimenter expectancy upon Senders' confidence,  $F_{(1,103)} = 7.06, p = 0.009$ . No significant interaction was found between experimenter attitudes towards psi and experimenter expectancy for either Receivers' confidence,  $F_{(1,105)} = 0.91, p = 0.34$ , or Senders' confidence,  $F_{(1, 103)} = 0.89, p = 0.35$ .

Keywords: Parapsychology; Extrasensory perception (ESP); Paranormal belief; Ganzfeld studies

Indexed papers: N/A

**Project:** 2002-143

Title: Receiver's EDA and skin temperature changes in remote bio-PK attack "Toh-ate"

Duration: 2003/02 – 2004/09

Researcher(s): Dr. Mikio Yamamoto, Dr. Hideyuki Kokubo, Dr. Weizhong Chen

Institution: National Institute of Radiological Sciences, Chiba-shi (Japan)

Results: "Toh-ate" is a traditional Japanese martial art requiring special skill of its practitioners. Toh-ate is a non-contact attack by one person against another when the two are separated at a distance. In our previous studies with qigong or martial arts practitioners, a few exceptional subjects showed anomalous

signal transmission in time coincidence of subjects' motions or physiological change even if in two separated rooms with each in a double blinded condition (Yamamoto et al. 1996, Chen et al. 2002.). In the present study, we researched the generality of this phenomenon by examining responses of plural veteran pairs. Subjects were 3 pairs of trainees of Japanese martial arts and 3 pairs of trainees of Chinese qigong. As control, 6 other pairs participated; these persons had no martial arts training. Receiver and Sender were put in separate rooms with communicational deprivation. The Receiver was seated in a Faraday cage and the Sender performed only one sending motion per 80-sec trial on double blinded and randomized conditions. The timing of each subject's motions and physiological factors were recorded. Physiological analyses showed that no anomalous changes of the average gradient of skin temperature of the Receiver's palm were observed around the sending time. Also there was no difference between practitioners of the Japanese and Chinese arts. Regarding time coincidence, Japanese martial arts subjects showed no anomalous results although 4 of them were considered to have abilities for toh-ate to some degree (Kokubo et al. 2003). Two pairs of Chinese qigong practitioners showed 5% significance peaks at +11 sec, but no anomalous peak at 0 sec.

The results suggested that it is difficult to get good results if subjects do not have a sufficient career in a particular martial art or qigong school.

Keywords: Parapsychology; Psychokinesis (PK); Direct mental interactions with living systems (DMILS)

Indexed papers: N/A

**Project:** 2002-147

Title: The Manipulation of Ganzfeld ESP Performance by the Control of Implicit Percipient Variables

Duration: 2003/01 – 2005/09

Researcher(s): Prof. James Carpenter, Prof. Christine Simmonds

Institution: Rhine Research Center, Durham (USA)

**Results:** In stage one, 190 “mentation” transcripts of a body of ganzfeld data previously collected were analyzed on a number of variables measuring aspects of implicit attitude, emotional adjustment and perceptual style. A composite predictive scale derived from analyzing earlier data succeeded in discriminating hitting and missing cases in the new dataset. Supporting the validity of the approach. Then both datasets were combined, and new predictions were generated. Two variables, having to do with the approaches of positive self-transcendence and intellectualization were carried over to the second stage in which we tried to manipulate the levels of these dimensions and thereby gain some control over the ESP performance.

In stage two, 80 percipients and agent/partners were tested. Half of the subjects of each group were randomly assigned to either the “Enhanced” or the Standard/Control group. In the “Enhanced” condition we attempted to increase the experience of “Merger/Harmony” (a state of lowered personal boundaries and expansive well-being and sense of connection), and lower the approach of “Intellectualization” (a tendency to employ cognitive analysis). The Control condition was a standard ganzfeld. Percipients rated the target and provided post-session experiential reports. Contrary to our hopes, the “Enhanced” condition did not yield higher ESP scores, nor did it yield more psi-conducive aspects of experience as reflected in the post-session reports. Overall significant psi performance was observed in the form of an excess of extreme ranks. Performance was better in emotionally close sender/receiver pairs and in opposite-gender pairs. When percipients experienced the session in a more “altered” way in terms of lowered bodily awareness and loss of body boundaries, performance was better.

**Keywords:** Parapsychology; Extrasensory perception (ESP); Assessment tools; Ganzfeld studies

**Indexed papers:** N/A



**2004/05 Projects**

- Project:** 2004-01
- Title:** Mystical experience, thin boundaries, and transhumanation as predictors of psychokinetic performance with a Random Number Generator
- Duration:** 2006/02 – 2006/10
- Researcher(s):** Dr. Michael Thalbourne
- Institution:** Anomalistic Psychology Research Unit, University of Adelaide (Australia)
- Results:** A questionnaire survey was administered to 92 participants, containing, in order, the Boundary Questionnaire, the Rasch Mystical Experience Scale, and the Transhumanation Scale, which were incidentally found to correlate together positively and significantly. A subgroup of these participants ( $N = 71$ ) also underwent an experiment in exosomatic psychopraxia (a.k.a. psi) carried out using a random number generator (RNG). The RNG was so set up that there were 100 binary trials in each run, and 50 runs per session, of which just one was given, yielding a psychopractic measure called “scoresum”. Scoresum did not correlate significantly with transhumanation or its four subscales (mystical experience [6 items], paranormal experience, World of Spirit, or Kundalini), mystical experience [19 items], thin boundaries, age, sex, a pro attitude scale, perceived complexity, or perceived difficulty. A composite personality measure was formed: participants in group 1 ( $N = 20$ ) were high in transhumanation, reported mystical experience and had “thin” boundaries; participants in Group 3 ( $N = 20$ ) were low in transhumanation, reported little mystical experience and had “thick” boundaries; Group 2 ( $N = 31$ ) consisted of all those participants with mixed scores and who thus did not fall into either of the above two groups. Parapsychological results were suggestively rather than definitely significant, in regard to the differences between scoresum for Groups 1 and 3, and various position effects. In contrast, with regard to purely psychological analyses, there was a large number of significant and meaningful results.

Keywords: Parapsychology; Psychopraxia; Spiritualism; Spiritual traditions/experiences; Personality factors

Indexed papers: Jahn, R. G., Dunne, B. J., Acunzo, D. J., & Hoeger, E. S. (2007). Response of an REG-Driven robot to operator intention. *Journal of Scientific Exploration*, 21(1), 27-46.

**Project: 2004-02**

Title: Event related brain dynamics: An independent component analysis of prospective control in adults and infants

Duration: 2005/02 – 2007/07

Researcher(s): Prof. Ruud van der Weel, Prof. Audrey van der Meer, Prof. Ann-Mari Brubakk, Prof. Peter Svensson, Prof. Dawn Behne, Prof. David Lee, Prof. Marian Jongmans, Prof. Kerstin Rosander

Institution: Developmental Neuroscience Laboratory, Department of Psychology, Norwegian University of Science and Technology, Trondheim (Norway)

Results: N/A – Inconclusive Project

Keywords: Psychophysiology; Brain; Cognitive processes; Perception; Developmental psychology

Indexed papers: Van der Weel, F. R., & Van der Meer, A. L. (2009). Seeing it coming: infants' brain responses to looming danger. *Naturwissenschaften*, 96(12), 1385-1391. doi: 10.1007/s00114-009-0585-y

**Project: 2004-07**

Title: Prestimulus response in the sympathetic/parasympathetic nervous system

Duration: 2005/01 – 2008/04

Researcher(s): Dr. Edwin May

Institution: Laboratories for Fundamental Research, Palo Alto (USA)

## Results:

Thirty four participants took part in a formal study examining pre- and post-stimulus responses to acoustic stimuli consisting of 1-second of 95db of white noise with a random inter-stimulus interval of  $30 \pm 10$  s. The dependent variable was the difference between pulse-rate, which was measured by a standard 3-electrode ECG placement, prior to the choice of acoustic stimuli compared to prior to no-stimulus control. A Monte Carlo method was used to assess statistical relevance of the data. Two sets of data were collected to ascertain any Decision Augmentation Theory effects (i.e., experimenter psi): Condition A with 16 stimuli/participant and Condition B with 48 stimuli/participant. The best participant produced a pre-stimulus effect size of 1.02 ( $z = 2.05, p = 0.02$ ); however, the results across all 34 participants were disappointing. Combining the two conditions resulted in a total stimuli count of 518 contrasted with 512 silent controls. The effect sizes were 0.043 and 0.006 for Conditions A and B, respectively, which indicated there was no observed prestimulus pulse rate response to acoustic stimuli compared to controls. It is difficult to ascribe a meaning to a null result; however, we do consider a number of potential explanations.

- We did not screen participants for native ability in this particular setup, so it remains possible that we did not have psi talent in the participant pool.
- Contrary to expectations, heart rate may not be subject to prestimulus response effects.
- This particular study was plagued with difficulties from its inception. Some of these issues arose because we were not well trained in heart-rate measures and analyses. The result was that we had to restart the study learning as we went. This had two important side effects. The first is that it sharply reduced the available participant pool from which we could draw, and secondly and most importantly it had a demoralizing effect on the researchers.

This last point requires further discussion. It is a well-established effect that set and setting play an important role in experimental psychology and perhaps a determining role in parapsychological experiments. One of the strongest effects in the PSI literature is the so-called sheep/goat effect which may be a strong manifestation of this effect.

Because of the frustrating beginning to the study and because our team is strongly accustomed to obtaining positive results, we all became discouraged and less attentive to this study. Perhaps at a minimum this contributed to the null result or, at worst, maybe “caused” the null result.

Keywords: Parapsychology; Extrasensory perception (ESP); Presentiment

Indexed papers: May, E. C., Paulinyi, T., & Vassy, Z. (2005). Anomalous anticipatory skin conductance response to acoustic stimuli: experimental results and speculation about a mechanism. *Journal of Alternative and Complementary Medicine*, 11(4), 695-702. doi: 10.1089/acm.2005.11.695

**Project: 2004-09**

Title: Structural biology of human brain CNP, a protein essential for axonal survival

Duration: 2005/02 – 2007/04

Researcher(s): Dr. Andreas Hofmann

Institution: Institute of Cell & Molecular Biology, The University of Edinburgh, Scotland (UK)

Results: Our study was originally concerned with full-length brain Cyclic Nucleotide Phosphodiesterase (CNP), a member of the 2H phosphodiesterase family, which is found abundantly in the myelin of oligodendrocytes in the central nervous system, and has been shown to be of major importance for axonal survival. As such, CNP is believed to be implicated in diseases such as multiple sclerosis and schizophrenia. The three-dimensional structure of the full-length protein is anticipated to yield new insights into the molecular mechanisms of the protein. We have developed a protocol for expression and purification of the recombinant full-length protein, verified the integrity of the protein by mass spectrometry, and checked the fold and its stability by circular dichroism and fluorescence spectroscopy. Extensive crystallisation trials did not yield crystals suitable for X-ray diffraction so far. In selected trials, protein self-organisation was observed, probably indicating epitaxy-like formation of nanostructures on the glass plates.

Another family of brain proteins are the Visinin-like Proteins (VILIPs) that are neuronal calcium sensor proteins and an important factor for synaptic plasticity. They are involved in schizophrenia, neurodegenerative diseases such as Alzheimer's and other disorders.

To obtain further insights into the molecular level mechanisms of VILIPs, homology models were generated and modelling techniques were used to elucidate the binding mechanisms of these proteins to specific membrane components (PIPs). We have developed the first three-dimensional model of VILIP: PIP complexes, and propose a mechanism whereby recognition of specific PIP derivatives contributes to the targeting of VILIPs to subcellular locations.

Keywords: Psychophysiology; Brain; Assessment tools

Indexed papers: Wang, C. K., Simon, A., Jessen, C. M., Oliveira, C. L., Mack, L., Braunewell, K.-H., ... Hofmann, A. (2011). Divalent cations and redox conditions regulate the molecular structure and function of Visinin-like Protein 1. *PLoS ONE*, 6(11), e26793. doi: 10.1371/journal.pone.0026793

**Project:** 2004-14

Title: Detection and utilization of consciousness-related information fields stimulated in coherent group environments (FieldREG)

Duration: 2005/01 – 2006/02

Researcher(s): Prof. Robert G. Jahn, Dr. Brenda J. Dunne, Dr. York H. Dobyns

Institution: Princeton Engineering Anomalies Research (PEAR), New Jersey (USA)

Results: This BIAL-sponsored project has allowed us to extend our ongoing FieldREG research program to include: development of an elaborate database management system capable of extracting many psychological and physical correlates of the anomalous effects appearing in such FieldREG experiments; formulation of theoretical hypotheses regarding the source of the effects and the conditions favoring their appearance and enhancement;

design and implementation of a new generation of FieldREG equipment and software; acquisition of fresh experimental data to confirm and refine the theoretical models; investigation of possible pragmatic applications of the FieldREG effects in a variety of beneficial contexts.

Details of the experimental and analytical methods and the pertinent theoretical models are presented in our Interim and Final Reports, and in a number of archival articles listed below, all of which are downloadable from our website <[www.princeton.edu/~pear/](http://www.princeton.edu/~pear/)>. The results of this project confirm that FieldREG responses, when produced in environments fostering relatively intense or profound subjective resonance among the participants, can show large deviations from chance expectations. Venues that appear to be particularly conducive include intimate gatherings, group rituals, ceremonies at sacred sites, musical and theatrical performances, and other charismatic events. Applications in certain aspects of allopathic and alternative medical diagnoses and treatment also display correlations with patient conditions and responses. In contrast, data generated in more mundane contexts, such as academic conferences or business meetings, show significantly less deviation from chance than expected theoretically or displayed in equipment calibrations. Thus, the FieldREG strategy holds high promise for further understanding of consciousness-related information fields and their beneficial utilization in a broad range of human endeavors. Further extension of this work is planned

Keywords: Parapsychology; Assessment tools; Psychokinesis (PK); Field consciousness

Indexed papers: Jahn, R. G., & Dunne, B. J. (2007). The PEAR proposition [Reprint]. *Explore: The Journal of Science and Healing*, 3(3), 205-226. doi: 10.1016/j.explore.2007.03.005

Dunne, B. J., & Jahn, R. G. (2005). Consciousness, information, and living systems. *Cellular and Molecular Biology*, 51(7), 703-714. doi: 10.1170/t679

Jahn, R. G., & Dunne, B. J. (2005). The PEAR proposition. *Journal of Scientific Exploration*, 19(2), 195-245.

- Project:** 2004-15
- Title:** Pain control from the brain - Gene therapy in the treatment of chronic pain
- Duration:** 2005/01 – 2009/01
- Researcher(s):** Prof. Deolinda Lima, Prof. Isaura Ferreira Tavares, Dr. Marta Pinto, Dr. Isabel Martins
- Institution:** Instituto de Histologia e Embriologia, Faculdade de Medicina da Universidade do Porto (Portugal)
- Results:** The activity of the brain in pain modulation during chronic pain is changed. In general, the net balance of descending modulation during chronic pain consists on a decrease of descending inhibitory actions and an increase of facilitatory effects. Synchronous changes in neuronal responses at the spinal cord and pain control centres in the brain were detected. Variations in the expression of neurotransmitters and receptors in pain control centres of the brain may account for the effects of chronic pain. To target pain control centres of the brain, we elected a gene therapy approach based on the sustained and directed effects of the technique. The overexpression of pre-proenkephalin using a replication-defective vector derived from Herpes Simplex type 1 (HSV-1) in a pain control area of the brain (the caudal ventrolateral medulla), decreased behavioural responses in an inflammatory pain model, the formalin test, and inhibited nociceptive responses of spinal neurons. A reversal of behavioural pain responses was also induced in a traumatic neuropathic pain model using a HSV-1 vector in which a tissue-specific promoter (tyrosine hydroxylase; TH) controlled the expression of the TH transgene inserted in an antisense sequence. Using this vector, the decrease in the release of noradrenaline in a pain facilitatory centre (the dorsal reticular nucleus) induced long-lasting antinociceptive effects, detected during 22 days. Gene therapy may be considered an excellent molecular tool to understand the effects of chronic pain installation in pain control circuits of the brain. Furthermore, based on detailed morphofunctional knowledge of pain control centres of the brain and by electing the vector type, determining the better promoter and the suitable transgene for the construct, the effects of chronic pain may be corrected using gene therapy approaches.

Keywords: Psychophysiology; Pain

Indexed papers: Martins, I., Pinto, M., Wilson, S. P., Lima, D., & Tavares, I. (2008). Dynamic of migration of HSV-1 from a medullary pronociceptive centre: antinociception by overexpression of the preproenkephalin transgene. *European Journal of Neuroscience*, 28(10), 2075-2083. doi: 10.1111/j.1460-9568.2008.06492.x

Pinto, M., Castro, A. R., Tushdy, F., Wilson, S. P., Lima, D., & Tavares, I. (2008). Opioids modulate pain facilitation from the dorsal reticular nucleus. *Molecular and Cellular Neurosciences*, 39(4), 508-518. doi: 10.1016/j.mcn.2008.07.008

Pinto, M., Sousa, M., Lima, D., & Tavares, I. (2008). Participation of  $\mu$ -opioid, GABAB, and NK1 receptors of major pain control medullary areas in pathways targeting the rat spinal cord: Implications for descending modulation of nociceptive transmission. *Journal of Comparative Neurology*, 510(2), 175-187. doi: 10.1002/cne.21793

**Project: 2004-16**

Title: Perceptual memory in the human visual system

Duration: 2006/02 – 2010/04

Researcher(s): Doutora Patrícia Margarida Piedade Figueiredo, Dr. Mafalda Cavalheiro Gomes Moreira Mendes, Dr. Maria Fátima Loureiro da Silva, Dr. João Abel Loureiro Marques Xavier, Dr. Carlos Gomes

Institution: Instituto Biofísico para a Investigação em Luz e Imagem (IBILI), Coimbra (Portugal)

Results: In this Project, we have investigated memory mechanisms in the human visual system, by employing a combination of psychophysics and functional magnetic resonance imaging (fMRI) methodologies to identify the neural correlates of different types of learning processes. For this purpose, we implemented and optimized a number of fMRI visual mapping paradigms in order to identify the visual brain areas of interest.

We first observed the adaptive functional reorganization of visual memory in a population of temporal lobe epilepsy patients with right unilateral hippocampal sclerosis. We used fMRI to measure brain activity changes during the episodic encoding



of abstract line drawings and found that the patients engaged the left hippocampus more than controls and that the level of engagement was correlated with their memory recognition scores. These finds suggested functional reorganization of visual memory with an adaptive role, as a consequence of prolonged disease. We also found that familiar items activated visual cortical areas more than novel items, suggesting a reinstatement of visual information as a consequence of learning.

In a second study, we implemented a visual learning paradigm whereby subjects performed a face discrimination task on faces presented in multiple orientations, in order to investigate the hypothesis that the human visual system contains specialized processing mechanisms that are more engaged by upright faces than by inverted faces or non-face objects, as a result of extensive practice with upright faces. Our psychophysics experiments showed that participants gave more errors and were slower in their responses as faces were rotated away from 0°. In addition, performance was improved when participants underwent periods of training, both for trained and untrained orientations. Consistently with the expertise hypothesis, we also found a parametric modulation of fMRI activity in specialized visual brain areas, according to the quadratic behavioural effect of face orientation.

**Keywords:** Psychophysiology; Vision; Cognitive processes; Memory; Learning; Perception; Diseases/Injuries; Epilepsy; Functional magnetic resonance imaging (fMRI)

**Indexed papers:** Figueiredo, P., Santana, I., Teixeira, J., Cunha, C., Machado, E., Sales, F., ... Castelo-Branco, M. (2008). Adaptive visual memory reorganization in right medial temporal lobe epilepsy. *Epilepsia*, 49(8), 1395-1408. doi: 10.1111/j.1528-1167.2008.01629.x

**Project:** 2004-19  
**Title:** Parapsychological investigations: Reflections, adventures, and cautionary tales  
**Duration:** 2005/02 – 2006/03  
**Researcher(s):** Prof. Stephen E. Braude  
**Institution:** University of Maryland Baltimore County, Maryland (USA)

## Results:

The result of my research is a book whose principal theme is the appearance—and sometimes only the appearance—of psychic or paranormal events in everyday life. It's written both for academics and educated laypersons, and it describes some of my most memorable encounters with the ostensibly paranormal. I began serious philosophical study of the evidence in parapsychology thirty years ago, and since that time I've had many opportunities to investigate cases for myself. Most of those concerned alleged instances of spontaneous, large-scale psychokinesis (PK), and in the process I've gained insights into the investigative process as well as the phenomena themselves. My previous four books dealt either entirely or partially with theoretical issues relating to psychical research. Although this book also deals with some of those interesting issues, it's largely autobiographical, and it's presented in readable and relatively informal prose.

Five chapters discuss individual case investigations and the theoretical issues related to them. In Chapter 1, I present the case of the “gold leaf lady,” a Florida woman whose body would break out spontaneously and at close range in a golden foil that turned out to be brass. I describe the careful conditions under which that phenomenon has been observed, as well as a noted magician's inability to replicate it, and also a botched attempt by the TV show “Unsolved Mysteries” to study and document its occurrence. I also consider why the phenomenon took the peculiar form of brass leaf, and whether (if genuine) it should be regarded as a materialization or an apport (i.e., the paranormal movement of an object from one location to another).

Chapter 3 concerns my exasperating attempts in New York to study the alleged psychokinetic superstar, Joe Nuzum. I describe Nuzum's efforts to circumvent previously agreed-upon controls and how I apparently caught him cheating. I also describe how Nuzum was – sometimes innocently – aided in his evasions by his enthusiastic but uncritical supporters. To some extent this chapter is a cautionary tale. It indicates the sorts of things that can go wrong when a subject is given too much control of test conditions. It also details what at least appears to be both incompetence and treachery on the part of Nuzum's principal sponsor.

Chapter 4 is a kind of sequel to the Nuzum case. It's the story of a subject from California who seemed able in informal set-

tings to produce impressive observable psychokinetic effects. But when he was brought to New York for careful testing, his previously confident attitude was thoroughly undermined by his sponsor—the same person who had funded my experiments with Joe Nuzum, and who apparently wanted to retaliate against me for having claimed I caught Nuzum cheating. This, too, is a cautionary tale, concerning the psychological delicacy of even the most promising subjects, and the need for extreme care and sensitivity in dealing with them and in designing experimental protocols.

Chapter 5 describes a peculiar encounter I had with a policeman who believed he could transfer images from photographs onto other objects (including his own body), simply by placing the photos on those objects. Although nothing of the sort actually happened, the policeman, remarkably, continued to insist that the phenomenon was real and obvious. I consider this yet another cautionary tale; about how even presumably trained observers can be blinded by their own credulousness.

Chapter 6 concerns paranormal photography. It's a postscript to the famous case of Ted Serios, the subject of one of the most fascinating, and undoubtedly one of the strongest, investigations ever of observable PK. In the 1960s, Serios produced a variety of images and other effects on "instant" Polaroid film under well controlled conditions—for example, while separated at a considerable distance from the camera and while wearing clothes provided by the experimenters. Moreover, because Serios never handled the film and because the pictures developed immediately upon removal from the camera, the results couldn't be explained away as darkroom tricks. This chapter brings the case up to date and describes my own encounters with Serios, years after the major investigation of him had concluded.

To lend perspective to these case reports, in Chapter 2 I survey the dramatic and fascinating history of physical mediumship connected with the heyday of the Spiritualist movement (roughly, 1850-1930). The best cases from that era make it very clear why concerns about possible fraud are both legitimate but also sometimes overrated. Moreover, they supply a yardstick by which we can measure the significance of contemporary cases. I give special attention to the careers of D.D. Home and Eusapia Palladino, explaining why their best-documented phe-

nomena can't be dismissed as fraudulent and why effects of the magnitude found in these cases seem no longer to occur.

With Chapter 7, the book becomes somewhat more abstract, although the chapter begins with a personal matter. I start by describing one of my more curious apparent encounters with the paranormal—a very strange and seemingly meaningful coincidence. Inevitably, this raises a recurring hot topic originally introduced by Carl Jung—namely, synchronicity (acausal meaningful coincidence). However, because this concept is especially confused and widely abused, I take the opportunity to clarify it. And as a result, I theorize at somewhat greater length than in the previous chapters. In the process, I make several crucial and related points. Perhaps most important, I show that it's incorrect—in fact, incoherent—to claim (as many do) that synchronicity is a principle in nature that organizes events into meaningful clusters. Ultimately, I argue for a controversial—but I believe unavoidable—position: namely, that if genuinely nonrandom meaningful coincidences occur, this would be best explained in terms of a refined, extensive, and potentially very intimidating form of large-scale psychokinesis. In Chapter 8, I describe some of the intriguing activities of my wife Gina, an academic and clinical psychologist who also happens to be a virtuoso astrologer. Gina has successfully used her astrological skills to help several European and Asian professional soccer teams rise to the top of their respective leagues, and her startlingly detailed and accurate predictions were also highly valued within the Serbian mafia. This chapter presents some of the episodes from Gina's history and from our life together that have forced me—to my great discomfort—to confront my own prejudices against astrology. Finally, I bring this chapter and the book to a close with some speculations about the place of psychic abilities in the general scheme of things.

The various adventures recounted in this book are interesting in themselves, quite apart from their relevance to empirical and methodological issues in science generally and parapsychology in particular. Nevertheless, in their own distinctive ways all the reported cases are empirically significant. Some provide provocative evidence for the reality of psychokinesis; others document only human duplicity and delusion. Some offer object lessons about how not to investigate the paranormal. Some illustrate the fragility and context-sensitivity of the phenomena,

- as well as the need to probe beneath the psychological surface to understand their psychogenesis. Some show how evidence can be suppressed or compromised by the zealousness of both believers and non-believers. Moreover, the case of the gold leaf lady illustrates how the collection of evidence can be undermined by the interest and funding of the media.  
This book will be published in Fall 2007 by the University of Chicago Press, under the title *The Gold Leaf Lady and Other Parapsychological Investigations*.
- Keywords:** Parapsychology; Anomalous cognition/experiences; Spontaneous cases
- Indexed papers:** N/A
- Project:** **2004-21**
- Title:** Study of emotional perception and affective memory in a sample of normal subjects. Comparison with different clinical populations
- Duration:** 2005/05 – 2007/06
- Researcher(s):** Prof. Isabel Pavão Martins, Dr. Sílvia Fernandes, Prof. Alexandre Mendonça, Prof. Manuela Guerreiro
- Institution:** Laboratório de Estudos da Linguagem, Faculdade de Medicina de Lisboa (Portugal)
- Results:** Major outcomes from this study are:  
Healthy subjects ( $N = 131$ ) have enhanced memory for positive information compared to neutral and negative information both when analysed short and long term memory. This effect is independent of tested factors (age, education and gender). In what concerns emotion recognition, education positively influences the ability to recognize emotions, both by facial expressions and prosody. Contrarily, ageing negatively influences the recognition of emotional prosody.  
The analysis of the clinical populations with focal or diffuse deficits on the limbic system reveals that: after a unilateral Selective Amygdalo-Hipocampectomy for treatment of the epilepsy, patients ( $N = 35$ ) do not show impairment on emotional

processing. Subjects with Mild Cognitive Impairment ( $N = 38$ ) and Major Depression ( $N = 39$ ) significantly misunderstand neutral faces as sad, and are also impaired in the recognition of emotional prosody. Despite this impairment on emotion recognition both groups of patients have shown a pattern of emotional memory similar to healthy controls, which reveals dissociation between both processes.

These last results are being interpreted with the recently highlights of the overlap of dementia and depression.

**Keywords:** Psychophysiology; Emotion; Cognitive processes; Memory; Perception; Mental health; Neurodegenerative disorders; Diseases/Injuries

**Indexed papers:** N/A

**Project:** 2004-24

**Title:** A parapsychological investigation of the I Ching: The relationship between Psi, intuition, and time perception

**Duration:** 2005/04 – 2006/03

**Researcher(s):** Dr. Lance Storm

**Institution:** Anomalistic Psychology Research Unit, University of Adelaide (Australia)

**Results:** An anomalous effect may be involved in the Chinese system of divination, the I Ching. The I Ching user throws 3 coins, 6 times, to generate 1 of 64 possible 6-line symbols (hexagrams) and an associated reading. There is some indication that 1st-hexagram outcomes can be determined in advance of generating the hexagram (Thalbourne & Storm, in press). However, participants might not only target 1st-hexagrams (for a present-focused reading), but they may also target 2nd-hexagrams (for a future-focused reading—2nd-hexagrams are generated from the 1st-hexagram). It is theorised that hexagram targeting may accord with the participant's time perspective. A present time perspective (PTP) refers to immediate events; future time perspective (FTP) refers to what fate has in store. Since intuitive types are said to be future-oriented (i.e., typically looking

for the possibilities or future state of things), it is hypothesized that (i) FTP-types are more intuitive than PTPtypes. It is also hypothesised that (ii) hexagram hit-rates are above MCE, (iii) time perspective determines a participant's influence on hexagram outcomes (i.e., PTP types hit more often on 1st-hexagrams than FTP types who hit more often on 2nd-hexagrams), and (iv) intuition predicts hexagram outcomes. It was found that (i) FTP-types were not more intuitive than PTP-types; (ii) hit-rates were above chance on 2nd-hexagram hitting only, but not significantly; (iii) PTP-types did hit more often on 1st-hexagrams (25%) compared to FTP-types (22%), whereas FTP-types did hit more often on 2nd-hexagrams (36%) compared to PTP-types (31%)—but the differences were not significant; and (iv) there were no significant relationships between intuition and hexagram outcomes.

Keywords: Parapsychology; Extrasensory perception (ESP); Intuition

Indexed papers: Storm, L. (2006). A parapsychological investigation of the I Ching: The relationships between psi, intuition, and time perspective. *Journal of Parapsychology*, 70(1), 121-141.

**Project: 2004-28**

Title: Paranormal effects using sighted and vision-impaired participants in a quasi-ganzfeld task: A replication study

Duration: 2005/02 – 2005/08

Researcher(s): Dr. Lance Storm, Dr. Mikele Barrett-Woodbridge

Institution: Anomalous Psychology Research Unit, University of Adelaide (Australia)

Results: A replication study of an earlier study by Storm and Thalbourne (2001;  $N = 84$ ) was conducted to test the hypothesis that totally blind people compensate for their vision-impairment by developing superior psi ability compared to sighted people. Participants were required to describe a concealed line drawing, and then rank four pictures (1 target plus 3 decoys) from 'most likely' (rank #1) to be the target picture in the envelope to 'least likely' (rank #4). The concealed picture was

removed from its envelope and assigned its corresponding rank number. Previously, Storm and Thalbourne (2001) found an above-chance success-rate of 28% (where MCE = 25%) for the totally blind ( $n = 18$ ), which was superior (not significantly) to the hit-rate of 26% for the rest of the sample (i.e., sighted and partially blind participants combined;  $n = 66$ ). In the replication study ( $N = 76$ ), the same procedure was followed, but only totally blind and sighted participants were used. The totally blind group and the sighted group both scored at the same below-chance hit-rate of 21% ( $\pi = .45$ ,  $z = 0.51$ ,  $p = .365$ ). There was no evidence that psi compensates for blindness. When the dataset from the present study was combined with Storm and Thalbourne's (2001) dataset (total  $N = 160$ ), the sighted group scored significantly above chance on the sum-of-ranks measure ( $p = .040$ ). It was argued that if there is compensation for blindness, it might work in ways other than paranormal. It is also possible that blind people may prefer targets that are not of a visual nature.

Keywords: Parapsychology; Extrasensory perception (ESP); Clairvoyance; Diseases/Injuries; Blindness

Indexed papers: N/A

**Project: 2004-33**

Title: Dynamic brain patterns in neocortical areas during interpersonal transactions

Duration: 2005/01 – 2008/07

Researcher(s): Prof. Richard Wennberg, Prof. José Luis Perez Velazquez

Institution: Krembil Neuroscience Centre, Toronto Western Hospital and The Hospital for Sick Children, University of Toronto (Canada)

Results: Brain imaging performed during a variety of psychophysical experiments has demonstrated that specific neocortical areas change their activity when subjects are experiencing other subjects. Where in the brain self/other awareness is represented is an emerging area of investigation. We have addressed the



neuronal dynamics of interpersonal interactions using simple psychophysical paradigms while recording brain activity using magnetoencephalography (MEG). We build on current concepts of brain function and propose that the coordinated (synchronized) activity in distinct cortical areas will reveal brain regions involved in “self” versus “others” processing. In general, the analysis of synchronization of cortical regions derived from the MEG recordings revealed enhanced synchronization between the activity of the midline and the prefrontal cortex, and that the midline cortex synchronizes its activity with parietal areas as well. The pattern of synchronization was similar when study participants experienced noxious stimuli (a self-administered painful stimulus to the fingers of the right hand) as when they were watching films of other people or animals experiencing pain. However, these synchronization patterns differed from those obtained when the participants visualised photographs of faces, themselves included. We thus conclude that midline and prefrontal cortices are important in the processing of sensory painful stimulation, and in generating empathy towards others’ pain. We expect that these studies will serve as preliminary background to undertake the investigation of reflective self-awareness and its relation to interpersonal transactions.

**Keywords:** Psychophysiology; Brain; Pain; Emotion; Empathy; Electroencephalogram (EEG); Magnetoencephalogram (MEG)

**Indexed papers:** Garcia Dominguez, L., Wennberg, R., Perez Velazquez, J. L., & Guevara Erra, R. (2007). Enhanced measured synchronization of unsynchronized sources: inspecting the physiological significance of synchronization analysis of whole brain electrophysiological recordings. *International Journal of Physical Sciences*, 2(11), 305-317.  
 Perez Velazquez, J. L., Garcia Dominguez, L., & Guevara Erra, R. (2007). Fluctuations in neuronal synchronization in brain activity correlate with the subjective experience of visual recognition. *Journal of Biological Physics*, 33(1), 49-59. doi: 10.1007/s10867-007-9041-4

**Project:** 2004-34  
**Title:** fMRI and photo emission study of presentiment: The role of “coherence” in retrocausal processes

Duration: 2005/05 – 2007/11  
Researcher(s): Prof. Dick Bierman, Dr. Eduard van Wijk  
Institution: Parapsychologist Institute, Utrecht (The Netherlands)

Results: Eight experienced meditators were trained to meditate in the hostile environment of brain scanner. There they were presented with, in total, 64 random neutral, erotic and violent visual stimuli during meditation in the scanner. In a separate session they were presented similar stimuli during the resting state. The resting state measurements were also compared to data obtained from 8 control subjects.

Substantial effects of meditation on brain processing of different emotional visual stimuli were found in several brain regions. The relatively largest direct effects of meditation concerned Brodmann areas 18 and 19 in the Lingual Gyrus. Long term effects of meditation, inferred from the contrast between meditators in rest with control subjects in rest, were only found in brain regions that have been shown to be involved in attention.

For the evaluation of the hypothesis concerning presentiment we focused on the analysis of the anticipatory brain signals preceding neutral and emotional visual stimuli in the 36 regions of interest. In previous work with unselected subjects it was found that these anticipatory signals are dependent on the type of the future stimulus, in spite of the fact that at the time the signals are recorded the future stimulus is completely unknown and will be selected randomly.

Experienced meditators showed stronger presentiment especially when they were meditating. The effect of meditation was quite clearly that the ‘retrocausal’ effect of violent stimuli was reduced resulting in a relative larger contribution of erotic presentiment.

Keywords: Parapsychology and Psychophysiology; Altered states of consciousness; Meditation; Extrasensory perception (ESP); Presentiment; Emotion; Brain; Functional magnetic resonance imaging (fMRI)

Indexed papers: Bierman, D. J. (2011). Anomalous switching of the bi-stable percept of a necker cube: A preliminary study. *Journal of Scientific Exploration*, 25(3), 771–783.

<b>Project:</b>	<b>2004-35</b>
Title:	Pronouns and degeneration: Differences in processes and brain locations involved in pronoun interpretation in prodromal Alzheimer's disease and in healthy ageing
Duration:	2005/10 – 2010/09
Researcher(s):	Prof. José Augusto da Veiga Pinto de Gouveia, Prof. António Manuel Horta Branco, Dr. Horácio António de Jesus Firmino, Dr. José Augusto Simões Gonçalves Leitão, Prof. Maria Isabel Ferraz Festas
Institution:	Núcleo de Estudos e Intervenção Cognitivo-Comportamental, Coimbra (Portugal)
Results:	We used event related potentials (ERPs) and sLORETA to determine how the management of processing cost in pronoun interpretation is affected by age (young vs. elderly) and by the presence of a cue for pragmatic inferencing. The syntactic relation between an explicit pronoun and its antecedent was manipulated, yielding two types of sentences (Type 1: syntactic (cheap) or discourse (costly) processing routes available; violation of a conversational convention vs. Type 2: exclusive availability of the discourse route; conformity to conversational conventions). For the young adults a Late Positivity and selective activation of right BA9 and BA31 emerged in type 1 sentences, indexing the effort required to compute the pragmatic inference cued by the violation of a conversational convention (use of an explicit pronoun in type 1 sentences, where a null/silent would be more likely). This effect is absent in older participants, suggesting that, in their case, the processor fails to initially capture the oddity of the explicit pronoun, which is therefore conveniently processed at the cheaper syntactic level, but rendering the identity of its original form unavailable for later pragmatic inferential processing. Thus, older participants, unlike the young, recruit different processing routes for each sentence type, as demonstrated by an N400 and selective activation of right BA18 for type 2 sentences, in which only the discourse route is available. This N400 is absent in younger participants, since the clash between the expected null pronoun and the explicit one occurring in type 1 sentences leads the processor to shift resolution to the discourse level, where the unexpected form will remain accessible to the pragmatic module.

**Keywords:** Psychophysiology; Developmental psychology; Cognitive processes; Language; Neurodegenerative disorders; Alzheimer's disease; Mild cognitive impairment (MCI); Brain

**Indexed papers:** Leitão, J., Branco, A., Piñango, M., & Pires, L. (2009). Pronoun resolution to commanders and to recessors: A view from event-related brain potentials. In S. L. Devi, A. Branco, & R. Mitkov (Eds.), *Anaphora processing and applications* (Vol. 5847, pp. 107-120). Berlin: Springer-Verlag. doi: 10.1007/978-3-642-04975-0\_9

**Project: 2004-36**

**Title:** Identifying the determinants of stress and stress-related illness in newly qualified doctors

**Duration:** 2005/02 – 2007/11

**Researcher(s):** Prof. Stafford L. Lightman, Dr. Mark Wetherell, Dr. Anna Crown, Dr. Kav Vedhara

**Institution:** Henry Wellcome Laboratories for Integrative Neuroscience & Endocrinology, Bristol (UK)

**Results:** Due to the high levels of financial and personal burden of occupational stress this study aimed to examine mood, diurnal cortisol and stress reactivity among pre-registration doctors (PRHO) on 2 occasions: one capturing high stress (due to high novelty and low control) and one low stress (due to low novelty and high control). This equated to the beginning and end of a clinical rotation. 36 PRHO were recruited (Males = 15, mean age 25 years). Measures of mood alongside diurnal cortisol and stress reactivity (using the CO<sub>2</sub> test) were assessed at the beginning and end of a rotation.

It was found that self-reported mood remained stable across the 2 assessments as did the stress reactivity. However, significant differences were found for diurnal cortisol, with higher levels on waking at the end of a rotation but a greater rise in cortisol in the half hour after waking at the beginning of a rotation.

These results show evidence of a significant alteration of diurnal function of the HPA in response to occupational demands.

Keywords: Psychophysiology; Psychoneuroimmunology; Endocrinology; Stress and health; Occupational stress

Indexed papers: N/A

**Project:** 2004-37

Title: The effect of conscious states of neural activity

Duration: 2005/02 – 2007/07

Researcher(s): Prof. Shimon Ullman, Prof. Elisha Moses, Eng. Shimshon Jacobi

Institution: The Weizmann Institute of Science, Rehovot (Israel)

Results: The research project searched for empirical evidence related to the interactions of conscious perception and neural activity. The study developed and used two experimental approaches. The first was based on the use of a patterned neuronal culture, and the second on an EEG measured during a two-person interaction in a computer game. In both approaches the experiment tested the possible effect of conscious state of the person playing the computer game on the level of neuronal activity. The experiments were designed such that an effect of this type would be detected by a difference in the measured neural activity during game playing time compared with a reference pause period.

In the neuronal culture setup, the number of experiments was limited by the number of neurally responsive cultures. In one culture, activity during game periods was significantly higher than during reference period. In a second active culture, the activity was lower during game playing compared to the reference period, but the difference was relatively small. In the EEG setup, considerable efforts were devoted to the development of a stable measurement protocol and algorithms to automatically select the most appropriate electrode signals. The results of the two-person setup have not shown so far conclusive consciousness effects, but the amount of data collected so far is too limited to draw final conclusions. It will be possible to use the approach we developed to efficiently collect additional data and

analyze the problem in greater detail. The results also show that the application of learning algorithms to automatically identify and use the most appropriate signals will be highly beneficial in future studies.

Keywords: Psychophysiology; Brain; Cognitive processes; Consciousness; Assessment tools; Electroencephalogram (EEG)

Indexed papers: N/A

**Project: 2004-42**

Title: Exploring psychomanteum as a psi-conductive state of consciousness (Phase 2): Adding new perceptual, personality, abnormal thinking, and phenomenological variables of anomalous cognition using two favourable conditions: (1) visual/musical targets and (2) psychomanteum/non-psychomanteum sessions

Duration: 2005/03 – 2007/01

Researcher(s): Dr. Alejandro Enrique Parra, Dr. Jorge Fernando Villanueva

Institution: Instituto de Psicología Paranormal, Buenos Aires (Argentina)

Results: Although the psychomanteum technique was designed to facilitate reunion experiences with deceased individuals, is not normally employed to seek ESP information. The aim of this research project was to explore whether the psychomanteum technique encourages a psi-conductive state of consciousness, which would result in scoring that is significantly above MCE. One hundred and thirty participants (92 females and 38 males; Mean age = 47.44) were recruited by announcements in newspapers and our web site. Seventy eight percent claimed to have had a variety of ESP experiences. A number of variables, such as vividness of imagery and hallucinatory experience, were examined. Two conditions, psychomanteum and non-psychomanteum condition, were compared. A CD-pool containing 200 high-quality color pictures, such as animals, icons, foods, people, landscapes, religion, scenic pictures, structures, and humoristic cartoons, were designed using a RNG for randomization. Under psychomanteum condition, psi-hitting was

obtained (30.8% above MCE); however, under no-psychomanteum (“control”) condition, 29.2% was obtained (where 25% was expected). The results differ slightly from MCE in the psychomanteum condition ( $p = .02$ , one-tailed) in comparison with no-psychomanteum condition, but no significant differences were found. A number of positive correlations were also found, for instance, participants who attained higher scores on auditory and visual hallucinations tended to demonstrate psi-hitting.

**Keywords:** Parapsychology; Extrasensory perception (ESP); Telepathy; Altered states of consciousness; Hallucinations; Vivid imagery; Personality factors

**Indexed papers:** N/A

**Project:** 2004-47

**Title:** A combined psychophysiological and electrophysiological approach to investigate low-level visual perception in autism

**Duration:** 2005/06 – 2006/10

**Researcher(s):** Prof. Olivier Pascalis, Prof. Elizabeth Milne, Prof. David Buckley, Dr. Laurence Vigon

**Institution:** Department of Psychology, The University of Sheffield (UK)

**Results:** There are reports of atypical visual perception in individuals with autistic spectrum disorders (ASD) meaning that they perceive the world differently to typical observers. It remains unclear whether atypical perception reflects abnormality in the visual system, i.e. bottom-up processes, or in higher level cognition and information processing biases, i.e. top-down processes. The aim of this study was to investigate basic visual perception in participants with autistic spectrum disorder by measuring the visual evoked potentials elicited by simple visual stimuli in 20 children /adolescents with autistic spectrum disorder and 20 typically developing controls. We predicted, based on existing literature that low frequencies will be specifically atypical in autism and that high spatial frequencies may be intact. The VEP elicited by Gabor patches

presented at different spatial frequencies was measured (0.5 – 8 cycles/°). We found significant differences in the VEP elicited in the two groups. Specifically, the latency to peak was faster in the children with ASD than in the controls, and the amplitude of the C1 component was reduced in the majority of children with ASD. These data provide evidence of abnormality at a very early stage of visual processing in ASD, possibly at the level of V1. The finding reported here reflects the fact that 61.2% of the participants with autism did not have a negative component in their waveforms. This lack of C1 in some participants does not appear to correlate with age, IQ, severity of symptoms (as measured by the ASQ & CARS) or behavioural performance. It is now crucial to determine if such impairment influences the development of social cognitive functions such as face processing.

**Keywords:** Psychophysiology; Vision; Childhood and adolescent disorders; Autism spectrum disorder (ASD); Cognitive processes; Perception; Electroencephalogram (EEG)

**Indexed papers:** Milne, E., Scope, A., Pascalis, O., Buckley, D., & Makeig, S. (2009). Independent component analysis reveals atypical EEG activity during visual perception in individuals with autism. *Biological Psychiatry*, 65(1), 22-30. doi: 10.1016/j.biopsych.2008.07.017  
Wallace, S., Coleman, M., Pascalis, O., & Bailey, A. (2006). A study of impaired judgement of eye gaze direction and related face processing deficits in autism and Asperger's syndrome. *Perception*, 35(12), 1651-1654. doi: 10.1068/p5442  
Milne, E., Swettenham, J., & Campbell, R. (2005). Motion perception and autistic spectrum disorder: A review. *Cahiers de Psychologie Cognitive / Current Psychology of Cognition*, 23(1-2), 3-33.

**Project:** 2004-52  
**Title:** Selecting a past to remember: psychophysiological studies of forgetting and remembering  
**Duration:** 2005/02 – 2006/04  
**Researcher(s):** Dr. Edward Wilding, Dr. Jane Herron, Dr. Kevin Allan  
**Institution:** Cardiff University, School of Psychology, Wales (UK)



**Results:** In a series of studies, we investigated boundary conditions for when memory retrieval can be restricted successfully to task-relevant information. We exploited the fact that scalp-recorded electrophysiological indices of episodic retrieval processes can act as indicators of the conditions under which remembering is controlled. Our work suggests that temporal information is one form of mnemonic information over which less control can be exerted than can be exerted over other forms – in particular, colour and task information. This finding is broadly consistent with the notion that an important determinant of the conditions under which some kinds of information can be retrieved at the expense of others is the similarity between the different kinds of information. This may seem trivial, but understanding what dimensions of ‘difference’ do and do not permit selective retrieval has important practical implications for how memories are encoded and thus what kind of information is or is not likely to be confused with other kinds. In this regard, we also investigated whether the emotional valence of stimuli influenced the extent to which control over memory retrieval could be exerted. The rationale for this approach was the possibility that emotionally significant events are ones over which control is somewhat more difficult (compared to ‘neutral’ events). The data we acquired did not, however, support this position: participants were equally able to exert control over recovery of information associated with neutral words as with words with negative associations. These findings thus provide little support for the view that emotional valence is an important determinant of when remembering can and cannot be restricted to task-relevant information, although it remains a possibility that the stimulus sets we used did not separate words with neutral and negative valence scores to a sufficient degree for indices of differential retrieval processing to be evident in the electrophysiological record.

**Keywords:** Psychophysiology; Cognitive processes; Memory; Emotion

**Indexed papers:** Bridson, N. C., Fraser, C. S., Herron, J., & Wilding, E. (2006). Electrophysiological correlates of familiarity in recognition memory and exclusion tasks. *Brain Research*, 1114(1), 149-160. doi: 10.1016/j.brainres.2006.07.095

- Project:** 2004-55
- Title:** Describing the contents of consciousness - A study of the production of reports of mental imagery using parapsychological data
- Duration:** 2006/10 – 2009/02
- Researcher(s):** Dr. Robin Wooffitt
- Institution:** Department of Sociology, University of York (UK)
- Results:**
- Objectives:**  
A key objective of this project was to examine how people use communicative resources and linguistic tools to verbalise reflections on their own experience of consciousness. It is anticipated that the results of the project would be of benefit to parapsychologists interested in the ways in which mentations may reveal the working of anomalous communicative processes in ordinary consciousness.
- Methods:**  
Data consisted of audio recordings of the mentation stage of ganzfeld ESP experiments conducted at the Koestler Parapsychology Unit at the University of Edinburgh during the 1990s. These recordings were transcribed according to the conventions of conversation analysis.  
Data were analysed using conversation analysis. This is a qualitative method for the examination of the structural, interpersonal and normative properties of naturally occurring verbal interaction. It has previously been used in study of experimenter-subject interaction in ganzfeld experiments, in studies of reports of spontaneous psi related experiences, and in studies of the language of psychic practitioners.
- Results:**  
The empirical analysis has discovered various communicative practices by which participants in ganzfeld experiment produce mentation reports. Analysis focused on:  
The institutional character of the discourse of mentation reports (how descriptions of inner experience are designed to address the institutional, experimental and laboratory context in which the report is produced); The management of rights and responsibilities (how subjects display their tacit understanding of the normative obligations and expectations that underpin

participation in laboratory procedures).

The playfulness of mentation discourse (how subjects used poetic discourse in the mentations, and how these poetical features impinged on the content of the report).

Conclusions:

In various publications, we have argued that, in the use of introspective data, it may be necessary for parapsychologists and consciousness researchers to try to take account of the social and interpersonal properties of discourse and communication. This is because what is taken to be the content of a report may be inextricably tied to the discourse practices through which it is made available to the researcher.

**Keywords:** Parapsychology; Extrasensory perception (ESP); Consciousness; Ganzfeld studies

**Indexed papers:** Wooffitt, R., & Holt, N. (2011). Introspective discourse and the poetics of subjective experience. *Research on Language and Social Interaction*, 44(2), 135-156. doi: 10.1080/08351813.2011.567097

Wooffitt, R., & Holt, N. (2010). Silence and its organisation in the pragmatics of introspection. *Discourse Studies*, 12(3), 379-406. doi: 10.1177/1461445609358520

Wooffitt, R., Holt, N., & Allistone, S. (2010). Introspection as institutional practice: Reflections on the attempt to capture conscious experience in a parapsychology experiment. *Qualitative Research in Psychology*, 7(1), 5-20.

**Project:** 2004-57

**Title:** Imagery and emotion production during hypnosis: an electrophysiological approach

**Duration:** 2005/04 – 2007/05

**Researcher(s):** Prof. Zvonikov Vyacheslav Michailovich, Prof. Stroganova Tatiana Alexandrovna, Dr. Tsetlin Marina Mihailovna, Dr. Anna Kirenskaya, Dr. Vladimir Y. Novototsky-Vlasov, Ms. Anastasia V. Marushkina

**Institution:** Psychological Institute, Russian Academy of Education, Moscow (Russia)

**Results:** Thirteen high hypnotizable subjects participated in live hypnotic induction that included deep hypnotic relaxation, recollection of emotionally neutral, positive (P) and negative (N) past events. Eyes-closed waking state was considered as a baseline condition. Traditional spectral analysis of EEG (19 sites) was applied. Heart rate and skin conduction changes under hypnosis paralleled the anticipated increase of arousal level from relaxation to inner imagery and further to P and N emotion recollection, thus verifying the emotional experience. The observed decrease of ongoing EEG oscillations and coherence within all frequency bands under hypnosis session may reflect the specificity of hypnotic state as an altered state of consciousness. Mental imagery led to pronounced blockage of alpha oscillations over the posterior scalp area. The generalized increase of EEG spectral power (SP) was observed during emotional conditions. Delta and theta SP increase was more pronounced during N emotions, whereas alpha SP increase – during P emotions. Beta2 and gamma1 SP was higher at medial and right frontal, central and parietal sites during P emotions as compared to negative ones. Emotion-related patterns of coherence (COH) changes were frequency as well as hemispheric-specific depending on emotional valence. P emotions elicited more pronounced right-hemispheric COH increase within gamma bands. N emotions led to greater increase of left-hemispheric COH within theta, alpha3, and beta1 bands. EEG changes in waking control session had the same direction but were less pronounced than in hypnosis. The obtained results corroborate and extend the existing findings of the role of EEG rhythms in hypnotic state and emotion production.

**Keywords:** Psychophysiology; Brain; Emotion; Altered states of consciousness; Hypnosis; Electroencephalogram (EEG)

**Indexed papers:** Kirenskaya, A., Novototsky-Vlasov, V. Y., Chistyakov, A. N., & Zvonikov, V. M. (2011). The relationship between hypnotizability, internal imagery and efficiency of neurolinguistic programming. *International Journal of Clinical and Experimental Hypnosis*, 59(2), 225-241. doi: 10.1080/00207144.2011.546223

Kirenskaya, A., Novototsky-Vlasov, V. Y., & Zvonikov, V. M. (2011). Waking EEG spectral power and coherence differences between high and low hypnotizable subjects. *International Journal of Clinical and Experimental Hypnosis*, 59(4), 441-453. doi: 10.1080/00207144.2011.594744

- Project:** **2004-58**
- Title:** Comparative study of brain processes related to microgravity-induced and clinical oculomotor disturbances in subjects with the right and left eye dominance
- Duration:** 2005/04 – 2007/04
- Researcher(s):** Prof. Inessa B. Kozlovskaya, Ms. Elena S. Tomilovskaya, Dr. Anna Kirenskaya, Dr. Vladimir Y. Novototsky-Vlasov, Dr. Vadim V. Myamlin, Ms. Nelly R. Gallyamova
- Institution:** Institute of Biomedical Problems, Russian Academy of Sciences, Moscow (Russia)
- Results:** Data of 41 healthy subjects, 14 volunteers, exposed to dry immersion (DI) and 19 schizophrenic patients were analyzed. Healthy subjects were right-handed males with right (RE) and left (LE) eye dominance, and patients had RE dominance. 2 modifications of antisaccadic task were used. In A1 task fixation period was 800-1000 ms, and in A2 task – 1200-1400 ms. EEG was recorded from 19 sites. Mean amplitude of slow cortical negative potentials (SN) time-locked to peripheral cue onset was evaluated. The saccade characteristics did not depend on task and experimental conditions in healthy RE subjects. In LE subjects percent of errors was lower in A2 task than in A1 one, and increase of errors and saccade latencies was revealed after exposure to DI. Patients performed A2 task better than A1 one, but they exhibited delays in performance of correct saccades and larger number of errors in both tasks compared to healthy subjects. RE subjects demonstrated high level of frontal activation before antisaccades in both tasks. Reduced SN amplitude in frontal region was revealed in LE subjects. The most pronounced decline of SN amplitude in frontal regions was found in patients. Predominant left hemisphere activation was observed during the last 200 ms before peripheral cue in all groups. Changes in cortical activity after DI were similar in RE and LE groups: SN amplitude decreased, and foci of negativity shifted to the right hemisphere. Thus, obtained results (1) support the neurodevelopmental model of cerebral lateralization, (2) demonstrate the independence of basic hemisphere specialization from eyedness, (3) corroborate the important role of frontal disorders in genesis of schizophrenia.

**Keywords:** Psychophysiology; Brain; Vision; Mental health; Psychotic disorders

**Indexed papers:** Kirenskaya, A., Myamlin, V., Novototsky-Vlasov, V. Y., Pletnikov, M., & Kozlovskaya, I. (2011). The contingent negative variation laterality and dynamics in antisaccade task in normal and unmedicated schizophrenic subjects. *Spanish Journal of Psychology*, *14*(2), 869-83. doi: 10.5209/rev\_SJOP.2011.v14.n2.34

Kirenskaya, A., Tomilovskaya, E., Novototsky-Vlasov, V. Y., & Kozlovskaya, I. (2006). The effects of simulated microgravity on characteristics of slow presaccadic potentials. *Human Physiology*, *32*(2), 131-139. doi: 10.1134/S0362119706020022

Kirenskaya, A., Tomilovskaya, E., Novototsky-Vlasov, V. Y., & Kozlovskaya, I. (2006). The effects of simulated microgravity on characteristics of slow presaccadic potentials. *Fiziologiya cheloveka*, *32*(2), 10-19.

**Project: 2004-61**

**Title:** A neuropsychological examination of specific and global frontal lobe functions in siblings with and without eating disorders

**Duration:** 2005/08 – 2006/11

**Researcher(s):** Dr. Ulrike Schmidt, Dr. Kate Tchanturia, Dr. Pei-Chi (Thomas) Liao

**Institution:** Institute of Psychiatry, King's College London (UK)

**Results:** A total of 225 participants were recruited into this project. Women with current AN demonstrated poor decision making on the IGT compared to both healthy controls and recovered AN participants ( $p = 0.05$ ). AN patients, but not those who were recovered from AN, showed a significantly diminished Anticipatory Skin Conductance Response (ASCR) before making high-risk choices in comparison with female controls ( $p = 0.01$ ). BN patients did not show any significant differences in IGT performance or skin conductance response compared to the other groups. In the whole group of participants, IGT performance was not correlated to current levels of depression ( $p = 0.6$ ) or anxiety ( $p = 0.7$ ). However, IGT performance showed significant moderate correlations with ASCR ( $p = 0.01$ ). Data analysis (e.g. males, BN, genotype and IGT performance)

and is still in progress and more articles are being planned or in preparation.

AN is relatively rare condition in men. We have collected data and planning to increase recruitment of the participants to increase the power of this study in progress.

**Keywords:** Psychophysiology; Mental health; Eating disorders; Cognitive processes; Decision-making; Executive functions

**Indexed papers:** Davies, H., Liao, P. -C., Campbell, I. C., & Tchanturia, K. (2009). Multidimensional self-reports as a measure of characteristics in people with eating disorders. *Eating and Weight Disorders*, *14*(2-3), e84-e91.

Davies, H., & Tchanturia, K. (2005). Cognitive remediation therapy as an intervention for acute anorexia nervosa: A case report. *European Eating Disorders Review*, *13*(5), 311-316. doi: 10.1002/erv.655

Southgate, L., Tchanturia, K., & Treasure, J. (2005). Building a model of the aetiology of eating disorders by translating experimental neuroscience into clinical practice. *Journal of Mental Health*, *14*(6), 553-566. doi: 10.1080/09638230500347541

**Project:** **2004-62**

**Title:** Developing a “Recipe” for success in ESP experimental research (Phase II): Testing and improving a protocol

**Duration:** 2005/01 – 2007/06

**Researcher(s):** Dr. José M. Pérez Navarro

**Institution:** Department of Psychology and Counselling, University of Greenwich, London (UK)

**Results:** This project was aimed at testing and improving an experimental protocol for successful ESP research derived from a previous phase of research (Perez-Navarro, 2003).

One first study ( $N = 60$ ) was conducted to explore a set of participants’ traits, state, and environmental factors as predictors of the study success. Five variables showed significant associations with the participants’ ESP scores at an  $\alpha = .01$ . These were: sensory adaptation, concern on the external environment, absorption, and task disorientation during the Ganzfeld

stimulation as well as pre-session energetic arousal. A stepwise forward logistic regression analysis, performed on the predictors with p-values of .05 or less, showed a 3 variable solution. Thus, the probability of obtaining a hit in a given experiment was accounted by pre-session energetic arousal, concern about the external environment, and task disorientation during the Ganzfeld stimulation.

On the basis of the most successful predictors in this study a second experiment was designed and conducted. This second study ( $N = 90$ ) showed a significant hit rate of 33% ( $z = 1.86$ ,  $p = 0.03$ , one tail). Only four of the predictors tested replicated both significance and direction from the previous study. These were neuroticism, sensory adaptation, absorption, and task disorientation during the Ganzfeld stimulation. Three further variables (practice of mental disciplines, pre-session arousal, and arousal during the Ganzfeld stimulation) replicated direction but did not reach statistical significance in this second series.

Post-hoc analysis in this second series proved that operating simultaneously on three domains (participant selection, pre and on-session state, and post-hoc indicators of the occurrence of psi), screening for participants and/or weighting sessions, on the basis of the successful predictors observed in the pilot series was an efficient strategy, increasing the rate of success in this second study from 33% to 43.2%.

**Keywords:** Parapsychology; Extrasensory perception (ESP); Telepathy; Assessment tools; Ganzfeld studies

**Indexed papers:** Perez Navarro, J. M., & Cox, K. (2012). Context-dependence, visibility, and prediction using state and trait individual differences as moderators of ESP in a Ganzfeld environment. *Europe's Journal of Psychology*, 8(4), 559–572. doi: 10.5964/ejop.v8i4.507

**Project:** 2004-63  
**Title:** Attentional modulation in neural responses to faces  
**Duration:** 2005/02 – 2009/07  
**Researcher(s):** Prof. Jaime Iglesias Dorado  
**Institution:** Universidad Autónoma de Madrid, Facultad de Psicología (Spain)



Results: N/A  
 Keywords: Psychophysiology; Cognitive processes; Attention; Perception; Emotion; Brain

Indexed papers: Olivares, E. I., & Iglesias, J. (2010). Brain potential correlates of the “internal features advantage” in face recognition. *Biological Psychology*, 83(2), 133-142. doi: 10.1016/j.biopsycho.2009.11.011  
 Saavedra, C., Iglesias, J., & Olivares, E. I. (2010). Event-related potentials elicited by the explicit and implicit processing of familiarity in faces. *Clinical EEG and Neuroscience*, 41(1), 24-31. doi: 10.1177/155005941004100107  
 Santos, I. M., Iglesias, J., Olivares, E. I., & Young, A. W. (2008). Differential effects of object-based attention on evoked potentials to fearful and disgusted faces. *Neuropsychologia*, 46(5), 1468-1479. doi: 10.1016/j.neuropsychologia.2007.12.024

**Project: 2004-64**

Title: Degree of meditation attainment and comparison of type of meditation in relation to awareness of precognition targets

Duration: 2005/01 – 2008/04

Researcher(s): Dr. Serena M. Roney-Dougal, Dr. Jerry Solfvin

Institution: Psi Research Centre, Glastonbury (UK)

Results: The oldest Tibetan psychic traditions are those of oracles and Mo divination, a term covering a range of divinatory practices. More recent beliefs include attainment of psychic abilities through meditation; and high lamas called tulkus who consciously choose reincarnation.

A re-analysis of ashram data found that, with participants who completed at least 3 sessions, the advanced practitioners scored significantly better than the other two groups ( $p = 0.05$  and  $p = 0.04$ ). Psi score was significantly correlated with yogic attainment (*Pearson*  $r = 0.57$ ,  $p < 0.05$ , 2-tail).

With Tibetan Buddhist meditators years of practice correlated significantly with psi ( $r = 0.52$ ,  $p < 0.05$ , 2-tail). This was due to the monk group: years of meditation,  $r = 0.75$ ,  $p < 0.01$ , 2-tail). This result was confounded by significant psi-missing ( $t = -2.09$ ,  $p < 0.05$ , 2-tail) from the tulkus. The 3 participants

who scored most strongly in the psi-missing direction all reported childhood memories of previous lives as monks in Tibet during the Chinese invasion, with the subsequent imprisonment and torture.

In the final study, the 2 most experienced meditators gave independently significant psi-hitting ( $t = 2.25$ ,  $p = 0.04$ , 2-tail). 4 of the 12 meditation variables were significantly correlated with the psi scores, and an additional 3 variables were marginally significant, all in the predicted direction. The strongest correlation with psi was visualisation meditation, ( $r = 0.734$ ,  $p < 0.01$ , 1-tail); followed by time spent in retreat, ( $r = 0.572$ ,  $p < 0.05$ ); practicing breath techniques ( $r = 0.569$ ,  $p < 0.05$ ); and yoga asanas ( $r = 0.559$ ,  $p < 0.05$ ).

This research suggests that psychic awareness begins to manifest more reliably with years of meditation practice.

**Keywords:** Parapsychology; Altered states of consciousness; Meditation; Extrasensory perception (ESP); Precognition

**Indexed papers:** Roney-Dougal, S. M., & Solfvin, J. (2011). Exploring the relationship between Tibetan meditation attainment and precognition. *Journal of Scientific Exploration*, 25(1), 29 - 46.

Roney-Dougal, S. M., Solfvin, J., & Fox, J. (2008). An exploration of degree of meditation attainment in relation to psychic awareness with Tibetan Buddhists. *Journal of Scientific Exploration*, 22(2), 161-178.

Roney-Dougal, S. M., & Solfvin, J. (2006). Yogic attainment in relation to awareness of precognitive targets. *Journal of Parapsychology*, 70(1), 91-120.

**Project:** **2004-65**  
**Title:** An investigation into the possibility of a stimulus-response causal relationship in the electronic voice phenomenon  
**Duration:** 2005/02 – 2007/03  
**Researcher(s):** Dr. Alexander MacRae, Prof. Charl Vorster  
**Institution:** Skylab, Portree, Scotland (UK)  
**Results:** This project involved carrying out a large number of experiments based on the “Electronic Voice Phenomenon”, (EVP). That the

phenomenon exists as a phenomenon has been proven through experiment and analysis by the author and others. What was being investigated here was the assertion made by some EVP experimenters that the responses recorded as EVP could come in the form of answers to questions raised by the experimenter. A series of 6 questions was devised and the same set of questions was used in each experiment. Each question was separated by a 30 second silent period, to provide a time “window” during which responses could be assessed.

The responses were isolated out so that each response had its own audio file. A batch of files covering a 4-week period would then be sent to an Adjudicator (Dr Charl Vorster, Professor of Clinical Psychology) who would assess each response to determine if it could be regarded as an answer to one of the 6 questions. The Adjudicator’s findings were final, but to provide an objective weighting-factor a group of listeners were asked to do the same thing as the adjudicator, independently of each other. Their results, summed and taken as a percentage, was used as the weighting factor.

The project did not “behave” as it should. Initially there was a high correlation between questions and answers but this gradually decreased to close to zero.

Examining this suggested that the responses come from or via the unconscious – that using this electro-dermal activity based EVP system we were “listening-in” on the unconscious.

The conclusions were that there can be a significant correlation between question and response recorded, but that repeated usage of the same questions diminished their stimulatory potential, and that eventually responses seem to stimulate other responses rather than for that to result from the simultaneous presence of “discharged” questions. The results are also presented mathematically as 3-D graphs.

Keywords: Parapsychology; Survival after bodily death; Electronic voice phenomenon (EVP)

Indexed papers: N/A

- Project:** 2004-66
- Title:** Extrasensory perception and implicit sequence learning in a computer guessing task
- Duration:** 2005/04 – 2006/10
- Researcher(s):** Prof. John Palmer, Prof. Peter Brugger, Dr. Enrique Wintsch
- Institution:** Neurology Clinic, University Hospital Zurich (Switzerland)
- Results:** Sixty-four participants (Ps) completed 4 runs guessing sequences of the digits 1 through 4. Immediate feedback of targets was given only in Run 4. Ps made each response orally and by simultaneously clicking a mouse. In the 1st 2 runs (81 trials each) targets reflected extreme repetition avoidance (RA) or counting (1,2,3,4,1,2 ...). Ps scored significantly (sig.) positively on RA sequences only, with the degree of RA correlating sig. negatively with correct guesses (hits) among believers in the paranormal. Run 3 (101 trials) included a test of May's decision augmentation theory (DAT). Targets were random except for trials following trials in which P clicked the mouse when an unknown computer address contained a "1" ( $P = .2$ ). On such trials the target was determined by P's response bias in Runs 1-2, such as to increase the chances of a hit. Believers clicked the mouse sig. more often than chance when the computer was in the 1-state and sig. more often than skeptics, supporting DAT. In Run 4 (101 trials) half the Ps received as targets, after Trial 10, their previous responses in the run (pro-bias condition). The other Ps received targets opposite their response biases from Runs 1-2 (counter-bias condition). Half of each group received the feedback subliminally. Implicit sequence learning occurred sig. across all cells, but only for skeptics. This result could have been mediated by a lack of temporal lobe signs, on a measure of which skeptics scored much lower than believers. Consistent with an "anomalous anticipation effect" demonstrated in previous research, Ps' response biases in Run 3 sig. predicted whether they would receive a pro- or counter-bias target sequence in Run 4, but only if Run 4 feedback was subliminal.
- Keywords:** Parapsychology; Extrasensory perception (ESP); Precognition; Paranormal belief; Cognitive processes; Learning

Indexed papers: Palmer, J. (2009). Decision augmentation in a computer guessing task. *Journal of Parapsychology*, 73(1), 119-135

**Project: 2004-68**

Title: The emotional Stroop effect: Cognitive, emotional, and physiological aspects

Duration: 2005/05 – 2007/07

Researcher(s): Dr. Isabelle Blanchette, Dr. Anne Richards

Institution: University of Manchester (UK), Birkbeck College, University of London (UK)

Results: We examined how interference by emotional stimuli on a cognitive task was related to a) explicit affective ratings, b) electromyographic recordings of facial expressions, and c) skin conductance measures of arousal. We used a method of evaluative conditioning where initially neutral stimuli were repeatedly paired with negative or neutral images to manipulate their emotional connotation. The conditioned stimuli were then used in an Emotional Stroop task where participants named the colour in which the stimuli were presented. Participants high in anxiety were generally slower at naming the colour of negatively-conditioned stimuli, suggesting that the emotional connotation of these words interfered with the primary cognitive task. In different experiment, we compared supraliminal and subliminal presentation of the stimuli. An important finding was that emotional connotation acquired subliminally produced Stroop interference if the stimuli were presented subliminally, but not supraliminally. However, physiological measures of emotional reactions were sensitive to affective connotation even when cognitive measures were not, especially in highly anxious participants. For instance, anxious participants displayed elevated skin conductance to the subliminal presentation of negatively conditioned stimuli even when they were not explicitly aware of these stimuli. Another important finding was that micro facial expressions of emotion in reaction to the presentation of the emotional stimuli was a better predictor of Stroop interference than explicit affective ratings of these stimuli. The data from these experiments suggest that there are

complex dissociations between implicit and explicit components of emotional processing.

Keywords: Psychophysiology; Emotion; Cognitive processes

Indexed papers: Blanchette, I., & Richards, A. (2013). Is emotional Stroop interference linked to affective responses? Evidence from skin conductance and facial electromyography. *Emotion*, 13(1), 129-138. doi: 10.1037/a0029520

Blanchette, I., & Richards, A. (2010). The influence of affect on higher level cognition: A review of research on interpretation, judgment, decision making and reasoning. *Cognition & Emotion*, 24(4), 561-595. doi: 10.1080/02699930903132496

**Project: 2004-73**

Title: Spontaneous brain blood flow during guess - Research with near infrared spectroscopy

Duration: 2005/01 – 2006/07

Researcher(s): Dr. Mikio Yamamoto, Dr. Hideyuki Kokubo, Dr. Hideo Yoichi

Institution: Institute for Body Measurements, IRI, Schiba-shi (Japan)

Results: The present study deals with brain activities using fNIRS (functional near-infrared spectroscopy).

First, brain blood flow was measured while guessing a hidden figure (Zenar symbols) in a forced-choice test. Subjects were 14 healthy adult volunteers (8 males, 6 females): average age was 46.6 ( $SD = 15.2$ ). 1 trial was 3 min. Subjects scored degree of formulation of visual images. Results of 69 trials, spontaneous blood flow change (SBFC) often occurred at the temporal lobe, and at that time the images were formulated clearly. In other words, awareness was more activated. We named it as instantaneous highly activated state of awareness. However, SBFC did not relate to successful clairvoyant task.

Second, brain blood flow of various experts was measured in a free-response test to guess for the invalid parts of the inside of human body or for a small thing hidden in a dark box. Subjects were 11 healthy volunteers (5 males, 6 females): average age was 39.7 ( $SD = 12.1$ ). Two of them were famous star psychics of Russia and China. Brain activities of star psychics during

- clairvoyance were not similar to activities of other subjects. The characteristic activated area of star psychics was the prefrontal area although many subjects showed activation of the right temporal lobe. Star psychics seemed to think, not only formulate visual images. In addition, photons were measured around the target thing during the clairvoyant task. However there was no appearance of anomalous photon.
- Keywords:** Parapsychology and Psychophysiology; Extrasensory perception (ESP); Clairvoyance; Superior psi ability; Brain; Functional near-infrared spectroscopy (fNIRS)
- Indexed papers:** N/A
- Project:** **2004-74**
- Title:** High performance REG array with simultaneous read-out: Exploration of a new REF design, involving self-selective amplification and EEG triggered read-out for PK studies
- Duration:** 2005/01 – 2007/07
- Researcher(s):** Prof. Harald Walach, Dr. Tilmann Faul, Dr. Matthias Braeunig
- Institution:** Institute for Environmental Medicine and Hospital Epidemiology, University Hospital Freiburg (Germany)
- Results:** We constructed a true physical random event generator, the so-called T.REG, that uses triggers from various sources to elicit binary events sampled from electronic noise. The advantage of free triggers features most prominently in the idea of creating operational closure between the sampler and the triggering agent in an explicit trigger-feedback-loop. Three modes of triggers and arrangements are investigated: a fixed frequency clock and two types of modulated voltage controlled oscillators (VCO), one internally driven by the output sequence, the other modulated by subject's one-channel EEG pattern. With sampling three random sources in parallel channels, the integrative capacity of the apparatus is explored. Data has been collected from 20 human participants in all three triggering modes, trying to deviate the outcome of the REG under four experimental conditions. The subjects received acoustic feedback of their rate of success.

In trials of 1501 records, events and transitions are counted in blocks of 200 bits and analyzed under the null hypothesis of randomness. Descriptive statistics are extracted as  $Z$ -values with respect to the theoretical mean and variance. A significant shift in the mean value of the hit score could not be found. The variance measure, however, was increased to  $Z = 2.587$  across all subjects in EEG-triggered trials with M-Switch, a device to deliberately invert the meaning of hits and misses. Surprisingly, it has been found that the significantly increased variance was generated by male subjects only ( $Z = 2.937$ ), and in those periods when the M-Switch was not actively used (unpressed) ( $Z = 2.899$ ), indicating a possible psychological factor. It is conjectured that subjects react to the past sequence of events.

Keywords: Parapsychology; Assessment tools; Psychokinesis (PK); Electroencephalogram (EEG)

Indexed papers: N/A

**Project: 2004-75**

Title: Measurement of Event-related EEG correlations between two human subjects over a large distance

Duration: 2006/01 – 2007/09

Researcher(s): Prof. Harald Walach, Dr. Christian Seiter, Dr. Thilo Hinterberger

Institution: University College Northampton (UK)

Results: In order to proof the hypothesis of a correlation in stimulus-related electrophysiological measures in distant pairs of participant's measurements were carried out between one lab in England and one in Germany synchronously. 28 sessions were conducted with 16 pairs of participants in which one of both had to view 360 pictures in five runs. Emotionally affective pictures, neutral pictures, black screen stimuli, and pictures of the co-participant were presented. The three seconds post-stimulus event-related responses and power spectral EEG data of the non-stimulated participant were used for analysis. A non-parametrical statistical approach was applied to the epochs using a



randomized selection of 10 000 possible but arbitrary stimulus sequences in the same data files for comparison with the actual one.

The results for the entire group could not replicate the findings of the previous studies. The event-related potentials show no remarkable effect nor does the EOG reveal remarkable significances. The spectral analysis also did not show exceptional significances in all categories. However, the significances seem not to be equally distributed over all participants. Three participants show extraordinary high significances for emotional, affective, or the co-participants pictures. The SCPs and skin conductance level and response revealed the highest z-scores which is in line with the fact that both measures react highly sensitive on emotional changes and changes in the arousal level. Other measures such as the time series ERP and the frequency bands did not show exceptional significance values. However, extraordinary large values in some participants suggest the existence of 'gifted participants'.

Keywords: Parapsychology and Psychophysiology; Extrasensory perception (ESP); Telepathy; Superior psi ability; Electroencephalogram (EEG)

Indexed papers: N/A

**Project: 2004-76**

Title: Remote staring detected by conscious and psychophysiological variables - Combining and improving two successful paradigms

Duration: 2005/01 – 2006/12

Researcher(s): Dr. Stefan Schmidt, Dr. Susanne Müller, Prof. Harald Walach

Institution: Department for Evaluation of Complementary and Alternative Medicine, Hospital Epidemiology, Freiburg (Germany)

Results: Findings in parapsychology suggest an effect of distant intentionality. Two laboratory set-ups explored this topic by measuring the effect of a distant intention on psychophysiological variables. The DMILS (direct mental interaction in living systems) experiments investigate the effect of various intentions

on the electrodermal activity (EDA) of a remote subject. The “Remote Staring” experiments examine whether gazing by an observer (starer) covaries with the electrodermal activity of the person being observed (staree).

In two meta-analyses (Schmidt, Schneider, Utts & Walach, 2004) it became obvious that the remote staring studies had a lower overall quality than the DMILS studies. While there are some high quality DMILS studies (score over 90%) the highest quality in Remote Staring studies is 71%.

Thus there is a lack in studies with good methodology to assess the remote staring paradigm. We conducted a remote staring study that intended to overcome methodological shortcomings of earlier studies.

Fifty participants were invited to take part as starees. After completing questionnaires on mindfulness, mood, personality and paranormal belief they rested in a comfortable position in front of a video camera while their EDA was continuously monitored. The experimenter also acted as the starer and either observed or did not observe the participant through a closed circuit television system according to a random schedule. EDA during stare and non-stare epochs was compared for significant differences.

In addition to this basic (replication) set-up two new hypotheses were tested. The participant had the possibility to press a button whenever s/he feels stared at. This added a conscious response variable without engaging into the disadvantages of the standard conscious guessing paradigm (guessing strategies, response bias etc). Furthermore the distraction of the starer’s intention during non-stare epochs was varied. In one condition s/he was mentally occupied by a cognitive task, in the other s/he was just told not to stare (standard condition). We hypothesized that the distraction from the target in the standard condition was too weak to avoid an unwanted intentional effect in the staree.

Overall we did not find any staring effect at all, not in the EDA data and not in the ‘conscious’ open response situation. The difference between the conditions where the sender was distracted or not distracted was not significant ( $p = .07$ ) but for the condition where the starers were distracted ( $N = 20$ ) we found a medium effect size for a staring effect according.

Keywords: Parapsychology; Psychokinesis (PK); Remote staring/Being stared at; Assessment tools

Indexed papers: N/A

**Project:** 2004-77

Title: Stress and the psyche: methodological innovations in psycho-neuroimmunology

Duration: 2005/03 – 2007/06

Researcher(s): Dr. Matt Bristow, Dr. Rachel Cook

Institution: Department of Psychology, APU, Cambridge (UK)

Results: There is an inconsistency within the literature concerning whether acute stress leads to an increase or decrease in mucosal immunity. We examined this inconsistency using parachute jumping as an ecologically valid method of inducing acute stress coupled with psychological and physiological measures of stress on the day of the jump and seven days before and after it. Twenty-eight novice tandem jumpers participated in this study along with thirty one non-parachute controls. The parachutists completed a daily questionnaire assessing levels of stress and provided a 2-minute unstimulated saliva sample on each of the seven days before the parachute jump, the day of the jump and the seven days after the jump. A sub-group of 12 parachutists provided saliva samples before and after the parachute jump. Saliva samples were analysed for cortisol, a measure of physiological stress, and immunoglobulin A (IgA), a measure of mucosal immunity. There were significant and substantial increases in IgA and cortisol following the jump indicating that the parachutists found the experience stressful and that this led to an increase in mucosal immunity. These increases seem transient as there was no indication of any physiological or psychological change in the evening measures on the day of the jump or the days that followed. In conclusion, using an ecologically valid acute stressor we found evidence of a substantial but transient increase in mucosal immunity with no evidence of suppression. Acute stressful situations appear to

provide a brief enhancement of the mucosal immune system with no evidence of any detrimental effects.

Keywords: Psychophysiology; Stress and health; Psychoneuroimmunology; Endocrinology; Immunology; Assessment tools

Indexed papers: N/A

**Project: 2004-78**

Title: On the relationship between reality monitoring and belief in parapsychological phenomena: Neurophysiological studies

Duration: 2006/05 – 2008/09

Researcher(s): Dr. Kevin Allan, Dr. Fiona Gabbert, Prof. Christopher French

Institution: University of Aberdeen, School of Psychology, Scotland (UK)

Results: N/A

Keywords: Parapsychology and Psychophysiology; Paranormal belief; Anomalous cognition/experiences; Cognitive processes; Consciousness

Indexed papers: N/A

**Project: 2004-81**

Title: Photon emission of living witness in human healing and cognitive experiences

Duration: 2005/01 – 2006/12

Researcher(s): Prof. Roeland Van Wijk, Prof. G. L. R. Godaert, Dr. E. P. A. Van Wijk, Prof. R. Bajpai

Institution: International Institute of Biophysics, Neuss (Germany)

Results: The research established that the algae *Acetabularia acetabulum* can distinguish a therapeutic relationship from a situation wherein subjects are present without healing intention. Photomultipliers recorded the photon emission from the cells.

Subjects were not aware of the recordings. The experiments were conducted in cooperation with three “laying on of hands” healers. Healees were patients of the healers. Two settings were utilized. In one, data were derived over 5 days from 20 experimental healing sessions in the practice of the healer.

A photomultiplier was positioned in a juxtaposition room. Photon count distribution analysis ruled out the origin of photon count fluctuations from random disturbances. The value  $Q$  indicating the non-classical nature of the photon signals was 0.23 before healing; rose to 0.32 during healing and 0.36 over the first post-healing period; it then decreased to 0.31 in the latter post-healing period. In the second, data were derived over 6 days including 25 sessions in which two healers participated. They did healing in a setting 40 km from their practice. The equipment was situated in the room where the healing sessions took place.  $Q$  was 0.32 before healing; it rose to 0.35 and then 0.48 both during healing and in the first post-healing period; then it decreased to 0.38 in the second post-healing period. One-way ANOVA on treatment stages and  $Q$  demonstrated highly significant effects ( $p = 0.000000$ ). Fischer LSD post-hoc test showed that increase in  $Q$  is already almost significant during treatment, and it became significant ( $p = 0.01$ ) during the first post-healing period. The data confirm the initial 2003 study suggesting a change in the quantum character of photon signals as a result of healing.

**Keywords:** Parapsychology and Psychophysiology; Healing; Laying on of hands; Electroencephalogram (EEG)

**Indexed papers:** Van Wijk, R., Van Wijk, E., & Bajpai, R. (2006). Photocount distribution of photons emitted from three sites of a human body. *Journal of Photochemistry and Photobiology B-Biology*, 84(1), 46-55. doi: 10.1016/j.jphotobiol.2006.01.010

**Project:** 2004-82

**Title:** Detecção de informação emocional e sua interferência no processamento neurocognitivo: Um estudo em criminosos

**Duration:** 2005/01 – 2008/07

Researcher(s): Prof. João Eduardo Marques Teixeira, Prof. Manuel Fernando Santos Barbosa, Mr. Pedro Manuel Rocha Almeida

Institution: Centro de Ciências do Comportamento Desviante, Porto (Portugal)

Results: The interference of a secondary visual emotional task on the P3 component elicited by an auditory odd-ball paradigm was studied in recidivist inmates and controls. The main ERP study was preceded by a SDT based paradigm in order to assess the sensitivity of both groups for emotional arousal and valence.

For this phase, controls reported lower values, were less liberal and obtained higher sensitivity scores for emotional arousal, whereas no differences were found for valence except for criteria where groups did not differ for lower cut-points but did so for higher response categories (from 5-6 on). These results suggested that to obtain the same pattern of emotional responses for both groups, different stimuli ought to be used. Based on this, the visual stimuli for the ERP paradigm were selected so that both groups would be paired concerning their sensitivity values.

The ERP results showed that controls presented higher amplitudes for P3 under the Pure (absence of visual stimulation) condition than for Positive, Neutral or Negative conditions. There were no effects for the recidivist criminals. P3 peak latency was significantly earlier for the Pure condition.

Thus, for the control group, we obtained a reduction of auditory P3 peak amplitude when subjects were stimulated by pictures, regardless of its valence, suggesting a shift of attentional resources to such stimuli. This was not found for inmates.

This suggests that, besides a basic impairment on the detection and discrimination of emotional information, antisocials may further be affected by anomalous neurocognitive processing, translated by deficits in the efficient allocation of processing resources on peripheral tasks, even if they contain emotional significance.

Keywords: Psychophysiology; Emotion; Mental health; Antisocial behavior

Indexed papers: Marques-Teixeira, J., Barbosa, F., & Almeida, P. R. (2009). Using signal detection theory indexes for the experimental manipulation

of emotional states. *Methodology*, 5(2), 55-59. doi: 10.1027/1614-2241.5.2.55

- Project:** **2004-84**
- Title:** A consciência da dor: Alterações induzidas por dor crónica nos mecanismos neurobiológicos de aprendizagem, atenção e recompensa
- Duration:** 2005/01 – 2008/11
- Researcher(s):** Prof. Vasco Miguel Clara Lopes Galhardo, Prof. Deolinda Maria Valente Alves de Lima Teixeira, Dr. Miguel Santos Pais-Vieira, Dr. Clara Maria Pires Costa Bastos Monteiro
- Institution:** IBMC - Instituto de Biologia Molecular e Celular, Porto (Portugal)
- Results:** The studies performed in grant 84/04 “The Consciousness of Pain” led to significant advances in our understanding of the neurobiological mechanisms that induce cognitive alterations under chronic pain conditions. Our studies have introduced for the first time the use of complex cognitive tasks in animal models of chronic pain. The relevance of our studies is notorious not only from the quality of the scientific publications in which we have reported our results, but also from the impact that these studies have achieved in the Pain Research scientific community as inferred by the many invitations to present our results in international meetings.
- Specifically, in this Project we have:
1. developed for the first time a cognitive task for emotional decision making under ambiguity – the Rodent Gambling Task – that is sensitive to prefrontal and amygdalar functioning just like is observed in the human brain;
  2. demonstrated that prefrontal executive function assessed in our decision-making task is impaired in chronic pain animals, and that this pain-induced impairment is as severe as after a prefrontal lesion;
  3. demonstrated that chronic pain changes the neurochemical balance of dopamine and serotonin in the prefrontal cortex, amygdala, hippocampus, and ventral striatum;

4. demonstrated that chronic pain impairs working memory without affecting performance dependent on long-term memory;
5. demonstrated that chronic pain impairs attentional processing, without affecting choice impulsivity as some authors had previously suggested;
6. developed a novel software for acquisition of behavioral animal data and control of experimental arenas that was freely available for download by the neuroscience community.

Keywords: Psychophysiology; Pain; Cognitive processes; Decision-making; Memory; Attention; Learning; Brain; Assessment tools

Indexed papers: Ji, G., Sun, H., Fu, Y., Li, Z., Galhardo, V., & Neugebauer, V. (2010). Cognitive impairment in pain through amygdala-driven prefrontal cortical deactivation. *The Journal of Neuroscience*, *30*(15), 5451-5464. doi: 10.1523/JNEUROSCI.0225-10.2010

Neugebauer, V., Galhardo, V., Maione, S., Mackey, S. C. (2009). Forebrain pain mechanisms. *Brain Research Reviews*, *60*(1), 226-242. doi: 10.1016/j.brainresrev.2008.12.014

Pais-Vieira, M., Mendes-Pinto, M. M., Lima, D., & Galhardo, V. (2009). Cognitive impairment of prefrontal-dependent decision-making in rats after the onset of chronic pain. *Neuroscience*, *161*(3), 671-679. doi: 10.1016/j.neuroscience.2009.04.011

**Project: 2004-87**

Title: Early neurophysiological correlates of autism: visual attention and EEG rhythms

Duration: 2005/01 – 2007/04

Researcher(s): Prof. Tatiana Alexandrovna Stroganova, Prof. Mikael Elam, Dr. Elena Orekhova, Dr. Mariana Mihailovna Tsetlin, Dr. Alexei Alexandrovich Morozov

Institution: Moscow University for Psychology and Education, Faculty of Abnormal Psychology, Moscow (Russia)

Results: The study was focused on functional brain abnormalities associated with autism in 3-8 years-old boys. EEG was recorded 1) under controlled condition of sustained visual attention and 2) during sequential presentation of short novel visual stimuli



in two independent samples of boys with autism (BWA) from Moscow ( $N = 21$ ) and Gothenburg ( $N = 23$ ) and a corresponding number of age-matched typically developing boys. EEG spectral power (SP), SP interhemispheric asymmetry, inter-regional coherence within delta, theta, alpha, beta and gamma bands and stimulus-induced EEG alpha oscillatory response were analyzed. The main distinctive features of ongoing EEG in BWA of both samples were the excess of high frequency activity (beta and gamma) and atypical hemispheric asymmetry of slower (delta, theta and alpha) EEG oscillations. The increased amount of fast brain oscillations in EEG of BWA correlated with the degree of developmental delay and may reflect genetically mediated abnormalities of GABA mediator system found in autism. Atypical leftward broadband EEG asymmetry in BWA with a maximum effect over the mid-temporal regions was associated with decreased coherence within the theta band at mid-temporal regions of right hemisphere. Alpha blocking response to novel visual stimuli in BWA was abnormally reduced at higher-order visual areas of right hemisphere. These findings point to a decreased capacity of right hemispheric neural circuits to generate EEG rhythms and may indicate altered regional specialization as well as altered information processing in autism. The concurrent lack of normal leftward asymmetry of mu rhythm suggests that abnormalities in EEG lateralization in autism are regionally/functionally specific.

**Keywords:** Psychophysiology; Brain; Childhood and adolescent disorders; Autism spectrum disorder (ASD); Electroencephalogram (EEG)

**Indexed papers:** Orekhova, E. V., Stroganova, T. A., Nygren, G., Tsetlin, M. M., Posikera, I. N., Gillberg, C., & Elam, M. (2007). Excess of high frequency electroencephalogram oscillations in boys with autism. *Biological Psychiatry*, *62*(9), 1022–1029. doi: 10.1016/j.biopsych.2006.12.029

Stroganova, T. A., Nygren, G., Tsetlin, M. M., Posikera, I. N., Gillberg, C., Elam, M., & Orekhova, E. V. (2007). Abnormal EEG lateralization in boys with autism. *Clinical Neurophysiology*, *118*(8), 1842–1854. doi: 10.1016/j.clinph.2007.05.005

Stroganova, T. A., Orekhova, E. V., Prokofyev, A. O., Posikera, I. N., Morozov, A. A., Obukhov, Y. V., & Morozov, V. A. (2007). Inverted event-related potentials response to illusory contour in boys with autism. *Neuroreport*, *18*(9), 931–935. doi: 10.1097/WNR.0b013e32811e151b

**Project:** 2004-88  
**Title:** A influência social na memória: Estilo conformista, falsas memórias e alterações psicofisiológicas periféricas  
**Duration:** 2005/01 – 2007/04  
**Researcher(s):** Prof. Emanuel Pedro Viana Barbas de Albuquerque, Prof. Teresa Margarida Moreira Freire  
**Institution:** Centro de Investigação em Psicologia da Universidade do Minho (Portugal)  
**Results:** N/A  
**Keywords:** Psychophysiology; Cognitive processes; Memory; Social interaction/norms  
**Indexed papers:** N/A

**Project:** 2004-93  
**Title:** An investigation of effects of dreams on physiological measures of stress  
**Duration:** 2005/06 – 2007/09  
**Researcher(s):** Dr. Sue Wilson, Prof. David Nutt, Prof. S. Lightman  
**Institution:** Psychopharmacology Unit, Bristol (UK)  
**Results:** Part 1  
Baseline questionnaires showed that patients in both sleep disorder groups had significantly higher levels of anxiety and sleep disturbance and lower levels of general health compared with normal sleepers; the insomnia group had significantly higher depression ratings. Absolute levels of morning salivary cortisol were higher in both sleep disordered groups than in controls. Insomnia patients and parasomnia patients on 'good' nights had higher waking cortisol levels than controls, and similar levels to controls at 30min post waking. There was a variable response on parasomnia 'bad' nights with most patients waking with higher cortisol levels and some even having a fall rather than a rise 30 minutes after waking. Cortisol levels on awakening showed higher variability in those subjects reporting anxi-

ety dreams during the night. We demonstrated a significant relationship between cortisol levels and subjective measures of poor sleep quality. Occurrence of episodes of parasomnia was associated with awakening cortisol response unlike that of controls and insomnia patients.

Part 2

The automatic sampling system was reliable and effective in obtaining frequent blood cortisol samples without interfering with sleep. Cortisol levels fell during the first few hours of sleep and then showed a rise independent of sleep stage about halfway through the night, consistent with the literature. In addition, both awakenings and REM sleep tended to increase cortisol level. There was evidence of both circadian and sleep-stage-dependent regulation of night-time cortisol level. Awakening cortisol response was detected in both plasma and saliva samples but the size of the response was different using the 2 methods.

Keywords: Psychophysiology; Sleep and dreams; Mental health; Sleep disorders; Stress and health; Psychoneuroimmunology; Endocrinology

Indexed papers: N/A

**Project:** 2004-102

Title: Interspecies communication and telepathy with a language-using Parrot

Duration: 2005/05 – 2007/07

Researcher(s): Dr. Aimee Morgana, Prof. Rupert Sheldrake, Prof. Jane Goodall

Institution: The N’Kisi Partnership for Interspecies Communication, New York (USA)

Results: Research in interspecies communication and documentation of the language use and telepathic abilities of the parrot N’Kisi has continued. We have made more breakthroughs in his language skills, and progress in our various research studies. During the project term, N’Kisi’s contextual vocabulary increased from 1025 to 1286 words. He has also created original sen-

tences with complex grammatical structure. N’Kisi has created thousands of novel sentences, and many were captured with our new recording system.

While N’Kisi’s rate of learning new words has been fairly stable, his rate of spontaneous telepathy is more variable. As I learned during an analysis of possible incidents the first year, it had declined, and was not sufficiently robust to conduct more controlled studies. To gain more information, I undertook a comprehensive analysis of possible spontaneous incidents from daily logs. Incidents in 16 categories of potential telepathic response based on the type of stimulus or circumstance were analyzed by category and year, to study any notable patterns.

During this time I finished researching and installing a new camera set-up, after testing and trouble-shooting a range of equipment and software. I also devised, improved, tested, and implemented procedures for data acquisition and recording, and refined and prepared further research protocols. I then carried out a program of filming, with some notable incidents and possible spontaneous telepathy, which we will be working to transcribe and analyze. I also worked on a special featuring our work for Discovery Channel /Animal Planet, Jane Goodall’s When Animals Talk.

Keywords: Parapsychology; Animal psi; Animal & Human Psi; Telepathy

Indexed papers: N/A

**Project:** 2004-104

Title: Is psi a type of knowledge?

Duration: 2005/01 – 2006/11

Researcher(s): Dr. Dean Radin, Dr. Edwin May

Institution: Institute of Noetic Sciences, Petaluma, CA (USA)

Results: This experiment investigated the effect of a distant observer on a quantum optics system. The question was whether this form of “psi observation” would cause a change in the photons’ quantum wave-functions. A Michelson interferometer was located inside a sealed, light-tight, double steel-walled shielded chamber, and participants sat quietly outside the chamber with

eyes closed. Interference patterns were recorded by a cooled CCD camera once per second, and average illumination levels of these images were compared during counterbalanced “mental blocking” vs. non-blocking conditions. A lower overall level of illumination was predicted to occur during the blocking condition due to partial collapse of the quantum wave function.

Based on 18 experimental sessions, the outcome was significantly in accordance with the prediction ( $z = -2.82, p = 0.002$ ). This result was primarily due to nine sessions involving experienced meditators (combined  $z = -4.28, p = 9.4 \times 10^{-6}$ ); the other nine sessions with nonor beginning meditators were not significant (combined  $z = 0.29, p = 0.61$ ). The same protocol run immediately after each test session with no one present revealed no hardware or protocol artifacts that might have accounted for these results (combined  $z = 1.50, p = 0.93$ ). Other conventional explanations were considered and judged to be implausible. This study supports the idea that psi is a direct means of gaining knowledge, because knowledge of which path information in a quantum optics system will cause the wave function to collapse.

**Keywords:** Parapsychology; Extrasensory perception (ESP); Intuition; Psychokinesis (PK); Altered states of consciousness; Meditation

**Indexed papers:** Radin, D. I. (2008). Testing nonlocal observation as a source of intuitive knowledge. *Explore: The Journal of Science and Healing*, 4(1), 25-35. doi: 10.1016/j.explore.2007.11.001

Radin, D. I., Nelson, R. D., Dobyys, Y., & Houtkooper, J. (2006). Reexamining psychokinesis: Peer commentary on Bösch, Steinkamp and Boller (2006). *Psychological Bulletin*, 132(4), 529–532. doi: 10.1037/0033-2909.132.4.529

Schlitz, M., Wiseman, R., Watt, C., & Radin, D. (2006). Of two minds: Skeptic-proponent collaboration within parapsychology. *British Journal of Psychology*, 97(3), 313-322. doi: 10.1348/000712605X80704

**Project:** 2004-106

**Title:** The effect of pre-sensory emotional primes on ESP performance, subject mood, and the mere exposure effect

Duration: 2005/11 – 2009/07  
Researcher(s): Prof. James Carpenter, Dr. Christine Simmonds  
Institution: Rhine Research Center, Durham, NC (USA)

Results: Two studies exposed participants to separate sets of pictures in subliminal and extra-sensory ways. Messages intended to influence mood were also presented 5 times. An early memory was rated for valence as a measure of mood. Exposed pictures were paired with matched, unexposed pictures and participants were asked to say which they preferred. This tests the Mere Exposure Effect (MEE), assuming that the pre-exposed pictures will be preferred. We also assessed variables predicted to influence both effects, based upon prior findings and first sight theory. In the first study (59 females, 19 males) the messages intended to affect mood were presented subliminally, in the second study they were presented extrasensorily (completely blocked). In the second study (75 females, 18 males), the relationships found to most strongly predict extrasensory and subliminal preferences in the first study were combined to test for confirmation. In Study one, extrasensory response was expected to be affected by three facets of openness; anxiety, creativity, belief in ESP, tolerance for closeness and Liminal Orientation. Subliminal response was expected to vary in terms of Need for Structure, Need for Cognition, Liminal Orientation and Boredom Proneness. All relationships were expected to be stronger when mood had been manipulated to be more positive. Study two distinguished between pictures with human and non-human content.

Results for Study one found no overall MEE. Mood was influenced by the subliminal message. ESP response was significantly predicted by all 3 facets of openness, belief that ESP is possible, creativity, liminal orientation, tolerance of closeness, anxious vulnerability and need for structure. The strongest independent relationships were with a combined variable consisting of openness to fantasy, tolerance for merger, and (-) vulnerability. Subliminal response was predicted by Need for Cognition, Liminal Orientation and (-)Boredom Proneness. Only Liminal Orientation was independently predictive. Relationships were stronger when Ps had been induced to be in a positive mood, particularly with ESP.

In Study two, the extrasensory presentation of the mood-manipulation was not successful in affecting mood, so naturally-occurring mood was used instead. The composite variable intended to predict ESP response did so significantly. However, Liminal Orientation did not significantly predict subliminal response. As predicted, all relationships with ESP were stronger when mood was positive and when the target content was human. These things did not influence subliminal response.

Keywords: Parapsychology; Extrasensory perception (ESP); Emotion

Indexed papers: N/A

**Project: 2004-110**

Title: Reports of distressing anomalous experiences to UK parapsychology units: a survey, analysis and the creation of a practical response tool

Duration: 2005/03 – 2006/11

Researcher(s): Dr. Cláudia Coelho, Dr. Peter Lamont

Institution: Koestler Parapsychology Unit, Department of Psychology, Edinburgh (UK)

Results: N/A

Keywords: Parapsychology; Anomalous cognition/experiences; Spontaneous cases; Mental health; Psychotic disorders; Intervention

Indexed papers: N/A

**Project: 2004-112**

Title: Improvement of transcranial magnetic stimulation (TMS) coils for psychiatric applications

Duration: 2005/01 – 2007/11

Researcher(s): Prof. Pedro Cavaleiro Miranda, Mr. Yiftach Roth, Mr. Ludovic Correia, Mr. Ricardo Salvador, Dr. Abraham Zangen

Institution: Instituto de Biofísica e Engenharia Biomédica, Faculdade de Ciências da Universidade de Lisboa (Portugal)

Results: Two improved versions of a TMS coil designed for stimulation of deep neuronal structures, the new H1 and H2 coils, were built and tested for safety on 31 normal volunteers. Treatments were conducted with H1-coil, H2-coil, Standard (superficial) figure-8 coil and Sham coil at 1, 10 and 20 Hz. Analysis of short clinical assessments protocols and additional safety measurements revealed that TMS stimulation was well tolerated with no major side effects. Overall, the changes were not differential for the four treatment groups and no evidence was found for a possible deterioration in cognitive performance due to the TMS treatments. In some tests transient cognitive improvement were observed, but only with deep TMS.

The H-coils were then used in a clinical study to test for effectiveness and safety on 50 depressed patients, who received daily TMS treatment 5 days per week for 4 consecutive weeks. Stimulation with these coils was well tolerated, with no major side effects or adverse physical outcomes. Compared with the value prior to the start of TMS therapy,  $31.3 \pm 5.0$ , the average HAM-D scale dropped significantly to  $16.2 \pm 9.9$  on the day after completion of the therapy. There was no significant difference between the coils, but the H1 coil tended to induce greater antidepressant effects. The CANTAB performed before, during and after the study indicated selective improvement in cognitive functions, especially spatial memory and executive function.

We also showed, using computer models, that an effective way to improve the performance of the H-coils is to combine them with iron cores. Their presence contributes to an overall increase in stimulus intensity in the vicinity of the core, which is more pronounced in deep regions.

Keywords: Psychophysiology; Assessment tools; Intervention; Mental health; Mood disorders; Transcranial magnetic stimulation (TMS)

Indexed papers: Salvador, R., Miranda, P. C., Roth, Y., & Zangen, A. (2009). High permeability cores to optimize the stimulation of deeply located brain regions using transcranial magnetic stimulation. *Physics in Medicine and Biology*, 54(10), 3113-3128. doi: 10.1088/0031-9155/54/10/010



Levkovitz, Y., Roth, Y., Harel, E. V., Braw, Y., Sheer, A., & Zangen, A. (2007). A randomized controlled feasibility and safety study of deep transcranial magnetic stimulation. *Clinical Neurophysiology*, *118*(12), 2730-2744. doi: 10.1016/j.clinph.2007.09.061

Roth, Y., Amir, A., Levkovitz, Y., & Zangen, A. (2007). Three-dimensional distribution of the electric field induced in the brain by transcranial magnetic stimulation using figure-8 and deep H-coils. *Journal of Clinical Neurophysiology*, *24*(1), 31-38. doi: 10.1097/WNP.0b013e31802fa393

**Project: 2004-115**

Title: Psychophysiological analysis of learning and memory using zebrafish as an in vivo model system

Duration: 2006/01 – 2012/09

Researcher(s): Prof. Florian Engert, Dr. André Valente, Dr. Bettina Reiter, Dr. Johann Bollmann, Dr. Adam Kampff, Dr. Michael Orger

Institution: Harvard Biological Laboratories, Cambridge (USA)

Results: N/A

Keywords: Psychophysiology; Cognitive processes; Learning; Memory

Indexed papers: Valente, A., Huang, K. H., Portugues, R., & Engert, F. (2012). Ontogeny of classical and operant learning behaviors in zebrafish. *Learning & Memory*, *19*(4), 170-177. doi: 10.1101/lm.025668.112

**Project: 2004-116**

Title: Comparing conscious and physiological measurements in a cognitive DMILS study in Bali

Duration: 2005/03 – 2006/12

Researcher(s): Prof. Hoyt Edge, Prof. Luh Ketut Suryani, Dr. Niko Tiliopoulos, Dr. Annemieka Bikker

Institution: College of Arts and Sciences, Rollins College, Florida (USA)

Results: This project aimed at enquiring whether physiological responses (heart rate variability) is a more reliable indicator of psi influence than conscious responses (button presses) in a cross-cultu-

ral setting. It continued and extended the research program that we developed in Bali for the previous four years. The problems with the traditional cognitive DMILS methodology are two-fold: the button press may not be reliable as an indicator of loss of focus, and the number of button presses in Bali have been significantly fewer than in experiments in the US and Scotland. Through comparing heart rate variability (HRV) as an alternate measure of lack of attention, and through extensive interviews on the phenomenology of the button presses, we aimed to improve and make more consistent the cognitive DMILS protocol. HRV did not yield a more sensitive measure of psi influence. Although on average HRV tended to be slightly lower in the Help condition in Study 1, this difference was not statistically significant, Control ( $M = 5.84$ ,  $SD = 1.64$ ), Help ( $M = 5.79$ ,  $SD = 1.64$ ),  $t_{(59)} = 0.46$ ,  $p = .32$ , one-tail, *Cohen's d* = .06, *power* = .07. In the Study 2, there was no statistically significant difference in the HRV between the two conditions, Control ( $M = 8.74$ ,  $SD = 4.11$ ), Help ( $M = 8.96$ ,  $SD = 4.56$ ),  $t_{(42)} = 0.65$ ,  $p = .26$ , one-tail, *Cohen's d* = .09, *power* = .16 .

The interviews yielded significant phenomenal data, from which we concluded that the Balinese see falling out of focus as a state; that is, the time from the instant of losing focus until they regain it is viewed as one state and is responded to as one event. Thus, they tend to press the button only once during this time. Although we do not have comparable data on this, it seems that EuroAmericans might view the time from losing focus to regaining it as potentially a series of events, where they might try to regain focus but not achieve it, and thus they may press the button multiple times during this period, thus increasing the button presses in EuroAmerican cultures. We believe, however, that other cultural factors may be at work, particularly the importance of ritual prayer in Bali.

Keywords: Parapsychology; Psychokinesis (PK); Direct mental interactions with living systems (DMILS); Altered states of consciousness; Meditation

Indexed papers: Schmidt, S. (2012). Can we help just by good intentions? A meta-analysis of experiments on distant intention effects. *Journal of Alternative and Complementary Medicine*, 18(6), 529-533. doi: 10.1089/acm.2011.0321

- Project:** **2004-119**
- Title:** Event-related potentials of temperament traits in ADHD and conduct disorder
- Duration:** 2005/06 – 2007/11
- Researcher(s):** Dr. Katya Rubia, Dr. Alex Sumich, Dr. Philip Asherson, Prof. Eric Taylor
- Institution:** Dept. Child Adolescent Psychiatry, Institute of Psychiatry, London (UK)
- Results:** The aim of this study was to understand brain function involved in symptoms and temperament traits of ADHD and conduct disorder. The project includes 80 adolescent boys into the study (30 healthy individuals, 30 boys with ADHD, 20 boys with conduct disorder). We also made use of an international database of 245 children and adolescents to investigate maturational changes in brain function.
- A structured clinical interview was used to diagnose developmental problems including Attention Deficit and Hyperactivity Disorder (ADHD), oppositional defiant disorder (ODD) and Conduct Disorder (CD). A number of techniques were used to measure brain function including electroencephalography, event-related potentials and neuropsychology measures.
- Brain function assessment was performed using brain resource company techniques ([www.brainresource.com](http://www.brainresource.com)). We also used several self and parent report instruments to measure symptoms and temperament traits, in particular we were interested in callous/unemotional traits, emotional intelligence, affective problems, pragmatic language impairment, hyperactivity, impulsivity, and aggression. Data from this project have been presented in poster and oral form at the Applied Neuroscience Conference, May 17-20, 2007. Two manuscripts have been submitted, to Developmental Neuropsychology and to The Journal of Child Psychology and Psychiatry. The first of these studies investigates sex differences in the ontogenetic development of N200 and P300 components of the event-related potential. The second observes neurodevelopmental differences between healthy and behaviourally problematic adolescents, and investigates the relationship of involved mechanisms to clinical scores. Further publications from this dataset are in preparation.

**Keywords:** Psychophysiology; Brain; Childhood and adolescent disorders; Conduct disorder; Attention deficit hyperactivity disorder (ADHD); Developmental psychology

**Indexed papers:** Sumich, A., Sarkar, S., Hermens, D., Ibrahimovic, A., Taylor, A., & Rubia, K. (2012). Sex differences in brain maturation as measured using event-related potentials. *Developmental Neuropsychology*, 37(5), 415-433. doi: 10.1080/87565641.2011.653461

Sumich, A., Sarkar, S., Hermens, D. F., Kelesidi, K., Taylor, E., & Rubia, K. (2012). Electrophysiological correlates of CU traits show abnormal regressive maturation in adolescents with conduct problems. *Personality and Individual Differences*, 53(7), 862-867. doi: 10.1016/j.paid.2012.06.008

**Project:** 2004-128

**Title:** Telepathic behaviour associated with biochemical and neuroendocrine parameters

**Duration:** 2005/02 – 2008/06

**Researcher(s):** Prof. Maria Carlota Lopes Saldanha, Prof. Alberto Albino Granada Escalda, Dr. Teresa Raquel Duarte Pacheco, Dr. Ana Rosa Miranda dos Santos Silva

**Institution:** Unidade de Biopatologia Vascular, Instituto de Medicina Molecular, Faculdade de Medicina de Lisboa (Portugal)

**Results:** In our first study (1) we have shown maintenance of the erythrocyte integrity and a bradycardia effect followed by a significant decrease of plasma cortisol levels in rabbits submitted to telepathy experiments. These results suggested us the hypothesis that the number of hippocampus cortisol receptors are increased in telepathy situations as well as blood pressure variability existence. This hypothesis induces questions about cardiovascular and respiratory autonomic control behaviour. The fast Fourier Transform is used to obtain the low frequency (LF) and high frequency (HF), respectively parasympathic and sympathetic nervous system information. We can observe different LF/HF values for the basal states (LF/HFrabbit1A = 1,17 and LF/HFrabbit1B =1,70) of different rabbits. Two different scares were tested in a couple of rab-

bits, for the mobile phone tone scare we obtained LF/HFrabbit1=0,15 and for the blow on the rabbit nose LF/HFrabbit1=0,05. Based on the wavelet analysis of the arterial plethysmography data, we observed that the blow on the rabbit's nose was the best way to promote the scare.

Telepathy experiments in 2 couples of rabbits were performed with simultaneously arterial plethysmography monitorization for each pair; one scared and other not scared. Lactate and cortisol concentrations and AChE erythrocyte activity were determined after the scare in both the rabbits of the couple and no significant differences were verified. Differences were not visualized by imunohistochemic analysis of rabbit hippocampus tissue sections for glucocorticoid receptors. Besides the maintenance of the erythrocyte integrity and efficiency of the scare, demonstrated by the wavelet analysis, it was not sufficient to evidence a biochemical and neuroendocrine basis for telepathy between rabbits that lived together for 3 months.

Keywords: Parapsychology and Psychophysiology; Animal psi; Telepathy; Psychoneuroimmunology; Endocrinology

Indexed papers: N/A

**Project:** 2004-134

Title: Investigating the multidimensional nature of body image, sensorial representation, and phenomenology in relation to different forms of out-of-body experience

Duration: 2005/06 – 2006/07

Researcher(s): Dr. Craig Murray, Dr. Jez Fox

Institution: Manchester University (UK)

Results: Previous work (inc. project 124/02) has shown that people reporting 'out-of-body' experiences (OBEs) score higher on measures of dissociation & body dissatisfaction, lower on a measure of physical self-presentation confidence, and differ in regards to the perceptual experience of their body than non-OBEs. These findings have been interpreted as supporting a dissociational theory of the OBE. However, that research did

not distinguish between those who had had a spontaneous OBE, an OBE as part of a near-death experience (NDE), or other OBE forms. That was the focus of this project.

2,029 participants (1,067 M's & 962 F's, mean age 36.1,  $SD = 13.4$ ) completed an on-line survey exploring various aspects of bodily experience, such as: somatoform dissociation, physical self efficacy & body satisfaction. 1,110 reported having an OBE (560 M's, 550 F's, mean age 38.6,  $SD = 13.4$ ).

Six types of OBE were observed: Spontaneous ( $n = 355$ ), meditatively induced ( $n = 89$ ), alcohol ( $n = 6$ ) & drug related ( $n = 39$ ), whilst physically threatened ( $n = 32$ ) & as part of an NDE ( $n = 54$ ). 535 (48.6%) OBEs reported having more than 1 of these types of OBE. Broad differences between OBEs & non-OBEs were investigated using Multivariate Analysis of Variance (MANOVA) & Discriminate Function Analysis (DFA) statistics. MANOVA found sig. diff. for all DVs (analysed in two groups): Group 1:  $F_{(11,1925)} = 90.98, p < 0.001$ , & Group 2:  $F_{(16,1894)} = 66.86, p < 0.001$ .

DFA found one discriminant function which maximally separated the OBEs from non-OBEs: Group 1:  $\chi^2_{(11)} = 807.74, p < 0.001$ . & Group 2:  $\chi^2_{(16)} = 851.22, p < 0.001$ . The best predictors for distinguishing between OBEs & non-OBEs were the Experience, Belief and Ability sub-scales on the Anomalous Experience Inventory.

Keywords: Parapsychology; Out-of-body experience (OBE); Body awareness

Indexed papers: N/A

**Project: 2004-135**

Title: Telepresence and telepathy in immersive virtual reality

Duration: 2005/11 – 2007/04

Researcher(s): Dr. Craig Murray, Dr. Christine Simmonds, Dr. Jez Fox

Institution: Manchester University (UK)

Results: We developed an immersive virtual reality (IVR) application as an experimental environment and medium for the study of

telepathy. Our own Telepathy Immersive Virtual Environment (TIVE) uses three-dimensional computer graphics technology to generate artificial environments that afford real-time interaction and exploration in conjunction with head mounted displays (HMDs), sound, instrumented data gloves which allow participants to interact with virtual objects. We conducted two telepathy studies using TIVE.

In Study 1 100 pairs who each completed a trial as a sender and receiver, 200 trials in total. In Study 2 30 pairs which took part in four further trials without changing roles, a total of 120 trials.

Neither of the above studies showed evidence in support for the psi hypothesis, either in terms of directional hitting or in a post hoc magnitude analysis, where the outcomes were no different from what would be expected by chance.

Future analyses will explore correlates of psi performance within the same studies. This approach takes the view that the psi process may function differentially according to state of consciousness and personality factors. The null effect overall reported here may therefore reflect a systematic balance of psi hitting and psi missing.

**Keywords:** Parapsychology; Extrasensory perception (ESP); Telepathy; Assessment tools

**Indexed papers:** Murray, C., Howard, T., Wilde, D., Fox, J., & Simmonds-Moore, C. (2007). Testing for telepathy using an immersive virtual environment. *Journal of Parapsychology*, 71(1), 105-124.

**Project:** 2004-139

**Title:** Psicofisiologia e detecção do engano: paradigma do conhecimento culpável

**Duration:** 2005/10 – 2010/09

**Researcher(s):** Prof. Carlos Fernandes da Silva, Prof. Rui Paixão, Dr. Paulo Joaquim Farinha Rodrigues, Prof. Jorge Manuel Amaral Silvério

**Institution:** Departamento de Ciências da Educação, Laboratório de Psicologia, Universidade de Aveiro (Portugal)

Results: N/A  
Keywords: Psychophysiology; Social interaction/norms

Indexed papers: N/A

**Project: 2004-140**

Title: The CinEgg project: Assessing the relationship between group consciousness and Random Event Generators

Duration: 2005/02 – 2006/10

Researcher(s): Prof. Mario Varvoglis, Prof. Jean-Philippe Basuyaux, Dr. Pierre Macias

Institution: Institut Métapsychique International, Paris (France)

Results: Certain REG studies suggest that the simultaneous focus of many individuals on an emotionally charged event can provoke anomalous effects in Random Event Generators, even though the individuals are unaware of the REG. This would seem to point to a collective, unintentional form of psychokinesis (PK), affecting objects in an indiscriminate, fieldlike manner.

The cited studies, however, are open to alternative explanations. The current study sought to assess fieldlike PK by more closely tying ostensible PK effects to the mental state of a group of individuals. It was hypothesized that the outputs of a REG, hidden in a movie theatre, would reflect the emotional “ups and downs” induced by the film upon spectators. This “onsite” REG was sampled continuously during showtimes, over the course of many film séances while an “off-site” REG collected control data. Control data were also collected from both REGs during “offshow” hours. Data were collected for 5 films, with 15 - 25 seances per film.

It was predicted that significant results would be obtained for the Onsite / Showtime condition, in the form of:

1. a correlation between REG data sets collected across seances of a given film
2. a mean- or variance- shift in REG data, specifically for film sequences judged to be “intense”



**Results:**

Only 3 of the film datasets could be used. Neither of the two predictions was confirmed. A secondary analysis, exploring REG outputs as a function of the number of spectators per film séance, also yielded nonsignificant results.

The null outcomes of this study suggest that

1. unintentional, fieldlike PK does not exist, or,
2. the conditions needed to induce fieldlike effects were not present, or,
3. the study's statistical power was insufficient to detect trends in the data.

**Keywords:** Parapsychology; Psychokinesis (PK); Field consciousness

**Indexed papers:** N/A

**Project: 2004-150**

**Title:** Electrocortical activity during deep hypnosis experiences

**Duration:** 2005/11 – 2007/02

**Researcher(s):** Prof. Etzel Cardeña, Prof. Dietrich Lehmann, Prof. Mark Winkel

**Institution:** Department of Psychology, University of Lund (Sweden)

**Results:**

We followed a neurophenomenological approach by analyzing in parallel experience and brain processes of individuals with high, medium, and low hypnotizability. Hypnotizability was measured with the original instrument in English, and we found that although there was a small decrement in comparison with the instrument administered in Swedish, the English version was both valid and reliable. We also found that women seemed to be slightly more hypnotizable than men. There was also a significant correlation between hypnotizability and emotional contagion (the propensity to behavioral and subjective imitation of somebody else's emotion). With respect to experience and EEG activity, while the participants' EEG was evaluated, their responses to a baseline sitting down with eyes closed and then lifting an arm was compared to the same behaviors after a hypnotic induction; their spontaneous men-

tation during baseline and various prompts after an induction and a suggestion to go into their “deepest” state was also measured. A between-subjects factor (level of hypnotizability) and a within subject factor (baseline or other stages of the session) both had significant effects, as did their interaction. While the experience of low hypnotizables was characterized by “normal” mentation, that of “medium” hypnotizables was centered more on vestibular and other bodily sensations, and that of “highs” was characterized by positive affect and “exceptional” mystic-like phenomena. Spectral and source location EEG analyses corroborated various patterns of brain functioning differences. Among them, there was a significant correlation between cortical activity functioning (omega complexity) and hypnotizability, and also with specific subjective experiences (imagery experiences and highly emotional and mystic-like experiences). The induction of hypnosis had a differential effect on highs and lows, whereas the former tended to have their EEG activity become more posterior, the lows exhibited the opposite effect, becoming more frontal.

**Keywords:** Parapsychology and Psychophysiology; Altered states of consciousness; Hypnosis; Brain; Electroencephalogram (EEG)

**Indexed papers:** Cardena, E., Jonsson, P., Terhune, D. B., & Marcusson-Clavertz, D. (2013). The neurophenomenology of neutral hypnosis. *Cortex*, 49(2), 375-85. doi: 10.1016/j.cortex.2012.04.001  
 Cardena, E., Lehmann, D., Faber, P., Jonsson, P., Milz, P., Pascual-Marqui, R., & Kochi, K. (2012). EEG sLORETA functional imaging during hypnotic arm levitation and voluntary arm lifting. *International Journal of Clinical and Experimental Hypnosis*, 60(1), 31-53. doi: 10.1080/00207144.2011.622184  
 Cardena, E., & Terhune, D. B. (2009). A note of caution on the Waterloo Stanford Group Scale of Hypnotic Susceptibility: A brief communication. *International Journal of Clinical and Experimental Hypnosis*, 57(2), 222-226. doi: 10.1080/00207140802665484

**Project:** 2004-152  
**Title:** Relating psi to a theory of intuition: using precognition habituation to improve ganzfeld scores  
**Duration:** 2006/09 – 2008/05

- Researcher(s): Prof. Adrian Parker, Dr. Torbjorn Fagerberg  
 Institution: Psychology Department, Gothenburg University (Sweden)
- Results: The major study concerned the subliminal priming of participants with film clips prior to their ganzfeld sessions. In total, 64 trials (32 traditional psi ganzfeld trials and 32 comparison trials with primed targets) were conducted with receiver-sender pairs taking part in a digital real time ganzfeld. Prior to the session, they viewed thematic material from all four potential film clips presented at 40 milliseconds exposures. Although there was a statistically effect showing that the imagery from the clips later reemerged as a major part of the ganzfeld imagery, this concerned the non-target clips more than as the target material. First place rankings on the target clips gave only 13.7% hits (MCE 25%) and it may well be that the methodology overloaded the participants with dynamic material. Similar, apparently reversed effects have been found in other research in subliminal perception. An analysis of the emotional content of the film clips found a highly significant effect relating to sense of awe or “numinosity” but again in the reversed direction. A further study gave support for the influence of emotional sensitivity in mediating subliminal effect in the form of precognitive habituation effects.
- Keywords: Parapsychology; Extrasensory perception (ESP); Precognition; Ganzfeld studies
- Indexed papers: Parker, A., & Sjöden, B. (2010). Do some of us habituate to future emotional events? *Journal of Parapsychology*, 74(1), 99-115.
- Project: 2004-153**  
 Title: The neural basis of attention disorder in schizophrenia  
 Duration: 2005/02 – 2007/02  
 Researcher(s): Dr. Trevor J. Crawford, Prof. Bill Deakin, Dr. Stephen Higham  
 Institution: Mental Health Research Unit (Lancaster), Neuroscience and Psychiatry Unit, Manchester (UK)

- Results:
1. A deficit in executing antisaccades is commonly observed in schizophrenia. In addition, one cognitive feature of schizophrenia is a deficit in the ability to reorient attention away from salient events in the periphery. We did not find evidence for abnormal crossmodal attention-capture, using an auditory cue. Relative to control participants, schizophrenic participants generated slower responses when attention was triggered to the other side of the display.
  2. Under standard conditions prosaccades are generated more quickly than antisaccades and with fewer errors. However with illusory line motion there was reversed effect, with more correctly directed antisaccades than prosaccades and prosaccade latencies were slower than antisaccade latencies. These results support the hypothesis that attentional reorientation is a major factor in the control of antisaccades, and a critical factor in the deficit of antisaccades in schizophrenia.
  3. Research on behavioural inhibition in schizophrenia is heavily dependent on the antisaccade task. We have developed a novel task that will enable us to characterise inhibition more precisely. This novel test has the following features: (1) eye movements are naturalistic; (2) Spatial field of inhibition is readily mapped; (3) Temporal duration of inhibition easily measured. Most importantly, the failure of inhibitory control is indexed by faster saccade responses to the critical stimulus display. Thus, in contrast to the majority of available behavioural tasks, a functional impairment in the patients is indexed by 'better/faster' performance in this group. This is important because it ensures that any abnormality is not a non-specific effect of poor task compliance, task complexity or poor motivation.
- Keywords: Psychophysiology; Cognitive processes; Attention; Brain; Mental health; Psychotic disorders

- Indexed papers:
- Crawford, T. J., Kean, M., Klein, R. M., & Hamm, J. P. (2006). The effects of illusory line motion on incongruent saccades: Implications for saccadic eye movements and visual attention. *Experimental Brain Research*, 173(3), 498-506. doi: 10.1007/s00221-006-0392-z
- Crawford, T. J., Hill, S., & Higham, S. (2005). The inhibitory effect of a recent distracter. *Vision Research*, 45(27), 3365-3378. doi: 10.1016/j.visres.2005.07.024

- Project:** 2004-155
- Title:** Creativity, schizotypy, paranormal experiences and mental health: developing a new cognitive-parapsychological paradigm for the assessment of PSI performance in the laboratory
- Duration:** 2006/06 – 2009/07
- Researcher(s):** Dr. Christine Anne Simmonds, Dr. Nicola J. Holt
- Institution:** University College Northampton (UK)
- Results:** Filter theories of psi were explored in a modified Latent Inhibition (LI) paradigm (using a sender for psi conditions) which investigated the relationships between creativity, schizotypy, paranormal experiences, mental health and the processing of irrelevant stimuli. Study 1 found a significant LI effect but no psi effect. Creativity, positive schizotypy and belief in the paranormal ('transliminality') did not modulate the LI effect as hypothesised. However, meeting hypotheses, a significant psi-LI-like effect was obtained with highly transliminal participants. Study 2 explored the role of task complexity in a female only sample. The LI effect was present with an ordinary but not with a high masking task load. For the psi condition there were higher learning scores in both the ordinary and complex masking task conditions (independently significant for ordinary load only). Study 3 compared learning across different types of pre-exposure: no-pre-exposure (NPE); pre-exposure of perceptual stimulus (PE); pre-exposure of both perceptual and psi stimulus (PE+ $\psi$ PE); pre-exposure of psi-stimulus ( $\psi$ PE) and micro-exposure of perceptual stimulus (microPE). Learning Scores for MicroPE only differed significantly from NPE. All forms of pre-exposure slowed rather than hastened learning. Only learning in the PE and PE+ $\psi$ PE correlated significantly with personality measures, and high scorers were slower in PE. A cluster analysis supported the construct of the Happy Schizotype, who believes in the paranormal, is mentally healthy and creative. This profile (only) also appeared to show a significant psi effect.
- Keywords:** Parapsychology; Anomalous cognition/experiences; Paranormal belief; Transliminality; Cognitive processes; Attention; Consciousness; Assessment tools
- Indexed papers:** N/A

- Project:** 2004-163
- Title:** Effects of different biofeedback training procedures on quantitative electroencephalographic parameters of healthy subjects
- Duration:** 2005/01 – 2006/04
- Researcher(s):** Dr. Martijn Arns, Dr. Wytze van der Zwaag, Dr. Erica Heesen, Dr. Rien Breteler
- Institution:** Brain Resource Company B.V., Nijmegen (The Netherlands)
- Results:** The results show that GSR biofeedback, as compared to SCP Neurofeedback, is easier to learn which confirms the findings from Nagai et al. (2004). Furthermore, SCP-trained subjects show the biggest SCP differentiation as compared to GSR-trained people and GSRtrained people show the biggest GSR differentiation as compared to the SCP trained, which confirms that the primary learning effect can be found in the modality being trained; e.g. if subjects are trained on their SCP, then the differentiation of the SCP is also biggest and increases with training time. No clear differentiation effects were found for the 'other' modality suggesting that training on GSR does not directly affect or modulate SCP's and vice versa as measured with this differentiation method.
- No consistent differences were found in the pre- and post QEEG's for both groups. This is in agreement with the study from Kotchouby et al. (1999) who also failed to report consistent changes in the QEEG after SCP Neurofeedback.
- The individual correlation analysis revealed no correlations for the GSR Biofeedback group. However, for the SCP feedback group significant correlations were found for both the positivity and negativity conditions. The significant correlations seem to suggest that successful SCP trials are associated with increased arousal. These correlations are probably not related to a functional relation between SCP regulation and GSR regulation – which was the hypothesis to be investigated in this study. In such a case SCP positivity would be related to increased arousal, whereas SCP negativity would be related to decreased arousal or vice versa. Our results suggest increased GSR arousal being related to both training conditions, suggesting a non-specific arousal effect related to degree of success.

Keywords: Psychophysiology; Cognitive processes; Learning

Indexed papers: Spronk, D., Kleinnijenhuis, M., Luitelaar, G., & Arns, M. (2010). Discrete-Trial SCP and GSR training and the interrelationship between central and peripheral arousal. *Journal of Neurotherapy*, *14*(3), 217-228. doi: 10.1080/10874208.2010.501501

Kleinnijenhuis, M., Arns, M., Spronk, D., & Breteler, R. (2007). Comparison of discrete-trial based SMR and SCP training and the interrelationship between SCP and SMR networks: Implications for brain-computer interfaces and neurofeedback. *Journal of Neurotherapy*, *11*(4), 19-35. doi: 10.1080/10874200802162808

**Project:** 2004-168

Title: Electrocortical studies of the hippocampal-parahippocampal (HP) structures in humans: Foramen ovale (FO) electrodes, as a research tool in human cognition and epilepsy

Duration: 2005/02 – 2007/07

Researcher(s): Prof. Péter Halász, Dr. Zsófia Clemens, Dr. Csaba Borbély, Dr. Dániel Fabó

Institution: National Institute of Psychiatry and Neurology, Department of Neurology, Epilepsy Center, Budapest (Hungary)

Results: Using the opportunity to record parahippocampal activity with foramen ovale electrodes in epilepsy patients we examined high-frequency activity and its relation to NREM sleep-slow oscillations and sleep spindles.

Parahippocampal high-frequency activity was organized into bursts which were consistently associated with interictal epileptic spikes. Ripple density was higher during Non-REM than REM sleep ( $p < 0.001$ ). Ripple activity distinctly decreased time-locked to slow oscillation negative half-waves in the three patients without temporal structural alterations ( $p < 0.001$ ), whereas in the four patients with severe mesiotemporal structural alterations this coupling was obscure. Generally, in the patients ripple activity was increased before spindle peaks and distinctly decreased after the peak ( $p < 0.001$ ).

Coordinated occurrence of hippocampal ripples, sleep spindles and slow oscillations have already been reported in animals yet

the present results provide first evidence for such a temporal coupling in humans. Our findings are consistent with the notion of a hippocampo-to-neocortical information transfer during sleep that is linked to coordinate ripple and spindle activity, and that in the intact temporal lobe is synchronized to cortical slow oscillations.

Keywords: Psychophysiology; Brain; Diseases/Injuries; Epilepsy; Sleep and dreams

Indexed papers: Clemens, Z., Mölle, M., Eross, L., Barsi, P., Halász, P., & Born, J. (2007). Temporal coupling of parahippocampal ripples, sleep spindles and slow oscillations in humans. *Brain*, *130*, 2868-2878. doi: 10.1093/brain/awm146

Clemens, Z., Fabó, D., & Halász, P. (2006). Twenty-four hours retention of visuospatial memory correlates with the number of parietal sleep spindles. *Neuroscience Letters*, *403*(1-2), 52-56. doi: 10.1016/j.neulet.2006.04.035

### **2006/07 Projects**

**Project:** 2006-01  
**Title:** Automated testing for telepathy using emails and telephone calls  
**Duration:** 2007/10 – 2010/06  
**Researcher(s):** Prof. Rupert Sheldrake, Ms. Pamela Smart, Dr. David Luke  
**Institution:** Perrot-Warrick Project, London (UK)

**Results:** In previous research, we found that many people seem to know who is calling or sending an email or SMS message. Hit rates were above chance in randomized tests. In this project, we carried out automated tests using emails or telephone calls. Subjects registered online, giving their name, sex and age, the names of three contacts, people they knew well, and email addresses or mobile telephone numbers of all participants. The computer then selected one of the contacts at random and sent her a message by email or SMS asking her to contact the



subject through an email address or telephone number provided on the message. After she had responded, the system contacted the subject asking him to guess from which of his three contacts he was about to receive a message. After the guess was made, the email message was delivered or the telephone call connected. Subjects thus received immediate feedback. After a random time delay this process was repeated until 6 trials had been completed.

In the email telepathy test, in over 400 trials, the hit rate was 41.8%, significantly above the 33.3% level expected by chance ( $p = .0001$ ). In the telephone telepathy test, in more than 1,900 trials, the hit rate was 43.0%, very significantly above the as 33.3% expected by chance ( $p < 1 \times 10^{-9}$ ). There was no significant difference between the hit rates with male and female subjects. Both these experiments were also carried out in a precognitive form, in which the sender of the message was selected at random only after the subject had made his guess. In the precognitive email experiment the results were at chance level. In the precognitive telephone experiment the hit rate was 33.8%, only slightly above chance (with 548 trials,  $p = .03$ ).

**Keywords:** Parapsychology; Extrasensory perception (ESP); Telepathy; Precognition

**Indexed papers:** Sheldrake, R., & Avraamides, L. (2009). An automated test for telepathy in connection with emails. *Journal of Scientific Exploration*, 23(1), 29-36.

Sheldrake, R., Avraamides, L., & Novak, M. (2009). Sensing the sending of SMS messages: An automated test. *Explore: The Journal of Science and Healing*, 5(5), 272-276. doi: 10.1016/j.explore.2009.06.004

Sheldrake, R., & Beeharee, A. (2009). A rapid online telepathy test. *Psychological Reports*, 104(3), 957-970. doi: 10.2466/pr0.104.3.957-970

**Project:** 2006-07

**Title:** Further investigations of the I Ching: Reliability and replication studies

**Duration:** 2007/03 – 2008/05

**Researcher(s):** Dr. Lance Storm

**Institution:** Anomalous Psychology Research Unit, Dep. of Psychology, University of Adelaide (Australia)

**Results:** The I Ching is an ancient Chinese system of divination. The user throws three coins, six times, to generate one of 64 possible six-line symbols or hexagrams, and then consults the associated divinatory reading. It is conjectured that the I Ching process is underscored by a paranormal process the cause of which is likely to be the individual user. Past research has produced mixed results—in five studies, effects have ranged from chance, to significantly above chance, but no effect significantly below chance has been found. In a study by L. Storm (2006) it was theorised that hexagram targeting may accord with the participant's time perspective—a present time perspective (PTP) refers to immediate events; a future time perspective (FTP) refers to what fate has in store.

PTP and FTP types are determined from scores on the Time Perspective Inventory (Zimbardo & Boyd, 1999). In Storm's (2006) study and the present study it was hypothesised that PTP types prefer first-hexagrams, and FTP types prefer second hexagrams. Storm (2006) produced results that were in the directions hypothesized. In this replication study ( $N = 150$ ), hit rates for PTP types on first-hexagram hitting (30%) did exceed hit rates for FTP types (25%) as hypothesised, although the difference was not significant. The hit rate for FTP types on second-hexagram hitting (22%) did not exceed the hit rate for PTP types (27%). Hit rates were above chance on first-hexagram hitting (25.3%), but below chance on second-hexagram hitting (24.6%). Neither effect was significant. First-hexagram hitters rated their readings significantly higher (73%) on meaningfulness than first-hexagram missers (65%),  $p = .04$ . This effect was interpreted as fulfilling a theoretical condition that defines "meaningful coincidence" or synchronicity (Jung, 1960). A significant sheep-goat effect was found. A marginally significant aggregated hexagram hit rate of 27% across the six studies was also found ( $p = .072$ ). Two judges rated the 64 descriptor pairs of the Hexagram Descriptor Form.

Mean descriptor-pair ratings ranged between 60% and 82%. The experimental I Ching method was tested against three control methods. For the control methods, only 4.5% of the

- results were significant or marginally significant which could all be attributed to chance, but 14% of tests using the experimental method were significant or marginally significant effects.
- Keywords:** Parapsychology; Extrasensory perception (ESP); Precognition; Psychokinesis (PK)
- Indexed papers:** N/A
- Project:** **2006-12**
- Title:** The impact of mindfulness meditation on visuomotor performance and awareness of action: an EEG study of short- and long-term meditators
- Duration:** 2007/05 – 2009/11
- Researcher(s):** Prof. Stefan Schmidt, Dr. José Raul Naranjo
- Institution:** Institute of Environmental Medicine and Hospital Epidemiology, University Hospital Freiburg (Germany)
- Results:** **Background:**  
 Attribution of agency involves the ability to distinguish our own actions and their sensory consequences which are self-generated from those generated by external agents. There are several pathological cases in which motor awareness is dramatically impaired. On the other hand, awareness-enhancement practices like tai-chi and yoga are shown to improve perceptual-motor awareness. Meditation is known to have positive impacts on perception, attention and consciousness itself, but it is still unclear how meditation changes sensorimotor integration processes and awareness of action. The aim of this study was to investigate how visuomotor performance and self-agency is modulated by mindfulness meditation. This was done by studying meditators' performance during a conflicting reaching task, where the congruency between actions and their consequences is gradually altered. This task was presented to novices in meditation before and after an intensive 8 weeks mindfulness meditation training (MBSR). The data of this sample was compared to a group of long-term meditators and a group of healthy non-meditators.

**Results:**

Mindfulness resulted in a significant shift in attribution of self-agency towards the self in both groups. Novices in mindfulness demonstrated a strongly increased sensitivity to detect external influences in the task after the MBSR intervention. Both mindfulness groups demonstrated a speed-accuracy trade-off in comparison to their respective controls. This resulted in slower and more accurate movements.

**Conclusions:**

Our results suggest that mindfulness meditation practice is associated with slower body movements which in turn may lead to an increase in monitoring of body states and optimized re-adjustment of movement trajectory, and consequently to better motor performance. This extended conscious monitoring of perceptual and motor cues may explain the reported shift in the attribution of self-agency by an availability of more self-related cues in the memory upon evaluation of the trial. The reduction of detection threshold in the MBSR group is also likely due to the monitoring of these processes. Our findings confirmed our assumptions about the positive effect of mindfulness on perceptual-motor integration processes.

**Keywords:** Psychophysiology; Movement; Altered states of consciousness; Meditation; Self; Body awareness; Electroencephalogram (EEG)

**Indexed papers:** Naranjo, J. R., & Schmidt, S. (2012). Is it me or not me? Modulation of perceptual-motor awareness and visuomotor performance by mindfulness meditation. *BMC Neuroscience*, 13: 88. doi: 10.1186/1471-2202-13-88

**Project: 2006-13**

**Title:** Vinculação em bebés institucionalizados e competência narrativa dos seus principais cuidadores: Estudo sobre a actividade cardíaca do bebé na interacção com a figura de cuidados através do BioBeAMS 2.0

**Duration:** 2007/04 – 2010/05

**Researcher(s):** Prof. Isabel Maria Costa Soares, Prof. João Paulo Silva Cunha, Prof. Margarida Isabel Rangel Santos Henriques, Prof. Carla Cristina Esteves Martins, Dr. Pedro Miguel Brito da Silva Dias

- Institution: Centro de Investigação em Psicologia (CIPSi), Universidade do Minho, Braga (Portugal)
- Results: Children's development level and temperament: Most children presented cognitive, language and motor development level below the 50th percentile; over 58% of the children were perceived by the caregivers as displaying difficult temperament. Attachment, temperament, length of institutionalization, and exposure to risk factors: 31% of the children were classified as disorganized; over 45% displayed indiscriminate attachment behavior, which was positively correlated to the caregivers' perception of this kind of disturbed attachment and to the exposure to risk factors, and negatively correlated to the length of institutionalization. Quality of the caregivers' narratives and children's temperament, development level, and attachment quality: Caregivers had difficulties in producing narratives in the different tasks, particularly in the caregiving interaction (41.4% of the caregivers failed to even producing a narrative). Narrative quality was positively correlated to children's language development and negatively correlated to motor development. Attachment security was correlated to the presence of autobiographical narrative, but no correlation was found with the narratives' quality. Children's cardiac activity during the Strange Situation Procedure (SSP) and during caregivers' narrative tasks: Children's heart rate (HR) was higher during the SSP episodes of higher emotional stress. In comparison to the SSP, lower levels of HR were observed during the narrative tasks. Insecure and disorganized children displayed lower HR than secure children during several SSP episodes. No relations were found between caregivers' narrative quality and children's HR during the SSP and the narrative interaction tasks.
- Keywords: Psychophysiology; Attachment; Developmental psychology
- Indexed papers: Soares, I., Belsky, J., Oliveira, P., Silva, J., Marques, J., Baptista, J., & Martins, C. (2014). Does early family risk and current quality of care predict indiscriminate behavior in institutionalized Portuguese children? *Attachment and Human Development*. doi: 10.1080/14616734.2013.869237 [Epub ahead of print]  
Martins, C., Belsky, J., Marques, S., Baptista, J., Silva, J., Mes-

quita, A., Castro, F., Sousa, N., & Soares, I. (2013). Diverse physical growth trajectories in institutionalized Portuguese children below age 3: Relation to child, family, and institutional factors. *Journal of Pediatric Psychology, 38*(4), 438-448. doi: 10.1093/jpepsy/jss129

Soares, I., Belsky, J., Mesquita, A. R., Osório, A., & Sampaio, A. (2013). Why do only some institutionalized children become indiscriminately friendly? Insights from the Study of Williams Syndrome. *Child Development Perspectives, 7*(3), 187-192. doi: 10.1111/cdep.12036

**Project: 2006-23**

Title: Massagem ao bebé prematuro em cuidados intensivos neonatais: Efeito no funcionamento psicofisiológico dos bebés e pais

Duration: 2007/07 – 2010/11

Researcher(s): Prof. Bárbara Fernandes de Carvalho Figueiredo, Dr. Clara Sofia Domingues Paz Dias, Dr. Maria Alice Peixoto Freitas, Dr. Maria Agostinha Costa Andrade, Dr. Maria José Faria Novais Rebelo, Dr. Susana Nunes da Silva, Dr. Maria de Lurdes Alves Senra, Dr. Maria José Carvalho Ferreira, Dr. César Bessa Pinheiro Teixeira, Dr. Mariana Pinto Basto Teixeira, Dr. Diana Patrícia Pires Pinto, Dr. Mariana Bianchi de Aguiar, Dr. Ana Guedes, Dr. José Pombeiro

Institution: Cipsi, Universidade do Minho, Braga (Portugal)

Results: This study aimed to evaluate an intervention program with parents of premature infants who were hospitalized at a Neonatal Intensive Care Unit. The intervention program included daily tactile-kinesthetic stimulation, separately provided by the mother and the father to the infant during the hospitalization period and at home for 12 months. Selected outcome indicators for this evaluation were the infant's health and well-being (increasing weight and body mass index and reduction of hospitalization time) and psychomotor development. The reduction of the parents' psychological distress, as well as the promotion of the quality of their involvement, care, and interaction provided to the infant were also goals and positive outcomes of this intervention program.

Keywords: Psychophysiology; Parenthood; Conjuality; Mental health; Intervention

Indexed papers: N/A

**Project: 2006-30**

Title: Does calcium leak in the brain cause mental retardation?

Duration: 2007/01 – 2009/12

Researcher(s): Prof. Xander H.T. Wehrens, Dr. Subeena Sood, Dr. Priyanka Desai

Institution: Baylor College of Medicine, Texas (USA)

Results: Some patients with inherited mutations in the ryanodine receptor (RyR2) only develop cardiac arrhythmias, whereas others also develop mental retardation. We tested the hypothesis that mutation R176Q in RyR2 – identified in patients with arrhythmias – also exhibit defects in learning and memory. First, the passive avoidance test was performed for contextual and emotional memory. The R176Q/+ mutant mice did not show decreased latencies to enter the dark side in the passive avoidance test. Second, general anxiety evaluated with the passive avoidance task was normal. We conducted an open field test as a control experiment, to measure anxiety and locomotor activity. Wildtype and R176Q/+ mice behaved similarly in the open field test. The light-dark test revealed that R176Q/+ mice did not demonstrate altered exploratory behavior. Moreover, the R176Q/+ mice did not show altered exploratory behavior. Third, the Morris Water Maze was performed to test for learning and memory. There were no significant differences between WT and R176Q/+ mice. Moreover, there were no significant differences in the time to reaching the visible platform comparing both groups. The Rotarod test was performed a control for the Morris water maze test. Our results show that R176Q/+ mice have similar learning performance to WT mice on the rotarod. In conclusion, our results show that knocking mice with the R176Q/+ mutation, found in patients with cardiac arrhythmias, exhibit normal learning and memory abilities. These findings suggest that mutations of different residues within RyR2 may either cause cardiac or neuronal defects.

Keywords: Psychophysiology; Childhood and adolescent disorders; Mental retardation; Diseases/Injuries; Chromosomal abnormalities

Indexed papers: N/A

**Project: 2006-31**

Title: The use of a biological marker, 5-HT<sub>2C</sub> genotype, as a predictor of motivation, adherence and weight loss in participants of an obesity intervention programme

Duration: 2007/04 – 2010/09

Researcher(s): Dr. Caroline Dalton, Dr. Jeff Breckon, Dr. Robert Copeland, Dr. Brian Hall, Prof. Gavin Reynolds

Institution: Biomedical Research Centre and Centre for Sport and Exercise Science, Faculty of Health and Wellbeing, Sheffield (UK)

Results: The overall aim of this study was to investigate the influence of serotonin and dopamine receptor gene polymorphisms on various parameters relevant to the successful participation of obese people taking part in a diet and exercise obesity intervention. We demonstrated that serotonin receptor gene genotype has a significant influence on perception of hunger. We also showed that dopamine receptor gene polymorphisms significantly influence the dropout rate from an obesity intervention study, and suggest that this is due to the influence of these polymorphisms both on motivation to exercise and on restrained eating behaviours. Finally we demonstrated the efficacy of motivational interviewing in an obesity intervention programme and have shown that motivational interviews influence the relationship between measures of motivation or eating behaviours and weight loss measured by BMI change. These novel findings indicate that serotonin plays a key role in determining appetite. They also indicate that extent of dopamine signalling may influence an individual's motivation to engage in weight-loss programmes. Further studies are required to confirm these findings and investigate the underlying mechanisms involved.



Keywords: Psychophysiology; Diseases/Injuries; Obesity; Motivation; Intervention

Indexed papers: N/A

**Project: 2006-32**

Title: A review and analysis of conceptual frameworks in accounts of animal psi

Duration: 2007/09 – 2009/10

Researcher(s): Dr. Diane Dutton, Dr. Carl Williams

Institution: Liverpool Hope University, Liverpool (UK)

Results: A critical literature review of animal psi research and theory highlighted the central importance of the human-animal relationship, and its role in structuring both theoretical and methodological issues, including assumptions about the 'normal' perceptual and cognitive abilities of other species, the impact of the human-animal relationship on experimenter psi and the evidential value of spontaneous cases of psi. The evidence suggests that animal psi may function as an expression of relationship or 'resonance' between individuals, and indicates the necessity for embracing more relational models of psi. A conceptual metaphor analysis of academic and lay accounts of animal psi identified a number of assumptions, orienting and generative metaphors, revealing a preference within academic accounts for evidence-oriented research emphasising the natural behaviour of animals, and a search for ever more exact measurement of psi. In contrast to the more modern experimental parapsychological studies, older and lay theoretical accounts rely on quasi-spiritual concepts to account for ostensible ANP-SI and frame these behaviours in a much more complex way. By contrasting these two sets of conceptual models, their underlying theoretical and philosophical assumptions become clearer, highlighting their epistemological context and the role of debate and rhetoric in their construction.

Keywords: Parapsychology; Animal psi; Animal & Human Psi

Indexed papers: Dutton, D., & Williams, C. (2009). Clever beasts and faithful pets: A critical review of animal psi research. *Journal of Parapsychology*, 73(1), 43-68.

**Project: 2006-35**

Title: Development and genetic correlates of brain function in children at high- and low-risk for developing schizophrenia

Duration: 2008/01 – 2011/07

Researcher(s): Dr. Kristin Robyn Laurens, Prof. Sheilagh Hodgins, Prof. Robin M. Murray, Prof. Eric A. Taylor, Prof. David Collier, Prof. Sir Michael Rutter

Institution: Department of Forensic Mental Health Science, Institute of Psychiatry, King's College London (UK)

Results: We have developed a feasible and cost-effective method of identifying children who may be at high-risk for the development of schizophrenia spectrum disorders because they present multiple putative antecedents of schizophrenia. Our method involves screening community samples of children aged 9-12 years, using child and caregiver questionnaires, to identify children who experience the antecedents, including (i) psychotic-like experiences (PLEs), (ii) a social, emotional, or behavioural problem, and (iii) a delay/abnormality in speech and/or motor development. We have screened 8,000 children and 1,500 of their caregivers, with 9.4% of children (13.4% boys, 5.8% girls) presenting the triad of antecedents. Only longitudinal follow-up of the children can establish the degree to which experiencing these antecedents predicts later schizophrenia, but we have established that these children are characterised by several features that are observed in adults with schizophrenia: (1) the prevalence of antecedents is elevated among African-Caribbean and Black African individuals in the UK, as is the prevalence of schizophrenia; (2) preliminary data indicate that the children present a reduction in the amplitude of the error-related negativity event-related potential component, generated in the anterior cingulate, that indexes internal monitoring of behaviour; (3) the children present impaired intellectual and cognitive function (including working memory, executive

function, and verbal memory); and (4) the children present involuntary dyskinetic movement abnormalities. We are currently following the development of the children longitudinally in order to establish how strongly and specifically the antecedent triad predicts schizophrenia.

**Keywords:** Psychophysiology; Developmental psychology; Assessment tools; Mental health; Psychotic disorders

**Indexed papers:** Dickson, H., Cullen, A. E., Reichenberg, A., Hodgins, S., Campbell, D. D., Morris, R. G., & Laurens, K. R. (2014). Cognitive impairment among children at-risk for schizophrenia. *Journal of Psychiatric Research*, 50, 92-99. doi: 10.1016/j.jpsychires.2013.12.003

Cullen, A. E., de Brito, S. A., Gregory, S., Murray, R., Williams, S., Hodgins, S., & Laurens, K. R. (2013). Temporal lobe volume abnormalities precede the prodrome: A study of children presenting antecedents of schizophrenia. *Schizophrenia Bulletin*, 39(6), 1318-1327. doi:10.1093/schbul/sbs128

Matheson, S. L., Vijayan, H., Dickson, H., Shepherd, A. M., Carr, V. J., & Laurens, K. R. (2013). Systematic meta-analysis of childhood social withdrawal in schizophrenia, and comparison with data from at-risk children aged 9–14 years. *Journal of Psychiatric Research*, 47(8), 1061-1068. doi:10.1016/j.jpsychires.2013.03.013

**Project:** **2006-36**

**Title:** The psychophysiology of neurological abnormalities in first episode psychosis and in healthy individuals - A study using multimodal brain imaging

**Duration:** 2007/03 – 2010/09

**Researcher(s):** Dr. Paola Dazzan, Prof. Philip McGuire, Dr. Carmine Pariante, Dr. Marta Di Forti, Dr. Julia Lappin, Dr. Valeria Mondelli

**Institution:** Division of Psychological Medicine, Institute of Psychiatry, London (UK)

**Results:** This study evaluated 54 first psychotic episode patients and 46 healthy controls, using multimodal imaging (structural and functional), to identify the neuroanatomical and functional correlates of neurological performance. Patients showed more neurological signs than controls. There

were no significant differences in grey and white matter volumes between patients and controls, although patients had larger, at trend-level, CSF volumes. Global brain volumes were not correlated with performance at any of the neurological subscales.

Preliminary analysis of white matter tracts in patients showed that a worse performance in Primary signs, reflecting more “hard” neurological abnormalities, was associated with disruption of tracts integrity, and specifically with: increased Fractional Anisotropy (FA) of the Corpus Callosum, both Uncinate fasciculi, right Inferior Fronto-Occipital fasciculus (IFOF); left Inferior Longitudinal fasciculus (ILF). A worse performance on Motor Sequencing was associated with a shorter length of the right IFOF, and a worse performance in Sensory Integration was correlated with a reduction in right Mean Diffusivity of this fasciculus.

An Audio-Visual task was successfully developed to investigate sensory integration during functional MRI. Patients had longer reaction time, and gave more incorrect answers, and had larger frontal lobe activation than healthy controls, particularly so if they had a poorer response to treatment.

In conclusion, morpho-anatomical information alone are not sufficient to define the substrate of neurological dysfunction in psychosis, which is likely to reflect an altered structural, and possibly functional connectivity.

**Keywords:** Psychophysiology; Brain; Mental health; Psychotic disorders; Movement; Audition; Vision; Functional magnetic resonance imaging (fMRI)

**Indexed papers:** Belvederi Murri, M., Pariante, C., Dazzan, P., Hepgul, N., Papadopoulos, A., Zunszain, P., Di Forti, M., Murray, R., & Mondelli, V. (2011). Hypothalamic-pituitary-adrenal axis and clinical symptoms in first-episode psychosis. *Psychoneuroendocrinology*, 37(5), 629-644. doi: 10.1016/j.psyneuen.2011.08.013

Hepgul, N., Pariante, C., Dipasquale, S., Di Forti, M., Taylor, H., Marques, T. R., . . . Mondelli, V. (2012). Childhood maltreatment is associated with increased body mass index and increased C-reactive protein levels in first-episode psychosis patients. *Psychological Medicine*, 42(9), 1893-1901. doi: 10.1017/S0033291711002947

Mondelli, V., Cattaneo, A., Belvederi Murri, M., Di Forti, M., Handley, R., ... Pariante, C. (2011). Stress and inflammation reduce

brain-derived neurotrophic factor expression in first-episode psychosis: a pathway to smaller hippocampal volume. *Journal of Clinical Psychiatry*, 72(12), 1677-1684. doi: 10.4088/JCP.10m06745

- Project:** **2006-44**
- Title:** Brain electric activity in meditation: Extension of earlier work and hypothesis testing
- Duration:** 2007/10 – 2010/01
- Researcher(s):** Prof. Dietrich Lehmann, Mr. Shisei Tei, Dr. Pascal Faber, Prof. Hiraoki Kumano, Dr. Lorena Gianotti, Dr. Roberto Pascual-Marqui
- Institution:** The KEY Institute for Brain-Mind Research, University Hospital of Psychiatry, Zurich (Switzerland)
- Results:** Brain functional connectivity (FC) (computed via EEG LORETA cortical source modeling) in experienced meditators (13 Tibetan Buddhists, 15 QiGong, 14 Sahaja Yoga, 14 Ananda Marga Yoga, 15 Zen) was lower (no increases at all!) during deep meditation than during rest in all EEG frequencies (1.5 – 45 Hz) and all 5 meditation traditions. Into and out of meditation showed different FC topography. These results suggest that during meditation interaction between self-process functions is minimized, and constraints on the self process by other processes is minimized, resulting in experienced non-involvement, detachment and letting go, and all oneness and dissolution of ego borders. - FC during breath counting (as used in meditation, but given as task without referring to meditation) in meditation-naïve participants showed reduced FC in breath counting compared to rest, similar to the findings in experienced meditators.  
- During rest, EEG LORETA cortical source activity in Qi-gong meditators versus controls showed inhibition of frontal appraisal areas (increased EEG delta), while posterior areas (detection / integration of internal /external sensory information) were activated (decreased EEG delta). Apparently, neuroplasticity effects of long-term meditation practice (increased awareness and detachment) are carried over into non-meditating states.

- Qigong meditators doing Thinking of Nothing (TN) and Qigong (QG) had stronger EEG alpha-2 frequency during QG than TN in a single right parietal cluster of LORETA sources, and stronger beta-1 frequency in TN than QG in a single left prefrontal cluster, suggesting self-reference, attention, input-centered processing in QG, and control-centered processing in TN.

**Keywords:** Psychophysiology; Altered states of consciousness; Meditation; Brain; Electroencephalogram (EEG)

**Indexed papers:** Faber, P., Lehmann, D., Tei, S., Tsujiuchi, T., Kumano, H., Pascual-Marqui, R., & Kochi, K. (2012). EEG source imaging during two Qigong meditations. *Cognitive Processing*, 13(3), 255-265. doi: 10.1007/s10339-012-0441-4

Lehmann, D., Faber, P., Tei, S., Pascual-Marqui, R., Milz, P., & Kochi, K. (2012). Reduced functional connectivity between cortical sources in five meditation traditions detected with lagged coherence using EEG tomography. *NeuroImage*, 60(2), 1574-1586. doi: 10.1016/j.neuroimage.2012.01.042

Tei, S., Faber, P., Lehmann, D., Tsujiuchi, T., Kumano, H., Pascual-Marqui, R., Gianotti, L., & Kochi, K. (2009). Meditators and non-meditators: EEG source imaging during resting. *Brain Topography*, 22(3), 158-165. doi: 10.1007/s10548-009-0107-4

**Project:** 2006-45

**Title:** Psychophysiological studies of memory for imagined and perceived events: the effects of schizotypy

**Duration:** 2007/04 – 2008/05

**Researcher(s):** Dr. Jane Herron, Dr. Lisa Evans

**Institution:** Cardiff University, School of Psychology, Cardiff, Wales (UK)

**Results:** Contrary to expectations, schizotypy scores did not appear to influence memory accuracy or reaction time in either the location-based source task or the reality monitoring task. Differences were observed, however, in the event-related potential old/new effects as a function of schizotypy throughout the recording epoch (0-1900 ms post-stimulus). These differences were primarily evident when items had been presented in the auditory modality at study, and took the form of smaller old/

new effects for the high schizotypes than for the low schizotypes. Early inspection of the ERP data also indicates that the scalp distributions of the old/new effects differ between the groups, suggesting that the neural generators of the old/new effects were at least partially non overlapping between the two groups. In addition, it was observed that the modulating effect of retrieval task-type upon the old/new effects also differed to some extent between the two groups. For example, low schizotypes showed larger old/new effects for the location-based source task than for the reality monitoring task between 800-1200 ms, whereas the reverse was true for the high schizotypes. In addition to these primary findings, our large data set also allowed us to observe other interactions of interest to the memory field in general; between 800-1900 ms, we observed that the modality of study items interacted with retrieval task type such that the old/new effects elicited during these epochs were modulated by study modality during the location-based source monitoring task but not during the reality monitoring task.

Keywords: Psychophysiology; Cognitive processes; Memory; Mental health

Indexed papers: N/A

**Project:** 2006-49

Title: Exploring extrasensory perception under hypnosis stimulation: Personality, imagery, creativity dimension using emotional/neutral targets and relax-tension/hypnosis condition

Duration: 2007/02 – 2009/01

Researcher(s): Dr. Alejandro Enrique Parra, Dr. Juan Carlos Argibay, Dr. Sergio Matteucci

Institution: Instituto de Psicología Paranormal, Buenos Aires (Argentina)

Results: We conducted two trials of a free-response ESP test. The aim was to determine if two groups, 'low'- and 'high'-scorers on a measure of hypnotic susceptibility, would score differently on a psi-hitting task. We used the Harvard Group Scale of Hypnotic Susceptibility which assesses the hypnotisability of sub-

jects when tested in groups. The sample ( $N = 101$  psi-believing participants; 69 females and 32 males) was split into 'High HS' ( $n = 20$ ) and 'Low HS' groups ( $n = 81$ ) based on HS scores. There was a significant difference between the two groups on Hypnotic Susceptibility and psi scores (i.e., number of hits),  $t_{(99)} = 2.31, p = .012$ . A second study was carried out. A number of papers have investigated the idea of rational versus intuitive thinking and how this might relate to paranormal beliefs. Those who possess both intuitive and rational thinking styles are more likely to report paranormal experiences and subjective paranormal ability than those who express either intuitive or rational thinking.

The purpose of the present study was to investigate the differences between psychic claimants ( $N = 49$ ) and non-psychic claimants ( $N = 45$ ) on such personality factors as Global Constructive Thinking, Emotional Coping, Behavioural Coping, and Esoteric Thinking. The sample consisted of 94 participants, all of whom believed in psi. Participants completed the Constructive Thinking Inventory and the Anomalous Experiences Inventory. The psychic claimants group had significantly higher scores on 12 out of 23 factors/facets which could not all be explained by chance. Compared to non-psychic claimants, the psychic claimants tend to have more positive attitudes; their thinking is action-oriented; they are good behavioural copers; they think in ways that promote effective action; and they are more accepting of others. At the same time, they are more rigid in their thinking than non-psychic claimants.

Keywords: Parapsychology; Altered states of consciousness; Hypnosis; Extrasensory perception (ESP); Clairvoyance; Personality factors

Indexed papers: N/A

**Project:** 2006-51  
**Title:** Hallucination Experience and PSI: A psychological, psychopathological, psychophysiological and transcultural approach  
**Duration:** 2007/02 – 2009/01  
**Researcher(s):** Dr. Alejandro Enrique Parra, Dr. Luis Santiago Espinoza Paul



- Institution: Universidad Abierta Interamericana, Facultad de Psicología, Buenos Aires (Argentina)
- Results: The purpose of the present study is to test whether hallucinatory experiences respond to the dimensionality principle and whether they occur in non-psychotic disorders. Six hundred fifty six undergraduate students, 76% females and 24% males (age range 17-57), completed seven scales, such as the Hallucination Experiences Scale, Paranormal Experiences Questionnaire, Creative Experiences Questionnaire, Tellegen Absorption Scale, Dissociative Experiences Scale, Schizotypal Personality Questionnaire, and Eysenck Personality Inventory. Data for persons seeing apparitions (and having other experiences) were compared with data for those who did not. Experiencers scored higher on absorption ( $z = 6.06$ ), dissociation ( $z = 4.65$ ), fantasy proneness ( $z = 4.76$ ) and cognitive perceptual schizotypy ( $z = 8.21$ ) than non experiencers. Twenty-four (80%) out of 30 correlations were also significant. Apparitional and apparition-like experiences are related to higher levels of reports of absorption, dissociation and imaginative fantasy experiences. Such findings suggest that visions of ghosts may be related to cognitive processes involving fantasy and cognitive perceptual schizotypy proneness, which are correlated with each other. The results showed a higher level of cognitive-perceptual, schizotypy, absorption, dissociation, fantasy and hallucination proneness, and visual imagery in experiencers than in non-experiencers and confirm previous studies. The findings suggest that especially cognitive-perceptual aspects of schizotypy, such as disturbances in sense of self, certainty of self, and self-awareness, are essential features of persons who had paranormal experiencers.
- Keywords: Parapsychology; Altered states of consciousness; Hallucinations; Personality factors; Anomalous cognition/experiences
- Indexed papers: Parra, A., & Espinoza Paul, L. (2010). Comparación entre la esquizotipia positiva y negativa con la intensidad de la espiritualidad y las experiencias paranormales en población no-clínica. *Revista Argentina de Clínica Psicológica*, 19(2), 163-172.  
Parra, A. (2009). Testeando el modelo disociacional de las experiencias alucinatorias en individuos saludables: Relación con la per-

sonalidad y la propensidad a la fantasía. *Revista Latinoamericana de Psicología*, 41(3), 571-586

Parra, A. (2008). Efectos de las experiencias espirituales/paranormales en la vida de las personas y su bienestar psicológico. *Revista Argentina de Clínica Psicológica*, 17(3), 233-242.

**Project: 2006-54**

**Title:** Heterogeneity in high hypnotic suggestibility and its implications for the study of anomalous experiences

**Duration:** 2007/09 – 2010/10

**Researcher(s):** Dr. Devin Blair Terhune, Prof. Etzel Cardeña

**Institution:** Department of Psychology, Lund University, Lund (Sweden)

**Results:** The goal of this project was to examine whether there are discrete subtypes of highly suggestible individuals and to explore the relevance of these subtypes for the occurrence and expression of anomalous perceptual experiences. We conducted a series of studies to test predictions derived from typological models that assert that highly suggestible individuals are comprised of dissociative and imagery/fantasy subtypes who experience hypnosis and hypnotic suggestions through different mechanisms. These subtypes are also expected to report differential patterns of anomalous perceptual experiences. Our studies provide clear, but qualified, support for the typological models and illustrate the importance of dissociation and hypnotic suggestibility for our understanding of anomalous experiences. Three studies yielded complementary evidence for a dissociative highly suggestible subtype that experienced greater spontaneous alterations in awareness and poorer cognitive control during hypnosis and greater involuntariness during hypnotic responding and a second subtype that exhibited milder alterations in consciousness and marginally superior cognitive control during hypnosis, and strong baseline imagery. Our fourth study found that the two subtypes differed from low suggestible individuals, but not one another, in self-reported state dissociation and functional connectivity, as measured by EEG, during hypnosis. In a final study, we found that the dissociative subtype reported a greater amount and diversity of anomalous perceptual experiences. The results cumulatively

provide support for proposals that there are distinct subtypes of highly suggestible individuals but also point to the importance of similarities in this population.

**Keywords:** Parapsychology and Psychophysiology; Anomalous cognition/experiences; Altered states of consciousness; Hypnosis; Cognitive processes; Consciousness; Brain; Personality factors

**Indexed papers:** Terhune, D. B., & Brugger, P. (2011). Doing better by getting worse: Posthypnotic amnesia improves random number generation. *PLoS ONE* 6(12), e29206. doi: 10.1371/journal.pone.0029206  
 Terhune, D. B., Cardeña, E., & Lindgren, M. (2011). Differential frontal-parietal phase synchrony during hypnosis as a function of hypnotic suggestibility. *Psychophysiology*, 48(10), 1444-1447. doi: 10.1111/j.1469-8986.2011.01211.x  
 Terhune, D. B., Cardeña, E., & Lindgren, M. (2011). Dissociated control as a signature of typological variability in high hypnotic suggestibility. *Consciousness and Cognition*, 20(3), 727-736. doi: 10.1016/j.concog.2010.11.005

**Project:** 2006-57

**Title:** The diurnal pattern of cortisol secretion in relation to season in healthy participants and those with seasonal affective disorder (SAD)

**Duration:** 2007/02 – 2009/05

**Researcher(s):** Prof. Angela Clow, Prof. Phil Evans, Prof. Frank Hucklebridge, Dr. Lisa Thorn

**Institution:** Psychophysiology and Stress Research Group, Dep. of Psychology and Human and Health Sciences, University of Westminster, London (UK)

**Results:** This study compared the daily pattern of cortisol secretion in winter and in summer between two groups; participants with seasonal affective disorder (SAD) and age and sex-matched healthy controls. The diurnal pattern of cortisol secretion was assessed across two consecutive days in summer, and two in winter. 52 participants completed the study with an equal number in each group. In both winter and summer, par-

ticipants collected multiple saliva samples across the day to capture the cortisol awakening response (CAR) and declining levels across the day. In addition, state stress and arousal, perceived stress, anxiety and depression were assessed using validated questionnaires. The results indicated that SAD and control participants had similar psychological and cortisol profiles in summer. However, in winter, SAD participants reported greater depression, stress and anxiety compared with controls. In addition, they showed lower levels of arousal (i.e. more drowsy, tired and sluggish, less alert, active, energetic and stimulated) following awakening in the morning. The control group did not show seasonal changes in the pattern of cortisol secretion. By contrast, the CAR was significantly attenuated in SAD participants during winter months but not during the summer. There was no difference in cortisol levels during the rest of the day for SAD participants in winter. This study contributes to the understanding of the physiology of SAD and provides evidence for potential underlying pathophysiological mechanisms in SAD. It further substantiates the evidence that light therapy following awakening in the morning may be beneficial for SAD sufferers by increasing cortisol to normal levels, which in turn may alleviate symptoms.

**Keywords:** Psychophysiology; Mental health; Mood disorders; Psychoneuroimmunology; Endocrinology

**Indexed papers:** Thorn, L., Evans, P., Cannon, A., Hucklebridge, F., & Clow, A. (2011). Seasonal differences in the diurnal pattern of cortisol secretion in healthy participants and those with self-assessed seasonal affective disorder. *Psychoneuroendocrinology*, *36*(6), 816–823. doi: 10.1016/j.psyneuen.2010.11.003

Clow, A., Hucklebridge, F., Thorn, L. (2010). The cortisol awakening response in context. *International Review of Neurobiology*, *93*, 153-175. doi: 10.1016/S0074-7742(10)93007-9

**Project:** 2006-59  
**Title:** Probing the human mirror neuron system using EEG: action observation, error monitoring and empathy  
**Duration:** 2007/04 – 2011/09

Researcher(s): Dr. Joseph Patrick Levy, Dr. Armanda H. R. Holmes, Dr. Lance Slade, Dr. Jonathan Silas, Dr. Maria Nielsen  
 Institution: Centre for Research in Cognition, Emotion and Interaction, School of Human and Life Sciences, Roehampton University, London (UK)  
 Results: N/A  
 Keywords: Psychophysiology; Brain; Movement; Electroencephalogram (EEG)  
 Indexed papers: Silas, J., Levy, J., Nielsen, M., Slade, L., & Holmes, A. (2010). Sex and individual differences in induced and evoked EEG measures of action observation. *Neuropsychologia*, 48(9), 2417-2426. doi: 10.1016/j.neuropsychologia.2010.03.004

**Project: 2006-61**  
 Title: Neural mechanisms of temporal discounting  
 Duration: 2007/02 – 2009/10  
 Researcher(s): Prof. Margaret Livingstone, Prof. Nancy Kanwisher, Dr. Johannes Haushofer, Dr. Camilo Libedinsky  
 Institution: Harvard Medical School, Dep. of Neurobiology, Boston (USA)  
 Results: Our first goal was to determine which brain areas represent the temporal delay of reward and to find the shape of the neural discounting function. Our results indicate that temporal delay of reward is reflected in the activation of caudate nucleus and nucleus accumbens. This is the first study to identify neural correlates of discounted value free of confounds of decision-related activation.  
 Our second goal was to investigate brain activation during decisions between delayed outcomes, i.e. intertemporal choice. We found that activation in the caudate and the accumbens activation was driven by chosen value. We found a strong correlation in the left caudate nucleus between the steepness of the behavioral and neural discount functions. Thus, this region might underlie individual differences in intertemporal choice behavior.

Our third goal was to look for neural correlates of a behavioral framing effect we had observed in temporal discounting. However, further testing showed this effect to be an experimental artifact that arose from the fact that no real payoffs were involved in the original experiment. Psychologists studying economic decision-making have generally assumed that subjects make similar decisions both when real payoffs are involved, and when the questions are purely hypothetical. Our results challenge this assumption and underscore the importance of using real payoffs in economic decision-making experiments.

Keywords: Psychophysiology; Brain; Cognitive processes; Decision-making; Functional magnetic resonance imaging (fMRI)

Indexed papers: N/A

**Project: 2006-62**

Title: The pilgrimage project: A study of motivations and experiences in sacred spaces

Duration: 2007/03 – 2010/02

Researcher(s): Dr. Miguel H. Farias, Dr. Alana Harris, Prof. Christina Ausder Au, Dr. Katja Wiech, Dr. Pedro Soares, Dr. Wiebke Friese

Institution: Ian Ramsey Centre, University of Oxford (UK)

Results: The aim of this project was to understand the interaction between motivations to go on pilgrimage, spiritual behaviours and experiences, and psychological outcomes. Four hundred and fifty pilgrims to the Roman Catholic sites of Fátima, Lourdes, the Pagan site of Stonehenge, and the New Age town of Glastonbury were asked to fill in a questionnaire. This included standardized measures of positive and negative affect (PANAS), personality (EPQ), magical/paranormal ideation, religious belief/experience, and motivations to go on pilgrimage.

Spiritual Growth and Community/Care were the major motivational dimensions for pilgrims at both Christian sites, while Pagan pilgrims scored highest on Cosmic/Nature Closeness and Sensation Seeking motivations. Results for Positive

and Negative Affect showed that Christian pilgrims were significantly higher on positive affect than Pagan pilgrims, while Pagan pilgrims scored significantly higher on negative affect. Pagan pilgrims also had significantly higher scores on magical/paranormal ideation and spiritual experiences. We suggest that Pagan rituals elicit higher arousal than Christian ones, and are less supported by a social and belief structure. This makes Pagan pilgrims more likely to experience negative affect (e.g. fear) and a higher frequency of unusual experiences. The higher frequency on unusual experiences is also partially explained by a schizotypal personality disposition and a tendency to process information in an intuitive way.

**Keywords:** Parapsychology; Spiritualism; Religious beliefs/experiences; Spiritual traditions/experiences; Paranormal belief; Personality factors; Emotion; Motivation;

**Indexed papers:** Harris, A. (2013). Lourdes and holistic spirituality: Contemporary Catholicism, the therapeutic and religious thermalism. *Culture and Religion*, 4(1), 23-43. doi: 10.1080/14755610.2012.756411  
Oviedo, L., De Courcier, S., & Farias, M. (2013). Rise of pilgrims on the camino to Santiago: Sign of change or religious revival? *Review of Religious Research*, 1-10. doi: 10.1007/s13644-013-0131-4

**Project:** 2006-64

**Title:** Brain imaging study of the psychological antecedents and neural correlates of moral judgement

**Duration:** 2007/02 – 2008/12

**Researcher(s):** Dr. Nicholas Shackel, Dr. Katja Wiech, Dr. Guy Kahane, Dr. Miguel Farias

**Institution:** Ian Ramsey Centre, University of Oxford (UK)

**Results:** Using functional magnetic resonance imaging (fMRI) in healthy volunteers, we investigated the neural bases of counter-intuitive moral judgements, while controlling for the content of these judgments (utilitarian versus non-utilitarian). More specifically, we investigated the relationship between the effort required to arrive at a moral judgement, as reflected by behavioural and neural responses during moral decision-making,

and two personality traits, each potentially reflecting one of the two postulated pathways to counterintuitive moral judgment (cognitive effort or emotional deficit).

Counterintuitive judgements were perceived as more difficult than intuitive judgements, whereas there was no significant difference in perceived difficulty between utilitarian and deontological judgments. At the neural level, the fMRI data suggest that previously reported differences in moral judgment are in fact largely due to their intuitiveness and not to their content. Furthermore, we show that the difficulty of making counterintuitive moral judgments is reflected in activation in the rostral anterior cingulate cortex (rACC). Importantly, rACC activation during counterintuitive judgments of a specifically utilitarian character was negatively correlated with 'psychoticism', a trait associated with diminished affect and social awareness, but not with 'need for cognition', a trait reflecting preference for complex cognition.

**Keywords:** Psychophysiology; Brain; Social interaction/norms; Cognitive processes; Decision-making; Functional magnetic resonance imaging (fMRI)

**Indexed papers:** Wiech, K., Kahane, G., Shackel, N., Farias, M., Savulescu, J., & Tracey, I. (2013). Cold or calculating? Reduced activity in the subgenual cingulate cortex reflects decreased emotional aversion to harming in counterintuitive utilitarian judgment. *Cognition*, 126(3), 364-72. doi: 10.1016/j.cognition.2012.11.002

Kahane, G., Wiech, K., Shackel, N., Farias, M., Savulescu, J., & Tracey, I. (2012). The neural basis of intuitive and counterintuitive moral judgment. *Social Cognitive and Affective Neuroscience*, 7(4), 393-402. doi: 10.1093/scan/nsr005

**Project:** 2006-65

**Title:** Exploring the relationship of out-of-body experiences and hallucinations: The role of depersonalization experiences

**Duration:** 2007/03 – 2009/05

**Researcher(s):** Prof. Carlos S. Alvarado, Dr. Nancy Zingrone

**Institution:** Parapsychology Foundation Satellite Office, Virginia (USA)



## Results:

## Objectives:

Out-of-body experiences (OBEs) have been explored in terms of their relationship to absorption, body image, dissociation, dreams, fantasy proneness, imagery, schizotypy, openness to experience, parapsychological experiences, and alterations of consciousness. Because literature reviews have also suggested a relationship between OBEs and depersonalization, our objective was to explore this further.

## Methods:

We conducted a random postal survey (S1) and an open web-based survey (S2). Respondents completed the Cambridge Depersonalization Scale (CDS), the Satisfaction With Life Scale (SWLS) and demographic, medical, dream, synesthesia-like and parapsychological (psi) experience items. Some also completed the Launay-Slade Hallucination Scale (LSHS) and/or an OBE phenomenology instrument that resulted in an OBE Feature Index (OFI) and an OBE Transformation Score (OTS). Compared both within and between studies overall, for OBEers vs non-OBEers, and for low vs high CDS scorers: psychological scale scores; specific CDS item scores; OFI and OTS; presence/absence and frequency of medical, dream, mystical, synesthesia-like, and psi experiences.

## Results:

In S1 256 persons responded, 63% female and 38% male (Age  $R = 17-95$ ,  $M = 49.3$ ,  $SD = 18.7$ ). In S2 589 persons responded, 65% female and 35% male (Age  $R = 13-84$ ,  $M = 45.3$ ,  $SD = 14.2$ ). CDS Scores in S1 and S2 were significantly and positively correlated to all psi, mystical and déjà vu experiences, LSHS scores, lucid and disturbing dreams. CDS scores correlated significantly but negatively to SWLS scores in S1 ( $r_s = -.59$ ). In S1 and S2 positive significant relationships were found between CDS scores and OBEs. In S1 ( $N = 11$ ), high and low CDS scorers did not differ on the OFI or on specific OBE features, while in S2 ( $N = 61$ ) the feature "looking down while out of the body" was significantly different. In S1 and S2 we found significant positive relationships between OBEs and synesthesia, headaches and head injury. In S1 and S2, OBE frequency correlated significantly and positively with psi experiences, dreams, déjà vu, and mysticism. In S2, OBE frequency also correlated positively with LSHS scores. Claims and frequency of all experiences, CDS and LSHS scores, and

the OTS were significantly higher for respondents in S2 than in S1. Results of both our studies replicated comparable previous findings.

**Keywords:** Parapsychology; Out-of-body experience (OBE); Anomalous cognition/experiences; Altered states of consciousness; Hallucinations;

**Indexed papers:** Zingrone, N. L., Alvarado, C. S., & Agee, N. (2009). Psychological correlates of aura vision: Psychic experiences, dissociation, absorption, and synaesthesia-like experiences. *Australian Journal of Clinical and Experimental Hypnosis*, 37(2), 57-94.

**Project: 2006-70**

**Title:** “Out of body” and “In the body” experience: Psychophysiology of bodily self-consciousness

**Duration:** 2007/09 – 2008/05

**Researcher(s):** Prof. Patrick Haggard

**Institution:** University College London Institute of Cognitive Neuroscience, London (UK)

**Results:** The present research investigated the psychophysiology of “out of body” and “in the body experiences”. There are four main results of the research: 1. To investigate “out of body” experience, we provided a psychometric decomposition of the structure underlying bodily self-consciousness in the context of the so-called rubber hand illusion, and demonstrated selective links between individual components of self-consciousness and mental body representations (Longo et al., 2008). 2. We found that transcranial magnetic stimulation (TMS) to the temporo-parietal junction of the right – but not the left – hemisphere reduced the magnitude of interactions between visual and tactile body representations. This suggests that the TPJ is involved in detection of cross-modal conflict, and that this function is lateralised to the right hemisphere. 3. To investigate “in the body experiences”, we developed a simple behavioural method for measuring the implicit representation of the structure of the body, and documented systematic

distortions in this structure. We have, furthermore, collected normative data from a large and diverse sample, which can potentially be used to analyse abnormalities of bodily experience. 4. We found that vision of bodies in intrinsic (1st person) and perspectival (3rd person) perspectives had distinct effect on touch. TMS to the EBA, furthermore, had opposite effects on these two perspectives, suggesting that this region is involved in distinguishing bodily reference frames.

**Keywords:** Psychophysiology; Somatosensory system; Self; Body awareness; Transcranial magnetic stimulation (TMS)

**Indexed papers:** Tsakiris, M., Longo, M. R., & Haggard, P. (2010). Having a body versus moving your body: neural signatures of agency and body-ownership. *Neuropsychologia*, 48(9), 2740–2749. doi: 10.1016/j.neuropsychologia.2010.05.021

Haggard, P., & Jundi, S. (2009). Rubber hand illusions and size-weight illusions: Self-representation modulates representation of external objects. *Perception*, 38(12), 1796-1803. doi: 10.1068/p6399

Kammers, M. P., Longo, M. R., Tsakiris, M., Dijkerman, H. C., & Haggard, P. (2009). Specificity and coherence of body representations. *Perception*, 38(12), 1804-1820. doi: 10.1068/p6389

**Project:** 2006-71

**Title:** Ultra-weak photon emission and EEG in a study on color perception in the dark

**Duration:** 2007/03 – 2008/04

**Researcher(s):** Prof. Roeland Van Wijk, Prof. R. Bajpai, Dr. E. P. A. Van Wijk, Dr. S. Bosman, Dr. J. M. Ackerman

**Institution:** International Institute of Biophysics, Neus (Germany)

**Results:** A new photomultiplier device (single photon counting mode) allowing for simultaneous recording of ultra-weak photon emission (UPE) and EEG was used for studying the effect of 20 s exposure to a color filter and to study the correlation between UPE of the right hand dorsum and alpha activity. Human UPE (400-600 nm) was recorded continuously with 50 ms dwell times. EEG was recorded with a sample rate of 125 Hz per channel (filtering 1 Hz HP; 30 Hz LP) and of each 5 s

a FFT frequency spectrum was computed.

Post-exposure UPE ranged between 96.9 % and 106.9 % (mean 101.4 %) compared to pre-UPE (=100 %) values ( $p = 0.017$ ). EEG 7-13 Hz activity ranged between 90.5 % and 120.9 % (mean 102.3 %) compared to pre-EEG (=100 %) values ( $p = 0.007$ ). UPE increased during filter exposure and faded away after removal of the filter. EEG alpha decreased during exposure and showed a rebound followed by a decrease after removal. Pre-post differences were relatively small, permitting the combination of both (720 data sets/ experiment) for utilization in correlation analysis.

Significant correlations were found between the EEG range 7-13 Hz and the mean UPE in subjects with a relatively high photon emission ( $r = 0.7525$ ;  $p = 0.000$ ). Correlation was not dependent on 7-13 Hz activity ( $r = 0.0797$ ;  $p = 0.753$ ). Correlation was observed in 1 Hz sub-bands immediately next to major alpha activity. Correlation was commonly observed in left and right bands. Dual-type regulation (negative in 3 subjects; positive in 1 subject) may be related to dual type correlations of other physiological factors and of activity in other EEG frequency ranges and scalp locations with 7-13 Hz activity.

Keywords: Psychophysiology; Assessment tools; Brain; Electroencephalogram (EEG)

Indexed papers: Van Wijk, R., Bosman, S., Ackerman, J., & Van Wijk, E. (2008). Correlation between fluctuations in human ultra-weak photon emission and EEG alpha rhythm. *NeuroQuantology*, 6(4), 452-463.

**Project: 2006-72**

Title: Required time for cognitive and motor activities in lucid dreams

Duration: 2007/01 – 2009/01

Researcher(s): Dr. Daniel Erlacher, Dr. Michael Schredl, Dr. Carmen Gebhart

Institution: University of Heidelberg, Institute for Sport and Sports Science, Heidelberg (Germany)

Results: In this project the relationship between subjectively estimated time in REM lucid dreams and real time has been studied.

In general, earlier studies on dream research showed a rather strong correlation between the duration in dreams and wakefulness. However, for lucid dreaming we found that performing squads took lucid dreamers more time than in the waking state while for counting the same participants showed no differences between dreaming and wakefulness. To find out if the task modality, the task length or the task complexity require longer times in lucid dreams than in wakefulness three experiments were conducted. In experiment 1 and 2, lucid dreamers spent two to three non-consecutive nights in the sleep laboratory with PSG recording and were asked to either count from 1-10, 1-20 and 1-30 or walk 10, 20 or 30 steps in wakefulness and in their lucid dreams. While dreaming they marked onset of lucidity as well as beginning and end of the counting task with a Left-Right-Left-Right eye movement and reported their dreams after being awakened. In the third experiment, participants performed an exercise involving gymnastics elements such as various jumps and a roll. As a general result we found – as in the study before – that performing a task in the lucid dream requires more time than in wakefulness. This tendency was found for all three tasks. However, there was no difference for the task modality (counting vs. motor task). Also the relative time for the different lengths of the tasks showed no difference. And finally, the more complex motor task (gymnastic routine) did not require more time in lucid dreams than the simple motor task.

Keywords: Psychophysiology; Sleep and dreams; Altered states of consciousness; Lucid dreaming

Indexed papers: Erlacher, D., Schädlich, M., Stumbrys, T., & Schredl, M. (2014). Time for actions in lucid dreams: effects of task modality, length, and complexity. *Frontiers in Psychology*, 4: 1013. doi: 10.3389/fpsyg.2013.01013

Erlacher, D., & Chapin, H. (2010). Lucid dreaming: Neural virtual reality as a mechanism for performance enhancement. *International Journal Of Dream Research*, 3(1), 7-10. doi: 10.11588/ijodr.2010.1.588

**Project:** 2006-73  
**Title:** The role of the cortico-basal ganglia circuit in learning and memory: From patient studies to functional neuroimaging  
**Duration:** 2008/01 – 2011/09  
**Researcher(s):** Dr. Marieke van Asselen, Prof. Albert Postma, Prof. António Freire Gonçalves, Dr. Inês Almeida, Dr. José Rebola  
**Institution:** IBILI - Faculdade de Medicina, Universidade de Coimbra (Portugal)

**Results:** During this research project (73/06) we investigated the mechanism underlying implicit contextual learning as well as its neural correlates. Implicit contextual cueing is a learning mechanism in which visual information from our environment is memorized in order to facilitate visual search. In the first part of our research project we studied the mechanism underlying implicit contextual cueing using eye movement recording. First, we showed that peripheral vision can be used to memorize the context of a target (Van Asselen et al. 2009), whereas in our following study we demonstrated that object-based contextual cueing is associated with shorter fixation durations (Van Asselen et al., 2010). Finally, we showed that when two contextual cues are presented simultaneously, the contextual cueing effect is much larger than when one cue is presented. This effect is associated with fewer fixations and shorter saccade amplitudes, suggesting that a different search strategy is used. In the second part of this research project we aimed to look at the neural basis of implicit contextual cueing. Therefore, we tested patients with Huntington's and Parkinson's disease with a contextual cueing task and found that these patients are not able to benefit from the repeated contextual information (Van Asselen et al., 2009). Since both of these neurodegenerative diseases affect the basal ganglia, our findings suggest an important role for this brain area. Finally, by using fMRI we demonstrated that the exact neural network that is involved in implicit contextual cueing depends on the type of cues (object or spatial) that are used to guide attention.

**Keywords:** Psychophysiology; Brain; Cognitive processes; Learning; Neurodegenerative disorders; Huntington's disease; Parkinson's disease; Functional magnetic resonance imaging (fMRI)

**Indexed papers:** Van Asselen, M., Almeida, I., Júlio, F., Januário, C., Bobrowicz-Campos, E., Simões, M. R., Castelo-Branco, M. (2012). Implicit contextual learning in prodromal and early stage Huntington's disease patients. *Journal of the International Neuropsychological Society*, 18(4), 689-696. doi: 10.1017/S1355617712000288

Van Asselen, M., Júlio, F., Januário, C., Bobrowicz-Campos, E., Almeida, I., Cavaco, S., & Castelo-Branco, M. (2012). Scanning patterns of faces do not explain impaired emotion recognition in Huntington disease: Evidence for a high level mechanism. *Frontiers in Psychology*, 3, 31. doi: 10.3389/fpsyg.2012.00031

Van Asselen, M., Sampaio, J., Pina, A., & Castelo-Branco, M. (2010). Object based implicit contextual learning: A study of eye movements. *Attention, Perception & Psychophysics*, 73(2), 297-302. doi: 10.3758/s13414-010-0047-9

**Project:** **2006-78**

**Title:** ERP correlates of relational learning: Testing a behavioural model of word webs

**Duration:** 2007/01 – 2009/03

**Researcher(s):** Dr. Simon Dymond, Prof. Lanny Fields

**Institution:** Wales Institute of Cognitive Neuroscience, Dep. of Psychology, University of Wales, Swansea (UK)

**Results:** Relational learning research has highlighted a close functional overlap between the outcomes of studies with pseudowords and natural language processing effects. The key phenomenon from relational learning research is called stimulus equivalence, which shows that after learning a series of inter-connected, conditional (i.e., if-then) unidirectional relations among physically dissimilar pseudowords, participants spontaneously reverse and relate novel, bidirectional combinations of these stimuli, without any further training.

In this research, we sought to investigate the behavioural and event-related potential (ERP) correlates of relational learn-

ing, in particular N400, using a novel, stimulus-pairing yes/no procedure. The stimulus-pairing yes/no procedure involves the presentation of a sample followed by a choice stimulus. Participants are taught, through feedback, to press one of two keys representing Yes (or Same) and No (or Different). For example, given the pseudowords labelled “A1” and “B1”, pressing the Yes key was correct, while given the pair A1-B2 pressing the No key was correct. Also, given A2-B2, pressing Yes would be correct, and given the pair A2-B1, pressing the No key would be correct. In this way, two “within-class” relations (A1-B1 and A2-B2) and two “between-class” (A1-B2 and A2-B1) relations were explicitly taught. Following this training, and maintenance under conditions of reduced feedback, participants were, in Experiment 1, tested for symmetry, transitivity and one-node equivalence relations, in the absence of further feedback. In Experiment 2, two, three-member relations were trained and tested using one-to-many (A-B/A-C). If participants passed these tests, expanded relations were trained (C-D) and all trial types tested. EEG was recorded during this final test phase.

Overall, the modified training and testing protocol of Experiment 2 resulted in a higher pass-yield than Experiment 1. Behavioural results show that the stimulus-pairing yes/no procedure is effective with a combined one-to-many/linear-series training design as an efficient and reliable means of establishing arbitrary word-webs. The ERP analyses failed to reveal any significant differences between the trial types.

This highlights that the procedure, while effective for establishing arbitrary word webs, was not effective for evoking the N400 ERP.

Keywords: Psychophysiology; Cognitive processes; Learning; Language

Indexed papers: Wang, T., & Dymond, S. (2013). Event-related potential correlates of emergent inference in human arbitrary relational learning. *Behavioural Brain Research*, 236(1), 332–343. doi: 10.1016/j.bbr.2012.08.033



- Project:** **2006-80**
- Title:** Understanding the role of dendrites in cortical information processing
- Duration:** 2007/02 – 2010/02
- Researcher(s):** Prof. Drazen Domijan, Prof. Mladenka Tkalcic, Dr. Mia Setic, Prof. Ana Prorokvic, Dr. Pavle Valerjev
- Institution:** Dep. of Psychology, Faculty of Arts and Sciences, University of Rijeka, Rijeka (Croatia)
- Results:** We developed several neural network models based on dendritic computation. Dendrites as independent computational units enable simulation of wide variety of perceptual and cognitive phenomena. Computer simulations showed that new neural networks with dendrites are able to explain how neural activity is modulated by attention in primary visual cortex and in extra-striate cortex. Also it was shown how visual search is performed among moving targets and for targets that change locations due to the eye movements. The model of the interaction between dorsal and ventral visual streams enabled simulation of classical Gestalt principles of figure-ground organization (size, contrast, and convexity) along with newly discovered principles such as lower region and top-bottom polarity. The same model of figure-ground organization produced brain activation consistent with brain imaging studies and with electrophysiological recordings in the monkey brain. The model of temporal grouping is able to explain how we segregate figures from background based on temporal changes alone. This model does not require neural synchronization in order to sense temporal patterns. Furthermore, we developed a neural model of semantic memory which is able to simulate recent experimental findings about interaction between language understanding and perception and action. We performed several cognitive experiments which showed that perceptual and motor variables facilitate semantic processing in agreement with the model. Our project provided computational evidence for the importance of dendrites for information processing in the nervous system and for understanding visual perception and cognition.

**Keywords:** Psychophysiology; Brain; Cognitive processes; Attention; Memory; Perception; Vision; Functional magnetic resonance imaging (fMRI)

**Indexed papers:** Domijan, D. (2011). A computational model of fMRI activity in the intraparietal sulcus that supports visual working memory. *Cognitive, Affective, & Behavioral Neuroscience*, 11(4), 573-599. doi: 10.3758/s13415-011-0054-x

Domijan, D., & Šetic, M. (2008). A feedback model of figure-ground assignment. *Journal of Vision*, 8(7):10, 1-27. doi: 10.1167/8.7.10

Šetic, M., & Domijan, D. (2008). Modeling the top-down influences on the lateral interactions in the visual cortex. *Brain Research*, 1225, 86-101. doi: 10.1016/j.brainres.2008.05.076

**Project: 2006-85**

**Title:** The occurrence, phenomenology and psychological correlates of out-of-body and near-death experiences

**Duration:** 2007/06 – 2009/11

**Researcher(s):** Dr. Craig Murray, Dr. David J. Wilde

**Institution:** Manchester University, Manchester (UK)

**Results:** An Interpretative Phenomenological Analysis (IPA) of the data identified four main clusters of themes across the five studies. One cluster concerned the potential for the OBE to be viewed as an adaptive experience; occurring at times of personal significance and helping individuals cope with difficult life events. A second cluster highlighted the benefits and challenges that experiencers encountered when sharing their OBEs with other people as part of their sense-making endeavours. A third cluster of themes centred on the embodied nature of the OBE and the attributions and beliefs experiencers had about the perceived control and mastery they had over their OBEs. Also identified in this theme was the transactive nature of the out-of-body environments themselves, which were seen as meaningful places that facilitated experiencers' embodied, goal-oriented behaviours. The fourth cluster focused on the abundance of rarely discussed OBE features and the corresponding attribu-

tion experiences made of some kind of meaning to certain features, many of which were bound to previously held desires and beliefs, and tied in closely with their future anticipations and expectations. The theoretical implications for all of these findings are discussed.

**Keywords:** Parapsychology; Survival after bodily death; Out-of-body experience (OBE); Near-death experience

**Indexed papers:** Wilde, D., & Murray, C. (2010). Interpreting the anomalous: Finding meaning in out-of-body and near-death experiences. *Qualitative Research in Psychology*, 7(1), 57-72. doi: 10.1080/14780880903304550

Wilde, D., & Murray, C. (2009). An interpretative phenomenological analysis of out-of-body experiences in two cases of novice meditators. *Australian Journal of Clinical and Experimental Hypnosis*, 37(2), 90-118.

Wilde, D., & Murray, C. (2009). The evolving self: finding meaning in near-death experiences using interpretative phenomenological analysis. *Mental Health, Religion and Culture*, 12(3), 223-239. doi: 10.1080/13674670802334910

**Project:** 2006-90

**Title:** Advancing methodology in the psychophysiology of stress: capturing the complexity of immunity

**Duration:** 2007/07 – 2011/03

**Researcher(s):** Dr. Matt Bristow, Dr. Rachel Cook

**Institution:** Department of Psychology, Anglia Ruskin University, Cambridge (UK)

**Results:** N/A

**Keywords:** Psychophysiology; Stress and health; Chronic stress; Psychoneuroimmunology; Immunology

**Indexed papers:** N/A

**Project:** 2006-93  
**Title:** Exploring the relationship between susceptibility to false memories and belief in and experience of the paranormal  
**Duration:** 2010/02 – 2012/09  
**Researcher(s):** Prof. Christopher Charles French, Dr. Krissy Wilson  
**Institution:** Anomalistic Psychology Research Unit, Dep. of Psychology, Goldsmiths College, University of London (UK)  
**Results:** N/A  
**Keywords:** Parapsychology; Paranormal belief; Anomalous cognition/experiences; Memory  
**Indexed papers:** N/A

**Project:** 2006-94  
**Title:** Feedback modulation of visual processing by limbic circuits: A functional connectivity approach to visual face processing  
**Duration:** 2008/01 – 2011/02  
**Researcher(s):** Prof. Miguel de Sá e Sousa de Castelo-Branco, Dr. Cristina Januário, Dr. Solange Silva, Dr. Aldina Reis, Dr. Catarina Mateus, Dr. Miguel Cordeiro  
**Institution:** IBILI - Faculdade de Medicina, Coimbra (Portugal)  
**Results:** We have examined the specificity of face and emotion recognition networks in relation to other object recognition modules in normal subjects and disease models of impaired perception/limbic processing, using Event-Related Potential and fMRI measures and techniques to study causality in face processing networks. Response invariance properties of face processing networks, in particular 3D abstract control objects and faces were also tested. Perceptual correlates of holistic object processing in normal subjects and neurodevelopmental conditions were also studied using “Mooney” abstract faces and hierarchical stimuli. We have proven that the basal ganglia structures are crucial for emotional processing of central vs. peripheral faces irrespective of oculomotor processing demands. We were also

able to separate automatic from conscious aspects of emotional processing of faces, and have shown that the human amygdala has an important foveal bias for face processing of threat content. We have also used a novel paradigm that allowed for an explicit separation of the neural correlates of the sensory, perceptual and motor components in holistic face perceptual decision. This strategy was anchored on a well-defined neurochronometry of cognitive processes and helped elucidate the contribution of different regions in the visual stream and insular networks in perceptual decision-making and social cognition. We have also found Gamma band neural activity is related to perceptual “Eureka” effects when observing ambiguous dynamic faces. In sum our work elucidated the dynamics of low and high level affective face processing along the visual ventral stream, the amygdala and basal ganglia.

**Keywords:** Psychophysiology; Brain; Cognitive processes; Vision; Emotion; Functional magnetic resonance imaging (fMRI)

**Indexed papers:** Almeida, I., Van Asselen, M., & Van Asselen, M. (2013). The role of the amygdala and the basal ganglia in visual processing of central vs. peripheral emotional content. *Neuropsychologia*, *51*(11), 2120-2129. doi: 10.1016/j.neuropsychologia.2013.07.007

Bernardino, I., Castelhana, J., Farivar, R., Silva, E., & Castelo-Branco, M. (2013). Neural correlates of visual integration in Williams syndrome: gamma oscillation patterns in a model of impaired coherence. *Neuropsychologia*, *51*(7), 1287-1295. doi: 10.1016/j.neuropsychologia.2013.03.020

Graewe, B., Lemos, R., Ferreira, C., Santana, I., Farivar, R., De Weerd, P., & Castelo-Branco, M. (2013). Impaired processing of 3D motion-defined faces in mild cognitive impairment and healthy aging: An fMRI study. *Cerebral Cortex*, *23*(10), 2489-2499. doi: 10.1093/cercor/bhs246

**Project:** 2006-98

**Title:** The meaning-switch: Investigation of pre-cognition in an operationally closed system

**Duration:** 2007/07 – 2009/07

**Researcher(s):** Dr. Walter von Lucadou, Dr. Matthias Braeunig, Dr. Tilmann Faul

Institution: T.REG Systems Research Labs, Staufen (Germany)

Results: We investigated the effect of a human operator intention on the sampling of random bits from a Triggered Random Event Generator (T.REG). The device that has been constructed in a previous study (see 74/04) allows for the local environment to be coupled with the process. Binary events are triggered samples from an electronic random stream of states and acoustic feedback is given on the cumulative hit rate by rising and falling tones. The triggers are derived from an EEG recorded at the subject's forehead. A case is being made for operational closure: The subject can – in principle – direct the course of events, if there is intrinsic knowledge about the random stream. This knowledge is considered a systemic property of the arrangement giving rise to memory and self-organization that cannot be accessed or controlled from the outside.

In an intention task experiment a sample of 22 self-selected subjects are instructed to generate sequences of rising feedback tones. By using a special push button, called Meaning- or M-switch, the participant can decide on the meaning of hits and misses by inverting up/down-runs that are pre-cognitively intuited and create a mean shift, while the null hypothesis of random sampling is still maintained.

We extract the statistical properties of the bit sequences and compare the results with their theoretical expectation, as well as with a pseudo random generator also built into the system. Application of M-switch creates a gain with respect to the reconstructed un-inverted sequence of scores. The M-switch application is investigated in terms of psychological variables capturing the distinctive switching behavior of the participant. Finally, a matrix of physical and psychological measures is checked for excess correlation.

In the final and most conservative variable set we found 17 significant (at 5% level) correlations in a matrix of 24 x 9 variables, while simulations suggested an expectation of only 10 (median). This result was significant in a one-sided hypothesis test ( $p = 0.031$ ), supporting the hypothesis of 'generalized entanglement'. A previous hypothesis (from 74/04) on anomalous sampling could not be replicated.

Keywords: Parapsychology and Psychophysiology; Extrasensory perception (ESP); Precognition; Psychokinesis (PK)

Indexed papers: N/A

**Project: 2006-103**

Title: Psi related experiences and spatialization: The use of geographic information systems to investigate spontaneous psi phenomena and experient profiling

Duration: 2008/10 – 2010/06

Researcher(s): Prof. Roger Burrows, Dr. Madeleine Castro

Institution: Spatial Informatics Research and the Anomalous Experiences Research Unit, Department of Sociology, University of York (UK)

Results: Questions relating to five forms of paranormal experience (telepathy, precognition, extra sensory perception, contact with the dead and mystical/transcendent experiences) were included in two face-to-face IPSOS/Mori omnibus surveys conducted in January and February 2009. In total, a weighted, representative sample of 4,096 adults (16 years+) was collected from 203 sample points in the UK.

11% of the respondents reported at least one telepathic experience; 24% of the respondents reported at least one experience of precognition; 13% of respondents reported at least one experience of extra sensory perception; 10% of respondents reported at least one experience of after after-death communication; and 12% of respondents reported at least on mystical/transcendent experience. Over a third of all respondents reported one or more of these five experiences (36.8 %). This is lower than other existing results but in the middle of estimates suggesting that between 25-45 % of the population is likely to report having had a paranormal experience. With very few exceptions, there was little evidence of significant correlations between reports of experiences and traditional sociological or geodemographic variables (perhaps the most notable exception being the confirmation of the finding from previous studies

that women overwhelmingly report more experiences than men).

Spatial analysis showed a statistically significant regional skew towards the south west of England. By contrast, the north of England and London showed a statistically significant low level of reports of these psi related/anomalous phenomena.

**Keywords:** Parapsychology; Anomalous cognition/experiences; Spontaneous cases

**Indexed papers:** N/A

**Project: 2006-110**

**Title:** Paranormal belief and well-being: An exploratory of cognitive-perceptual bias

**Duration:** 2007/02 – 2009/09

**Researcher(s):** Dr. Neil Andrew Dagnall, Dr. Gary Munley, Dr. Andrew Parker

**Institution:** The Manchester Metropolitan University, Research Institute of Health and Social Change, Manchester (UK)

**Results:** Study 1 was conducted with the intention of identifying common facets of paranormal belief. A composite self-report measure containing items from several existing scales and newly constructed items (haunting/poltergeist activity and extraterrestrials) was produced. Principal component analysis was performed, and a nine factor structure emerged; measuring belief in: Hauntings, Other Life, Superstition, Religious Belief, Alien Visitation, Extrasensory Perception, Psychokinesis, Astrology, and Witchcraft. The analysis suggested that items measuring Alien Visitation and Hauntings should be included within paranormal belief measures.

Study 2 investigated the relationship between belief in extra-terrestrial life, UFOs and paranormal belief. The results revealed that UFO-related beliefs were more highly correlated with paranormal belief than belief in extra-terrestrial life. Partial correlation controlling for the overlap between the two extra-terrestrial related dimensions revealed a series of weak negative correlations between belief in extra-terrestrial life and



paranormal belief, and moderate positive correlations between UFO-related beliefs and paranormal belief. These findings indicate that only the more extreme UFO-related beliefs were associated with general paranormal belief.

Study 3 investigated the relationship between cognitive-perceptual measures (schizotypy, transliminality and delusional ideation) and paranormal belief. All three constructs were found to be significantly positively correlated with paranormal belief. Comparisons between participants high and low (above vs. below the median) on each cognitive-perceptual measure revealed that participants above the median demonstrated higher levels of endorsement on each of the paranormal belief subscale measures. Partial correlation and a hierarchical regression, with the predictor variables entered in order of zero-order correlation, revealed the majority of variance within paranormal belief was explained by the cognitive-perceptual factor of schizotypy. Study 4 employed the dot-probe detection technique to investigate whether participants high in paranormal belief demonstrate a selective attentional bias towards paranormal related words. Level of paranormal belief, schizotypy, delusional ideation and transliminality were not found to affect attentional deployment; no differences were observed between participants scoring high and low on each of the measures. The pattern of results was consistent across factors suggesting that paranormal related stimuli are no more prone to attentional capture than neutral control stimuli.

Keywords: Parapsychology; Paranormal belief; Assessment tools; Transliminality; Personality factors

Indexed papers: Dagnall, N., Drinkwater, K., & Parker, A. (2011). Alien visitation, extra-terrestrial life, and paranormal beliefs. *Journal of Scientific Exploration*, 25(4), 699-720.

Dagnall, N., Munley, G., Parker, A., & Drinkwater, K. (2010). Paranormal belief, schizotypy and transliminality. *Journal of Parapsychology*, 74(1), 117-143.

Dagnall, N., Parker, A., Munley, G., & Drinkwater, K. (2010). Common paranormal belief dimensions. *Journal of Scientific Exploration*, 24(3), 477-494.

- Project:** 2006-120
- Title:** Psicoendocrinologia do comportamento parental humano: Alterações hormonais, síndrome de couvade e responsividade parental em pais-expectantes
- Duration:** 2007/02 – 2009/01
- Researcher(s):** Prof. Isabel Maria Pereira Leal, Prof. Rui Filipe Nunes Pais de Oliveira, Prof. Luís Adriano Neves Gonçalves Sobrinho, Dr. Rita Maria Morgado Gomez
- Institution:** Centro de Investigação e Intervenção, Instituto Superior de Psicologia Aplicada, Lisboa (Portugal)
- Results:** Animal studies have been documenting the association between hormonal changes and the emergence of parental behavior in both males and females of a variety of species. Human data have been very scarce, but findings of three previous studies showed that hormone levels of human fathers can change during the reproductive period. The results of the current project constitute a step forward in the study of the psychoendocrinology of parental behavior, by indicating that hormone changes experienced by men during their partner's pregnancy associate to the expression of paternal involvement after the birth. Thus, fathers who presented higher levels of paternal behavior after the birth (HIF, high-involvement fathers), but not less involved fathers (LIF), were found to have increased levels of Progesterone, Estradiol and Testosterone during pregnancy comparing to postpartum hormone levels and to hormone levels of controls; in addition, Prolactin levels were found to be increased from pregnancy to postpartum in HIF, but not in LIF, whereas Cortisol levels were found to be elevated after the birth in LIF only. These results are generally consistent with previous findings on the neuroendocrinology of paternal behavior in mammals, and add support to the hypothesis that in bi-parental mammals, including humans, the expression of paternal and maternal behavior involve homologous neuroendocrine mechanisms. These findings can contribute to 'validate' the experience of more parentally motivated men, as well as to inform about conditions in which pro-social behavior, including parental investment, is compromised.

Keywords: Psychophysiology; Psychoneuroimmunology; Endocrinology; Parenthood

Indexed papers: Gomez, R., & Leal, I. (2008). Ajustamento conjugal: Características psicométricas da versão portuguesa da Dyadic Adjustment Scale. *Análise Psicológica*, 4(26), 625-638.

**Project: 2006-125**

Title: Psychophysiological effects of human pheromones

Duration: 2007/05 – 2010/10

Researcher(s): Prof. Francisco Gomes Esteves, Prof. Mats Olsson, Dr. Johan Lundstrom, Prof. Pedro Barbas de Albuquerque, Prof. Maria Benedita Monteiro, Prof. Maria Paula Carneiro, Dr. Patrícia Arriaga Ferreira

Institution: Centro de Estudos e Intervenção Social, ISCTE, Lisboa (Portugal)

Results: N/A

Keywords: Psychophysiology; Psychoneuroimmunology; Endocrinology; Sexual behavior; Emotion

Indexed papers: N/A

**Project: 2006-127**

Title: The effects of receiver/sender sex pairing, emotional and biological bond, and photic driving upon ganzfeld ESP task success

Duration: 2007/01 – 2013/11

Researcher(s): Dr. Ben Roberts, Dr. Ian Hume, Dr. Laura Taylor

Institution: Coventry University, Psychology Department, Faculty of Health and Life Sciences, Coventry (UK)

Results: N/A

Keywords: Parapsychology and Psychophysiology; Extrasensory perception (ESP); Brain; Spontaneous cases; Ganzfeld studies

Indexed papers: N/A

**Project: 2006-131**

Title: How do we learn to associate events separate in time: A study using trace auditory fear conditioning

Duration: 2007/01 – 2010/07

Researcher(s): Dr. Marta de Aragão Pacheco Moita, Dr. Marta Guimarães

Institution: Instituto Gulbenkian de Ciência, Oeiras (Portugal)

Results: N/A

Keywords: Psychophysiology; Brain; Cognitive processes; Learning; Memory; Emotion

Indexed papers: Guimarães, M., Gregório, A., Cruz, A., Guyon, N., & Moita, M. (2011). Time determines the neural circuit underlying associative fear learning. *Frontiers in Behavioral Neuroscience*, 5: 89. doi: 10.3389/fnbeh.2011.00089

**Project: 2006-134**

Title: The role of stress in cortico-basal ganglia loop processing and instrumental conditioning

Duration: 2007/01 – 2010/02

Researcher(s): Prof. Nuno Jorge Carvalho de Sousa, Dr. Rui Manuel Fernandes da Costa, Dr. Eduardo Miguel Gonçalves Dias Ferreira, Prof. João José Cardoso Cerqueira, Dr. Pedro Alexandre Teixeira

Institution: Life and Health Sciences Research Unit, School of Health Sciences, University of Minho, Braga (Portugal)

- Results:** The data obtained in this project originates the following conclusions:  
Chronic exposure to stress results in impaired goal-directed behavior and increased predisposition for habitual strategies. Chronic stress triggers a divergent structural reorganization of corticostriatal circuits, suggesting that the induced damage to the associative network drives behavioral control to the more wired sensorimotor circuit. Our electrophysiological data in vivo indicates that the structural reorganization of corticostriatal circuits following chronic stress causes changes in neuronal activity in these networks.
- Keywords:** Psychophysiology; Stress and health; Chronic stress; Brain; Cognitive processes; Decision-making
- Indexed papers:** Dias-Ferreira, E., Sousa, J., Melo, I., Morgado, P., Mesquita, A. R., Cerqueira, J., . . . Sousa, N. (2009). Chronic stress causes frontostriatal reorganization and affects decision-making. *Science*, 325(5940), 621-625. doi: 10.1126/science.1171203
- Project:** **2006-137**
- Title:** Influências das emoções e dos sentimentos na percepção do tempo cronológico
- Duration:** 2007/02 – 2010/10
- Researcher(s):** Prof. Teresa Maria Morais Garcia-Marques, Dr. Alexandre Constâncio Fernandes
- Institution:** Unidade de Investigação em Psicologia, do Desenvolvimento e da Educação, Instituto Superior de Psicologia Aplicada, Lisboa (Portugal)
- Results:** The acceleration of the internal clock promoted by arousal of emotional stimuli has been suggested as the mechanism underlying the effects of emotion in time perception (i.e., time overestimation) outweighing the attentional effects (i.e., loss of temporal information) of processing such stimuli. However there is no empirical demonstration that these are indeed the explanatory factors of the influence of emotion on time perception, and even if this is how these factors interfere in time

judgments. In this project we developed a set of experiments to disentangle these factors. We used physiological measures, able to provide independent indexes without disrupting the time estimation task, and examine mediation effects of these emotional dimensions on time perception. Additionally, we contrast the effects of emotions with the effects of other non-emotional feelings, familiarity and perceptual fluency in order to circumscribe the underlying processes. Our studies generally suggest that duration judgments were affected by emotional arousal, though this effect seems to be moderated by emotion type, valence, response delay, and arousal manipulation. Nevertheless psychophysiological mediation analysis reveals a more complex process of time processing of emotion stimuli than predicted by 'internal clock' models. In addition, our studies imply that the feeling of stimulus familiarity and fluency is associated with a time overestimation. This effect is moderated by attention, also in an unpredicted way. Our results suggest surprisingly similar mechanisms on how the perceptual fluency, familiarity, and emotions influence the perception of time, and that somehow refutes the prevailing explanations in the literature. Together these results indicate a conjugation between the perception of temporal units and procedural changes of the stimuli, i.e., that temporal and nontemporal information are combined in the temporal estimates of emotional stimuli.

Keywords: Psychophysiology; Cognitive processes; Perception; Emotion

Indexed papers: N/A

**Project:** 2006-144

Title: Event-related brain potential correlates of conscious and non-conscious processing in anxiety

Duration: 2007/10 – 2010/11

Researcher(s): Dr. Anne Richards e Dr. Amanda Holmes, Dr. Emily Hannon

Institution: Birkbeck College, University of London and Roehampton University, London (UK)

- Results:** An adaptation paradigm was used for Experiment 1 ( $N = 40$  in final sample), where fear-neutral morphed expressions were classified for affect after exposure to either fear or neutral faces. There was a shift towards 'fearful' classifications of morphs following neutral compared to fear adaptation. ERP data analysis revealed a more pronounced late positive potential (LPP), beginning at ~400 ms post-stimulus onset, in high but not low anxious people following neutral compared to fear adaptation. As behavioural adaptation increased there was a linear augmentation in the magnitude of the late-LPP. These effects were apparent for trait and state anxiety, and for depression. These data show that negative moods are associated with increased sensitivity to visual contextual influences from top-down elaborative modulations, as reflected in an enhanced LPP deflection. In two oddball experiments, irrelevant emotional expressions were presented outside of (Experiment 2,  $N = 13$  in final sample) or within (Experiment 3,  $N = 15$  in final sample) focal attention. The neurophysiological markers for emotional processing (LPP, Early Posterior Negativity [EPN]) were observed when the irrelevant emotional expressions were the focus of attention (Experiment 3) but eliminated when outside of focal attention (Experiment 3). The visual mismatch negativity (vMMN), said to index automatic encoding violations of visual featural regularities, was observed for unattended happy emotional expressions but not for fearful ones. The 'pre-attentive' encoding of featural changes arose only for happy faces and not for other less featurally salient expressions, such as fear. These data suggest that spatial attention is involved in the direct modulation of non-perceptual processes relating to the evaluation of emotional significance.
- Keywords:** Psychophysiology; Emotion; Cognitive processes; Perception; Electroencephalogram (EEG)
- Indexed papers:** Richards, A., Holmes, A., Bethell, E., & Pell, P. (2013). Adapting effects of emotional expression in anxiety: Evidence for an enhanced Late Positive Potential. *Social Neuroscience*, 8(6), 650-664. doi: 10.1080/17470919.2013.854273

- Project:** 2006-147
- Title:** Cognitive and affective trait effects of meditation-training on brain and behaviour. An event-related longitudinal fMRI study
- Duration:** 2007/03 – 2009/09
- Researcher(s):** Prof. Ulrike Halsband, Dr. Susanne Müller
- Institution:** Department of Psychology/Neuropsychology, University of Freiburg (Germany)
- Results:** We tried to bridge the gap between the two main study types concerning meditation by conducting a longitudinal study on meditation training with different types of assessment strategies including brain imaging techniques (fMRI) using the paradigm of “binocular rivalry” by testing the effects of attentional training on the switching rate during several measures. Eighteen healthy right-handed volunteers (5 males, 13 females, ages 20-57,  $M = 32.8$ ) participated in the first (baseline; t0) measures. After the first measures and after participating in the meditation training for a few times eleven participants left the study and were not available for further measures. Seven participants (1 male, 6 females, ages 20-57,  $M = 37.2$ ) remained in the study and took part in all the subsequent measures (t1, t2, t3). Behavioural measurements indicate that the ability to focus on the desired percept while suppressing the undesired one improved during the course of the meditation training. We found clear cut effects after six months of training in all participants concerning their attentional abilities (“attending to the stimulus“ vs. “passively viewing“), differences were observed and characterized by activations in the left and right superior frontal and middle gyrus, suggesting an enhanced capacity for selective attention. No clear cut effects were found concerning our hypotheses about binocular rivalry. On a single-subject level remarkable changes were found in some subjects concerning mindfulness, well-being, and clarity to and repair of their own feelings and also in the ability to improve in the paradigm of binocular rivalry.
- Keywords:** Psychophysiology; Brain; Intervention; Cognitive processes; Attention; Altered states of consciousness; Meditation; Electroencephalogram (EEG); Functional magnetic resonance imaging (fMRI)



Indexed papers: Halsband, U., Müller, S., Hinterberger, T., & Strickner, S. (2009). Plasticity changes in the brain in hypnosis and meditation. *Contemporary Hypnosis*, 26(4), 194–215. doi: 10.1002/ch.386

**Project: 2006-151**

Title: The measurement and characterization of charge accumulation and electromagnetic energy emissions from bioenergy healers: Part 2

Duration: 2007/02 – 2012/05

Researcher(s): Prof. William Joines

Institution: Rhine Research Centre, Durham, North Carolina (USA)

Results: Approximately 100 subjects (experienced meditators, self-proclaimed healers, and others) have been tested in a double darkroom using invisible infrared (IR) and invisible ultraviolet (UV) detection instruments to measure intensity levels (photons/second) of human emission, and if subjects could control their radiation by intention. These studies demonstrate that most of the healers did produce excess IR radiation or heat in their palms and on their foreheads during their healing process. Of the 100 participants who were part of the UV study, three different meditation healing groups (each group consisting of three inexperienced healers seated in front of the UV detector) produced a rise in photon count of 40 to 60 photons per second above a baseline of 8 to 10 photons/second that persisted during each 15-minute segment of the meditation. Two other subjects (an experienced healer and an experienced meditator) consistently produced between 400,000 and 800,000 UV photons per second over a time span of several seconds. In more recent tests, still another experienced healer produced over 1.6 million UV photons per second above baseline. These photon emissions were produced at the request of the researchers and stopped when the researcher asked them to relax. Thus, both experienced and inexperienced healers and meditators are able to produce invisible light emission through focused intention. Future research will explore the origin of the energy increases and the methods used by the individuals to produce this increased energy. Also, we will explore the relationship between

this work and reports of luminous radiation around people (the aura), mental communication (ESP) and mental interaction with materials (psychokinesis).

**Keywords:** Parapsychology; Healing; Altered states of consciousness; Meditation

**Indexed papers:** Joines, W., Baumann, S., & Kruth, J. (2012). Electromagnetic emission from humans during focused intent. *Journal of Parapsychology*, 76(2), 275-294.

**Project:** 2006-154

**Title:** High-frequency oscillations and rhythmic slow activity during virtual navigation, REM sleep and wake-sleep transitions: Studies on intracranial recordings in humans

**Duration:** 2008/01 – 2009/10

**Researcher(s):** Prof. Péter Halász, Dr. Zsófia Clemens, Dr. Csaba Borbély, Dr. Daniel Fabó

**Institution:** Budapest-Bethel Epilepsy Center Foundation (BBEC), Budapest (Hungary)

**Results:** This study relied on nine epilepsy surgery candidates implanted with foramen ovale electrodes. 1.5-3Hz rhythmic slow activity (RSA) was a predominant activity pattern during REM sleep in most patients. This activity was also found to be highly synchronous both intra- and interhemispherically. Positive half-waves of the 1.5–3Hz RSA were identified by a semi-automatic algorithm during REM sleep. High-frequency activity was assessed as root mean square (RMS) for 11 consecutive 20 Hz-wide frequency bands between 20 and 240Hz. Calculating individual spectra revealed a broad but definite peak in the high-frequency band in seven cases (hemispheres). Statistical analysis revealed a clear phase-coupling of high-frequency activity in all patients and for most of the high-frequency bands studied. This phase relation was similar across the high frequency bands within the same patient and hemisphere. This allowed us to use individually defined fixed intervals of 0.1s to statistically compare RMS values corresponding to the peak

and the trough of the triggered RMS curve. Typically the preferred phase occurred before the RSA peak used as trigger. In most cases modulation statistics exhibited a U-shaped curve with highest significance levels in the middle frequency bands (60–80Hz and 80–100Hz). Compared to these bands modulation generally weakened across both decreasing and increasing frequency ranges. Such a phase-coupling between delta and gamma activity is similar to that seen between theta and gamma in rodents. We consider this commonality to be an additional reason for regarding delta rather than theta as the human analogue of RSA in animals.

**Keywords:** Psychophysiology; Brain; Sleep and dreams; Diseases/Injuries; Epilepsy

**Indexed papers:** Clemens, Z., Borbély, C., Weiss, B., Eross, L., Szucs, A., Kelemen, A., Fabó, D., Rásonyi, G., Janszky, J., & Halász, P. (2013). Increased mesiotemporal delta activity characterizes virtual navigation in humans. *Neuroscience Research*, 76(1-2), 67-75. doi: 10.1016/j.neures.2013.03.004

Clemens, Z., Mölle, M., Eross, L., Jakus, R., Rásonyi, G., Halász, P., & Born, J. (2011). Fine-tuned coupling between human parahippocampal ripples and sleep spindles. *European Journal of Neuroscience*, 33(3), 511-520. doi: 10.1111/j.1460-9568.2010.07505.x

Clemens, Z., Weiss, B., Szucs, A., Eross, L., Rásonyi, G., & Halász, P. (2009). Phase coupling between rhythmic slow activity and gamma characterizes mesiotemporal rapid-eye-movement sleep in humans. *Neuroscience*, 163(1), 388-96. doi: 10.1016/j.neuroscience.2009.06.044

**Project:** 2006-157

**Title:** Enhancing hit rates on psi tests with optimal levels of transliminality

**Duration:** 2007/01 – 2008/07

**Researcher(s):** Dr. James Houran

**Institution:** Integrated Knowledge Systems Inc., Springfield (USA)

**Results:** Houran and Lange (in press) reanalyzed data from two different studies (I Ching and haunt experiences) that examined transliminality and anomalous experiences simultaneously to

determine if there was an “optimal level” of transliminality for putative psi. Transliminality and Sex effects on anomalous experiences were identified in one dataset, as indicated by statistically significant variation in subjects’ experiential response hierarchies. Next, these differential effects were identified also in the other dataset at the behavioral level as indicated by subjects’ performance on an I Ching task. Results suggest that putative psi was best facilitated in women with high Transliminality scores and men with low Transliminality scores. As a cross-check of this heuristic, Houran and Lange (in preparation) explored experimenter effects in an experiment with the Chinese book of divination the I Ching, which contains 64 hexagrams (6-line structures) and associated readings. Three coins are thrown six times to generate one of these hexagrams. Participants and Experimenters ( $N = 120$ ) were recruited based on scoring patterns on Transliminality and Paranormal Belief to produce four experimental groups ( $N = 15$  pairs each) of varying levels of Paranormal Belief and Transliminality: High/High; High/Low; Low/High and Low/Low. Participants selected 16 of 64 hexagram-descriptor pairs, based on their emotional or cognitive states of mind. A “hit” was observed when 1 of the 16 choices would come up ( $P_{mce} = .25$ ). It was predicted that the hit rate of the High/High group would be significantly greater than chance, the High/High group would score significantly higher than the three control conditions (High/Low, Low/High, Low/Low) and that the three control conditions would score similarly. It was further expected that Transliminality, Paranormal Belief and Sex would show main and interaction effects for hit rate on the I Ching task. The hit rate on Hexagram 1 was 28 out of 60, or 46.7% which far exceeds the 25% chance level and the High/High group did have the highest raw score hit rate, but there were no significant main or interaction effects of Transliminality, Paranormal Belief or Sex. These surprising findings suggest that the specific differences in experimental protocols between the present study and past research are partly responsible. The two main differences involve (i) the notion of spontaneity and ambiguity related to the task and (ii) treating psi outcomes on the I Ching as a Rasch-trait variable rather than as independent observations.

**Keywords:** Parapsychology; Extrasensory perception (ESP); Precognition; Transliminality; Paranormal belief

**Indexed papers:** Houran, J. (2007). Entropy and environmental mystery: A parapsychological perspective. *Perceptual and Motor Skills*, 105(2), 688-690. doi: 10.2466/pms.105.2.688-690

**Project:** 2006-161

**Title:** The relation of mind to body. Psychophysiological studies of the placebo effect

**Duration:** 2007/01 – 2010/05

**Researcher(s):** Prof. Magne Arve Flaten, Prof. Oddmund Johansen, Dr. Terje Simonsen, Mr. Per M. Aslaksen, Mr. Peter Lyby, Dr. Espen Bjorkedal

**Institution:** Department of Psychology, University of Tromso (Norway)

**Results:** Placebo analgesia is the reduction in pain after administration of a placebo with information that it will reduce pain. We have shown that placebo analgesia can be objectively recorded by physiological measures (electromyography, heart rate variability, and event-related potentials (ERP)). Reduced ERPs indicate that placebos activate descending pain inhibitory pathways. The placebo response, or more precisely, the expectation of drug effects, can add to the effect of the drug. There is some evidence that placebo effects are strongest when expectations are reinforced by administration of an active drug. Of special importance to the present project was the investigation of the role of stress and negative emotions in placebo analgesia. Our hypothesis was that the placebo reduced stress and nervousness, and thereby reduced pain. Fear of pain was positively related to stress both during pain and in the anticipation of pain, and negatively related to placebo analgesia. However, other factors also contribute to the placebo analgesia. The present findings suggest that decreased stress may strengthen the placebo response. This may have important clinical consequences, as stress reduction could aid in treatment of pain. Furthermore, male subjects responded

with lower stress after placebo medication and larger placebo responses. These findings suggest that males respond differently to verbal placebo information compared to females. It is not known whether this is due to more effective pain inhibitory mechanisms in males, or to cognitive factors. In sum, there is a contribution of reduced stress to placebo analgesia, and for reasons unknown this effect is larger in males.

Keywords: Psychophysiology; Pain; Emotion; Electroencephalogram (EEG)

Indexed papers: Bjørkedal, E., & Flaten, M. (2012). Expectations of increased and decreased pain explain the effect of conditioned pain modulation in females. *Journal of Pain Research*, 5, 289-300. doi: 10.2147/JPR.S33559

Flaten, M., Aslaksen, P., Lyby, P., & Bjørkedal, E. (2011). The relation of emotions to placebo responses. *Philosophical Transactions of the Royal Society B*, 366, 1818-1827. doi: 10.1098/rstb.2010.0407

Lyby, P., Aslaksen, P., & Flaten, M. (2011). Variability in placebo analgesia and the role of fear of pain — an ERP study. *Pain*, 152(10), 2405-2412. doi: 10.1016/j.pain.2011.07.010

**Project: 2006-162**

Title: Paranormal healing, paranormal belief, and physical and psychological well-being

Duration: 2007/01 – 2009/03

Researcher(s): Dr. Caroline Watt, Dr. Alison Easter

Institution: Koestler Parapsychology Unit, Psychology Department, The University of Edinburgh, Scotland (UK)

Results: Study 1 was a partially-blinded randomized controlled clinical trial of distance healing with 60 arthritis sufferers. The results suggest that although generalized belief in healing seems to have little effect on self-reported pain, health and well-being, knowledge that one is receiving distance healing appears to be associated with improved outcomes for those who are in the healing group. Participants unaware that they were receiving healing showed no evidence of improved outcomes, thus not supporting the hypothesis that there can be health gains through distance healing alone.

Study 2 consisted of a questionnaire survey of 130 distance healers. Respondents displayed extremely high levels of spiritual connectedness, extremely permeable boundaries, frequent experience of exceptional phenomena, high levels of agreeableness and openness, and regarded themselves as driven by a compassionate desire to help others.

Study 3 used Interpretative Phenomenological Analysis (IPA) to develop an in-depth understanding of how healees experience and attribute meaning to their distance healing encounter. Interviews were conducted with fifteen Sri Lankan healees. Five themes emerged as a result of the IPA analysis: difficulty with the concept of “telepathic” or “distance” healing; tension between traditional Buddhist healing, and modernizing Western influences; subversion of doctor/patient relationship for experienced healees; a fluid notion of time; and varieties of healing experiences. Overall, the experience of healing seemed to be almost uniformly positive for the participants in this study, even when there was no physical improvement in health.

**Keywords:** Parapsychology; Healing; Distant healing; Paranormal belief; Personality factors

**Indexed papers:** Easter, A., & Watt, C. (2011). It's good to know: How treatment knowledge and belief affect the outcome of distant healing intentionality for arthritis sufferers. *Journal of Psychosomatic Research*, 71(2), 86-89. doi: 10.1016/j.jpsychores.2011.02.003

**Project:** 2006-163

**Title:** Effects of hypnotizability on EEG and autonomic concomitants of imagery and emotion production

**Duration:** 2007/06 – 2009/07

**Researcher(s):** Dr. Zvonikov Vyacheslav Michailovich, Prof. Stroganova Tatiana Alexandrovna, Dr. Anna Kirenskaya, Dr. Vladimir Novototsky-Vlasov, Mr. Andrey Chistyakov

**Institution:** Serbsky National Research Centre for Social and Forensic Psychiatry, Moscow (Russia)

**Results:** 19 high (H), 12 medium (M) and 12 low (L) hypnotizable subjects participated in 2 experimental sessions - hypnotic (HS) and waking (WS). EEG (19 sites), heart rate (HR) and skin conduction changes (SC) were recorded during the eyes-closed baseline condition, hypnotic relaxation, and recollection of emotionally neutral, positive and negative past events. EEG spectral analysis was applied.

Subjective scores of image vividness and emotion intensity were significantly higher in H subjects compared to L ones. Distinct increase of HR and SC was observed during the recollection of past events depending on emotional load compared to baseline in the group H both in HS and WS. HR and SC changed insignificantly in the group L. The study showed the stable and significant EEG differences between three groups in all functional conditions, including baseline. Three main EEG features distinguished group H from both other groups - increased spectral power (SP) of theta1 and theta2 bands and significantly higher coherence (Coh) within theta1, theta2, and alpha1 bands; SP and Coh within beta2 and gamma1 ranges were lower in H subjects compared to L ones. These differences were generalized. Greater SP and Coh during HS as compared to WS were found within theta – alpha ranges only for H subjects. No clear SP differences between HS and WS and higher Coh in HS only within alpha range were revealed in L group. The reactive EEG changes during the image and emotional loads were revealed in all frequency ranges in H subjects. In L group SP changes were non-significant both at the low (delta - theta) and high (gamma2) frequency ends of the spectrum, and Coh changes didn't involve delta - theta ranges. All M subjects' scores were intermediate between H and L ones. At that, patterns of EEG changes were frequency as well as hemispheric-specific depending on emotional valence only in H subjects. Thus, the ability to experience the emotions and inner images with the close to real life intensity is H subjects' distinctive feature and is related to the high level of information processing.

**Keywords:** Psychophysiology; Altered states of consciousness; Hypnosis; Brain; Emotion; Electroencephalogram (EEG)

**Indexed papers:** Kirenskaya, A. V., Novototsky-Vlasov, V. Y., Chistyakov, A. N., & Zvonikov, V. M. (2011). The relationship between hypnotizability,



internal imagery and efficiency of neurolinguistic programming. *International Journal of Clinical and Experimental Hypnosis*, 59(2), 225-241. doi: 10.1080/00207144.2011.546223

Kirenskaya, A., Novototsky-Vlasov, V. Y., & Zvonikov, V. M. (2011). Waking EEG spectral power and coherence differences between high and low hypnotizable subjects. *International Journal of Clinical and Experimental Hypnosis*, 59(4), 441-453. doi: 10.1080/00207144.2011.594744

**Project: 2006-165**

Title: The sense of self in the brain: Neural correlates of self-recognition

Duration: 2007/09 – 2010/01

Researcher(s): Dr. Emmanouil (Manos) Tsakiris, Dr. Angela Sirigu, Prof. Patrick Haggard, Dr. Matteus Joffly

Institution: Department of Psychology, Royal Holloway, University of London (UK)

Results: The exact relation between the sense that one's body is one's own (body-ownership) and the sense that one controls one's own bodily actions (agency) has been the focus of much speculation, but remains unclear. On an 'additive' model, agency and body-ownership are strongly related; the ability to control actions is a powerful cue to body-ownership. This view implies a component common to the senses of body-ownership and agency, plus possible additional components unique to agency. An alternative 'independence' model holds that agency and body-ownership are qualitatively different experiences, triggered by different inputs, and recruiting distinct brain networks. We tested these two specific models by investigating the sensory and motor aspects of body-representation in the brain using fMRI. Activations in midline cortical structures were associated with a sensory-driven sense of body-ownership, and were absent in agency conditions. Activity in the pre-SMA was linked to the sense of agency, but distinct from the sense of body-ownership. No shared activations that would support the additive model were found. The results support the independence model. Body-ownership involves a psychophysiological baseline, linked to activation of the brain's default mode

network. Agency is linked to premotor and parietal areas involved in generating motor intentions and subsequent action monitoring. The apparently inconsistent results between psychophysical and neuroimaging experiments are interpreted in the context of our recent understanding of neuropsychological syndromes that affect action- and/or body-awareness.

**Keywords:** Psychophysiology; Brain; Self; Body awareness; Functional magnetic resonance imaging (fMRI)

**Indexed papers:** Tsakiris, M., Longo, M. R., & Haggard, P. (2010). Having a body versus moving your body: Neural signatures of agency and body-ownership. *Neuropsychologia*, 48(9), 2740–2749. doi: 10.1016/j.neuropsychologia.2010.05.021

Haggard, P., & Tsakiris, M. (2009). The experience of agency: Feelings, judgments and responsibility. *Current Directions in Psychological Science*, 18(4), 242-246. doi: 10.1111/j.1467-8721.2009.01644.x

**Project: 2006-167**

**Title:** A study to assess the validity of applied kinesiology (AK) as a diagnostic tool and as a nonlocal proximity effect

**Duration:** 2007/02 – 2010/01

**Researcher(s):** Dr. Stephan A. Schwartz, Dr. Ginette Nachman, Dr. William Frazer Morris

**Institution:** Laboratories for Fundamental Research, California (USA)

**Results:** This study sought to answer the following: 1. Is there a difference in muscular strength when individual holds substance inimical to life processes compared to substance essential for life? 2. Does effect involve input from person being measured, and kinesiologist doing measurement, or only person measured? 3. Is the result the same when different kinesiologists take measurement, or when no kinesiologist is involved? 4. Does belief, expectation, gender, or time cognition play a role?

**Methods:**

51 participants 3 trials: first kinesiologist, second kinesiologist, no kinesiologist testing using hand dynamometer. Each trial used pair of randomly numbered sealed vials, one vial saline solution, the other saline solution plus ionic hydroxylamine hydrochloride (NH<sub>3</sub>OH)<sup>+</sup>. Each trial involved a separate muscle

test for each vial. All present blind to vial containing toxin. Kinesiologist force measured via pressure pad system.

**Results:**

151 sets of trials toxic vial identified 80 times (53%), onetailed exact binomial p-value 0.258. Results kinesiologists: chance. Dynamometer results: chance. Testing whether significant difference in proportions for whom AK test worked based belief whether it would work non-significant chi-square value: 0.6 ( $p = 0.439$ ) for trials with one kinesiologist, and 2.222 ( $p = 0.136$ ) for hand dynamometer trials. Gender variable: no significant difference males and females, for trials of male kinesiologist or hand dynamometer, combined data for two female kinesiologists did reveal difference. Of 33 female sessions 15 successful (45%); 18 male sessions, 14 successful (78%) chi-square statistic: 4.96,  $p = 0.026$ . Given multiple testing chi-square results interpreted cautiously. Belief in whether or not AK test will work not significantly related to whether did work. Chi-square test time perception/correct vial choice: non-significant. Chi-square statistic using hand dynamometer data: 0.927,  $p\text{-value} = 0.629$ .

**Conclusion:**

Study and review of AK literature using QUADAS, STARD, JADAD and CONSORT suggest AK fails as reliable diagnostic tool upon which health decisions can be based.

**Keywords:**

Parapsychology; Assessment tools; Healing

**Indexed papers:**

Schwartz, S. A., Utts, J., Spottiswoode, J., Shade, C., Tully, L., Morris, W., & Nachman, G. (2014). A double-blind, randomized study to assess the validity of Applied Kinesiology (AK) as a diagnostic tool and as a nonlocal proximity effect. *Explore: The Journal of Science and Healing*, 10(2), 99-108. doi: 10.1016/j.explore.2013.12.002

**Project:**

**2006-169**

**Title:**

Exploring the relationship between paranormal belief, the propensity to make the type I error and the detection of paranormal and weak signals amid visual and auditory noise

**Duration:**

2009/09 – 2011/01

**Researcher(s):**

Dr. Christine Anne Simmonds-Moore

- Institution:** Liverpool Hope University (UK)
- Results:** 95 participants (believers and skeptics) took part in a study comprising a series of 4 visual noise and 4 auditory noise (pink noise) trials. Each participant was exposed to 2 degraded stimuli, 1 ESP stimulus and 1 random trial for each sense. Believers and skeptics did not differ in the number of guesses made regarding target identity. However, believers' guesses were generally more elaborate and complex; their reaction times to decide that something was present (for the auditory condition) were faster, they were more confident about their first guesses and made more misidentifications than skeptics. Overall, more guesses and misidentifications were made for the visual condition.
- Believers and skeptics did not differ in their overt detection of weak visual or auditory stimuli. Overall, reaction times were faster when a degraded stimulus was present compared to the random condition. For judge 1, there was a trend toward a significant ESP effect for the auditory condition ( $z = 1.93$ ,  $p = .053$ ) and a suggestive effect for the visual condition ( $z = 1.65$ ,  $p = .099$ ). For judge 2, there were no significant effects for either sense. For the auditory sense, more guesses were made for the psi than the random conditions. Believers did not differ significantly from skeptics in terms of ESP scoring.
- By exploring schizotypy, this study also found evidence for different types of believer and disbeliever; a healthy and less healthy believer and an equivalent healthy and less healthy skeptic. There were no differences between the two different types of believer on ESP scoring.
- Overall, the Magical Ideation scale did not correlate with ESP scoring. However among skeptics, there was a significant negative correlation with auditory ESP.
- Keywords:** Parapsychology; Paranormal belief; Extrasensory perception (ESP); Personality factors
- Indexed papers:** N/A

- Project:** 2006-170
- Title:** Seeing the future: Exploring presentiment with eye gaze and pupillary dilation
- Duration:** 2007/01 – 2008/10
- Researcher(s):** Dr. Dean Radin
- Institution:** Institute of Noetic Sciences, Petaluma, CA (USA)
- Results:** A broad range of human activity is involved in anticipatory behavior, from the placebo effect, to predicting the next influenza strain, to catching a baseball. Conventional models of anticipation assume that events unfold in a strictly unidirectional flow of time, from past to future. This assumption was tested experimentally. Pupillary dilation, spontaneous blinking, and eye movements were tracked before, during and after participants viewed photographs with varying degrees of emotional affect. Photos were selected uniformly at random with replacement from the International Affective Picture System. Eye data prior to exposure to emotional and calm photos were compared using nonparametric differential procedures. Eye data were predicted to show larger anticipatory responses before emotional photos than before calm photos, under conditions that excluded sensory cues, statistical cues, and other conventional means of inferring future events. Pupillary dilation and spontaneous blinking increased more before emotional vs. calm photos (combined  $p = 0.00009$ ). Horizontal eye movements indicated a brain hemisphere asymmetry before viewing the photos that was appropriate to both the emotionality ( $p = 0.05$ ) and the valence of the future images ( $p = 0.01$ ). Overall females tended to perform better than males. In alignment with the outcomes of previous studies based on other physiological variables, this outcome suggests that comprehensive models of anticipatory behaviour may require consideration of transtemporal influences from the future.
- Keywords:** Parapsychology; Extrasensory perception (ESP); Presentiment
- Indexed papers:** Radin, D., & Borges, A. (2009). Intuition through time: What does the seer see? *Explore: The Journal of Science and Healing*, 5(4), 200-211. doi: 10.1016/j.explore.2009.04.002

- Project:** 2006-174
- Title:** Experimental investigation of a Psi training program
- Duration:** 2007/05 – 2009/01
- Researcher(s):** Dr. Marilyn Schlitz, Dr. Dean Radin, Dr. Cassandra Vieten, Dr. Colin Cherot
- Institution:** Institute of Noetic Sciences, Petaluma, CA (USA)
- Results:** To test the claim that transformative practices may lead to enhanced intuitive experiences, we conducted an experiment on the “sense of being stared at” in a group of sixteen experienced TM-Sidhi meditators vs. sixteen non-meditators. The experiment was controlled by a web-based program, which used a web-cam to present the live image of a distant person over the Internet. The program randomly assigned staring vs. non-staring trials based on a true random source, and it automatically recorded the stared-at person’s guesses. The stared-at person in this test was located inside a secure, electromagnetically shielded chamber, and the chamber was monitored by an experimenter, to rule out potential collusion between the participants.  
As expected, the meditation group’s scores on a self-transcendence scale were significantly higher than the control group’s, but the meditators did not show enhanced performance on the experimental task. Instead, the meditators obtained chance results while the control group showed nearly significant ability to detect distance staring.  
A consistently positive finding in this experiment was a confirmation of the “sheepgoat” effect: Participants’ expectations and beliefs strongly predicted their actual performance. Each of four questions asking about expectations of success showed that participants who expected to do well performed consistently better than those who did not.
- Keywords:** Parapsychology; Psychokinesis (PK); Remote staring/Being stared at; Extrasensory perception (ESP); Intuition; Altered states of consciousness; Meditation; Paranormal belief
- Indexed papers:** N/A

- Project:** **2006-181**
- Title:** Brain activity during psychokinetic task - Research with near infrared spectroscopy
- Duration:** 2007/02 – 2008/04
- Researcher(s):** Dr. Mikiyo Yamamoto, Dr. Hideyuki Kokubo
- Institution:** Institute for Living Body Measurements, International Research Institute, Chiba (Japan)
- Results:**
- Objectives:**  
To test teleportation phenomenon by a famous Chinese psychic and study brain blood flow change during teleportation tasks.
- Methods:**  
Subject was a Chinese female W004. Targets were vitamin C pills of Chocola (Eisai) on an electric balance or in a bottle. W004 tried to teleport pills in free style tests. One trial was 30-45 min. All tests were monitored by video cameras.
- Measurements:**  
Brain blood flow was measured by fNIRS; OMM-3000 (Shimadzu) which uses 3 NIR lasers of 780, 805 and 830nm. Respiration, electrodermal activity and photoplethysmograms were measured by MP150 (Biopack Systems). Pill weights were measured with an analytical semi-micro balance every second at 0.01 mg accuracy. Two RNGs and thermo sensors were set around the balance. An electrostatic voltmeter was set in front of the balance.
- Psychological tests:**  
W004 was given a profile questionnaire and 5 questionnaires on character traits. Uchida-Kraepelin Psychodiagnostic test was also done. To get usual activities for W004, she was given facial recognition tests using photos of a young Japanese woman's face as stimuli; six basic emotions were laughter, surprise, fear, anger, dislike and contempt, and 10 intermediate faces.
- Results:**  
Good results on teleportation were not obtained. There was no anomaly detected by the IR sensors and thermo camera. During PK tasks, electric charge of W004's body vibrated at low frequency. Brain blood flow increased at her right hemisphere during teleportation tasks. The activated areas were similar to

those during facial recognition tests. Personality of W004 was common, not abnormal.

Keywords: Parapsychology and Psychophysiology; Psychokinesis (PK); Functional near-infrared spectroscopy (fNIRS)

Indexed papers: N/A

**Project: 2006-195**

Title: Seeing into the future: Temporally reversed implicit perceptual priming

Duration: 2007/05 – 2011/03

Researcher(s): Prof. Jonathan Wolf Schooler, Dr. Merill McSpadden

Institution: Memory, Emotion, Thought and Awareness Labs, Department of Psychology, University of British Columbia, Vancouver (Canada)

Results: The first part of our research efforts were aimed towards exploring an implicit precognition paradigm in which participants attempted to detect or identify images that were sometimes re-presented in the future. In the original paradigm, with seven out of nine prior variations of this procedure (with over 700 participants total), we found evidence that the perception of images is enhanced if they were going to be re-presented in the future ( $p < .001$ ). Since receiving the Bial grant we carried out the TRIPP paradigm with an additional 1400 participants, and 14 experiments. These studies were geared primarily towards trying to identify the procedure that produced the most reliable results. In all of these studies participants viewed an image, made a judgment about the perceptibility of the image, and then a prime either was or was not presented. Unfortunately, assorted variations to the procedure failed to produce more reliable effects, and although several studies have produced significant findings, the overall TRIPP effect has not proven reliable across these new studies. Despite negative results, the systematic decline in effect size seen in these studies could have important implications for this type of work and these findings have already generated significant discussion. The other



- strand of research on retrocausal practice effects has resulted in a promising paradigm that has been developed to predict meaningful real-world events. Results suggest that it is possible to use this paradigm to predict the outcome of a roulette spin (Black vs. Red) greater than chance (57%,  $N = 151$ ,  $p < .05$ ).
- Keywords:** Parapsychology; Extrasensory perception (ESP); Precognition; Psychokinesis (PK); Retrocausality
- Indexed papers:** Schooler, J. W. (2011). Unpublished results hide the decline effect. *Nature*, 470(7335), 437-437. doi: 10.1038/470437a
- Project:** **2006-196**
- Title:** Effect of the comprehensive Art of Living yogic breathing programme on the physiological and psychological well-being
- Duration:** 2007/04 – 2009/09
- Researcher(s):** Dr. Sanja Kostrun, Dr. Irena Svenda, Dr. Sanja Kordic, Prof. Fahri Saatvcioglu, Mr. Hrvoje Tadic, Dr. Hujic Aleksandra
- Institution:** The Art of Living Foundation Croatia, Zagreb (Croatia)
- Results:** The aim of this study was to investigate the effect of the AOL program on the physiological and psychological well-being of healthy volunteers and to determine significantly changed markers in order to use them in subsequent studies. Comprehensive yogic program consisting of yogic postures, unique breathing exercises, relaxation techniques and stress management has been applied. Effect was measured by a) physiological parameters - metabolic, inflammatory, oxido-reductive and stress status, as well as cardiovascular and autonomic system parameters, and b) psychological parameters - health status, satisfaction with life, quality of life, self-esteem, emotional status, anxiety and neuroticism. The study included pre-post test design with wait-listed control group. Intervention group participated in the initial 6 day course, with regular daily home practice and weekly follow-ups for a period of three months. Results of this study show: a) psychological parameters - significant decrease in anxiety and negative emotions, significant increase of positive emotions, increase in self-esteem and

overall satisfaction with life. Health self-estimate shows that after the course participants exhibit better social functioning, smaller emotional barriers regarding everyday challenges, increased health self-estimate, better mental health and vitality; b) physiological parameters – significant decrease of total and LDL cholesterol, and slight increase of cortisol were measured immediately after the course. Three months after the course statistically significant decrease of total cholesterol and diastolic pressure, and slight increase of super oxide bismutase and C-reactive protein were measured. Most significant changes were measured for spirometric parameters which points to more effective pulmonary function. As the changes of psychological parameters were most prominent immediately after the course, changes in physiological parameters show slower trend, with increased changes three months after the course.

Keywords: Psychophysiology; Stress and health; Well-being; Intervention

Indexed papers: N/A

### **2008/09 Projects**

**Project:** 2008-15  
**Title:** Psi information system software design for parapsychological research: SIPSI v.3.0: references, bibliometry research and video-DVD collection database  
**Duration:** 2009/01 – 2011/01  
**Researcher(s):** Dr. Alejandro Enrique Parra, Sr. Alejandro Jarandilla, Ms. Teresa Porcel, Mr. Bernardo Olivares Torres, Mr. Jorge Villanueva  
**Institution:** Instituto de Psicología Paranormal, Buenos Aires (Argentina)  
**Results:** The aim of the SIPSI v.3.0 is to include a bibliographic citation and/or an abstract, of any book or article (scholarly or popular), thesis, chapter, conference proceedings paper, or separate report or monograph on parapsychology or related consciousness studies. SIPSI v.3.0 is a collection of compu-

terized bibliographic databases that emphasize parapsychology and related consciousness disciplines. The latter includes literature on altered states, spiritual disciplines that may be psi-related, the mind body relationship, consciousness anomalies, and theories, methods, and techniques dealing with aspects of consciousness. Where obtainable, citations to non-English language materials are also included, if possible with English and non-English abstracts. Non-English languages included are Dutch, French, German, Italian, Japanese, Polish, Portuguese, Russian, and Spanish. Also included are relevant articles published in subject specialist journals in such fields as psychology, physics, engineering, education, philosophy, religion, psychiatry, medicine, literature, folklore, mathematics, anthropology; general science magazines. SIPSI includes also books and articles on parapsychology from 1900 to date and some of the most relevant books from other disciplines up to 2010 were included.

Keywords: Parapsychology; Assessment tools

Indexed papers: N/A

**Project: 2008-17**

Title: Enhancing psychokinesis task performance: volition and other attempts to study PK performance through the practice of imagery strategies

Duration: 2009/02 – 2011/02

Researcher(s): Dr. Alejandro Enrique Parra, Dr. Juan Manuel Corbetta, Dr. Irma Juana Caputo

Institution: Instituto de Psicología Paranormal, Buenos Aires (Argentina)

Results: This research project aimed at exploring the role of volition in Random Number Generator (Model M) tasks. Three volitional (imagery) strategies were examined: (1) goal oriented, (2) process oriented, and (3) end oriented (final result) strategies. A number of participants practice each one of the three strategies on six occasions. In Study 2, the participants completed four sessions each, a control condition was added. A number of ses-

sions were conducted. In both studies, the three strategies were carried out in order to enhance the PK scoring or increase PK scores over a period of time (as we predict), thus to confirm earlier findings with imagery strategies and PK. The sample included 62 participants, both 40 females (71.4%) and 22 males (28.6%), their ages ranged from 19 to 77 years (*Mean* = 48.47; *SD* = 11.02). The procedure of each session was as follows. Each subject was met by Experimenter 1 and shown the main console containing the Zener diode and processing circuitry. The subjects were told that this was an exploratory test of PK that they would be asked to influence the output of an RNG by focusing their attention on the circle of lights display since it would give them feedback and represented the outcome of the electrical events they were attempting to influence. Since this study was designed as a pilot study, we asked several descriptive questions of the data. First, was there evidence for PK overall or in any of the conditions. The random event generator produced decisions in accordance with the subject's instructions (hits) 51.9% of the time ( $Z = 2.38$ ,  $p < .02$ , two tailed). Almost all of the positive scoring occurred with the goal oriented imagery, which produced 52.9% hits and was independently significant ( $Z = 2.61$ ,  $p < .01$ , two tailed). The present research project part of an attempt to clarify the concept of PK and empirically explore it more effectively.

Keywords: Parapsychology; Psychokinesis (PK); Intention

Indexed papers: N/A

**Project: 2008-23**

Title: A Test for Mindfulness – The Bistable Images Test

Duration: 2009/01 – 2010/09

Researcher(s): Prof. Harald Walach, Dr. Ursula Mochty

Institution: University of Northampton, School of Social Sciences (UK)

Results: We used the bistable Necker cube as a potential test for mindfulness. In a cross sectional study participants with a long meditation practice perceived significantly fewer reversals than control persons, when asked to hold on to one perception. This

was correlated with meditation time per week. This finding documents that perceptual processes might indeed be altered by meditation practice. Meditators also were more mindful, less anxious and depressed than the control group, but were not different in attention control under time pressure (d2-test). Meditators also had a significantly shorter reaction time, and this might even be a better measure of mindfulness to be studied in the future. These results support the assumption that meditation practice enhances perceptual control and mindfulness. Without instruction to hold on to one percept, there was no difference between the groups. The results of a longitudinal study with meditation novices clearly demonstrate a significant improvement over 8 weeks in all variables. Selective attention and mindfulness increased significantly with participants becoming significantly less anxious and depressed. Participants were able to successfully increase the average time in between perceived reversals under both conditions.

A decrease in the amount of perceived reversals was significant for the passive condition and almost reached significance under the active condition.

**Keywords:** Parapsychology; Altered states of consciousness; Meditation; Cognitive processes; Attention

**Indexed papers:** Sauer, S., Lemke, J., Wittmann, M., Kohls, N., Mochty, U., & Walach, H. (2012). How long is now for mindfulness meditators? *Personality and Individual Differences*, 52(6), 750-754. doi:10.1016/j.paid.2011.12.026

**Project:** 2008-30

**Title:** Does meditation practice modulate the dynamics of attentional neural networks? An EEG study

**Duration:** 2009/09 – 2011/04

**Researcher(s):** Dr. Peter Malinowski, Prof. Thomas Gruber, Dr. Gernot G. Supp

**Institution:** Liverpool John Moores University, School of Psychology (UK)

**Results:** The aim of the research project was to investigate whether a brief daily mindfulness meditation practice can contribute to an improvement of attentional functions and changes in the underlying brain networks.

Towards this end we conducted a longitudinal EEG study with randomized control group design that assessed the modification of attentional functions after 16 weeks of mindfulness meditation practice. At baseline participants were allocated to a meditation (MG) or a wait-list control group (CG). The MG received three hours mindfulness meditation training and were requested to meditate daily for ten minutes for the next 16 weeks. At baseline, after 8 weeks and after 16 weeks, participants performed computerized tasks that address attentional control mechanisms, while the 64-channel EEG was recorded. The analysis of the event-related potentials (ERP) of the EEG confirmed that regular mindfulness practice influences brain mechanisms of attentional control evidenced by differences between the MG and CG in ERP components that indicate inhibitory, resource allocation and conflict monitoring processes. Importantly, also the levels of self-reported mindfulness (assessed with the Five Facet Mindfulness Questionnaire) increased significantly in the MG compared to the CG. This increase was positively correlated with the self-reported amount of meditation practice.

Consistent with recent findings, the pattern of results suggests that mindfulness practice may be associated with a more even distribution of limited attentional resources and more efficient conflict monitoring.

**Keywords:** Psychophysiology; Altered states of consciousness; Meditation; Cognitive processes; Attention; Electroencephalogram (EEG)

**Indexed papers:** Malinowski, P. (2013). Neural mechanisms of attentional control in mindfulness meditation. *Frontiers in Neuroscience*, 7: 8. doi: 10.3389/fnins.2013.00008

Moore, A., Gruber, T., Derose, J., & Malinowski, P. (2012). Regular, brief mindfulness meditation practice improves electrophysiological markers of attentional control. *Frontiers in Human Neuroscience*, 6: 18. doi: 10.3389/fnhum.2012.00018

Chiesa, A., & Malinowski, P. (2011). Mindfulness-based approaches: Are they all the same? *Journal of Clinical Psychology*, 67(4), 404-424. doi: 10.1002/jclp.20776

- Project:** 2008-32
- Title:** Conscious will and voluntary actions: is there a last ventriloquist in the brain?
- Duration:** 2009/04 – 2012/02
- Researcher(s):** Prof. José Luis Perez Velazquez, Dr. Richard Wennberg, Dr. Luis Garcia Dominguez
- Institution:** Hospital for Sick Children, University of Toronto (Canada)
- Results:** A fundamental topic in neuroscience is the nature of “free will” and how it is derived from neurophysiological processes. In this study, we investigate decision-making by examining the differences in brain activity underlying free and forced behaviours using magnetoencephalographic (MEG) recordings from subjects performing button pressing tasks that require them to exercise their choice by pushing one of two buttons in response to various cuing methods. The greatest ability to discriminate (>80% classification accuracy) free and forced trials came from MEG sensors located over the primary sensory cortices specific for the modality used to cue each trial: either visual (occipital) or auditory (left temporal), and minor non-localized differences for trials that were pre-specified. These findings suggest that primary sensory areas play a crucial part of the information processing steps organizing the production of free and forced behaviours, and, contrary to the current conceptualisation, that fronto-parietal processes may not be the principal determinants of these actions.
- Keywords:** Psychophysiology; Cognitive processes; Decision-making; Brain; Magnetoencephalogram (MEG)
- Indexed papers:**
- Kostelecki, W., Mei, Y., Garcia Dominguez L, & Perez Velazquez, J. L. (2012). Patterns of brain activity distinguishing free and forced actions: contribution from sensory cortices. *Frontiers in Integrative Neuroscience*, 6, 84, 1-7. doi: 10.3389/fnint.2012.00084
- Perez Velazquez, J. L. (2012). The biophysical bases of will-less behaviors. *Frontiers in Integrative Neuroscience*, 6: 98, 1-10. doi: 10.3389/fnint.2012.00098
- Kostelecki, W., Garcia Dominguez, L., Perez-Velazquez, J. (2011). Single trial classification of magnetoencephalographic recordings using Granger causality. *Journal of Neuroscience Methods*, 199(2), 183-191. doi: 10.1016/j.jneumeth.2011.04.032

- Project:** 2008-34
- Title:** Process- and Proof-focused Investigation of Anomalous Information Reception by Mediums: A Two-Part Quantitative Study
- Duration:** 2009/01 – 2011/02
- Researcher(s):** Dr. Julie Beischel, Dr. Adam J. Rock, Dr. Mark E. Boccuzzi, Mr. Michael Biuso
- Institution:** The Windbridge Institute for Applied Research in Human Potential, Tucson (USA)
- Results:** Part I of 34/08 addressed the potential correlation between the mediums' phenomenology and the accuracy of their readings. Directly after each of two test readings for paired discarnates, 19 claimant mediums completed the Phenomenology of Consciousness Inventory (PCI). The dimensions of Anger, Sadness, and Negative Affect were significantly positively correlated with Accuracy Scores. In addition, Sadness and Altered Time Sense were significantly positively correlated with the Global Difference Score (a measure of specificity). Conversely, Self-Awareness was significantly negatively correlated with the Global Difference Score. Part II of the study addressed the following hypothesis: Windbridge Certified Research Mediums (WCRMs) can report accurate and specific information about discarnates using anomalous information reception (AIR); that is, without any prior knowledge about the discarnates or sitters, in the absence of any sensory feedback, and without using deceptive means. Each of eight WCRMs performed two quintuple-blind readings for two blinded and absent sitters. In 11 of 12 returned readings, sitters chose the intended vs. control reading as their own ( $p = .003$ ; one-tailed). The mean Global and Percent Accuracy scores given by sitters for whom readings were intended were significantly higher than those scores given by sitters for whom the readings were not intended (3.4 and 54% vs. 2.0 and 33%, respectively;  $F_{(2, 21)} = 4.52, p = .02$ ). The effect sizes determined for whole-reading and item-by-item scores were both large ( $d = 1.07$  and  $1.20$ , respectively).
- Keywords:** Parapsychology; Survival after bodily death; Mediumship
- Indexed papers:** N/A



**Project:** 2008-36  
**Title:** Neural Correlates of Sympathetic Magical Belief  
**Duration:** 2009/02 – 2012/02  
**Researcher(s):** Prof. Bruce M. Hood, Dr. Nathalia Gjersoe, Dr. Richard Wise  
**Institution:** Cardiff University Brain & Repair Imaging Centre (UK)

**Results:** In sympathetic magical belief, action to a representation of an object is thought to affect the object itself. This supernatural belief is common in preliterate societies but rarely explicitly endorsed in scientifically literate adults. Regardless, our results show that even those who do not express sympathetic magical beliefs nonetheless show significantly greater activation in the insular cortex, a brain area associated with pain and loss, and the anterior cingulate cortex, an area associated with suppression of emotion, when viewing a video of a beloved object being destroyed relative to controls, even though they know it to be pretend. We interpret the result as evidence that (a) scientifically literate adult implicitly endorse sympathetic magical beliefs when reasoning about emotionally important objects and (b) that this bias is suppressed by frontal lobe networks, enabling rational explicit responses.

**Keywords:** Parapsychology and Psychophysiology; Paranormal belief; Brain; Functional magnetic resonance imaging (fMRI)

**Indexed papers:** Lindeman, M., Riekk, T., & Hood, B. (2011). Is weaker inhibition associated with supernatural beliefs? *Journal of Cognition and Culture*, 11(1-2), 231-239. doi: 10.1163/156853711X570038  
 Hood, B., Donnelly, K., Leonards, U. & Bloom, P. (2010). Implicit voodoo: electrodermal activity reveals a susceptibility to sympathetic magic. *Journal of Cognition and Culture*, 10(3), 391-399. doi: 10.1163/156853710X531258

**Project:** 2008-38  
**Title:** Creative psi functioning  
**Duration:** 2009/09 – 2012/07  
**Researcher(s):** Prof. Suitbert Ertel, Dr. Ulrich Timm  
**Institution:** University of Göttingen (Germany)

Results: N/A – Inconclusive Project  
Keywords: Parapsychology; Psychokinesis (PK); Anomalous cognition/experiences; Superior psi ability

Indexed papers: N/A

**Project: 2008-39**

Title: Anomalous Communication: The Transmission of Subjective Significance

Duration: 2009/02 – 2011/09

Researcher(s): Dr. Wolfgang Ambach, Dr. Tim Schönwetter

Institution: Institute for Frontier Areas of Psychology and Mental Health (IGPP), Freiburg (Germany)

Results: In this project, we implemented the psychophysiological concept of the orienting response (OR) in the investigation of anomalous correlations between physiological activity and events conventionally considered as unperceivable. We questioned whether the subjective significance of an object for one partner of an emotionally related pair modulates the OR in the second, spatially separated partner when he or she is confronted with a picture of the same object. In the first main study, we investigated 50 participant pairs in a modified Guilty Knowledge Test. In order to (a) prevent a confound of physiological responses with answering behavior, (b) implement a synchronistic timing, and (c) increase a possible anomalous effect, we investigated 48 participant pairs in a modified guessing task in the second main study. This task was tested with 48 participants in a pretest study. Taken together, results of the three studies provided no evidence for anomalous correlations of physiological activity and events conventionally considered as unperceivable. Analyses of electrodermal response amplitudes, heart rate changes, respiratory changes and pulse activity of the investigated participants revealed no significant differences of the OR ( $d < 0.15$ ,  $p > .1$ ) between objects with and without particular significance for the partner. Guessing rates were at chance expectation ( $p > .1$ ).

- No influence of moderator variables (connectedness between participants, paranormal belief) was found. Methodological analyses provided evidence for an artifact in prior studies of this research approach: Effects of serial positioning can lead to a biased estimation of the alpha level, whenever physiological responses to stimuli presented serially are analyzed.
- Keywords:** Parapsychology; Extrasensory perception (ESP)
- Indexed papers:** Schönwetter, T., Ambach, W., & Vaitl, D. (2011). Does a modified guilty knowledge test reveal anomalous interactions within pairs of participants? *Journal of Parapsychology*, 75(1), 93-118.  
 Schönwetter, T., Ambach, W., & Veitl, D. (2011). Does autonomic nervous system activity correlate with events conventionally considered as unperceivable? Using a guessing task with physiological measurement. *Journal of Parapsychology*, 75(2), 327-348.
- Project:** 2008-42
- Title:** Marcadores Fisiológicos de Processamento Sensorial do Recém-Nascido
- Duration:** 2009/02 – 2013/02
- Researcher(s):** Dr. Adriana da Conceição Soares Sampaio, Dr. Maria de Góis Vicente Ramalho Eanes, Dr. Clédna Patrícia de Oliveira Silva, Dr. Hugo Miguel Braga de Almeida Tavares
- Institution:** CIPsi - Centro de Investigação em Psicologia, Universidade do Minho, Braga (Portugal)
- Results:** The main objective of this study was to identify physiological markers of the sensorial processing of the newborn and relation with behavioral measures. In order to accomplish this aim, we collected: a) EEG, physiological and neurobehavioral measures at 1-month-old; and 2) behavioral and cognitive measures at one-year old.  
 Results showed that when considering the visual and auditory evoked potentials, no statistically significant differences were found between the three intensities. However, when correlating the physiological data with the neurobehavioral assessment, we verified that higher ERP amplitudes (e.g. P100) were observed for higher stimuli intensities, which were further correlated

with neurobehavioral domains that characterized more reactive infants. For the physiological measures, statistically significant differences were found in the Cardiac Frequency to visual stimuli, where higher frequencies were also observed for higher intensities. Moreover, this increased physiological reactivity was correlated with the neurobehavioral domain Autonomic System, suggesting that increased physiological response to higher intensity stimuli was observed in more reactive infants. With respect to auditory stimulus, we did not observe differences between intensities. Additionally, when Respiratory Frequency was analyzed, we did not observe differences between the three intensities for visual and auditory stimuli. Nevertheless, when correlating the physiological data with the neurobehavioral assessment, hyper-reactive domains were correlated with higher respiratory frequencies. These findings suggest that infants who presented more reactive neurobehavioral features tend to present a more reactive physiological pattern to external stimuli.

**Keywords:** Psychophysiology; Developmental psychology; Physical development and health

**Indexed papers:** Góis-Eanes, M., Gonçalves, O., Caldeira-da-Silva, P., & Sampaio, A. (2012). Biological and physiological markers of tactile sensorial processing in healthy newborns. *Infant Mental Health Journal*, 33(5), 535-542. doi: 10.1002/imhj.21328

**Project:** 2008-44

**Title:** A Test of the Model of Pragmatic Information using European Cases of Anomalous Experiences

**Duration:** 2009/04 – 2012/01

**Researcher(s):** Dr. Caroline Watt, Dr. Ian Tierney

**Institution:** Koestler Parapsychology Unit, The University of Edinburgh, Scotland (UK)

**Results:** A three-year study was conducted as the first systematic test of von Lucadou's Model of Pragmatic Information using spontaneous reports of RSPK-type Anomalous Experiences. The study involved collaboration amongst over 60 European centres for parapsychological research and individual researchers. Follow-

ing 43 referrals, a total of 17 cases passed the initial screening process, and 14 completed the full study, six of which were in the 'documented' group. The Europsi project was successful in creating a network of collaborators active in parapsychology and clinical parapsychology, and facilitated communication amongst that group. The study website operated successfully, as the rejection rate was consistent with that predicted from previous research. Analysis of the two formal study hypotheses did not provide support for the predictions of the MPI, and it was concluded that this aspect of the research was of limited success due to low statistical power. Debriefing revealed that some collaborators reported a dramatic drop in the frequency of contacts from the public, which they largely attributed to the burgeoning popularity of amateur 'ghost' investigation groups and the ease with which the internet allowed such groups to be located. They also reported that in cases where the callers were in distress, they felt reluctant to delay assisting the caller by referring them to the study. All respondents indicated a willingness to continue to refer cases to the study website.

Keywords: Parapsychology; Anomalous cognition/experiences; Spontaneous cases

Indexed papers: N/A

**Project:** 2008-45

Title: Refining the methodology of alpha electroencephalographic biofeedback and exploring its effect on cognition and mood

Duration: 2009/02 – 2012/04

Researcher(s): Dr. David Vernon, Dr. Soren Andersen, Dr. Neil Rutterford, Prof. Marcia Pasqualini, Dr. Olga Bazanova

Institution: Dept. of Applied Social Sciences, Canterbury Christ Church University (UK), University of East Anglia Norwich (UK), Dept. of Psychology, Avila University, Kansas City (USA), Siberian Branch of the Russian Medical Academy, State Institute for Molecular Biology and Biophysics, Nonvosibirsk (Russia)

**Results:** EEG biofeedback did not result in any clear changes in EEG, either within or across training sessions for three of the four locations. There was also no clear difference in behavioural performance of the EEG training group compared to those receiving mock feedback.

However, for the Russian group the results showed that alpha biofeedback training enhanced the alpha peak frequency, width and power in the individual upper alpha range, but only for participants with a low baseline alpha peak frequency (<10 Hz). In contrast, the mock biofeedback increased resting alpha power only in participants with high baseline resting alpha frequency. With regards to changes in cognitive performance those given real EEG biofeedback training showed evidence of improving their response times and accuracy when completing a mental rotation task. Though this was only seen for those with lower individual alpha peak frequencies (<10Hz). Similarly, those receiving real feedback that had low peak alpha also showed improved performance on a conceptual span memory task. There was also a reduction in anxiety levels for those given real feedback with high peak alpha.

The findings are less clear and robust than we had originally anticipated. The various reward thresholds seemed to have little impact on the effectiveness of the training. However, given the overall lack of effects this may be due to other aspects of the methodology. With regards to effects of EEG biofeedback on cognition there were only main effects of Time suggesting that improvements over time were the result of practice rather than the intervention. The differences found for the Russian cohort may be the result of specific cultural influences which we hope to explore further.

**Keywords:** Psychophysiology; Cognitive processes; Learning; Electroencephalogram (EEG)

**Indexed papers:** Bazanova, O., & Vernon, D. (2013). Interpreting EEG alpha activity. *Neuroscience and Biobehavioral Reviews*. doi: 10.1016/j.neubiorev.2013.05.007

Bazanova, O. M. (2011). Individual alpha peak frequency variability and reproducibility in dependence on the experimental conditions. *Zhurnal Vysshej Nervnoj Deyatelnosti Imeni I P Pavlova*, 61(1), 102-111.

Vernon, D., Dempster, T., Bazanova, O., Rutterford, N., Pasqualini, M., Andersen, S. (2009). Alpha neurofeedback training for performance enhancement: reviewing the methodology. *Journal of Neurotherapy*, 13(4), 214-227. doi: 10.1080/10874200903334397

- Project:** 2008-48
- Title:** ERP correlates of relational learning II: Testing a behavioural model of visual-visual and auditory-visual priming
- Duration:** 2009/09 – 2011/03
- Researcher(s):** Dr. Simon Dymond, Dr. Sara Tapaeru Minster
- Institution:** Department of Psychology, Wales Institute of Cognitive Neuroscience, Swansea University, Wales (UK)
- Results:** The present study examined the behavioural and electrophysiological correlates of derived relational responding (stimulus equivalence). Participants were trained, but not tested, for the formation of 4, 3-member stimulus relations (A1-B1-C1, A2-B2-C2, A3-B3-C3, and A4-B4-C4) consisting of pseudo-words, before then receiving a relatedness decision task that presented all combinations of stimulus pairs (Directly Trained (i.e., A1-B1), Symmetry (i.e., B1-A1) and Equivalence (i.e., C1-B1), as well as Between Pair directly trained (i.e., A1-B2), symmetry (i.e., B1-A2), and equivalence (i.e., C1-B2) trials. Analyses compared each of these trial-types, as well as Within and Between comparisons. Thirty-five healthy controls were recruited. Twenty-one participants passed the final matching to sample test for derived relations. Behavioural results indicated that reaction times on Equivalence trials were significantly slower than all other trials types. Directly Trained trials were marginally faster than Symmetry trials ( $p = .49$ ) and Equivalence trials ( $p < .000$ ); Symmetry trials were significantly faster than Equivalence trials ( $p < .000$ ); and Between trials were significantly slower than Within trials ( $p = .01$ ). With the EEG data, a series of repeated ANOVAs were calculated across three frequency ranges (i.e., alpha, beta, and theta). Significant results for mean amplitude were typically found in the 4 to 8 Hz (theta) range, 350 ms after target onset, whereas peak mean amplitude differences were typically found in the theta range 250 ms after target onset. Overall, equivalence trials evoked greater negativity than symmetry or directly trained trials. Further analyses are ongoing, but the present preliminary findings are supportive of a derived relations approach to the electrophysiological correlates of relational learning.
- Keywords:** Psychophysiology; Cognitive processes; Learning; Electroencephalogram (EEG)

Indexed papers: Want, T., & Dymond, S. (2013). Event-related potential correlates of emergent inference in human arbitrary relational learning. *Behavioural Brain Research*, 236(1), 332-343. doi: 10.1016/j.bbr.2012.08.033

**Project: 2008-50**

Title: Retroactive/Precognitive Priming: The role of attention allocation on time-reversed affective processing

Duration: 2009/01 – 2011/07

Researcher(s): Dr. Alexander Batthyany, Dr. Ivan Spajic, Dr. Georg Kranz

Institution: Austrian Society for Parapsychology and Border Areas of Science Experimental Working Group, Institute of Social and Cultural Anthropology, University of Vienna (Austria)

Results:

General:

All 120 subjects completed the full experiment. Hence there were sixty full sets of data for the neutral and the heightened attention conditions.

Memory Test and Manipulation Check:

First, in the spontaneous memory test, subjects correctly remembered on average 10 and 12 prime words in the forward and backwards priming tasks. The second memory test, i.e. the manipulation checks was in line with instructions: subjects in the attend condition recognized on average 13 and 15 words in the recognition tests after the forward and retroactive priming tasks, respectively. Subjects in the neutral instructions recognized only about 4 and 6 words in the recognition memory after the proactive and retroactive priming tasks, respectively, a difference which was significant, at  $p < 0.05$ .

Priming Variables:

However, the present study failed to replicate the retroactive priming effect. To reiterate, in accordance with Bem's original reports, we expected to find a backwards priming effect, i.e. a facilitation of processing of probes depending on the subsequently shown primes; and secondly, in accordance with earlier priming literature, we expected that this retroactive priming effect would be more pronounced when subjects were prompted to focus on the prime words. However, these predictions were not fulfilled.



Neither in the neutral instructions condition, nor in the attend condition could we detect any evidence suggestive of a retrocausal effect of prime words on probe evaluations. Our results rather show that there was no significant facilitation effect of subsequent prime exposure in the neutral condition ( $t_{(119)} = 0.89$ ;  $p = 0.207$ ), or in the attend condition ( $t_{(119)} = 1.02$ ;  $p = 0.155$ ). Though results move in the right direction, including a somewhat more pronounced trend in the expected direction in the attend instructions condition, they fail to reach significance in either condition.

Keywords: Parapsychology; Extrasensory perception (ESP); Precognition

Indexed papers: N/A

**Project: 2008-54**

Title: Brain activity during remote information access

Duration: 2009/10 – 2011/06

Researcher(s): Dr. Jérôme Daltrozzo, Prof. Boris Kotchoubey, Dr. Ahmed A. Karim

Institution: Institute of Medical Psychology and Behavioral Neurobiology, Eberhard-Karls-University, Tübingen (Germany)

Results: Illusory own-body perception (IOBPs) such as out of body experiences (OBEs) and distortion of body parts have attracted most interest when reported by patients suffering near-death experiences, but they have also been reported to occur spontaneously in patients with epilepsy, during dreams and have been induced by electrical stimulation of the right temporoparietal junction (TPJ). However, the neurophysiological mechanisms involved in IOBPs remain elusive. The aim of this study was to investigate under which conditions transcranial brain stimulation (TBS) can induce IOBPs.

Most remarkably, we found that only inhibition of the TPJ induced IOBPs. Neither high-frequency TBS of the TPJ nor low-frequency TBS of a control site induced such effects. Thus, our effects were area and frequency specific. Although none of the subjects reported OBEs, low-frequency TBS of the TPJ

induced illusory own-body perceptions such as twitching sensations and illusory movements of body parts. Spectral EEG analyses revealed that IOBPs could only be induced, if the deactivation of the TPJ was associated with the deactivation of the frontopolar cortex. Our data imply that the impairment of a temporoparietal *and* a frontal network is necessary for IOBPs. In a further study we investigated the effects of TBS during REM sleep on own-body perception in dream reports. Compared with sham stimulation, a significant decrease in the amount of movements in the dream report was found only after inhibitory TBS.

These studies reveal novel approaches for probing the neurobiology of IOBPs in the awake and the sleeping mind and might provide new insights in understanding the pathophysiology of neuropsychiatric disorders associated with abnormal own-body perceptions.

**Keywords:** Psychophysiology; Out-of-body experience (OBE); Brain; Sleep and dreams; Body awareness; Transcranial magnetic stimulation (TMS); Electroencephalogram (EEG)

**Indexed papers:** Klein, E., Mann, A., Huber, S., Bloechle, J., Willmes, K., Karim, A. A., Nuerk, H. C., & Moeller, K. (2013). Bilateral bi-cephalic tDCS with two active electrodes of the same polarity modulates bilateral cognitive processes differentially. *Plos One*, 8(8): e71607. doi: 10.1371/journal.pone.0071607

Krippel, M., & Karim, A. A. (2011). "Theory of mind" and its neuronal correlates in forensically relevant disorders. *Nervenarzt*, 82(7), 843-852. doi: 10.1007/s00115-010-3073-x

**Project:** 2008-56

**Title:** The Sheep-Goat effect as a matter of compliance vs. noncompliance: The effect of reactance in a forced-choice ball selection test

**Duration:** 2009/03 – 2010/09

**Researcher(s):** Dr. Lance Storm, Prof. Suitbert Ertel, Dr. Adam Rock

**Institution:** Anomalistic and Transpersonal Psychology Research Unit, School of Psychology, Deakin University, Burwood (Australia)

## Results:

According to Reactance Theory (Brehm & Brehm, 1981), when an individual's freedom is threatened through some form of coercion, reactance usually sets in. Reactance is "a motivational state aimed at restoring the threatened freedom" (Silvia, 2005, p. 277), which may explain the sheep-goat effect—i.e., the tendency for believers ("sheep") to psi-hit and non-believers ("goats") to psi-miss. In this study, the effects of reactance on psi performance are investigated in Ertel's (2005b,c) Ball Selection Test. It was hypothesized that goats are more reactant than sheep in psi tests because goats are predisposed to disproving the psi hypothesis which requires noncompliance. The sheep-goat measure used in the study was the Australian Sheep-Goat Scale (Thalbourne, 1995). In a laboratory setting, participants completed up to four runs (60 trials/run) of paranormal target-seeking (trying to predict the numbers on ping-pong balls). Hit rate for the whole sample ( $N = 82$ ) was significant, 21.06% ( $p = .002$ ), where PMCE = 20%. Participants were randomly assigned to a control condition ( $n = 42$ ) or treatment ( $n = 40$ ) condition requiring them to read an opinionated statement that induces reactance. The opinionated communication was an adapted text used successfully by Silvia (2005). There was a significant reactance effect, with „reactants” (mean percentage = 20.26%) scoring significantly lower than „controls” (mean percentage = 21.74%), but no significant sheep-goat effect, though hit rates were in the direction hypothesized—the significant sheep hit rate (21.51%) was higher than the hit rate for goats (20.82%), but not significantly. When simple effects were tested, reactant sheep, with a 19.95% hit rate, scored significantly lower than control sheep with their hit rate of 23.09%. Reactant goats (19.92%) also scored lower than control goats (20.74%), but not significantly. Note that reactant goats scored the lowest of all four sub-groups, and this was expected according to reactance theory about goats, but they were not significantly lower than any other group. Post hoc, it was surmised that high reactance at the start of psi-testing may be a "trait" in goats (but not sheep; i.e., there may be a ceiling effect for goats on "state" reactance), so that sheep may be more vulnerable to reactance than goats, and this might explain the significant simple effect for sheep. Future studies on sheep-goat effects should include a measure of trait reactance so that pre-experimental reactance can be controlled.

Keywords: Parapsychology; Paranormal belief; Extrasensory perception (ESP); Precognition

Indexed papers: Storm, L., Ertel, S., & Rock, A. J. (2013). The sheep-goat effect as a matter of compliance vs. noncompliance: The effect of reactance in a forced-choice ball selection test. *Journal of Scientific Exploration*, 27(3), 393-411.

**Project: 2008-59**

Title: Generating Psi with Optimal Levels of Transliminality - A critical replication and extension

Duration: 2009/02 – 2010/02

Researcher(s): Dr. James Houran

Institution: Integrated Knowledge Systems, Springfield (USA)

Results: Lange and Houran (2010) constructed and validated a new measure called the “Business Intuitions Inventory” and found that “intuitions” in the workplace are related to transliminal processes, but the validity of the sample’s self-reported intuitions was not specifically addressed. Houran and Lange (2010) therefore examined the correlation between self-reported intuitions and the propensity to exhibit emotional and cognitive biases in the previously collected dataset ( $n = 889$ ). The misattribution hypothesis was not confirmed; in fact, intuitive experiences were associated ( $r = .38, p < .001$ ) with a lack of confirmatory biases. Transliminality consequently facilitates a confluence of unconscious information from tacit knowledge, pattern recognition and perhaps a “future orientation” that involves psi. Situational and motivational factors, akin to experimental effects in psi research, contribute to the process. Rasch scaling analyses found that transliminality and intuition form a continuum, with the highest levels of transliminality being associated with intuitions that are described as paralleling psychic ability. As a follow-up, Lange and Houran (2013) explored experimenter effects in a study with the Chinese book of divination the I Ching using four experimental groups ( $n = 15$  pairs each) of extreme questionnaire levels of Paranormal Belief and Transliminality: High Participant/High Experi-

menter; High Participant/Low Experimenter; Low Participant/High Experimenter and Low Participant/Low Experimenter. Participants selected 16 of 64 hexagram-descriptor pairs, based on their emotional or cognitive states of mind. A “hit” was observed when 1 of the 16 choices would come up ( $P_{mce} = .25$ ). The overall hit rate on Hexagram 1 was 34 out of 60 (i.e., 56.7%), which far exceeds ( $p < .001$ ) the chance level hit rate of 25%. The probability of hitting on Hexagram 1 is greater in the High Participant and High Experimenter condition (13 out of 20, or 65%) than in the Low/Low, Low/High, and High/Low conditions. The finding of 13 Hexagram 1 “hits” in 20 trials for the High/High condition cannot be attributed to chance alone ( $p < .001$ ). However, the observed “hitting” on Hexagram 1 in the other three conditions occurred essentially at chance levels (all  $p > .10$ ). Statistically significant main effects of Participant and Experimenter were also found, although both effects are moderated by a powerful Participant x Experimenter interaction effect. The High/High condition stands out from the Low/Low, Low/High, and High/Low combinations, which are indistinguishable among themselves.

Keywords: Parapsychology; Extrasensory perception (ESP); Intuition; Paranormal belief; Transliminality

Indexed papers: Lange, R., & Houran, J. (2010). Transliminal view of intuitions in the workplace. *North American Journal of Psychology*, 12(3), 501-516.

**Project:** 2008-63

Title: Experimental tests of the role of consciousness in the physical world

Duration: 2009/02 – 2011/02

Researcher(s): Dr. Dean Radin, Dr. Paul Wendland, Eng. Robert Rickenbach, Dr. Cassandra Vieten

Institution: Institute of Noetic Sciences, Petaluma, CA (USA)

Results: A double-slit optical system was used to test the possible role of consciousness in the collapse of the quantum wavefunction. The ratio of the interference pattern’s double-slit spectral power to its single-slit spectral power was predicted to decrease when

attention was focused toward the double slit as compared to away from it. Each test session consisted of 40 counterbalanced attention-toward and attention-away epochs, where each epoch lasted between 15 and 30 s. Data contributed by 137 people in six experiments, involving a total of 250 test sessions, indicate that on average the spectral ratio decreased as predicted ( $z = -4.36$ ,  $p = 6 \times 10^{-6}$ ). Another 250 control sessions conducted without observers present tested hardware, software, and analytical procedures for potential artifacts; none were identified ( $z = 0.43$ ,  $p = 0.67$ ). Variables including temperature, vibration, and signal drift were also tested, and no spurious influences were identified. By contrast, factors associated with consciousness, such as meditation experience, electrocortical markers of focused attention, and psychological factors including openness and absorption, significantly correlated in predicted ways with perturbations in the double-slit interference pattern. The results appear to be consistent with a consciousness-related interpretation of the quantum measurement problem.

**Keywords:** Parapsychology and Psychophysiology; Psychokinesis (PK); Altered states of consciousness; Meditation; Consciousness; Electroencephalogram (EEG)

**Indexed papers:** Radin, D., Delorme, A., & Michel, L. (2013). Psychophysical interactions with a double-slit interference pattern. *Physics Essays*, 26(4), 553-566.

Radin, D., Michel, L., Galdamez, K., Wendland, P., Rickenbach, R., & Delorme, A. (2012). Consciousness and the double-slit interference pattern: Six experiments. *Physics Essays*, 25(2), 157-171. doi: 10.4006/0836-1398-25.2.157

Radin, D., Vieten, C., Michel, L., & Delorme, A. (2011). Electrocortical activity prior to unpredictable stimuli in meditators and nonmeditators. *Explore: The Journal of Science and Healing*, 7(5), 286-299. doi: 10.1016/j.explore.2011.06.004

**Project:** 2008-66  
**Title:** Spirituality, religious coping and paranormal beliefs and their relation to OCD and anxiety disorders' symptomatology and treatment outcome

- Duration: 2009/01 – 2011/06
- Researcher(s): Dr. Agorastos Agorastos, Prof. Steffen Moritz, Prof. Michael Kellner, Dr. Christoph Muhtz
- Institution: University Medical Centre UKE – Hamburg Eppendorf, Centre of Psychosocial Medicine, University Clinic of Psychiatry and Psychotherapy, Department for Anxiety Disorders, Hamburg (Germany)
- Results: The objective of this study was the investigation of the relationship between spirituality, magical/paranormal ideation and religious coping in an unselected population of patients with OCD or another anxiety disorder. The sample for this study was recruited in the Department of Anxiety Disorders in the University Clinic for Psychiatry and Psychotherapy in Hamburg, Germany. Psychometric data have been collected by the Revised Paranormal Belief Scale, Magical Ideation Scale and Brief Multidimensional Measure of Religiousness/Spirituality in patients with OCD ( $n = 49$ ), other AD ( $n = 36$ ) and healthy samples ( $n = 35$ ).  
 The preliminary results showed no significant differences among the three groups with respect to the most factors, as well as no significant differences between the OCD and the anxiety groups in all factors. The only statistical significant difference was found between Healthy and non-Healthy individuals with respect to the factor of negative coping, whereby the healthy samples reached lower scores in negative religious coping than the anxiety and OCD groups.  
 Our study does not support prior studies, suggesting an important role of these traits in the etiopathogenesis of anxiety and OCD. On the other hand, our study validated prior study results showing a significant correlation between negative religious coping and both anxiety and obsessive-compulsive disorders. Our results underline a possible major role of negative religious coping in anxiety disorders and support a potential incorporation of R/S aspects in the psychotherapeutic treatment, targeting mainly better cognitive coping strategies for patients.
- Keywords: Parapsychology; Paranormal belief; Spiritualism; Religious beliefs/experiences; Mental health; Anxiety disorders

Indexed papers: Agorastos, A., Metscher, T., Huber, C. G., Jelinek, L., Vitzthum, F., Muhtz, C., ... Moritz, S. (2012). Religiosity, magical ideation, and paranormal beliefs in anxiety disorders and obsessive-compulsive disorder: a cross-sectional study. *Journal of Nervous and Mental Disease*, 200(10), 876-884. doi: 10.1097/NMD.0b013e31826b6e92

**Project: 2008-71**

Title: Emergent information in the visual environment: the role of fractal dimension in anomalous information acquisition

Duration: 2009/02 – 2011/04

Researcher(s): Prof. Paul Stevens

Institution: Bournemouth University, Poole (UK)

Results: This study aimed to (1) determine if fractal dimension represented a cue which maps onto some basic human desires: a healthy environment, the presence of water, and a sense of spirituality; (2) understand relationships between the fractal dimension of visual scenes, human physiological responses to such scenes and self-reported preference for a visual environment.

Phase 1 showed no significant difference between sites classed as “sacred” vs “secular” and the fractal dimension of the dominant edges in visual images of those sites ( $W = 174$ ,  $N = 40$ ,  $p = 0.25$ ). However, differences for hydrogeological sites were close to significance (shallow vs deep water table:  $W = 23$ ,  $N = 18$ ,  $p = 0.07$ ) and for biodiversity sites were significant (high vs low:  $W = 25$ ,  $N = 40$ ,  $p = 1.34 \times 10^{-7}$ ).

Phase 2 showed a significant negative relationship ( $r = -0.11$ ,  $p = 0.03$ ) between the skin conductance magnitude and the fractal dimension of the dominant visual edge, suggesting that visual complexity relates to our level of arousal upon seeing that site. A relationship between expressed preference and fractal dimension was also supported ( $\rho = 0.61$ ,  $p = 0.03$ ).

In combination, this supports the idea that humans have an inherent ability to recognise and prefer environments that are ecologically healthy. Given the change in physiological arousal, this suggests that visual response during dowsing might be a useful area to be pursued by interested researchers (as depth of water table showed a possible negative correlation to fractal



dimension, which showed a negative correlation related to skin conductance response, therefore near-to-surface water should show a relaxation response that could be expressed via ideomotor action).

Keywords: Parapsychology; Spiritualism; Stress and health; Well-being

Indexed papers: N/A

**Project: 2008-73**

Title: Learning and Generalization on Psi Perceptual Tasks

Duration: 2009/01 – 2011/04

Researcher(s): Dr. Julia Mossbridge

Institution: Visual Perception, Cognition, and Neuroscience Laboratory, Department of Psychology, Northwestern University, Evanston (USA)

Results: Results from a series of training experiments suggest that measurable improvements in behavioral performance on psi tasks cannot be trained using the 15-day regimen used here, nor using a longer-term (23-211 day) regimen. Moving on to a series of experiments in untrained participants, we examined heart pulse period and skin conductance (SC) during remote stare detection and precognition tasks. In the first of three remote stare detection experiments, we found a significant increase in pulse period when participants were covertly observed versus when they were not observed; this was not replicated in the remaining two experiments. We also performed five precognition experiments (using a guess-the-future-target task); behavioral performance was at chance. In the first and second experiments, we found a significant increase in pulse period during the ten seconds preceding feedback indicating the guess was correct, but this was not replicated in the third experiment. In a fourth experiment, we found a significant SC difference preceding correct vs. incorrect feedback for one task but not another task, and no heart rate difference for either task. The fifth experiment showed no significant heart rate difference, but a near-significant SC difference in the two feedback condi-

tions. A post-hoc analysis of data from all precognition experiments taken only from the first trial performed (to rule out expectation and other order effects) revealed a large, statistically significant anticipatory SC effect in men, a trend toward an opposing effect in women, and a statistically significant sex x feedback interaction. Based on these results, we reached several conclusions that will influence future examinations of these phenomena.

Keywords: Parapsychology; Extrasensory perception (ESP); Precognition; Cognitive processes; Learning

Indexed papers: Mossbridge, J., Tressoldi, P., & Utts, J. (2012). Predictive physiological anticipation preceding seemingly unpredictable stimuli: A meta-analysis. *Frontiers in Psychology*, 3: 390, 1-18. doi: 10.3389/fpsyg.2012.00390

**Project:** 2008-74

Title: Cortical Oscillations and Altered States of Consciousness: The Study of Meditative States and Functional Brain Connectivity

Duration: 2009/08 – 2011/10

Researcher(s): Prof. José Luis Perez Velazquez, Prof. William Gaetz

Institution: The Hospital for Sick Children, Toronto (Canada)

Results: The purpose of our research is to study the coordinated collective cortical activity derived from magnetoencephalographic (MEG) recordings during the practice of meditation. Some publications demonstrated an enhancement of synchronization of brain signals (scalp electroencephalographic recordings) during meditation. However other results have cast some doubt in these observations; specifically, studies that showed that gamma activity inferred from scalp EEG recordings is largely the result of increased tone in head muscles that closely associates with brain function. MEG recordings were taken of participants during a control period and during one-pointed (samatha) and insight (vipassana) meditation. In addition, simultaneous electromyographic (EMG) recordings were taken to assess scalp muscle activity. The neurophysiological activity (MEG signals) is analysed in terms of phase synchronization at

different frequency bands from 4 to 35 Hz. The EMG signals of scalp sensors showed that there was no increase in power at any frequency during meditation in the expert group, hence these results do not support our hypothesis of a possible enhancement of muscle activity during meditation practice. No significant change in synchronization amongst the MEG sensor signals during meditation was noted, thus we could not reproduce previous published results. This could be due to several factors: we used MEG and not EEG (EEG uses a common reference and that poses problems when assessing synchrony); our subjects performed other types of meditation; and finally, other studies used monks with a level of expertise probably higher than that of our participants.

**Keywords:** Psychophysiology; Altered states of consciousness; Meditation; Brain; Movement; Magnetoencephalogram (MEG); Electroencephalogram (EEG)

**Indexed papers:** N/A

**Project:** 2008-77

**Title:** How do you know what others feel? A psychophysiological study of social cognition and aging

**Duration:** 2009/01 – 2011/02

**Researcher(s):** Dr. Sarah MacPherson, Ms. Edyta Monika Hunter, Prof. Louise H. Phillips

**Institution:** Human Cognitive Neuroscience Research Group, Department of Psychology, The University of Edinburgh, Scotland (UK)

**Results:** In Study 1, the results indicate that older adults benefit from congruent multisensory information in social situations, which is expressed by higher accuracy in cross-modal congruent condition but not in conditions where emotions were presented only in one modality i.e. faces and voice on their own. The analysis of fixation time looking at facial features in Study 2 revealed that younger and older adults spend a similar amount of time looking at the eyes, mouth and periphery of the face and both groups looked longer at facial features in the incongruent condition than in the congruent condition.

Older adults who looked less at the eye and mouth region were better at making matching decisions about congruent stimuli. In contrast, younger adults who looked longer at the facial features, performed better in matching cross-modal congruence than younger adults who spent less time looking at the faces. The results from Study 3 suggest that older adults performed significantly more poorly than younger adults on both Theory of Mind tasks presented to multiple sensory modalities (video) and a single modality (text).

Keywords: Psychophysiology; Developmental psychology; Cognitive development; Emotion

Indexed papers: Hunter, E., Philips, L., & MacPherson, S. (2010). Effects of age on cross-modal emotion perception. *Psychology and Aging, 25*(4), 779-787. doi: 10.1037/a0020528

**Project: 2008-79**

Title: Absorption Experiences and their relationships to dreams, imaginary companions and Parapsychological experiences

Duration: 2009/10 – 2011/09

Researcher(s): Prof. Nancy L. Zingrone, Prof. Carlos S. Alvarado

Institution: Division of Perceptual Studies, University of Virginia Health System (USA)

Results: N/A

Keywords: Parapsychology; Anomalous cognition/experiences; Personality factors

Indexed papers: N/A

**Project: 2008-81**

Title: Subjective Experiences Associated with Seizures

Duration: 2009/10 – 2012/10

Researcher(s): Prof. Bruce Greyson, Dr. Nathan B. Fountain, Prof. Donna K. Broshek, Ms. Lori L. Derr

Institution: Division of Perceptual Studies, University of Virginia Health System (USA)

Results: Alterations of consciousness are critical factors in the diagnosis of epilepsy and seizure disorders. With this alteration in consciousness, some persons report unusual experiences that resemble mystical experience. This study identified and characterized the subjective experiences associated with seizure activity, using standardized quantitative instruments. More than half the patients in this study recalled some subjective experience in association with their seizures, but none of their descriptions met criteria for mystical experience or for near-death experience. Those few features of mystical or near-death experience that were reported were not associated primarily with temporal lobe function, nor with the right or left side of the brain. Among 100 patients, 7 reported out-of-body experiences associated with their seizures. There were no differentiating traits associated with reports of out-of-body experience, in terms of either demographics, medical history including seizure risk factors and precipitants, seizure characteristics including localization and type of seizure, or neuropsychological functioning including ability to recall subjective experiences associated with their seizures.

Keywords: Parapsychology and Psychophysiology; Diseases/Injuries; Epilepsy; Brain; Altered states of consciousness; Out-of-body experience (OBE); Electroencephalogram (EEG)

Indexed papers: N/A

**Project: 2008-83**

Title: Measurement and Analysis of Interindividual Psychophysiological Differences in Experienced Meditators

Duration: 2009/10 – 2011/03

Researcher(s): Dr. Thilo Hinterberger, Dr. Niko Kohls

Institution: Institut für Umweltmedizin und Krankenhaushygiene, Universitätsklinikum Freiburg (Germany)

**Results:** The connection between mindfulness, a positive evaluation of mystical experiences and a decreased psychopathology could be demonstrated in subjective self-ratings but also in the gamma activity of resting state EEG. The same could be observed in the EEG coherence of beta band activity. This is a surprising match between behavioural self-ratings of the concept of mindfulness and the brain electrical physiology. The results strongly support the idea that a state of mindful presence and an attitude of acceptance are closely related to psychological health and a positive acceptance of mystical experiences.

While meditation essentially was found to be a state of reduced lower frequencies, the beta1 amplitudes seem to increase in parietal areas similarly to the state of presence. High frequency EEG correlations indicate an increased state of presence in experienced meditators compared to the less experienced meditators.

Highly significant brain state changes between various meditative tasks in experienced meditators indicate that meditation trained persons show higher brain dynamics than less experienced people giving rise to the hypothesis that those people may be able to experience themselves in more different ways. This offers meditators a higher range of mental possibilities. As similar results were seen in the most present versus least present participants, we also could say that the self-rated personal trait of being present is connected with the ability of altering the physiological state of presence.

**Keywords:** Parapsychology and Psychophysiology; Altered states of consciousness; Meditation; Brain; Functional magnetic resonance imaging (fMRI); Electroencephalogram (EEG)

**Indexed papers:** Hinterberger, T., Schoner, J., & Halsband, U. (2011). Analysis of electrophysiological state patterns and changes during hypnosis induction. *International Journal of Clinical and Experimental Hypnosis*, 59(2), 165-179. doi: 10.1080/00207144.2011.546188

**Project:** 2008-86

**Title:** How psychophysiological anticipatory information can be used to solve intuitive tasks with random events

**Duration:** 2009/01 – 2011/03

- Researcher(s): Dr. Patrizio Tressoldi, Dr. Stefano Massaccesi, Dr. Massimiliano Martinelli
- Institution: Dipartimento di Psicologia Generale, Padova (Italy)
- Results: Using the methodological paradigm to investigate the presentiment phenomenon and its extension to pre-alerting and guessing tasks, we planned to explore whether participant heart rate signals could be used to predict whether randomly selected future stimuli would be pleasant or unpleasant. After evidence found in Experiment 1 of different anticipatory signals before the perception of pleasant and unpleasant sounds, we further explored the effect by asking participants to block incoming unpleasant sounds. The prediction was tested in Experiment 2 using an explicit intuitive condition and an implicit condition in which incoming unpleasant sounds were automatically skipped, based on physiological response. Experiment 3 used only the implicit intuitive condition. When participants were divided into high and low scorers on absorption, high absorbers obtained a statistically significant difference in the means of blocked pleasant and unpleasant sounds (Exp. 2 and Exp. 3), but only in the implicit condition. Overall, these results seem to suggest the possibility of exploiting anticipatory physiological signals to predict future events using implicit intuition. With a new study, we aimed to replicate and extend the findings obtained by the previous experiments. In this study, two pools of pleasant and alerting sounds were used to test the generality of previous findings. By using fifty participants, it was also possible to study whether gender could be a further moderator of the observed effect. Results confirm the findings of Tressoldi, et al. (2009), clarifying that the effect was present only in females. Further statistical analysis suggests that absorption acts as an implicit cognitive “filter” only for pleasant sounds.
- Keywords: Parapsychology; Extrasensory perception (ESP); Precognition; Personality factors

Indexed papers: Tressoldi, P., Martinelli, M., Scartezzini, L., & Massaccesi, S. (2010). Further Evidence of the Possibility of Exploiting Anticipatory Physiological Signals to Assist Implicit Intuition of Random Events. *Journal of Scientific Exploration*, 24(3), 411-424.

**Project: 2008-89**

Title: The Neuropsychophysiological Basis of Empathy: The role of neuroendocrine, autonomic and central nervous system variables

Duration: 2009/01 – 2012/03

Researcher(s): Prof. Óscar Filipe Coelho Neves Gonçalves, Dr. Patrícia Silva, Dr. Ana Pinheiro

Institution: Cipsi – Centro de Investigação em Psicologia, Universidade do Minho, Braga (Portugal)

Results: N/A

Keywords: Psychophysiology; Emotion; Empathy; Assessment tools; Psychoneuroimmunology; Endocrinology; Brain; Functional magnetic resonance imaging (fMRI)

Indexed papers: Leite, J., Carvalho, S., Galdo-Álvarez, S., Alves, J., Sampaio, A., & Gonçalves, O. (2012). Affective picture modulation: Valence, arousal, attention allocation and motivational significance. *International Journal of Psychophysiology*, 83(3), 375-381. doi: 10.1016/j.ijpsycho.2011.12.005

Carvalho, S., Leite, J., Galdo-Álvarez, S., & Gonçalves, O. (2011). Psychophysiological correlates of sexually and non-sexually motivated attention to film clips in a workload task. *PLoS ONE*, 6(12), e29530. doi: 10.1371/journal.pone.0029530

Oliveira-Silva, P., & Gonçalves, O. (2011). Responding empathically: A question of heart, not a question of skin. *Applied Psychophysiology and Biofeedback*, 36(3), 201-207. doi: 10.1007/s10484-011-9161-2

**Project: 2008-94**

Title: Manipulação da Emoção em Ambientes de Realidade Virtual Imersiva: Validação Metodológica



- Duration: 2009-01 - 2011-10
- Researcher(s): Dr. Luís Manuel Coelho Monteiro, Prof. João Eduardo Marques Teixeira, Prof. Manuel Fernando dos Santos Barbosa, Prof. Jorge Manuel Amaral Silvério
- Institution: UnIPSa – Unidade de Investigação em Psicologia e Saúde: Laboratório de Psicofisiologia / Grupo de Psicobiologia / Instituto Superior de Ciências da Saúde – Norte, Paredes (Portugal)
- Results: The main objectives of this work were to test if it was possible to conciliate Virtual Reality techniques with the recording of neurophysiological data, and to develop and validate new methodological paradigms to study the psychobiology of emotion. The first study consisted in selecting 3D stimuli similar to those used in the traditional methodological approach to study emotion. We selected 131 stimuli, which were normalized and validated using the Self-Assessment Manikin, in a sample of 214 healthy subjects. The results obtained were consistent with previous studies conducted with 2D stimuli, allowing the development of a Database of Affective 3D Pictures. In the second study, we tested if the induction of emotions with 3D stimulation techniques caused more intense emotional responses than with 2D techniques. To that end we recorded behavioral and peripheral physiological measures associated with the visualization of the three Scenarios in two modalities (2D vs.3D). Results suggested that 3D visualization causes more intense emotional responses. The third study aimed at testing the interference of emotional information in the neurocognitive processing, through Event-related Potential analysis in a dual-task auditory oddball paradigm. Our results showed that emotional induction through 3D stimulation recruits more attentional resources than through 2D stimulation, causing a greater interference in the cognitive processing. Finally, in the fourth study, we presented indexes of brain activation obtained through Functional Magnetic Resonance Imaging (fMRI) when subjects were exposed to the Scenarios in two modalities (2D vs. 3D). Results indicate that 3D visualization is associated to higher activation of the amygdala complex.

Keywords: Psychophysiology; Emotion; Brain; Assessment tools

Indexed papers:       Dores, A. R., Almeida, I., Barbosa, F., Castelo-Branco, M., Monteiro, L., Reis, M., ... Caldas, A. C. (2013). Effects of emotional valence and three-dimensionality of visual stimuli on brain activation: An fMRI study. *NeuroRehabilitation*, 33(4), 505-512. doi: 10.3233/nre-130987

**Project:               2008-96**

Title:                   Brain Activity During PK and Facial Recognition Tasks – Research with near Infrared Spectroscopy

Duration:             2009/03 – 2011/01

Researcher(s):       Dr. Mikio Yamamoto, Dr. Hideyuki Kokubo

Institution:          Bio-Emission Laboratory, International Research Institute (IRI), Chiba (Japan)

Results:               We have challenged the most difficult theme; study on teleportation. Subjects of our study are famous Chinese psychic sisters Ms. Qiang Wang (W004) & Ms. Ping Wang (W003). We asked them to move pills on an electric balance without touches. Moreover, we measured their brain blood flow using functional near-infrared spectroscopy (fNIRS) during the task. Unfortunately, we did not succeed to observe the teleportation phenomena. Moreover, we had a difficulty to execute further studies because Wang sisters claimed that the teleportation task was too difficult for them although they succeeded teleportation tasks in their young age. They had seldom conducted typical psi experiments recently and their recent practices were non-contact healing chiefly. Therefore, we changed the master plan of the study and measured their present bio-PK abilities. We have two quantitative measuring methods for non-contact healing (a kind of bio-PK). One of them is the gas measurement method, and the other is the biophoton method. We used the gas measurement method, and tried to measure spatial distribution of potential of healing power which is generated around a healer. Results, we succeeded to obtain very interesting data. It was suggested that:

1. A wave-like potential distribution is generated around a sub-

- ject during a healing task.
2. The potential has symmetry with anisotropy between front-backward and left-rightward direction.
  3. The fundamental equation of healing (bio-PK) phenomena is a second order differential equation which is similar to the Schrödinger equation.
- Keywords: Parapsychology and Psychophysiology; Psychokinesis (PK); Brain; Functional near-infrared spectroscopy (fNIRS)
- Indexed papers: N/A
- Project: 2008-102**
- Title: Susceptibility to affect-based framing effects as a predictor of psychic experience
- Duration: 2009/01 – 2012/10
- Researcher(s): Prof. Richard S. Broughton
- Institution: Centre for the Study of Anomalous Psychological Processes, School of Social Science, The University of Northampton (UK)
- Results: Broughton's model of extrasensory perception proposes that the emotional system may have been co-opted by evolution to work with memory to present anomalous information in a manner that helps humans to make adaptive decisions when sensory information is inadequate. This study attempted to gain experimental support by using the framing effect as an individual differences measure of sensitivity to emotional input that would correlate with psychic experiences and/or ability. Framing effect sensitivity was measured using a financial risk behavioural task and a battery of 'Asian disease' style questions. The Australian Sheep-Goat questionnaire assessed psychic beliefs and experiences. Psychic ability was measured using the Intuitive Market Trader (a futures market share trading simulator) and a precognitive Remote Viewing task. Additional personality and cognitive style data were obtained from the IPIP NEO-FFI battery, Emotion Business Decision Making Inventory, and the Rational-Experiential Inventory. Results of the 125 completed participants indicated that both framing-effect

tasks functioned as expected but neither measure showed any relationship with psychic experience or ability. As expected, the Experiential factor (only) of the REI was correlated positively and significantly with the psychic beliefs ( $p = .00002$ ) and experiences ( $p = .000003$ ) and the Experiential factor was also positively and significantly correlated with performance in the Intuitive Market Trader psychic ability test ( $p = .007$ ). While REI results provide promising support for emotion-based models of psychic functioning, the principal goal of developing the framing effect as a predictor of psychic experience and ability was not achieved.

Keywords: Parapsychology; Extrasensory perception (ESP); Emotion

Indexed papers: N/A

**Project: 2008-104**

Title: Lability and PK performance: Identifying the optimal conditions for PK-RNG effects in the laboratory using an I Ching task

Duration: 2009/01 – 2013/10

Researcher(s): Dr. Chris A. Roe

Institution: Centre for the Study of Anomalous Psychological Processes [CSAPP], University of Northampton (UK)

Results: Study 1 used a new PK testing program involving an I Ching divination task. Three hexagrams were produced by sampling 3 sources of randomness (RNG, RND function in BASIC, random number tables). Participants rated all I Ching outcomes in advance using a Q-sort method. As predicted, highest ratings were awarded to hexagrams sampled from the most labile randomness source, but effects were small and nonsignificant. A similar pattern was found for participant lability, and for the interaction. Study 2 was an on-line survey to produce a psychometrically robust measure of lability and explore its relationship with spontaneous PK. A 71-item Lability Scale incorporated five factors, of which three – Intuitive Cognition, Ego-orientated Cognition and Emotional Interpreta-

tion – predicted PK experience scores. Study 3 used this new scale in an I Ching experiment, and looked at the effects of physiological arousal on performance. No interaction effects between participant and target system lability were found and relationships with arousal measures were inconsistent, but included significant correlations between PK score and heart rate (low lability) and PSS (high lability). Study 4 focused on researcher-participant interaction quality; no lability interaction effect was found, and there were no differences found between the ‘friendly’ and ‘formal’ conditions. Study 5 compared a non-striving ‘practice’ trial and a ‘test’ in which participants were strived for a desired outcome. This gave a significant interaction between individual lability levels and RNG lability levels. Performance in ‘test’ condition was significantly better than in the ‘practice’ condition for low and intermediate lability target systems.

**Keywords:** Parapsychology; Psychokinesis (PK); Paranormal belief; Personality factors; Assessment tools

**Indexed papers:** N/A

**Project: 2008-105**

**Title:** Testing the Psi-mediated Instrumental Response theory using an implicit psi task

**Duration:** 2009/01 – 2013/10

**Researcher(s):** Dr. Chris A. Roe

**Institution:** Centre for the Study of Anomalous Psychological Processes [CSAPP], University of Northampton (UK)

**Results:** Four ESP experiments were completed as a programmatic replication of Luke et al. (2008) using an implicit psi task with contingent rewards. Study 1 used a new computer program to control for artifacts. Participants completed a ‘personal preferences pretest’, rating the attractiveness of 15 sets of 4 abstract images. In fact this was an implicit precognition task, and the program randomly chose one of the 4 images as ‘target’; participants with more hits than MCE were given a pleasant task

as 'reward'; those at or below MCE completed an unpleasant task as 'punishment'. Nonsignificantly more hits than MCE were achieved; performance was unrelated to luck scale scores, but was significantly correlated with Openness to Experience [OE]. Study 2 compared intentional and nonintentional versions of the task; participants performed at near-chance levels for both conditions. Study 3 explored the construct of latent inhibition (LI). The 'preferences task' was simplified to control for differences in image attractiveness; sets of 4 images were replaced by mirror image pairs. Participants scored suggestively above chance at the psi task, though relationships with LI and OE were not confirmed. Study 4 focused on measures of individuals' sensitivities to rewards or punishments, and effects of experimenter-participant interaction were assessed. Hit rates were close to MCE, and unrelated to sensitivity to reward or punishment. However, ratings for participant relaxation, rapport, and positivity did correlate with psi performance. The four studies combined give a positive but nonsignificant effect size (Stouffer  $z = .51$ ); when combined with previous studies by Luke et al., the effect size remains highly significant (Stouffer  $z = 4.12$ ).

Keywords: Parapsychology ; Extrasensory perception (ESP) ; Precognition

Indexed papers: Hitchman, G.A., Roe, C.A., & Sherwood, S. (2012). A re-examination of non intentional precognition with openness to experience, creativity, psi beliefs and luck beliefs as predictors of success. *Journal of Parapsychology*, 76(1), 109-145.

**Project:** 2008-122

Title: Mindfulness and emotional factors contributing to intuitive decision-making in the medical settings

Duration: 2009/10 – 2012/11

Researcher(s): Prof. Henk Barendregt, Dr. Stephen Whitmarsh, Dr. Eva Lobach, Prof. Dick J. Bierman, Dr. Fabio Giommi

Institution: Mind Brain Mindfulness research group (MBM) of the Institute of Computing and Information Sciences (ICIS), Nijmegen (The Netherlands)

- Results:** Participants were unknowingly exposed to complex regularities in a working memory task. The existence of implicit knowledge was subsequently inferred from a preference for stimuli with similar grammatical regularities. Several affective traits have been shown to influence AGL performance positively, many of which are related to a tendency for automatic responding. We therefore tested whether the mindfulness trait predicted a reduction of grammatically congruent preferences, and used emotional primes to explore the influence of affect. Mindfulness was shown to correlate negatively with grammatically congruent responses. Negative primes were shown to result in faster and more negative evaluations. We conclude that grammatically congruent preference ratings rely on habitual responses, and that our findings provide empirical evidence for the non-reactive disposition of the mindfulness trait.
- Keywords:** Psychophysiology; Emotion; Cognitive processes; Learning; Decision-making
- Indexed papers:** Whitmarsh, S., Udden, J., Barendregt, H., & Petersson, K. (2013). Mindfulness reduces habitual responding based on implicit knowledge: Evidence from artificial grammar learning. *Consciousness and Cognition*, 22(3), 833-845. doi: 10.1016/j.concog.2013.05.007
- Project:** **2008-126**
- Title:** A Experiência da Dor: alterações funcionais induzidas por Dor Crónica nos circuitos neuronais de recompensa e aversão
- Duration:** 2009/03 – 2013/10
- Researcher(s):** Prof. Vasco Miguel Clara Lopes Galhardo, Prof. Deolinda Maria Valente Alves de Lima Teixeira, Dr. Clara Maria Pires Costa Bastos Monteiro, Dr. Hélder Cardoso Cruz, Dr. Maria Leonor Godinho, Dr. Daniela Seixas, Dr. Sónia Margarida Dourado
- Institution:** IBMC – Instituto de Biologia Molecular e Celular, Porto (Portugal)
- Results:** This research project aims at understanding the alterations that occur following the onset of prolonged and stressful pain conditions, in the connectivity of brain areas that process reward-

ing and aversive stimuli and in areas critical for learning and memory.

For achieving our goal we use a combination of novel decision-making and working-memory operant tasks together with state-of-the-art multielectrode neurophysiology recordings in awake freely moving animals. In a typical experiment we chronically implant 16-32 tungsten microwires in up to 4 brain areas.

The results of this project showed that:

a) the neuronal firing rate in the orbitofrontal cortex was correlated with the probability of choosing a low versus high-risk food reward in each trial, and that chronic pain reduced the fraction of risk-averse neurons;

b) neuropathic pain induces an increase in the number of place fields encoded by hippocampal neurons;

c) chronic pain changes the circadian behavioral state leading to a disruption of sleep patterns, and that there was a large decrease in the functional connectivity between the somatosensory cortex and somatosensory lateral thalamus;

d) pain increases neuronal activity in the amygdala triggering a decrease in prefrontal activation and impairing decision-making;

e) pain induces an impairment of working memory performance, decrease in single neuron activity in the mPFC, and reduction in the frontohippocampal connectivity correlated with correct performance;

f) congenital lack of pain in *Prrxl1* KO mice causes a behavioural and neurophysiological pattern of brain activity that is the inverse of what we observed in animals with either neuropathic or inflammatory chronic pain.

Keywords: Psychophysiology; Pain; Cognitive processes; Brain

Indexed papers: Cardoso-Cruz, H., Sousa, M., Vieira, J. B., Lima, D., & Galhardo, V. (2013). Prefrontal cortex and mediodorsal thalamus reduced connectivity is associated with spatial working memory impairment in rats with inflammatory pain. *Pain*, *154*(11), 2397-2406. doi: 10.1016/j.pain.2013.07.020

Cardoso-Cruz, H., Lima, D., & Galhardo, V. (2013). Impaired spatial memory performance in a rat model of neuropathic pain is associated with reduced hippocampus-prefrontal cortex connectivity. *The Journal of Neuroscience*, *33*(6), 2465-2480. doi: 10.1523/JNEU-



ROSCI.5197-12.2013

Pais-Vieira, M., Aguiar, P., Lima, D., Galhardo, V. (2012). Inflammatory pain disrupts the orbitofrontal neuronal activity and risk-assessment performance in a rodent decision-making task. *Pain*, 153(8), 1625-1635. doi: 10.1016/j.pain.2012.04.011

**Project: 2008-127**

Title: Prefrontal control of impulsive action

Duration: 2009/02 – 2011/03

Researcher(s): Dr. Masayoshi Murakami, Dr. Zachary F. Mainen

Institution: Instituto Gulbenkian de Ciência, Oeiras (Portugal)

Results: Impulse control - withholding short term benefits to achieve longer term goals - is an important facet of goal-directed behavior. Frontal cortex has been hypothesized to exert top-down control of impulsive actions. We investigated neural correlates of impulse control in frontal cortical areas.

In an impulse control task, rats interacted with a waiting port and a reward port. While waiting in the waiting port, size of the reward available at the reward port switched from small to big following a signaled but unpredictable interval. The waiting time of the rats varied randomly across trials. Through multiple single neuron recordings from the frontal cortical areas, we found a neural activity which predicts the waiting time of the rat. There were 20% of predictive neurons in premotor area of frontal cortex, but close to chance level (7%) in the medial prefrontal cortex. A different analysis revealed that a subpopulation of neurons in the premotor area showed ramping activity during the waiting, which reached the same firing rate just before the leaving. The rate of ramping activity was negatively correlated with the waiting time in a majority of ramping neurons. When we tested the neural activity in 2 different impulse control tasks requiring different actions, it is suggested that the waiting time predictive activity in the premotor area does not represent action-non-specific signal such as an impulse control signal, but represents action-specific signal, such as the timing of a particular action. These results suggest an involvement of premotor cortex neurons in deciding the timing of action in the context of impulse control task.

Keywords: Psychophysiology; Brain; Cognitive processes

Indexed papers: N/A

**Project: 2008-130**

Title: As Experiências Óptimas na vida diária e Padrões Fisiológicos associados: para um conhecimento da Personalidade Autotélica

Duration: 2009/01 – 2011/09

Researcher(s): Prof. Teresa Freire, Dr. Mário João Pereira Sequeira Santos, Prof. Marta Bassi, Dr. Gabriela Matias

Institution: Centro de Investigação em Psicologia (CIPsi), Universidade do Minho, Braga (Portugal)

Results: Objectives: The autotelic personality is associated with traits associated with positive mental and physical health outcomes. Furthermore, the autotelic personality was associated with a better functioning in daily life contexts. The aim of this study was to investigate whether autotelic personality characteristics are associated with experiential and physiological momentary responses to daily life contexts.

Methods: Sixty-seven female college students from the University of Minho, Portugal, used the Experience Sampling Method during a week, completing questionnaires and collecting saliva samples 8 times daily. We performed multi-level analyses to investigate the effects of autotelic personality characteristics on subjective experience and cortisol secretion.

Results: Autotelic students experienced lower negative affect and fatigue, and higher levels of engagement in daily life, than less autotelic students. In solitude, autotelic students did not experience heightened negative affect in solitude as their less autotelic individuals did. Although daily solitude was associated with heightened cortisol levels, we did not find a moderating effect of autotelic personality on cortisol levels in solitude.

Conclusions: Current results shed new clues about the assessment of the psychophysiology of the autotelic personality. Findings help clarify how daily contexts influence the affective and neuroendocrine responses of individuals, contributing for future health outcomes.

- Discussion: We discuss future directions such as the inclusion of other physiological measures (e.g., salivary alpha-amylase) and the study of different moments in time to understand the effects of positive personality characteristics on processes such as adaptation and health outcomes.
- Keywords: Psychophysiology; Personality; Psychoneuroimmunology; Endocrinology
- Indexed papers: Matias, G., Nicolson, N., & Freire, T. (2011). Solitude and cortisol: Associations with state and trait affect in daily life. *Biological Psychology*, 86(3), 314-319. doi: 10.1016/j.biopsycho.2010.12.011
- Project: 2008-136**
- Title: Psychophysiological Markers of Externalizing Personality in Non-Clinical and Criminal Populations
- Duration: 2009/01 – 2014/01
- Researcher(s): Dr. Isabel Maria Barbas dos Santos, Dr. Jorge Manuel Costa Oliveira, Dr. Paula Emanuel Rocha Martins Vagos, Prof. Nick Anthony DeFilippis
- Institution: Laboratório de Psicologia Experimental e Aplicada (PsyLab) do Centro de Investigação em Educação e Ciências do Comportamento (CIECC), Universidade de Aveiro, Departamento de Ciências da Educação (Portugal)
- Results: This project aimed to identify the psychophysiological markers of externalizing personality within a non-clinical population, during performance on a range of executive, emotional and social tasks. Before psychophysiological data collection, the Externalizing Inventory (ESI) was translated and adapted to the Portuguese population. The validation studies of the ESI showed good psychometric qualities, consistent with the original structure of the instrument. A sample of 426 university students was initially assessed on several measures of personality, anxiety and depression, and based on their externalizing scores (high, average and low), a sample of 58 participants was tested in a number of laboratory tasks of executive, emotional and social processing, with the co-registration of EEG/ERP. Partici-

pants scoring high and average on the externalizing vulnerability performed significantly worse on the subscale “Loss of Set – Conceptual” of the Halstead Category Test than participants scoring low, and ERP differences were also observed in executive tasks. Results from a speeded emotion categorization task (emotional vs. neutral face) showed significantly slower RTs in the angry and happy conditions for the high externalizers than low externalizers, as well as differences in early and late ERPs. The present results indicate that a higher externalizing vulnerability is associated with an increased difficulty at the level of abstract concept formation and poor cognitive flexibility. Moreover, there is evidence of an emotion specific deficit for high externalizers, as well as alterations in the error processing mechanisms, as evidenced by electrophysiological markers of such processes.

Keywords: Psychophysiology; Personality; Cognitive processes; Executive functions; Emotion; Assessment tools; Electroencephalogram (EEG)

Indexed papers: N/A

**Project: 2008-141**

Title: Neural and Computational Mechanisms of Conscious and Unconscious Decisions Under Uncertainty

Duration: 2010/11 – 2014/01

Researcher(s): Dr. Edward Vul, Prof. Nancy Kanwisher, Prof. Joshua Tenenbaum

Institution: Department of Psychology, University of California, San Diego, CA (USA)

Results: I am pleased to report a number of successes on the research stemming from this bursary, all on the general theme of quantifying uncertainty and risky decision-making across domains. We have now measured such behavior for conscious and unconscious perception in tasks ranging from intuitive physics in infants and adults, binocular rivalry, and early visual processing. Moreover, we developed a method to discover the structure of neural representations and applied it to visual cognition. This report is structured by the papers that have stemmed

in part from this bursary.

1) We investigated how people forage in an uncertain environment, and found that visual search follows optimal foraging informed by the distribution of the number of targets across displays. This indicates that people learn target distributions from the environment, and integrate this learning with uncertain, sparse measurements of the richness of a given scene, to yield near-optimal foraging behavior.

2) Here we investigated pure reasoning about physically constrained objects in infants. We showed that a simple kinematic model can account for infants' surprisal in a number of classic, and new, experiments measuring how infants perceive objects. This suggests that even as infants, humans can reason about physical scenarios and can combine uncertainty about object locations and motion, along with constraints from base rates.

3) Here we asked whether bistability in the visual system during binocular rivalry might reflect optimal inference given uncertainty about the latent causes of visual input. We showed that Gibbs (or Markov chain Monte Carlo) inference in a model that captures the structured dependencies of the visual world yields both the global switching dynamics, as well as the local transition dynamics, of binocular rivalry.

4) Here we asked whether uncertainty about the timing of rapid sequences of events is combined with expectations about the temporal structure of the world – we find that such an account can explain a number of RSVP perception phenomena, including repetition blindness, the attentional blink, and patterns of errors in those tasks.

5) Here we proposed an overarching agenda for combining uncertain reasoning with cognitive constraints to yield rational process models. We propose that by considering optimal engineering solutions to implementing inference under uncertainty, we may develop process models of human reasoning.

6) This is the culmination of many strands of research in which we devised methods to discover the structure of visual representations in the human brain. We applied our data driven 'functional clustering' to fMRI data to show that we can find which objects seem to be subserved by similar neural substrates, and to identify neural substrates that seem to have sufficiently homogenous function. This hypothesis-neutral method of discovering functional neural architecture yields strong evi-

dence for the face, place, and body areas, and opens the possibility for discovering new functional regions in the brain.

7) Here we measured uncertainty in the mapping function between visually presented magnitudes, and self-reported numerical estimates. We find that mapping of magnitudes onto numbers reveals a bilinear function that highlights two regimes of (mis)calibration: small magnitudes are mapped veridically, with considerable stability. However, larger magnitudes (above about 15) are systematically mismapped, and show slow drift over time. We believe this slow drifting mismapping reflects a process of MCMC learning of the uncertain mapping from magnitudes onto our verbal number line.

8) In this work we measured the sources of uncertainty in human physical reasoning, particularly in the domain of reasoning about physical objects undergoing simple 2D motion. We find that most of the uncertainty in these cases arises from stochastic dynamics: meaning that our forward physical models are not deterministic, but are themselves uncertain. Moreover, this physical uncertainty propagates non-linearly, and yields stable patterns of bias and error in human judgments and decisions.

9) Here we measured uncertainty and the dynamics of verbal problem solving in a semantic remote associates test. We find that people search through their semantic space via a partially-guided random-walk, consistent with a MCMC chain exploring the semantic space weighted by the constraints of the cues.

Keywords: Psychophysiology; Cognitive processes; Perception; Attention; Decision-making; Brain; Vision; Functional magnetic resonance imaging (fMRI)

Indexed papers: Smith, K., Huber, D., & Vul, E. (2013). Multiply-constrained semantic search in the Remote Associates Test. *Cognition*, 128(1), 64-75. doi: 10.1016/j.cognition.2013.03.001

Smith, K., & Vul, E. (2013). Sources of uncertainty in intuitive physics. *Topics in Cognitive Science*, 5(1), 185-199. doi: 10.1111/tops.12009

Cain, M., Vul, E., Clark, K., & Mitroff, S. (2012). A bayesian optimal foraging model of human visual search. *Psychological Science*, 23(9), 1047-1054. doi: 10.1177/0956797612440460

- Project:** 2008-146
- Title:** Life-Span Changes in Electrophysiological Patterns Associated with Temporal Discrimination
- Duration:** 2009/01 – 2012/02
- Researcher(s):** Prof. Patrizia Bisiacchi, Prof. Giovanni Sparacino, Dr. Vincenza Tarantino, Dr. Sami Schiff
- Institution:** Department of General Psychology, University of Padua (Italy)
- Results:** The present project aimed at investigating neural correlates of time processing in the life-span. To this aim three lines of research were carried out.  
 The first line concerned the development of new methodological tools for the analysis of EEG signal. A novel channel reactivity based (CRB) method has been created for individual alpha frequency (IAF) computation. The CRB method is based on quantitative indexes and criteria and relies on task-specific alpha reactivity patterns rather than on the presence of peaks in the EEG spectrum. In order to improve time-frequency analyses of EEG data, we applied a wavelet-based methodology using a continuous wavelet transform with a complex Morlet as mother function. Furthermore, event-related potentials (ERPs) were measured using a single-trial approach to estimate the intra individual variability (IIV) of P300 parameters (latency and amplitude).  
 The second line identified cognitive and neural mechanisms underlying time processing in young and older adults. The overall findings were very promising. By testing healthy subjects, we could clarify cognitive processes engaged in time processing, especially related to memory. Furthermore, by means of the EEG/ERP methodology we could elucidate the role of frontal and parietal brain regions involved in such processing, and their development and decline with age.  
 The third line examined cognitive performance and electrophysiological patterns associated with timing and related cognitive processes in pathological populations, such as minimal hepatic encephalopathy, Parkinson's disease, preterm newborns, and ADHD.  
 Both behavioral and ERP data in patients supported the hypothesis that the processing of time in the range of hundred

milliseconds to few seconds is impaired in such clinical populations. Results might further have implications in the diagnostic and rehabilitation protocols.

**Keywords:** Psychophysiology; Developmental psychology; Cognitive processes; Brain; Childhood and adolescent disorders; Neurodegenerative disorders; Diseases/Injuries; Assessment tools; Electroencephalogram (EEG)

**Indexed papers:** Schiff, S., D'Avanzo, C., Cona, G., Goljahani, A., Montagnese, S., Volpato, C., ... Bisiacchi, P. (2014). Insight into the relationship between brain/behavioral speed and variability in patients with minimal hepatic encephalopathy. *Clinical Neurophysiology*, 125(2), 287-297. doi: 10.1016/j.clinph.2013.08.004  
Mento, G., Tarantino, V., Sarlo, M., & Bisiacchi, P. (2013). Automatic temporal expectancy: a high-density event-related potential study. *PLoS One*, 8(5): e62896. doi: 10.1371/journal.pone.0062896  
Goljahani, A., D'Avanzo, C., Schiff, S., Amodio, P., Bisiacchi, P., & Sparacino, G. (2012). A novel method for the determination of the EEG individual alpha frequency. *NeuroImage*, 60(1), 774-786. doi: 10.1016/j.neuroimage.2011.12.001

**Project: 2008-148**

**Title:** Design and Testing of a Wearable Device for Neurofeedback of Physiological Correlates to States of Consciousness

**Duration:** 2009/04 – 2011/03

**Researcher(s):** Dr. Thilo Hinterberger

**Institution:** Institut für Umweltmedizin und Krankenhaushygiene, Universitätsklinikum Freiburg (Germany)

**Results:** Two prototypes of a small, wearable feedback device have been developed that allow for real-time data processing, sonification and control of light sources. The first prototype was equipped with 2 analog-to-digital converters for direct read in of pulse and respiration data. EEG data can be received via a USB interface from the PC. A 32 bit microprocessor was used for data processing. Processed data were sent to a MIDI sound chip and to a light controller. The second prototype was equipped with a Bluetooth transceiver that could directly interface a small, wearable EEG amplifier measuring EEG and pulse simultaneously.



The algorithms for sonification have also been implemented in a PC-based program for improved performance reasons. The systems were able to control studio lighting systems and external speakers. Consequently, a whole feedback environment was created that allowed a person to experience the inner processes in the outer world. This feedback environment was termed „Sensorium”.

In a pilot study, 20 participants (10 experienced meditators and 10 non-meditators) have been exposed in a meditative session to their ongoing brain and heart signals inside the Sensorium. ECG (pulse), slow cortical potentials, and different EEG frequencies were fed back in real-time. All participants were impressed and gave positive feedback. Almost all of them reported an increase in contentment, relaxation, happiness, and inner harmony which was assessed in a questionnaire. They also reported a widening of their body consciousness. In future, therapeutic paradigms will be developed and the treatment effects on people with psychological or psychosomatic diseases will be evaluated.

**Keywords:** Psychophysiology; Assessment tools; Intervention; Altered states of consciousness; Meditation; Electroencephalogram (EEG)

**Indexed papers:** Hinterberger, T., (2011). The Sensorium: A Multimodal Neuro-feedback Environment. *Advances in Human-Computer Interaction*, Article ID 724204, 1-10. doi: 10.1155/2011/724204

**Project:** **2008-149**

**Title:** A closer look at meditation: Challenging the attentional network on different types of meditative procedures

**Duration:** 2010/04 – 2011/09

**Researcher(s):** Prof. Stefan Schmidt, Prof. Harald Walach, Dr. Thilo Hinterberger, Dr. Matthias Braeunig, Dr. Jose Raul Naranjo and Dr. Kathrin Simshäuser

**Institution:** Center for Mindfulness, Meditation and Neuroscience Research, Instit. of Environmental Health Sciences, Univ. Medical Center Freiburg (Germany)

**Results:** Meditation can be described as a special way to pay attention on a continuous moment to moment basis. Research has shown that meditation techniques are able to enhance attentional capacities. In this study we took a closer look at this relationship between meditation and attention. At first we developed three different assessment tools for the description of a meditation practice without referring to any esoteric or religious aspects. A scale assessing the motivation of meditators was developed by the psychometric assessment of 550 meditators. Here a psychometric valid, highly reliable scale with a stable four factor structure could be developed. Regarding meditation practice it was necessary to differentiate between different types of attention cultivated in different meditation styles. The main dimension here was the difference between a narrow focused attention and a wide and open form of attention. This difference was assessed with several visual analog scales.

Regarding the human attentional network three distinct systems of attention (alerting, orienting and executive control) are known. We recruited 25 long-term meditators and 25 sex and age matched controls. They were tested for their performance in each of the three networks by the attention network test (ANT) while EEG was measured to assess event related potentials (ERP) in relation to the ANT stimuli.

We could demonstrate that meditators had a significant better performance on the executive component of the ANT ( $p < .05$ ). There was no difference for the two other networks. Meditators practicing meditation with a narrow focus of attention showed a better performance in the executive control function of the ANT ( $r = .34$ ) but the correlation failed to reach significance.

**Keywords:** Psychophysiology; Assessment tools; Cognitive processes; Attention; Brain; Altered states of consciousness; Meditation

**Indexed papers:** N/A

**Project:** 2008-159

**Title:** Developing a “Recipe” for Success in ESP Experimental Research (Phase III): Integrating Psi-conducive Practices

- Duration: 2009/01 – 2011/01
- Researcher(s): Dr. José M. Perez Navarro
- Institution: University of Greenwich, Eltham, London (UK)
- Results: One hundred individuals took part in a free-response ESP experiment. Half of them were tested using a standard Ganzfeld condition while the other half were through a modified experimental condition that integrated a series of psi-conductive practices recommended by researchers in the area in a previous phase of research. Participants in the modified experimental condition (15 direct hits, 30%,  $z = 0.82$ ,  $p = 0.21$ ) were more successful than in the Ganzfeld (11 direct hits, 22%,  $z = -0.49$ ,  $p = 0.31$ ). However, this difference did not reach significance ( $z = 0.92$ ,  $p = 0.18$ ). The mean z-score for the sample was not significant either ( $z = 0.19$ ,  $p = 0.42$ ). Among the measures that could be quantified in the modified condition only the degree of success of the target stimulus in previous studies correlated positively with the session outcome at an alpha level below 0.01 (0.39,  $p = 0.004$ ). Two other variables: feedback to the sender participant and post-session review showed correlation indices in the expected direction with  $p$ -values below 0.05 (0.36,  $p = 0.01$  and 0.32,  $p = 0.02$ , respectively). Variables male-female pairing and personalised setting showed small, non-significant coefficients (0.11,  $p = 0.44$  and 0.10,  $p = 0.47$ , respectively). In a multiple regression analysis only the variable post-session review contributed to the prediction of performance by participants in this condition with a significant coefficient of 0.15 ( $p = 0.006$ ). Feedback to the sender participant showed a marginally significant coefficient of 0.06 ( $p = 0.05$ ). The set of predictors accounted for 26.4% of the criterion.
- Keywords: Parapsychology; Extrasensory perception (ESP); Assessment tools; Ganzfeld studies
- Indexed papers: Pérez Navarro, J. M. (2012). An Empirical Evaluation of a Set of Recommendations for Extrasensory Perception Experimental Research. *Europe's Journal of Psychology*, 8(1), 32-48. doi: 10.5964/ejop.v8i1.297

**Project:** 2008-162  
**Title:** Meditation at the core: Neuroscientific comparison of attentional resource allocation in different meditation practices  
**Duration:** 2009/02 – 2012/07  
**Researcher(s):** Dr. Arnaud Delorme, Dr. Claire Braboszcz, Dr. Romain Granchamps, Dr. Rael Cahn, Dr. Emmanuel Fernandez  
**Institution:** CERCO, Centre de Recherche Cerveau et Cognition, Toulouse (France)

**Results:** Despite decades of research, effects of different types of meditation on electroencephalographic (EEG) activity are still being defined. We compared practitioners of three different meditation traditions (Vipassana, Himalayan Yoga and Shooonya) with a control group during a meditative and instructed mind-wandering (IMW) block. All meditators showed higher 60-110 Hz gamma activity than control subjects when meditating. This effect was positively correlated with meditation experience. Independent component analysis was used to show that gamma activity did not originate in eye or muscle artifacts. In addition, we observed higher 7-11 Hz alpha activity in the Vipassana group during meditation compared to all other groups. We showed that meditation practice evokes changes in the EEG gamma frequency range that are common to a variety of meditation practices. Our results emphasize the value of including controls and groups of different meditation traditions in neuroscientific studies of meditation.

**Keywords:** Parapsychology and Psychophysiology; Altered states of consciousness; Meditation; Brain; Emotion; Electroencephalogram (EEG)

**Indexed papers:** N/A

**Project:** 2008-167  
**Title:** Testing the ontological status of the experience of meditation-induced timeless states  
**Duration:** 2009/02 – 2010/07  
**Researcher(s):** Dr. Cassandra Vieten, Dr. Dean Radin, Dr. Marilyn Schlitz

- Institution: Institute of Noetic Sciences, Petaluma, CA (USA)
- Results: Experienced meditators occasionally report experiences of “timelessness,” or states of awareness that seem to transcend the usual boundaries of the subjective present. This study explored the nature of such experiences by measuring 32 channels of EEG prior to exposure to unpredictable light and sound stimuli in eight experienced meditators and eight matched controls. The experiment postulated (a) that if some aspect of perception extends into the future, then prestimulus measurements would differ depending on stimuli that were about to be selected by a truly random process, and (b) that such differences would be more apparent in meditators than in non-meditators. Each of the 32 EEG channels was baseline-adjusted on each trial by the electrical potential averaged from 2 seconds to 1 second pre-stimulus. Then for each channel the average potential was determined from 1 second pre-stimulus to stimulus onset. The resulting means across subjects in each group were compared by stimulus type using randomized permutation procedures and corrected for multiple comparisons using False Discovery Rate. Within the control group, no EEG channels showed significant pre-stimulus differences between light vs. sound stimulus conditions, but within the meditator group 5 of 32 channels showed significant differences ( $p < 0.05$ , two-tailed). Comparisons between control and meditator groups showed significant pre-stimulus differences prior to audio tone stimuli in 14 of 32 channels ( $p < 0.05$ , two-tailed, of which 8 channels were at  $p < 0.005$ , two-tailed). This outcome successfully replicates effects observed in conceptually similar experiments.
- Keywords: Parapsychology and Psychophysiology; Altered states of consciousness; Meditation; Extrasensory perception (ESP); Pre-cognition; Brain
- Indexed papers: Radin, D., Vieten, C., Michel, L. & Delorme, A. (2011). Electro-cortical Activity Prior to Unpredictable Stimuli in Meditators and Nonmeditators. *Explore: The Journal of Science and Healing*, 7(5), 286-299. doi: 10.1016/j.explore.2011.06.004

**Project:** 2008-169  
**Title:** When Rejection Hurts: Probing the Neural Basis of Childhood Social Exclusion with a Dense-array EEG  
**Duration:** 2009/02 – 2011/09  
**Researcher(s):** Dr. Michael J. Crowley, Prof. Linda C. Mayes, Dr. Christopher A. Bailey  
**Institution:** Yale Child Study Center, New Haven (USA)  
**Results:** N/A  
**Keywords:** Psychophysiology; Social interaction/norms; Brain; Functional magnetic resonance imaging (fMRI)

**Indexed papers:** White, L., Wu, J., Borelli, J., Mayes, L., & Crowley, L. (2013). Play it again: neural responses to reunion with excluders predicted by attachment patterns. *Developmental Science*, 16(6), 850–863. doi: 10.1111/desc.12035  
White, L. O., Wu, J., Borelli, J. L., Rutherford, H. J. V., David, D. H., Kim-Cohen, J., ... Crowley, M. J. (2012). Attachment dismissal predicts frontal slow-wave ERPs during rejection by unfamiliar peers. *Emotion*, 12(4), 690-700. doi: 10.1037/a0026750  
Bolling, D., Pitskel, N., Deen, B., Crowley, M., Mayes, L., Pelphrey, K. (2011). Dissociable brain mechanisms for processing social exclusion and rule violation. *Neuroimage*, 54(3), 2462-2471. doi: 10.1016/j.neuroimage.2010.10.049

**Project:** 2008-176  
**Title:** How do we choose a partner? Neural circuits involved in inbreeding avoidance and mate selection  
**Duration:** 2009/02 – 2011/03  
**Researcher(s):** Dr. Susana Sá Couto Quelhas Lima, Dr. Léa Zinck  
**Institution:** Instituto Gulbenkian de Ciência, Oeiras (Portugal)  
**Results:** In this project we focused on assortative mate choice that may contribute to the reproductive isolation of the two European subspecies of the house mouse, *Mus musculus musculus* and *Mus musculus domesticus*. We developed full mating and limited-contact paradigms. We found that receptive *musculus*

females exhibit a robust preference to mate with males of the same subspecies. However, they mate readily with each male in no choice condition, and non-receptive females exhibit no preference. Moreover, when no physical contact is allowed, the female's preference is maintained regardless of their estrous state. These experiments establish an assortative mate preference assay appropriate for the investigation of its underlying substrates. Our results highlight the interplay between the chooser's internal state and the nature of the interaction with prospective mates and suggest that the decision is based on a comparison of the options available, rather than on an absolute preference.

We then interrogated the ontogeny of this preference, by performing adoption experiments where musculus females were raised in a domesticus environment. Our results show that female mouse mate preference has a hierarchical dependence on early postnatal life experience and the order of males encountered as an adult. Whereas females raised in their normal musculus environment display a robust homosubspecific preference, females fostered in a domesticus family prefer the first male encountered, regardless of subspecies. Thus, early life experience of musculus females, when and only when concordant with genetic self-identify, overrides sampling order effects, ensuring robust assortative choice. In the absence of this phylogenetic-ontogenetic match, simple primacy effects dominate mate preference.

**Keywords:** Psychophysiology; Assessment tools; Animal behavior; Sexual behavior

**Indexed papers:** Zinck, L., & Lima S. (2013). Mate Choice in *Mus musculus* Is Relative and Dependent on the Estrous State. *PLoS ONE* 8(6): e66064. doi: 10.1371/journal.pone.0066064

**Project:** 2008-179

**Title:** Percepção Extra-sensorial: um estudo acerca da possibilidade de visão heteroscópica

**Duration:** 2009/02 – 2010/06

Researcher(s): Prof. Álvaro Luiz Tronconi, Prof. Moema da Silva Borges, Dr. Joel Paulo Russomano Veiga, D. Cleunice de Arruda Castro, Dr. Eloina Terezinha Domanski, D. Walkyria Eyre

Institution: HUB – Hospital Universitário de Brasília e NEFP – Núcleo de Estudos dos Fenômenos Paranormais, Brasília (Brazil)

Results: The Mann-Whitney test, applied to the data as presented on the Methodology, evidenced some peculiarities, in which the number of results FP becomes statistically significant, expressing that the sensitive seeks to attain a higher number of hits by guessing a high number of suggestions. On the other hand, his remote-viewing results, are slightly better than the presential ones which may suggest that there was no cold reading. Greater difference between the presential and remote data of the sensitive 123 which could suggest cold reading. The same observation could be made for the results of the sensitive 001, but for all this data the statistic difference among them was not significant. Other important result evidence that the fact of believing or not in HV does not alter the performance of the sensitives. Other data showed evidence of a slight improvement on the performance of the sensitive after his 3rd data collection, probably optimizing it. All the sensitives studied presented more hits on the SD - Syndromic Diagnosis, A possible interpretation of these results would be that the sensitives were not decoding correctly the accessed information during the process of their extra-sensorial perceptions. The Kappa Indicator test shows that the hits and errors attained by two or more sensitives on the same patients have no correlation between them. It is important to say that the sensitives 800 and 900 collected their data simultaneously, on the same room, evidencing that the fact of diagnosing the same patient simultaneously had no effect on their performance.

Keywords: Parapsychology; Extrasensory perception (ESP)

Indexed papers: N/A



- Project:** **2008-183**
- Title:** Communication in shared altered states using the hypnotic and Ganzfeld induction of lucid dreams
- Duration:** 2009/03 – 2012/05
- Researcher(s):** Prof. Adrian Parker, Dr. Annekatrin Puhle, Dr. Amanda Sondelors, Dr. Andreas Lantz, Dr. Timo Paulson
- Institution:** University of Gothenburg, Psychology Department: Consciousness Studies Unit (Sweden)
- Results:**
- Objectives:**  
The project had its starting point in the paper in Science 1976, on State Specific Sciences by Charles Tart and the work on shared dreams by Robert Waggoner. Its objective is to document the frequency of lucid and shared dreams and to find ways of producing potentially shared states of consciousness in the laboratory.
- Method 1:**  
Involved surveys of the student population to establish the frequency of the lucid and shared dreams and select suitable participants.
- Results:**  
The major survey found that about 80% of students reported experiencing a least one lucid dream with 24% of them reporting one or more per month. The frequent lucid dreamers were more likely to report more content and communication with dream figures. Shared or mutual dreams were reported by 13% of the respondents and occurred most often amongst those having one or more lucid dreams per month. A survey of students sleep habits indicated that so-called “power naps” are used purposively by 60% of students with 21% of students using them regularly.
- Method 2:**  
The use of a special form of stroboscopic stimulation has been reported by Winkler and Proeck to facilitate the occurrence of lucid dream-like states. Volunteers reporting lucid dreams and related experiences were located in separate laboratory and each was given a half hour of stroboscopic stimulation. A randomly selected melody was played to one of the participants during each session. The task for the other participant was to

try to successively identify it from a sample of 4 control decoys.

Results:

Were exactly at chance expectancy. All the hits came from the sessions in which one of the experimenters was a participant.

Method 3:

The third study worked with participants selected on a volunteer basis via this survey for their potential at experiencing lucidity during dreaming. Pairs of participants took part in a telepathy type experiment with one of them taking on the role of sender and the other receiver. Both of the participants were encouraged to have "power naps" during the session, which lasted 45 min. To facilitate the induction of power naps, participants listened to seashore noise supplied to them through earphones. The participant in the role of the sender received at regular intermittent periods the sound from music clips relating to specific environmental scenes. The participants in the role of sender received only seashore noise. REM monitoring masks (the REM Dreamer) were placed over the eyes of both participants located in separate.

Keywords: Parapsychology; Altered states of consciousness; Lucid dreaming; Sleep and dreams; Ganzfeld studies

Indexed papers: N/A

**Project: 2008-185**

Title: Paranormal Beliefs and Experiences: Indicators of Mental Health or Mental Disorder?

Duration: 2009/01 – 2011/11

Researcher(s): Dr. Anneli Goulding

Institution: Psychology Department, Gothenburg University (Sweden)

Results: Three schizotypy profile groups were identified in this project through cluster analytic procedures; one group with low or average scores on the O-LIFE sub-scales as compared to norm data and the whole group of participants (Low/Average schizotypy), one group with high scores on the positive schizotypy sub-scale and low scores on the other sub-scales (Positive

schizotypy), and one group with high scores on the positive and disorganised schizotypy sub-scales (Positive/Disorganised schizotypy).

The Low/Average and Positive schizotypy groups had no worse mental health or cognitive functioning than the general population. Thus, the hypothesis that the schizotypy profile group with a high degree of positive schizotypy together with low degrees of the other schizotypy factors (compared with norms) would not differ from norms regarding cognitive function was confirmed.

The Positive/Disorganised schizotypy group had worse mental health compared to norm data and this group also had cognitive functioning below the average range regarding four sub-tests measuring executive function. However, the results from the cognitive tests were inconclusive since this group had scores within the average range on two other cognitive tests. These results support the fully dimensional model for schizotypy and indicate that for some people positive schizotypy should not be regarded as a sign of mental ill-health or as a symptom.

Keywords: Parapsychology; Paranormal belief; Personality factors; Mental health; Psychotic disorders

Indexed papers: N/A

**Project:** 2008-189

Title: Exploration of the Effect of Local Geomagnetic Activity and Tibetan Buddhist Meditation on Psychic Awareness

Duration: 2009/10 – 2013/07

Researcher(s): Dr. Serena M. Roney-Dougal, Dr. Adrian Ryan

Institution: Psi Research Centre, Glastonbury, Somerset (UK)

Results: Geomagnetic activity was at its lowest level since records began over 100 years ago. This meant that the original project of ascertaining variation in effect on psychic awareness from sunspot minimum to maximum could not be determined. Therefore, results from both the preliminary and follow-up studies

were combined. The main findings were: 1) Overall, males scored significantly negatively (mean psi score = -0.15,  $p = .02$ , 2-tailed), whereas females scored at chance levels (mean psi score = 0.02); the difference was significant ( $p = .03$ ).

2) Although the first hypothesis was not supported significantly, psi scoring did drop-off at high levels of band 3 GMA as predicted. The GMA threshold at which scores dropped was lower than hypothesized, but close to that observed in a recent study of local GMA during 100 remote viewing trials conducted at Lancaster University.

3) Participants achieved high scores during periods of very low band 3 GMA. This pattern was also observed in the Lancaster University study mentioned above, but not in other data sets studied by Ryan.

4) Hypothesis 2 was not supported. There was no indication of an enhancement of psi scoring during periods of high band 1 activity. This is probably attributable to the extremely low levels of GMA during the study.

5) The exploratory hypothesis, that the participants responding most strongly to GMA would be those with the highest scores on the TLE questionnaire, was marginally significant ( $p = .06$ ).

6) A second exploratory hypothesis postulating a link between daily temperatures and psi scoring was in a similar direction to that predicted but not to a significant degree.

Keywords: Parapsychology; Magnetic field; Altered states of consciousness; Meditation; Extrasensory perception (ESP)

Indexed papers: N/A

**Project: 2008-200**

Title: The Effect of Paranormal Belief and Cognitive-Perceptual Factors on Mnemonic Performance: An Experimental Investigation

Duration: 2009/08 – 2011/09

Researcher(s): Dr. Neil Andrew Dagnall, Dr. Andrew Parker, Dr. Gary Munley

Institution: The Manchester Metropolitan University (MMU), Research Institute of Health and Social Change, Faculty of Health, Social Care & Education, Division of Psychology and Social Change, Manchester (UK)

- Results:** Experimental methods were used to explore the relationship between paranormal belief, cognitive perceptual measures (schizotypy, delusional ideation and transliminality) and mnemonic performance. Phase I, employing the Deese-Roediger-McDermott (DRM) paradigm, found that participants scoring above (vs. below) the median for belief in the paranormal and delusional ideation produced higher numbers of false memories for critical lures (associative false memory). Level of paranormal belief and level of cognitive-perceptual factor had no effect upon true memory (presented items), or other measures of false memory (non-presented list items and non-presented critical lures). Overall, paranormal belief and cognitive-perceptual factor scores were not predictors of mnemonic performance (true and false memory). In addition to this, neither level of paranormal belief, nor level of cognitive-perceptual factor had a consistent effect on the quality of memories as measured by the remember-know procedure. Phase II, using the misinformation effect, found that only level of paranormal belief affected mnemonic performance. Participants in the upper quartile scored higher on true memory and recognised more misinformation items (false memory) than participants in the lower quartile. The cognitive-perceptual measures had no effect on memory. Whilst, positive correlations were observed between signal detection measures of memory (true  $d'$ , false  $d'$ , and unrelated information) these measures failed to correlate with either paranormal belief, or the cognitive-perceptual measures. Finally, level of paranormal belief and level of cognitive-perceptual factor had no effect on remember-know responses.
- Keywords:** Parapsychology; Paranormal belief; Personality factors; Cognitive processes; Memory
- Indexed papers:** Dagnall, N., Munley, G., Parker, A., & Drinkwater, K. (2010). Paranormal belief, schizotypy, and transliminality. *Journal of Parapsychology*, 74(1), 117-143.

### **2010/11 Projects**

- Project:** 2010-01
- Title:** Neurocognitive correlates of the out-of-body experience and kindred hallucinations of embodiment and the ‘self’
- Duration:** 2011/03 – 2013/05
- Researcher(s):** Dr. Jason John Braithwaite
- Institution:** Selective Attention and Awareness Laboratory (SAAL) Behavioural Brain Sciences centre, School of Psychology, University of Birmingham (UK)
- Results:** New findings from this project have shown that specific neurocognitive biases do appear to underlie certain anomalous bodily experiences (e.g., the out-of-body experience: OBE). The OBE groups showed distinct profiles on measures of; (i) embodied and disembodied perspective-taking; (ii) measures of cortical hyperexcitability; (iii) measures of the rubber-hand illusion, and its psychophysical correlates; and (iv) instability in temporal-lobe processing. In addition, the current evidence suggests that previous tasks have not been sensitive enough to reveal such important differences. As a consequence, the tasks which have been developed as part of this project for measuring concepts like cortical hyperexcitability, perspective-taking, and the rubber-hand illusion have led to a significant contribution that will have a large impact on the field of research. As well as making important contributions to scientific theory, the present project will also lead to important methodological improvements in the assessment of the neurocognitive correlates of the out-of-body experience and guide future research in the field. Findings from the project have been published in major international peer-reviewed neuroscience journals and more publications are currently being reviewed.
- Keywords:** Psychophysiology and Parapsychology; Out-of-body experience (OBE); Self; Body awareness
- Indexed papers:** Braithwaite, J. J., Brogna, E., Bagshaw, A. P., & Wilkins, A. J. (2013). Evidence for elevated cortical hyperexcitability and its association with out-of-body experiences in the non-clinical population:

new findings from a pattern-glare task. *Cortex*, 49(3), 793-805. doi: 10.1016/j.cortex.2011.11.013

Braithwaite, J. J., James, K., Dewe, H., Medford, N., Takahashi, C., & Kessler, K. (2013). Fractionating the unitary notion of dissociation: disembodied but not embodied dissociative experiences are associated with exocentric perspective-taking. *Frontiers in Human Neuroscience*, 7: 719, 1-12. doi: 10.3389/fnhum.2013.00719

**Project: 2010-08**

**Title:** Hallucination experience and psi (Phase II): New psychological, psychopathological, psychophysiological and transcultural approach

**Duration:** 2011/03 – 2013/01

**Researcher(s):** Dr. Alejandro Enrique Parra, Dr. Romina Ileana Mielgo, Dr. Irma Juana Caputo

**Institution:** Universidad Abierta Interamericana, Facultad de Psicología, Buenos Aires (Argentina)

**Results:** An out-of-body experience or OBE is one in which the “self” or center of awareness seems to the experient to occupy temporarily a position that is spatially remote from his or her body. The experience seems are very widespread in the general population. Some studies show a close relation between the incident of OBEs and their psychological correlates, especially personality variables, absorption, and dissociative experiences. Six specific hypotheses are tested: Students who report out-of-body experiences have a higher capacity for (1) absorption, (2) dissociation, (3) fantasy proneness, (3) kinetic and visual imagery, (4) visual and tactile hallucination, and (5) cognitive-perceptual, disorganized and interpersonal schizotypy than non-experients. A total of 648 undergraduate students population included 76% females and 24% males, who completed a number of scales. Data for experients of OBE were compared with data for those who did not (experients  $N = 132$  vs. non experients  $N = 516$ ). The results showed a higher level of cognitive-perceptual, schizotypy, absorption, dissociation, fantasy and hallucination proneness, and visual imagery in OBEs than in non-OBEs which confirm previous studies. The statistical test found that the absorption and cognitive-per-

ceptual schizotypy were the best discriminant for visual [ $F_{(2/498)} = 81.08; p < .001$ ] and tactile hallucination [ $F_{(2/498)} = 88.44; p < .001$ ], which underlie the differentiation of the OBErs and non-OBErs. The term hallucination has pejorative overtones in spite of the widespread occurrence of anomalous perceptual experiences in the normal population. Some subjects report beneficial effects from OBEs in an adaptive way.

**Keywords:** Parapsychology; Out-of-body experience (OBE); Personality factors

**Indexed papers:** Parra, A. (2013). Cognitive and emotional empathy in relation to five paranormal/anomalous experiences. *North American Journal of Psychology*, 15(3), 405-412.

Parra, A. (2012). Experiencias perceptuales inusuales, experiencias anómalo/paranormales y propensión a la esquizotipia. *Universitas Psychologica*, 11(1), 269-278.

**Project: 2010-21**

**Title:** Effects of intentionally enhanced tea on mood

**Duration:** 2011/04 – 2013/01

**Researcher(s):** Prof. Yung-Jong Shiah, Dr. Dean Radin

**Institution:** Psychology Department of Kaohsiung Medical University, Kaohsiung (Taiwan)

**Results:** **Objective:**

This study explored whether drinking tea “treated” with good intentions would enhance mood more than drinking ordinary tea, under double-blind, randomized conditions.

**Design:**

Each evening for 7 days in a row volunteers recorded their mood using the Profile of Mood States questionnaire. On days 3, 4 and 5 of the test each participant drank 600 cc of oolong tea in the morning and again in the afternoon. One randomly assigned group blindly received tea that had been intentionally treated by three Buddhist monks; the other group blindly received untreated tea from the same source. On the last day of the test each person indicated what type of tea they believed they had been drinking.



**Participants:**

Stratified random sampling was used to assign 189 adults into two groups matched by age, gender, the psychological trait of neuroticism, and the amount of tea consumed on average per day. All participants were Taiwanese and lived in Kaohsiung, Taiwan, and the test was conducted over the course of one week to reduce mood fluctuations due to changes in local weather and other common influences.

**Results:**

Those who drank treated tea showed a greater increase in mood than those who drank untreated tea (Cohen's  $d = 0.65$ ,  $p = 0.02$ , two-tailed). Change in mood in those who believed that they were drinking treated tea was much better than those who did not believe (Cohen's  $d = 1.45$ ,  $p = 0.00002$ , two-tailed).

**Conclusion:**

Tea treated with good intentions improved mood more than ordinary tea derived from the same source. Belief that one was drinking treated tea produced a large improvement in mood, but only if one was actually drinking the treated tea, indicating that belief and intentional enhancement interact. This also suggests that the aesthetic and intentional qualities associated with the traditional tea ceremony may have subtle influences that extend beyond the ritual itself.

**Keywords:**

Parapsychology; Psychokinesis (PK); Intention

**Indexed papers:**

Shiah, Y. -J., & Radin, D. (2013). Metaphysics of the tea ceremony: A randomized trial investigating the roles of intention and belief on mood while drinking tea. *Explore: The Journal of Science and Healing*, 9(6), 355-360. doi: 10.1016/j.explore.2013.08.005

**Project:**

**2010-27**

**Title:**

From trance to transcendence during meditation

**Duration:**

2011/06 – 2013/06

**Researcher(s):**

Prof. Joseph Glicksohn, Dr. Abraham Goldstein, Dr. Aviva Berkovich Ohana

**Institution:**

The Leslie and Susan Golda (Goldschmied) Multidisciplinary Brain Research Center, Bar-Ilan University, Ramat Gan (Israel)

**Results:** A total of 16 mindfulness meditators (MM) underwent both MEG measurement and structural MRI. Of these, a total of 12 had previously served in an EEG study with us, and their EEG data are reported (as part of a larger set) in a forthcoming publication (Berkovich-Ohana, Glicksohn, & Goldstein, under review).

We report: (1) that default mode network (DMN) activity is identified as reduced gamma mean phase coherence (MPC) during the transition from resting state to a time-production task; (2) a state increase in alpha MPC; (3) MM-induced trait reduction in right theta and left alpha and gamma MPC.

In our MEG study, we devised a novel protocol for assessing a change in time perception, space perception and perception of self, and focus on three specific experiences: a sense of timelessness, a sense of spacelessness and a sense of selflessness. Common brain regions underlying the spacelessness and timelessness conditions were found only for theta activity, including the bilateral parietal and medial frontal cortex, the right temporo-parietal cortex and left precuneus, as well as the cerebellum.

We found that shifting from a 'narrative' self-awareness to a 'minimal' self-awareness (MS) involves extensive medial prefrontal gamma band (60-80 Hz) decrease; (2) shifting to a selfless mode of processing is related to beta-band (13-25 Hz) decreases in a network that includes medial prefrontal, medial posterior and lateral parietal regions. These data are reported in two forthcoming publications (Berkovich-Ohana et al., under review; Dor-Ziderman et al., under review).

**Keywords:** Parapsychology and Psychophysiology; Altered states of consciousness; Meditation; Trance; Brain; Cognitive processes; Perception; Consciousness; Assessment tools; Functional magnetic resonance imaging (fMRI); Magnetoencephalogram (MEG)

**Indexed papers:** Berkovich-Ohana, A., Dor-Ziderman, Y., Glicksohn, J., & Goldstein, A. (2013). Alterations in the sense of time, space, and body in the mindfulness-trained brain: a neurophenomenologically-guided MEG study. *Frontiers in Psychology*, 4: 912. doi: 10.3389/fpsyg.2013.00912

Berkovich-Ohana, A., Glicksohn, J., & Goldstein, A. (2013). Studying the default mode and its mindfulness-induced changes us

ing EEG functional connectivity. *Social Cognitive and Affective Neuroscience*. doi: 10.1093/scan/nst153

Dor-Ziderman, Y., Berkovich-Ohana, A., Glicksohn, J., & Goldstein A (2013). Mindfulness-induced selflessness: a MEG neurophe-  
nomenological study. *Frontiers in Human Neuroscience*, 7: 582. doi:  
10.3389/fnhum.2013.00582

- Project:** 2010-32
- Title:** Facilitating healthy ageing: Investigating neuroprotective effects of mindfulness practice
- Duration:** 2011/04 – 2013/05
- Researcher(s):** Dr. Peter Malinowski, Prof. Thomas Gruber, Dr. Cathy Montgomery
- Institution:** Liverpool John Moores University, School of Natural Sciences and Psychology Byrom Street, Liverpool (UK)
- Results:** The aim of the project was to investigate whether regular, brief mindfulness practice, previously shown to be beneficial in improving attentional control functions, would positively influence the process of cognitive ageing. During the first phase of the project various measures of cognitive performance were trialled in older participants. Based on the results and practical insights from these pilots a 3-arm longitudinal control trial was run with participants (age 55 – 75 years). The mindfulness group (MG,  $N = 20$ ) engaged in 7 weeks of brief (10 minutes), daily mindful breathing exercises while the active control group (ACG,  $N = 20$ ) engaged in the same amount of cognitive training, similar to available “brain gym” programs. A third waitlist control group (WCG,  $N = 10$ ) only took part in the assessment. At the beginning and end of the programme participants completed four cognitive tasks (the attentional blink task, the Continuous Performance Test, an emotional Stroop task and a spatial short-term memory task). Employing a 64-channel EEG set-up, electrophysiological measures were recorded concurrently. Currently the extensive dataset is being analysed. A first, cursory analysis suggests that the MG improved above and beyond both control groups on several performance parameters. Additionally, aspects of the event-related potentials, indicative of

distinct improvements in attentional functions, appear to be selectively improved in the MG.

As the majority of the MG participants also reported positive influences on their daily life, our preliminary conclusion is that a brief mindful breathing practice can yield positive effects in older participants and may thus be a building block for a lifestyle that facilitates healthy ageing.

**Keywords:** Psychophysiology; Altered states of consciousness; Meditation; Cognitive processes; Attention; Intervention; Electroencephalogram (EEG)

**Indexed papers:** N/A

**Project: 2010-37**

**Title:** Psychophysiological mechanisms of hierarchical novelty detection in the human auditory brain

**Duration:** 2011/04 – 2013/03

**Researcher(s):** Prof. Carles Escera, Dr. Sabine Grimm, Dr. Marc Recasens

**Institution:** Research Institute for Brain, Cognition and Behavior (IR3C) and Department of Psychiatry and Clinical Psychobiology, Faculty of Psychology, University of Barcelona (Spain)

**Results:** The goal of the present project was to demonstrate that novelty detection is a basic principle of the functional organization of the auditory system, expanding from lower levels along the auditory pathway in the brainstem up to higher-order areas of the cerebral cortex. As novelty detection requires the modeling of regularity in the acoustic environment, we go beyond by proposing that increasing levels of complexity in acoustic regularity will be encoded in higher levels of the auditory system's hierarchy. Traditionally, auditory novelty detection has been studied by means of the mismatch negativity (MMN) event-related brain potential, generated in the auditory cortex with a latency of about 100-150 ms. In the present project, we found that auditory stimuli differing in intensity or in location from the preceding acoustic regularity not only elicited the MMN but much earlier deviance-related correlates, by the Na for location and by the Na-Pa transition for intensity changes,

respectively. These effects occurred only at 20-30 ms from change onset, revealing that deviance detection is a pervasive property of the auditory system. Moreover, as the experiments were appropriately controlled, so that deviant stimuli were compared to identical low probability stimuli but occurring on a context of other low probability stimuli, the results support a mechanism of regularity encoding for deviance detection. Also, we proposed a model where much more complex types of regularity would be encoded higher up in the auditory hierarchy yielding change-related effects only by the latency window of the MMN.

Keywords: Psychophysiology; Audition; Brain

Indexed papers: Grimm, S., & Escera, C. (2012). Auditory deviance detection revisited: Evidence for a hierarchical novelty system. *International Journal of Psychophysiology*, 85(1), 88-92. doi: 10.1016/j.ijpsycho.2011.05.012

Grimm, S., Recasens, M., Althen, H., & Escera, C. (2012). Ultrafast tracking of sound location changes as revealed by human auditory evoked potentials. *Biological Psychology*, 89(1), 232-239. doi: 10.1016/j.biopsycho.2011.10.014

Althen, H., Grimm, S., & Escera, C. (2011). Fast detection of unexpected sound intensity decrements as revealed by human evoked potentials. *PLoS ONE*, 6(12): e28522. doi: 10.1371/journal.pone.0028522

**Project:** 2010-39

Title: Paranormal belief, evaluation of paranormal experiences, schizotypy and reality testing

Duration: 2011/09 – 2013/11

Researcher(s): Dr. Neil Andrew Dagnall, Dr. Gary Munley, Dr. Andrew Parker

Institution: The Manchester Metropolitan University, Research Institute of Health and Social Change, Faculty of Health, Psychology and Social Care, Dep. of Psychology, Manchester (UK)

Results: The project consisted of two phases. Phase I (respondents 1215) sought to develop a new measure of paranormal belief (the Manchester Metropolitan University New, MMU-N). Principal components analysis identified eight factors: Haunt-

ings, Alien Visitation, Superstition, Psychokinesis, Religious Beliefs, Astrology, ESP and Witchcraft. Each factor was coherent, possessed conceptual clarity and demonstrated good internal reliability. The MMU-N measure overall and its subscales correlated positively with: traditional measures of paranormal belief (Revised Paranormal Belief Scale, & Australian Sheep Goat Scale), anomalous beliefs (urban legends & conspiratorial beliefs) and paranormal experiences. Additionally, the MMU-N correlated with reality testing<sup>1</sup> deficits in a manner similar to the established paranormal measures. Phase II (respondents 305) examined the degree to which specific probabilistic biases (misperception of chance & conjunction fallacy) were associated with belief in the paranormal and reality testing. Participants completed measures assessing probabilistic reasoning, belief in the paranormal and reality testing. Findings were consistent across belief measures. The best predictor of paranormal belief and reality testing deficits was perception of randomness. Comparisons (below vs. above the median) supported this finding. The results provide support for the notion that paranormal believers are more likely to misinterpret chance phenomena as non-random. Proneness to standard conjunctions was not associated with belief in the paranormal. However, believers solved fewer paranormal conjunctions than non-believers.

Footnote<sup>1</sup>: This project was approved on the understanding that reality testing and cognitive bias would be explored rather than schizotypy.

Keywords: Parapsychology; Paranormal belief; Personality factors; Anomalous cognition/experiences; Assessment tools

Indexed papers: N/A

**Project:** 2010-40

Title: Psychophysiological investigations of interference resolution during memory retrieval

Duration: 2011/05 – 2012/10

Researcher(s): Prof. Edward Wilding, Dr. Damian Cruse

- Institution: Cardiff University Brain Research Imaging Centre (CUBRIC), School of Psychology, Cardiff (UK)
- Results: The objective of this experiment was to investigate changes in neural activity over the course of a memory retrieval task. The assumption was that the demands placed on monitoring the contents of retrieval would increase as the numbers of stimuli to which memory judgments were required also increased. We tested this by measuring event-related potentials (ERPs) during the test phase of a retrieval task, because ERPs index processes related to retrieval monitoring.  
 Participants ( $N = 16$ ) first studied words in one of two colours. Studied and unstudied (new) words were then presented in a neutral colour. ERPs were acquired while people made old/new and then study colour judgments to the test words. The differences between ERPs associated with correct judgments to new words (correct rejections) and correct colour judgments to old words were compared for the first and the second halves of the retrieval task. The rationale for this first/second half separation was that the demands on monitoring would increase during the task and would be revealed by differences between ERP indices of retrieval monitoring over the course of the task.  
 The critical ERP indices differed qualitatively from approximately 1000ms post-stimulus, indicating that not entirely the same retrieval processes were operating in support of accurate memory judgments over the retrieval task. In combination with the absence of evidence for this change in another experiment where auditory rather than visual contexts were used at study, these findings suggest the outcome is not simply an effect of time on task. It is possible that the effects specific to the second half of the retrieval task index additional processes engaged as the demands placed on distinguishing between similar memory representations increase. Irrespective of the accuracy of this account, however, the findings indicate there are circumstances where making functional inferences about patterns of neural activity in brain imaging experiments based on data averaged over the entirety of retrieval tasks might lead to inaccurate functional characterisations.
- Keywords: Psychophysiology; Memory
- Indexed papers: N/A

- Project:** 2010-42
- Title:** Conscious induction of theta EEG patterns by a healing procedure
- Duration:** 2011/11 – 2013/03
- Researcher(s):** Dr. Stefan Schmidt, Dr. Thilo Hinterberger
- Institution:** Center for Mindfulness, Meditation and Neuroscience Research, Institute of Environmental Health Sciences, University Medical Center Freiburg (Germany)
- Results:** A new healing procedure termed ThetaHealing is making extraordinary claims regarding healing effects and healing mechanism but so far no scientific evaluation has been conducted. One of the basic claims of ThetaHealing is that the experienced theta healer enters via a special meditation in a so called 'theta state' which is then also induced in the patient by the healer. It is proposed that this state is correlated with strong theta rhythmic activity patterns (4-7Hz) in the respective EEG of healer and patient. We assessed this claim in a dual EEG experiment by recording simultaneously EEG from 10 Theta Healers and 10 patients. Hypotheses were (i) healers taught in this method will elicit theta rhythmic activity in their EEG. (ii) There will be an increase of theta rhythm brain activity in the patient once the ThetaHealer tried to connect. (iii) There will be significant more correlational patterns between the healer's and the patient's EEG once both are in the so called theta state compared to a control condition.
- We found no changes in theta activity for different healing phases and comparisons in the clients. We furthermore found either no changes or even significant decreases of theta-activity in the healers. Over the course of the whole session theta-activity decreased significantly in healers. With respect to correlation patterns between healers and clients we found either none or only moderate correlations.
- Overall it is concluded that none of the claims could be supported by our study. Our study had good internal validity and moderate to good external validity. Thus, we consider our results as valid. Our study has not assessed any claims to heal clients and no conclusion can be made with regard to this claim.



Keywords: Parapsychology and Psychophysiology; Healing; Distant healing; Altered states of consciousness; Electroencephalogram (EEG)

Indexed papers: N/A

**Project: 2010-45**

Title: Shamanic-like journeying and psi-hitting: Searching for the psi-conductive component(s) of a novel experimental protocol

Duration: 2011/04 – 2012/12

Researcher(s): Dr. Adam Rock

Institution: Phoenix Institute of Victoria, Prahran (Australia)

Results: It is pertinent to explore stimulus conditions that might produce psi effects at least as strong as those elicited in the ganzfeld condition, particularly if those stimulus conditions are less complex than the ganzfeld. Consequently, Storm and Rock developed an imagery cultivation (IC) model, which considers shamanic-like techniques to be psi-conductive, and provided some supportive evidence for their claim. The objective of the present study was to determine which component(s) of the shamanic-like journeying stimulus used by Storm and Rock is/ are psi-conductive. Since psi-modifying variables should also be investigated in psi research, paranormal belief/experience (measured on Thalbourne's Australian Sheep-Goat Scale), Transliminality (the tendency for psychological material to cross into or out of consciousness), and Self-Expansiveness (measured on Friedman's Self-Expansiveness Level Form) were tested in the present study as possible predictors of psi. Nonshamans ( $N = 200$ ) were randomly assigned to one of four conditions: (a) instructions + drumming; (b) instructions only; (c) drumming only; and (d) control condition (i.e., no instructions, no drumming). After these conditions, participants gave mentations, and ranked a randomly selected concealed line-drawing as target. Hit rates were above chance (not significantly) in all three treatment conditions, and below chance in the control condition. Paranormal belief, transliminality, and self-expansiveness did not predict hit rates.

**Keywords:** Parapsychology; Assessment tools; Spiritualism; Spiritual traditions/experiences; Ganzfeld studies

**Indexed papers:** Rock, A. J., Storm, L., Harris, K., & Friedman, H. (2013). Shamanic-like journeying and psi-signal detection: I. In search of the psi-conductive components of a novel experimental protocol. *Journal of Parapsychology*, 76(2), 321-347.

Rock, A. J., & Storm, L. (2012). Shamanism, imagery cultivation, and psi-signal detection: A theoretical model, experimental protocol, and preliminary data. *International Journal of Transpersonal Studies*, 31(2), 91-102.

**Project:** 2010-50

**Title:** Trance: Cortical representations

**Duration:** 2011/03 – 2013/05

**Researcher(s):** Dr. Alessandra Ghinato Mainieri, Dr. Julio Fernando Prieto Peres, Prof. Alexander Moreira de Almeida, Prof. Ute Habel, Dr. Nils Kohn

**Institution:** Department of Psychiatry and Psychotherapy, RWTH Aachen University, Aachen (Germany)

**Results:** Evidence has shown that there are high levels of psychotic experiences in the general population, often not related to mental disorders. We investigated the neural correlates of psychotic experiences in healthy spiritual mediums. An fMRI study was developed with 8 healthy mediums and 6 controls. The mediums entered in mediumistic trance state using a standardized manner; in a control condition they were instructed to re-enact the same mediumistic experience that they had during trance condition but in a non-trance state. Both groups took part in a resting state session. The data was analysed using model-based (GLM) and model-free analysis (ICA). Vivid mediumistic state and deep level of spiritual connection reported by the mediums during trance were associated with stronger activation areas related to sensory and attentional networks compared to re-enactment and rest: lateral occipital cortex, posterior cingulate cortex, temporal pole, middle temporal gyrus and orbitofrontal cortex. We also observed increased

functional connectivity within the regions of sensory and auditory resting state networks for mediumistic state compared to control condition. The default mode network (DMN) was identified in all conditions. However, we did not find any change in connectivity within the regions of DMN. Increased activation in cortical sensory and attentional areas during mediumistic state and preserved functional connectivity within the DMN regions might reflect an expression of the non-pathological nature of psychotic experiences in mediums. Possible neural correlates for the generation of sensory experience in the absence of external stimulation are discussed in the context of pathological and non-pathological psychotic experiences.

- Keywords:** Parapsychology and Psychophysiology; Altered states of consciousness; Trance; Brain; Functional magnetic resonance imaging (fMRI)
- Indexed papers:** N/A
- Project:** **2010-55**
- Title:** The developmental and psychophysiological emergence of dreams and nightmares: state-dependent and state-independent fronto-cortical disconnectivity
- Duration:** 2011/03 – 2014/02
- Researcher(s):** Dr. Róbert Bódizs, Dr. Peter Daniel Simor, Dr. Piroska Sándor, Dr. Szilvia Csóka, Dr. Klára Horváth
- Institution:** Institute of Behavioural Sciences, Semmelweis University, Budapest (Hungary)
- Results:** We aimed to characterize sleep and to test the frontal dysfunction hypothesis of nightmares, as well as to bridge the relationship between the ontogeny of frontal-executive and emotion regulation functions with age-related peculiarities of dreams and nightmares. Nightmare sufferers (NS) were characterized by performance decreases in several executive tasks (Emotional Go/NoGo, Emotional Stroop, Verbal Fluency). Alterations in the sleep architecture (decreases: sleep efficiency, slow wave sleep; increases: wakefulness, arousals, REM sleep), microstructure (increases in A2-microarousals of the cyclic al-

ternating pattern), and qEEG (increased REM sleep 10–14 Hz power and synchronization) were paralleled by a more pronounced first-night effect of NS. Children are more accomplished dreamers with dream narratives closer to adult dream reports than authors of previous laboratory findings described. 4–8 years old children were characterized by a positive correlation of dream report length with slow wave sleep and with performance in the Emotional Stroop test. Negative correlation between the developmental level of executive functioning and dream recall frequency was also established. Our results suggest that NS are characterized by impairments in executive tasks involving the suppression of task-irrelevant semantic representations. Moreover, nightmare-related alterations in sleep architecture and microstructure are characterized by wake-like intrusions disturbing the neurocognitive function of sleep, as well as by emotion-related increases in REM propensity. Children's dreams should be collected by novel methods, involving their parents. Children's dreams depend on the maturation of emotion regulation and executive functions.

Keywords: Psychophysiology; Sleep and dreams; Mental health; Sleep disorders; Brain; Developmental psychology; Electroencephalogram (EEG)

Indexed papers: Kis, A., Szakadát, S., Simor, P., Gombos, F., Horváth, K., & Bódizs, R. (2013). Objective and subjective components of the first-night effect in young nightmare sufferers and healthy participants. *Behavioral Sleep Medicine, 12* [Epub ahead of print]. doi: 10.1080/15402002.2013.829062

Simor, P., Bódizs, R., Horváth, K., & Ferri, R. (2013). Disturbed dreaming and the instability of sleep: Altered nonrapid eye movement sleep microstructure in individuals with frequent nightmares as revealed by the cyclic alternating pattern. *Sleep, 36*(3), 413–419. doi: 10.5665/sleep.2462

Simor, P., Horváth, K., Ujma, P., Gombos, F., & Bódizs, R. (2013). Fluctuations between sleep and wakefulness: Wake-like features indicated by increased EEG alpha power during different sleep stages in nightmare disorder. *Biological Psychology, 94*(3), 592–600. doi: 10.1016/j.biopsycho.2013.05.022

- Project:** 2010-57
- Title:** Psychophysiological, behavioural and experiential responses to evoked positive and negative emotion in people with eating disorders
- Duration:** 2011/03 – 2012/04
- Researcher(s):** Dr. Kate Tchanturia, Dr. Helen Davies
- Institution:** King's College London, Institute of Psychiatry, London (UK)
- Results:** This study used an amusing and sad film clip to evoke emotion responses in participants with anorexia nervosa and bulimia nervosa. Emotion response was measured via facial expression, subjective reports and skin conductance (SC) reactivity. Results showed differences in emotion responses between positive and negative affect and across the eating disorder groups. The anorexia nervosa group showed a general attenuation of positive affect but more of a dysregulated profile to negative stimuli with attenuated facial expression but subjective and physiological arousal similar to controls. Therefore, supporting the notion that negative expression is being inhibited. Generally, it was observed that the bulimia nervosa participants had a similar profile in emotion response to the control group, however they demonstrated an increase in SC reactivity to the sad film clip, compared to HC. In conclusion, this study highlights the importance of using multiple measures of emotional responding in clinical samples as group differences may be observed with some response measures but not with others. This study supports models of eating disorders which propose emotion avoidance in anorexia nervosa (Schmidt & Treasure, 2006; Treasure et al, 2012) and dysregulation in bulimia nervosa (Cooper et al, 2006) as maintaining factors of the disorders.
- Keywords:** Psychophysiology; Mental health; Eating disorders; Emotion
- Indexed papers:** Tchanturia, K., Hambrook, D., Curtis, H., Jones, T., Lounes, N., Fenn, K., Keyes, A., Stevenson, L., & Davies, H. (2013). Work and social adjustment in patients with anorexia nervosa. *Comprehensive Psychiatry*, 54(1), 41-45. doi: 10.1016/j.comppsy.2012.03.014  
Tchanturia, K., Davies, H., Harrison, A., Fox, J., Treasure, J., & Schmidt, U. (2012). Altered social hedonic processing in eating disorders. *International Journal of Eating Disorders*, 45(8), 962-969. doi: 10.1002/eat.22032

Tchanturia, K., Liao, T., Forcano, L., Fernandez-Aranda, F., Uher, R., Treasure, J., ... Campbell, I. (2012). Poor decision making in male patients with anorexia nervosa. *European Eating Disorders Review, 20*(2), 169-173. doi: 10.1002/erv.1154

- Project:** **2010-58**
- Title:** Somatic psi vs. Survival psi: A quantitative investigation of mediums' phenomenology comparing psychic readings and ostensible communication with the deceased
- Duration:** 2011/03 – 2013/02
- Researcher(s):** Dr. Julie Beischel, Dr. Adam J. Rock, Dr. Mark Boccuzzi, Dr. Michael Biuso
- Institution:** The Windbridge Institute for Applied Research in Human Potential, Tucson (USA)
- Results:** Qualitative research has indicated that mediums' experiences during mediumship readings for the deceased are distinguishable from their experiences during psychic readings for the living. This study employed the Phenomenology of Consciousness Inventory (PCI), a standard retrospective analysis tool that quantitatively measures 26 phenomenological dimensions, to assess the experiences of 10 Windbridge Certified Research Mediums (WCRMs) during double-blind readings for living targets and deceased targets. During 19 of 20 readings, the WCRM stated her impressions regarding the status of the named target (living or deceased). In 14 of those cases, the WCRM's impressions accurately reflected the status (74%,  $p = 0.032$ ). In addition, six of the WCRMs were able to accurately determine the status of the targets in both of their readings. It should be noted that the WCRMs were instructed that each target could be living or deceased. A significant difference was seen between the living target condition and the deceased target condition for the dimension Love with higher scores in the deceased reading condition ( $p < 0.05$ ). In the subset of six WCRMs who accurately determined the status of the targets, significantly higher intensity values were seen for readings for deceased targets (vs. readings for living targets) for the dimensions Positive affect, Joy, and Love (all  $p$

< 0.05). These quantitative data collected under blinded conditions reflect the WCRMs' qualitative descriptions of the differences between communication with the deceased and acquisition of psychic information and provide further evidence distinguishing between survival psi and somatic psi.

Keywords: Parapsychology; Survival after bodily death; Mediumship

Indexed papers: N/A

**Project: 2010-64**

Title: A psychophysiological investigation of semantic contributions to episodic memory

Duration: 2011/03 – 2013/01

Researcher(s): Dr. Andrea Greve, Prof. Edward Wilding

Institution: Cardiff University Brain Research Imaging Centre (CUBRIC), School of Psychology, Cardiff University (UK)

Results: This research project investigated how semantic information influences memories of episodic events. Focusing on the meaning of events at the time of encoding is a good way of making them more memorable. The central aim of this project was to elucidate which memory processes are particularly sensitive to certain kinds of semantic manipulations. We assessed this question by investigating how established event-related potential (ERP) indices of Familiarity (providing a sense of previous encounter, indexed by the early frontal old/new effect, occurring at 300-500ms post stimulus) and Recollection (retrieval of detailed contextual information, indexed by a later parietal old/new effect, occurring at 500-800ms post stimulus) varied according to semantic relations between stimuli and type of semantic encoding subjects employed to process stimuli. Experiment 1 revealed that stimulus-driven semantic manipulations have a particularly strong impact on episodic retrieval via familiarity-driven processes. Reliable differences in ERP indices occurred at anterior scalp locations from 300-500ms (early frontal old/new effect) for related vs. unrelated items. Experiment 2 was able to investigate the basis of this impact

in more detail and demonstrated that the familiarity-driven memory effect is linked to semantic feature overlaps between stimuli, but less so to the kind of semantic processing employed. Our data revealed modulations in early frontal old/new effects that were linked to changes in semantic relatedness between stimuli. The level of strategic semantic processing employed at encoding, however, did not modulate early frontal old/new effects. Overall these findings allow us to establish a more detailed account by which semantic information is able to influence episodic retrieval. Our data suggest that stimulus driven semantic processes modulate familiarity based memory judgements. These findings have important implication for how semantic information can be used to structure learning environments to become more memorable.

Keywords: Psychophysiology; Cognitive processes; Memory; Electroencephalogram (EEG)

Indexed papers: N/A

**Project: 2010-66**

Title: The spiritual brain: Neuropsychological and neurophysiological investigations of self-transcendence and spirituality

Duration: 2011/04 - 2013/02

Researcher(s): Dr. Salvatore Maria Aglioti, Prof. Cosimo Urgesi, Dr. Franco Fabbro, Dr. Matteo Candidi, Dr. Fabio Campanella

Institution: Department of Psychology, University of Rome "La Sapienza", Roma (Italy)

Results: The project aimed at characterizing the neurocognitive basis of religiousness/spirituality (RS) and its links with the bodily self. First, by using transcranial magnetic stimulation (TMS), we down-regulated neural activity of the inferior parietal (IPL) and prefrontal areas to test possible modifications of implicit RS in healthy subjects. We found that TMS of the IPL increased participants' implicit RS. Given the role of the parietal cortex in self-awareness and body schema representation, the results suggest that altered parietal activity is a neurophysiological substrate of self-transcendence. Preliminary results on 12



patients with lesion to either parietal or frontal brain regions confirmed the role of the parietal cortex in RS. The links between self-transcendence and bodily self were also investigated in 96 children. We explored how personality traits influence the development of the abilities to mentally rotate bodies and external objects. We found that mental body rotation is acquired later than mental object rotation (from 8-9 vs. 7 years of age) and that personality traits such as cooperativeness and self-transcendence importantly influence the development of these abilities. Finally, we assessed whether training in mindfulness meditation (MM) promotes congruency between implicit and explicit RS and their general increase in healthy subjects. Of note, for MM participants (vs. no MM controls), we found increased implicit RS after MM. Moreover, explicit and implicit RS were correlated, especially after MM. By using different approaches, the present project fostered our knowledge of the neurocognitive processes that allow humans to transcend the spatiotemporal constraints of the physical body increasing their RS.

**Keywords:** Parapsychology and Psychophysiology; Spiritualism; Brain; Diseases/Injuries; Self; Body awareness; Developmental psychology; Altered states of consciousness; Meditation; Transcranial magnetic stimulation (TMS)

**Indexed papers:** Crescentini, C., Fabbro, F., & Urgesi, C. (2013). Mental spatial transformations of objects and bodies: Different developmental trajectories in children from 7 to 11 years of age. *Developmental Psychology*. doi: 10.1037/a0033627

**Project:** 2010-72

**Title:** Neurocognitive mechanisms supporting the influence of memory on visual attention in healthy and disease

**Duration:** 2011/04 – 2013/10

**Researcher(s):** Dr. José Miguel Pinto Cardoso de Bourbon Teles, Dr. David Soto, Dr. Paul Bentley

**Institution:** Centre for Neuroscience, Faculty of Medicine, Department of Neuroscience and Mental Health, Imperial College London (UK)

**Results:** In the research project we present causal evidence from a lesion study with rare thalamic patients that the anterior ventrolateral (VL) region plays a pivotal role in linking mnemonic and attention control functions in the human brain. Subsequent fMRI work with healthy volunteers further demonstrated how the role of anterior VL thalamus in cognitive control may be shaped by experience-dependent learning, namely, in task contexts where the association between memory contents and the incoming perceptual data needs to be learned in order for memory to guide search behavior.

Together, these findings provide new and unique insight into the functional role of thalamic structures for high-level behavioral control, critically, for the biasing of attentional selection through memory and learning. The results furthermore stress the importance of characterizing the functional role of subcortical nuclei, in addition to cortical systems (e.g. parietofrontal), for a complete understanding of the mechanisms of attention and cognitive control.

**Keywords:** Psychophysiology; Cognitive processes; Attention; Memory; Brain; Diseases/Injuries; Transcranial direct current stimulation (tDCS)

**Indexed papers:** N/A

**Project: 2010-74**

**Title:** The psychobiological effects of yoga/meditation in a prison population

**Duration:** 2012/02 – 2014/03

**Researcher(s):** Dr. Miguel Farias, Dr. Amy Bilderbeck

**Institution:** Department of Experimental Psychology, University of Oxford (UK)

**Results:** Yoga and meditation have been shown to be effective in alleviating symptoms of depression and anxiety in healthy volunteers and psychiatric populations. Recent work has also indicated that yoga can improve cognitive-behavioural performance and control. Although there have been no controlled studies of the effects of yoga in a prison population, we reasoned that yoga

could have beneficial effects in a setting where psychosocial functioning is often low, and the frequency of impulsive behaviours is high.

Participants were recruited from 7 British prisons, and randomly allocated to either a 10-week yoga programme (yoga group; 1 class per week;  $N = 45$ ) or a control group ( $N = 55$ ). Self-report measures of mood, stress, and psychological distress were collected before and after the intervention period. Participants completed a cognitive-behavioural task (Go/No-Go) at the end of the study, which assessed behavioural response inhibition and sustained attention.

Participants in the yoga group showed increased self-reported positive affect, and reduced stress and psychological distress, compared to participants in the control group. Participants who completed the yoga course also showed better performance in the cognitive-behavioural task, making significantly fewer errors of omission in Go trials and fewer errors of commission on No-Go trials, compared to control participants. Yoga may be effective in improving subjective wellbeing, mental health, and executive functioning within prison populations. This is an important consideration given the consistently high rates of psychological morbidity in this group and the need for effective and economical intervention programmes.

**Keywords:** Parapsychology; Intervention; Stress and health; Well-being; Cognitive processes; Altered states of consciousness; Meditation

**Indexed papers:** Bilderbeck, A., Farias, M., Brazil, I., Jakobowitz, S., & Wikholm, C. (2013). Participation in a 10-week course of yoga improves behavioural control and decreases psychological distress in a prison population. *Journal of Psychiatric Research*, 47(10), 1438-1445. doi: 10.1016/j.jpsychires.2013.06.014

**Project:** 2010-82

**Title:** An investigation into the prevalence and phenomenology of synchronicity experiences in the clinical setting

**Duration:** 2011/03 – 2012/07

**Researcher(s):** Dr. Elizabeth Roxburgh

Institution: Centre for the Study of Anomalous Psychological Processes (CSAPP), The University of Northampton (UK)

Results: A survey conducted with a random sample of psychologists, psychotherapists, and counsellors found that 44% ( $N = 100$ ) of respondents had experienced synchronicity in the clinical setting, 67% ( $N = 150$ ) of the sample felt that synchronicity events could be useful experiences in therapy, and 31% ( $N = 51$ ) felt that they might be useful. Explanations that respondents gave for why synchronicity experiences occurred in therapy were significantly different according to professional group membership. For example, psychologists were significantly more likely than both counsellors ( $F_{(1, 122)} = 4.763, p = .031$ ) and psychotherapists ( $F_{(1, 150)} = 6.569, p = .011$ ) to agree that chance coincidence was an explanation for synchronicity, whereas, counsellors ( $F_{(1, 118)} = 8.258, p = .005$ ) and psychotherapists ( $F_{(1, 151)} = 11.589, p = .001$ ) were significantly more likely than psychologists to agree that a need for unconscious material to be expressed could be an explanation for synchronicity experiences in the clinical setting. This may have an impact on how practitioners respond to clients who report anomalous experiences. Interviews with a subsample of respondents identified three superordinate themes that illuminate how participants interpret and address synchronicity experiences in therapy: 'Sense of connectedness', 'Therapeutic process', and 'Professional issues'. Participants commented on how their experience of synchronicity in the clinical setting was a profound moment that facilitated growth in their clients and resulted in a stronger therapeutic relationship. Synchronicity experiences are perceived to be a useful 'tool' for the therapeutic process, which has important implications for training and supervision.

Keywords: Parapsychology; Anomalous cognition/experiences; Intervention

Indexed papers: N/A

- Project:** 2010-85
- Title:** Importance of cognitive coping in facilitation of hypno-relaxation in stressed students and in anxious patients: Holistic psycho-neuroendocrino-immunological analysis (Building telepathic contact with the inner adviser)
- Duration:** 2010/11 – 2012/10
- Researcher(s):** Prof. Margit Keresztes, Prof. Tibor Rudisch, Dr. Zoltán Kovács, Prof. János Tajti, Dr. János Gardi, Dr. Gyöngyi Serfózo
- Institution:** Dept. Biochemistry, Medical Faculty, University of Szeged, Szeged (Hungary)
- Results:** Our aim was to compare the effect of standard and cognitive hypnorelaxations on the psycho-neuro-immunological status in healthy stressed students (before-during examination term) and in chronic anxious patients. The patients ( $n = 30$ , mean age: 47.5) and the students ( $n = 20$ , mean age: 20.5) completed perceived stress and coping (Rahe), depression (BDI), hypnotizability (Harvard), trait and state anxiety (Spielberger) tests. Tensions of 7 muscles were measured by computer-assisted surface EMG. ACTH, cortisol and special immunological markers (LL-37, lactoferrin, sICAM-1, IL-6, galectin-3) were assayed in blood plasma. Biosamples were collected before and after one cognitive and two standard hypnorelaxations.
- In students, significant decrease of ACTH level was detected after each hypnorelaxation session ( $p < 0.05$ ); only standard sessions were effective in downregulating cortisol level ( $p < 0.01$ ). Onset of the examination term enhanced muscle tension dramatically in students ( $p < 0.0001$ ). In patients, state anxiety score was significantly decreased after each hypnorelaxation ( $p < 0.05$ ), and cortisol was reduced after the cognitive ( $p < 0.001$ ) and the second standard ( $p < 0.01$ ) sessions. Interestingly, cognitive hypnorelaxation resulted in an increase of muscle tension (especially on the left side) both in students and in patients. Standard hypnorelaxation reduced muscle tension only in patients ( $p < 0.01$ ). No significant changes were seen in immunological markers. All in all, muscle tension scores appeared to be sensitive indicators of psychological stress in addition to stress hormones (ACTH, cortisol). Relaxed psychosomatic state seemed to be more facilitated by standard hypnorelaxation than by a cognitive coping one.

Keywords: Psychophysiology and Parapsychology; Mental health; Anxiety disorders; Altered states of consciousness; Hypnosis; Psychoneuroimmunology; Stress and health; Intervention

Indexed papers: N/A

**Project: 2010-86**

Title: The different faces of one's self: Neural correlates of changes in self-identity

Duration: 2011/09 – 2012/10

Researcher(s): Dr. Ana Tajadura-Jiménez, Dr. Emmanouil (Manos) Tsakiris

Institution: Department of Psychology, Royal Holloway University of London (UK)

Results: (1) The neural processes that underpin the cognitive capacity for self-recognition were investigated in two fMRI studies: Aging-related changes in self-face identification: Participants viewed images of either their own face as it currently looks morphed with the face of a familiar other or their childhood face morphed with the childhood face of the familiar other. Results suggest that distinct neural structures encode changes in self-identity across time. Activity in areas that have a generalised selectivity for faces, including the inferior occipital gyrus, the superior parietal lobule and the inferior temporal gyrus, varied with the amount of current self in an image. Activity in areas involved in memory encoding and retrieval, including the hippocampus and the posterior cingulate gyrus, and areas involved in creating a sense of body ownership, including the temporo-parietal junction and the inferior parietal lobule, varied with the amount of childhood self in an image. (2) Sensory-driven changes in self-face identification. Participants experienced tactile stimulation delivered to their face, whilst observing either temporally synchronous or asynchronous tactile stimulation delivered to another person's face on either a congruent or incongruent location. Activity in a network of multisensory areas including the right temporo-parietal Junction (rTPJ) and middle frontal gyrus, the bilateral anterior insula and intraparietal sulcus, showed an effect of

synchronous, congruent stimulation. Activity in the rTPJ was scaled with the extent to which the participants' felt identification with the observed face during stimulation. These results provide a functional basis for the neural plasticity of the self-recognition network.

**Keywords:** Psychophysiology; Brain; Self; Functional magnetic resonance imaging (fMRI)

**Indexed papers:** Apps, M. A., Tajadura-Jiménez, A., Sereno, M., Blanke, O., & Tsakiris, M. (2013). Plasticity in unimodal and multimodal brain areas reflects multisensory changes in self-face identification. *Cerebral Cortex*. doi: 10.1093/cercor/bht199

Apps, M. A., Tajadura-Jiménez, A., Turley, G., & Tsakiris, M. (2012). The different faces of one's self: An fMRI study into the recognition of current and past self-facial appearances. *NeuroImage*, 63(3), 1720-1729. doi: 10.1016/j.neuroimage.2012.08.053

**Project:** 2010-94

**Title:** Cortical and autonomic responses associated with accurate intuition

**Duration:** 2011/10 – 2013/04

**Researcher(s):** Prof. Paul J. Mills, Dr. Arnaud Delorme, Dr. Julie Beischel, Dr. Dean Radin, Dr. Rael Cahn

**Institution:** Institute of Noetic Sciences, Petaluma, CA (USA)

**Results:** During advanced meditative practices, unusual perceptions can arise including the sense of receiving information about unknown people who are deceased. As with meditation, this mental state of communication with the deceased involves calming mental chatter and becoming receptive to subtle feelings and sensations. Psychometric and brain electrophysiology data were collected from six individuals who had previously reported accurate information about deceased individuals under double-blind conditions. Each experimental participant performed two tasks with eyes closed. In the first task, the participant was given only the first name of a deceased person and asked 25 questions. After each question, the participant was asked to silently perceive information relevant to the question for 20 s and then respond verbally. Responses were transcribed

and then scored for accuracy by individuals who knew the deceased persons. Of the four mediums whose accuracy could be evaluated, three scored significantly above chance ( $p < 0.03$ ). The correlation between accuracy and brain activity during the 20 s of silent mediumship communication was significant in frontal theta for one participant ( $p < 0.01$ ). In the second task, participants were asked to experience four mental states for 1 min each: (1) thinking about a known living person, (2) listening to a biography, (3) thinking about an imaginary person, and (4) interacting mentally with a known deceased person. Each mental state was repeated three times. Statistically significant differences at  $p < 0.01$  after correction for multiple comparisons in electrocortical activity among the four conditions were obtained in all six participants, primarily in the gamma band (which might be due to muscular activity). These differences suggest that the impression of communicating with the deceased may be a distinct mental state distinct from ordinary thinking or imagination.

**Keywords:** Parapsychology and Psychophysiology; Survival after bodily death; Mediumship; Electroencephalogram (EEG)

**Indexed papers:** Delorme, A., Beischel, J., Michel, L., Boccuzzi, M., Radin, D., & Mills, P. (2013). Electrocortical activity associated with subjective communication with the deceased. *Frontiers in Psychology*, 4: 834. doi: 10.3389/fpsyg.2013.00834

**Project: 2010-96**

**Title:** The psychophysiology of positive psychology

**Duration:** 2011/06 – 2013/09

**Researcher(s):** Prof. Angela Clow, Dr. Lisa Thorn, Dr. Nina Smyth, Prof. Frank Hucklebridge

**Institution:** Psychophysiology and Stress Research Group, Department of Psychology, University of Westminster, London (UK)

**Results:** Well-being was associated with attachment style: securely attached people exhibited better well-being. However neither well-being nor attachment style were associated with the cortisol awakening response (CAR), the cortisol diurnal decline or mean levels of cortisol across the day in a population of healthy



young females. These findings led us to explore age-related effects using hair measures of cortisol.

Hair cortisol (HC) provides a retrospective trait measure of cortisol secretion. Again there was no association between HC and well-being in young healthy females. The older females had higher HC than the healthy young, which is interpreted as a consequence of aging. Surprisingly we found that older females with higher HC had higher levels of well-being. This finding suggests that cortisol acts as an 'energiser' in healthy older females. Together these results question the validity of cortisol as a useful biomarker in the healthy young. It also provides evidence for the neurotoxicity hypothesis of cortisol secretion: well-being did not relate to cortisol secretion in early adulthood with effects emerging in late adulthood.

A subsidiary methodological finding from the study was that previously considered 'safe' saliva sampling delays of around 8 min between awakening and the start of sampling resulted in erroneous over-estimated CAR magnitude and earlier CAR peak timing. Five min saliva sampling in the post-awakening period suggested this was a consequence of a 10 min time lag between awakening and the start of the cortisol rise (previously considered to be linear). In contrast, non-adherence 3-12 hours post-awakening did not impact on diurnal cortisol measures. This can usefully inform future CAR studies.

**Keywords:** Psychophysiology; Stress and health; Well-being; Psychoneuroimmunology; Endocrinology; Attachment; Developmental psychology

**Indexed papers:** Smyth, N., Clow, A., Thorn, L., Hucklebridge, F., & Evans, P. (2013). Delays of 5-15min between awakening and the start of saliva sampling matter in assessment of the cortisol awakening response. *Psychoneuroendocrinology*, 38(9), 1476-1483. doi: 10.1016/j.psyneuen.2012.12.013

Smyth, N., Hucklebridge, F., Thorn, L., Evans, P., & Clow, A. (2013). Salivary cortisol as a biomarker in social science research. *Social and Personality Psychology Compass*, 7(9), 605-625. doi: 10.1111/spc3.12057

**Project:**

**2010-102**

**Title:**

The importance of the rapid eye movement sleep stage for creativity and for creative problem solving

Duration: 2011/07 – 2013/11  
Researcher(s): Prof. Ingegerd Carlsson, Dr. Per Davidson, Dr. Una Gustafsson, Dr. Markus Jansson-Frojmark, Prof. Sara Mednick, Dr. Marianne Ors  
Institution: Department of Psychology, Lund University, Lund (Sweden)  
Results: N/A  
Keywords: Psychophysiology; Sleep and dreams; Cognitive processes; Executive functions  
Indexed papers: N/A

**Project: 2010-105**

Title: Analgesic properties of computer games  
Duration: 2011/09 – 2013/02  
Researcher(s): Dr. Stephen Fairclough, Dr. Helen Poole  
Institution: School of Natural Sciences and Psychology, Liverpool John Moores University, Liverpool (UK)

Results: The concept of immersion describes a graded psychological experience that corresponds to the way in which we engage with tasks or stimuli. Selective attention is the psychological mechanism at the heart of an immersive experience. It is also known that selective attention may play an important role during the perception of pain, there is evidence that distraction from painful stimuli can increase pain tolerance. This convergence has led to a line of research where immersion in virtual tasks (e.g. computer games) is utilized for therapeutic purposes and pain relief. The first experiment adopted an Evoked Response Potential (ERP) methodology based on the auditory oddball paradigm. We developed a methodology where participants played a computer game whilst being exposed to a series of tones that were irrelevant to the game. Our participants were exposed to the oddball paradigm during several game conditions. The degree of demand experienced by participants was manipulated to yield easy, hard and impossible levels of difficulty. Participants experienced these

three levels of difficulty on three display types: a small 5" display, a large TV display and a Head-Mounted Display (HMD). Our findings revealed that immersion was highest during hard/impossible levels of demand that increased the intrinsic motivation of the participant. However, we found no effect of display type on immersion.

Our second experiment focused on the motivational aspects of immersion and we once again exposed our participants to easy, hard and impossible levels of demand. Instead of using an auditory oddball task to capture ERP modulation, participants were exposed to repeated painful stimuli based on contact heat applied to the forearm. The aim of this experiment was to investigate whether ERP responses to painful stimuli were modulated by the level of game demand. This experiment failed to reveal any statistically significant findings and there were a number of methodological issues that may have been responsible for this null finding.

Keywords: Psychophysiology; Cognitive processes; Attention; Pain

Indexed papers: N/A

**Project:** 2010-106

Title: Mapping the psychophysiology of anxiety responses using virtual reality

Duration: 2011/07 – 2014/01

Researcher(s): Dr. Simon Dymond, Dr. Philip M. Newton, Dr. Bryan Roche

Institution: Department of Psychology, Wales Institute of Cognitive Neuroscience, Swansea University, Swansea (UK)

**Results:** To model the development and generalization of anxiety-related behaviours in humans using the conditioned suppression paradigm, three experiments were conducted using a novel virtual reality task. Participants first underwent operant followed by fear conditioning in which a background colour conditioned stimulus (CS+) was paired with an instructed unconditioned stimulus (US), such as the screen shaking and a loss of accumulated points. Another background colour was not paired with the US (CS-). Conditioned suppression was then tested with presentations of the remaining CSs. Suppression ratios were calculated for multiple topographies of response (shots, hits, breaks, and accuracy). Significant suppression was observed for directly learned cues. Across experiments, generalized suppression was observed for all cues associated via acquired equivalence, symmetry and derived equivalence relations. A post-experimental measure of CS-US awareness indicated high levels of conditioning participants reporting awareness of the contingencies.

**Keywords:** Psychophysiology; Cognitive processes; Learning; Mental health; Anxiety disorders; Assessment tools

**Indexed papers:** Greville, J., Dymond, S., Newton, P., & Roche, B. (2013). Acquired equivalence and generalized suppression in a virtual reality environment. *Learning & Behavior*, 1-8. doi: 10.3758/s13420-013-0129-3

Greville, J., Newton, P., Roche, B., & Dymond, S. (2013). Conditioned suppression in a virtual environment. *Computers in Human Behavior*, 29(3), 552-558. doi: 10.1016/j.chb.2012.11.016

**Project:** 2010-111

**Title:** Investigating perceptual dynamics through “mind reading”

**Duration:** 2011/03 – 2013/11

**Researcher(s):** Dr. Christoph T. Weidemann

**Institution:** Swansea University, Department of Psychology, School of Human and Health Sciences, Swansea (UK)

**Results:** N/A

- Keywords: Psychophysiology; Cognitive processes; Perception; Decision-making; Brain; Electroencephalogram (EEG)
- Indexed papers: N/A
- Project: **2010-139**
- Title: Mobile consciousness: Developing a smartphone application for REG exploration and distributed consciousness research
- Duration: 2011/03 – 2012/05
- Researcher(s): Prof. Robert G. Jahn, Adam M. Curry, Hale Brownlee, Dr. Brenda J. Dunne
- Institution: International Consciousness Research Laboratories, New Jersey (USA)
- Results: Investigations of methods for generating true-random numbers from the internal hardware of a smartphone device resulted in a successful technique to convert processes within an Apple iPhone's accelerometer into random binary numbers which passed statistical tests of randomness. An intuitive graphical interface was developed for the iPhone to generate, utilize, and transmit data. Server-side algorithms were implemented to collect, store, and analyze transmitted data. Aggregated results of a "real-world" deployment of the iPhone application produced a body of calibration data comprising 30-bit trials with a terminal  $z$ -score of -0.17. Upward-intention data yielded a terminal  $z$ -score of 0.64, while downward-intention data yielded a terminal  $z$ -score of -1.09, both in the desired direction of effort. Given the limited size of these exploratory experiments, these results were not statistically significant, but the effect sizes were of a scale consistent with those of many successful mind-matter interaction studies. The effort has established both the viability and the core technology behind what could be a new generation of research techniques into consciousness-correlated physical phenomena. The wide availability of smartphones offers new possibilities in mobile computing that can extend this research to a much larger community of users, while eliminating many of the costs

and complexities associated with strictly hardware-based and localized methods of the same.

Keywords: Parapsychology; Assessment tools; Psychokinesis (PK)

Indexed papers: N/A

**Project: 2010-142**

Title: Towards a replicable formula for significant intuitive ability in an applied setting

Duration: 2011/03 – 2012/06

Researcher(s): Dr. James Houran, Dr. Rense Lange

Institution: Integrated Knowledge Systems, Illinois (USA)

Results: Lange, Houran and Lange (in press) designed and validated a new, computerized psi test that aimed to improve controls conditions above and beyond our previous work with the I Ching. The main feature of this software was that the design incorporated the well-validated Theory of Reasoned Action model in decision-making. This allowed us to test intuition paralleled well-defined cognitive processes or whether psi could be a contributing variable as suggested by previous research. A convenience sample of hospitality executives ( $N = 62$ ) responded both intuitively (spontaneous) and cognitively (reasoned) to a set of narratives via a computerized questionnaire that presented hypothetical situations that were conducive to intuitive thinking. Also embedded in the computerized task was a test of psi, thereby allowing correlations between a psi target and the two sets of responses. Other covariates included Sex, Transliminality and Paranormal Belief (New Age Philosophy and Traditional Paranormal Beliefs). No Sex effects were found. Chance-level results on hit rate were observed, although hit rate did show patterns suggesting that some variables promote person-conduciveness to psi. Scores on transliminality significantly and positively predicted scores on intuitive thinking, which in turn were significantly related to hit rate. New Age Philosophy was moderately correlated with transliminality and intuitions as might be expected, but it had no relation to hit rate. Most

importantly, intuitive responses could not be entirely explained in terms of a conventional “weighting” cognitive process inherent to many other contexts of decision-making. Thus, we (Houran & Lange, submitted) found mixed support for our idea that inherently novel, spontaneous and ambiguous situations (i.e., conducive for intuitive thought) overcomes participants’ lower levels of belief and transliminality levels.

**Keywords:** Parapsychology; Extrasensory perception (ESP); Intuition; Paranormal belief; Transliminality; Assessment tools

**Indexed papers:** N/A

**Project:** 2010-154

**Title:** Sleep-dependent emotion regulation

**Duration:** 2011/05 – 2013/05

**Researcher(s):** Prof. Pascal Hot, Prof. Yoshiniro Kobayashi, Eng. Adeline Paignon

**Institution:** Laboratoire de Psychologie et Neurocognition (LPNC), Université de Savoie, Chambéry (France)

**Results:** Goal:

Recent neuroimaging studies support that emotion regulation could be strengthened by sleep. First, MRI findings (Yoo et al., 2007; Walker et al., 2011) have demonstrated that REM sleep decreases amygdala reactivity to intrinsically emotional stimuli, previously experienced. Second, one study (Pace-Schott et al., 2009) suggests that sleep reduces affective impact of an emotional learning. The main goal of our work is to identify neural activities during sleep as the cause of reduced emotional reactivity for a new emotional learning.

Methods:

Two groups, a “sleep” group (13 participants) and a “wake” group (15 participants) have performed the protocol. Both groups watched a set of 15 short neutral and scary movies (4 sec each) ended with the presentation of neutral pictures. Conditioned neutral pictures (previously associated to scary movies) were next presented alone, immediately after the conditioning and after a 12hr delay. Physiological and psychological re-

sponses to conditioning pictures were measured. For the sleep group, sleep EEG was recorded during 3 consecutive nights, the last one following the conditioning protocol.

Results and Discussion:

Main results showed that emotional responses were reduced in the sleep group compared to the wake group. In the sleep group, significant differences were observed between the control night and the 'emotional' night only for the theta band during the REM sleep. By contrast EEG activity during both light and deep sleep appears to be globally unaffected by experimental conditions. This result suggests that theta rhythm is increased during REM-sleep subsequent to emotional learning, sustaining emotional adaptation process.

Keywords: Psychophysiology; Sleep and dreams; Emotion; Brain; Electroencephalogram (EEG)

Indexed papers: N/A

**Project: 2010-170**

Title: The role of fusion of multisensory percepts in dynamic facial/body expressions: an fMRI study

Duration: 2011/04 – 2013/11

Researcher(s): Dr. Gina Maria Costa Caetano, Prof. Miguel Castelo-Branco, Prof. Beatrice de Gelder, Eng. Gregor Philipiak

Institution: Instituto Biomédico de Investigação de Luz e Imagem - IBILI, Faculdade de Medicina, Universidade de Coimbra (Portugal)

Results: N/A

Keywords: Psychophysiology; Emotion; Cognitive processes; Perception; Brain; Functional magnetic resonance imaging (fMRI)

Indexed papers: Almeida, I., Van Asselen, M., & Castelo-Branco, M. (2013). The role of the amygdala and the basal ganglia in visual processing of central vs. peripheral emotional content. *Neuropsychologia*, 51(11), 2120-2129. doi: 10.1016/j.neuropsychologia.2013.07.007



- Project:** 2010-178
- Title:** Neural mechanisms of social transmission of fear
- Duration:** 2011/10 – 2013/07
- Researcher(s):** Dr. Marta de Aragão Pacheco Moita, Dr. Ana Pereira, Dr. Susana Lima
- Institution:** Champalimaud Foundation, Lisboa (Portugal)
- Results:** In addition to learning signs associated with specific threats, animals can use con-specific alarm signals (such as alarm pheromones and calls) and eavesdrop on other species. These mechanisms allow animals to avoid the necessity of learning through what might be a fatal encounter with a predator. Our laboratory has recently shown that rats use freezing as a signal of threat. In our study, we trained one rat, the demonstrator, to fear a tone cue and the next day tested their fear of the cue in the presence of the cage-mate, the observer. We found that observer rats perceive the cessation of movement-evoked sound (caused by freezing of the demonstrator) as a signal of danger and its resumption as a signal of safety. In addition, we have found that observer rats previously exposed to footshocks display observational freezing, but naive observer rats do not, indicating that learning from self-experience with an aversive event is important for rats to respond to freezing displayed by others. We hypothesize that rats learn to associate their own freezing response with the aversive shock, such that later on freezing itself becomes an alarm cue. Indeed, experiments in the lab have shown that exposure to shock, or contextual fear learning in the absence of freezing, are not sufficient to allow for observational freezing. This set of experiments paved the way to the underpinnings of the neural mechanism underlying social transmission of fear in rats.
- Keywords:** Psychophysiology; Emotion; Animal behavior; Cognitive processes; Learning
- Indexed papers:** Pereira, A. G., Cruz, A., Lima, S. Q., & Moita, M. A. (2012). Silence resulting from the cessation of movement signals danger. *Current Biology*, 22(16), R627-R628. doi: 10.1016/j.cub.2012.06.015

**Project:** 2010-180  
**Title:** Neuronal mechanisms underlying sex hormone-dependent switching of sexual receptivity  
**Duration:** 2011/05 – 2013/07  
**Researcher(s):** Dr. Kensaku Nomoto, Dr. Susana Lima  
**Institution:** Champalimaud Foundation, Lisboa (Portugal)

**Results:** Animals should choose appropriate actions at the right time in order to survive or reproduce successfully. During social interactions, animals must choose either being affiliative or antagonistic. It is well established that the reproductive cycle modulates this choice, and that female rodents show increased sexual receptivity when they are fertile. The ventrolateral part of the ventromedial hypothalamus (VMHvl) is thought to be involved in the neural control of such behavioral change. However, it remains unclear how the orchestrated activity of the VMHvl neurons produces different behaviors depending on the reproductive phase. To address this issue, we performed multiple single-unit recording experiments across the reproductive cycle in female mice during social interactions. We found that the proportion of male responsive neurons in the VMHvl increases during the sexually receptive phase. This was not the case with the female-evoked responses. These results suggest that a change in the proportion of male-responsive neurons facilitates transmission of male information to the downstream brain regions, which may lead to increased sexual receptivity.

**Keywords:** Psychophysiology; Animal behavior; Sexual behavior; Brain

**Indexed papers:** N/A

**Project:** 2010-186  
**Title:** Brain mechanisms of placebo analgesia  
**Duration:** 2011/03 – 2014/01  
**Researcher(s):** Prof. Magne Arve Flaten, Prof. Per M. Aslaksen, Prof. Torgil R. Vangberg, Dr. Odd Petter Eldevik, Prof. Jan Bergdahl, Dr. Sara Vambheim, Dr. Just C. Thoner

Institution: University of Tromsø and University Hospital of North Norway, Tromsø (Norway)

Results: Four studies investigated whether negative emotions (stress, anxiety, fear) reduced or abolished placebo analgesia. Several studies have shown less placebo analgesia in females compared to males, which could be due to more negative emotions in females. Study 1 showed that higher fear of pain reduced subjective and electrophysiological placebo analgesic responses. Sensation of pain can be inhibited by applying a second noxious stimulus elsewhere on the body. This procedure activates endogenous pain inhibitory mechanisms. Study 2 investigated whether expectations modulated this effect on tonic pain. Negative information about the effect of conditioning stimulation induced stress in females, and higher fear of pain was associated with increased stress during conditioning stimulation in females. In Study 3 fear was induced by the anticipation of electric shock to investigate whether fear reduced placebo analgesia. Induced fear abolished placebo analgesia, and this was strongest in subjects with high scores on measures of fear. Study 4 used functional resonance imaging (fMRI). It was hypothesized that differences in placebo responding between males and females should be correlated with larger placebo-related neural responses in the thalamus, the ACC and the insular cortex in males compared to females. During anticipation of pain, females had higher activation in the left cerebellum and the left hippocampus compared to males, areas that in previous research have been implicated in emotional processing. In sum, the four studies indicate that placebo analgesia is stronger in males than in females. This is due to more fear and anxiety in females in anticipation of the painful stimulation.

Keywords: Psychophysiology; Pain; Emotion; Brain

Indexed papers: Bjørkedal, E., & Flaten, M. A. (2012). Expectations of increased or decreased pain explain the effect of conditioned pain modulation in females. *Journal of Pain Research*, 5, 289-300. doi: 10.2147/JPR.S33559

Lyby, P., Forsberg, J. T., Asli, O., & Flaten, M. A. (2012). Induced fear reduces the effectiveness of a placebo intervention on pain. *Pain*, 153(5), 1114-1121. doi: 10.1016/j.pain.2012.02.042

Meissner, K., Bingel, U., Colloca, L., Wager, T., Watson, A., & Flaten, M. (2011). The placebo effect: Advances from different methodological approaches. *Journal of Neuroscience*, 31(45), 16117-16124. doi: 10.1523/jneurosci.4099-11.2011

- Project:** 2010-190
- Title:** The Sharefeld: A new standard for free response ESP research
- Duration:** 2011/04 – 2013/09
- Researcher(s):** Dr. Mario Varvoglis, Dr. Peter Bancel, Dr. Djohar Si Ahmed, Eng. Jean-Paul Bailly
- Institution:** Institut Métapsychique International, Paris (France)
- Results:** Background:  
Recent meta-analyses have shown that psi-research protocols coupling subject optimization (or “noise reduction”) procedures with a free-response testing approach produce a moderate degree of replicability and adequate effect-sizes. However, these protocols are time- and resource- intensive; a single trial, or data point, can take one hour or more. Thus, in a field of limited resources, they are not well suited for process-oriented research.  
The Sharefield project explores an alternative approach: an automated experimental protocol that combines optimization procedures with forced-choice testing, involving higher data collection rates. The project’s long term goal is to develop a readily replicable testing protocol that produces superior effect sizes and is useful for process-oriented research.  
Objectives:  
1. Develop and perfect a novel automated testing approach combining forced-choice testing with subject-optimization procedures, so as to obtain a flexible and powerful psi-research tool.  
2. Conduct a telepathy experiment based on this approach, to assess its viability and determine improvements. Integrating a comparison between subject-optimized conditions (OS) with Non-Optimized conditions (N-OS), the experiment tests three hypotheses: I) the trial effect size for the OS condition will be significant II) the trial effect size for the OS condition will be superior to that obtained in the N-OS condition III) the OS session effect size will be superior to 0.135, the ES established for the Ganzfeld.

## Results:

## Main Analyses

For the Optimized-Sessions (OS), we obtained 253 hits out of 500 trials ( $Z = 0.268$ ,  $ES = 0.012$ ,  $p = \text{N.S.}$ ). Hypothesis I was not confirmed. The difference in trial effect sizes between OS and N-OS conditions was  $ES = 0.099$  ( $Z = 1.35$ ,  $p = 0.09$ ). Hypothesis II was not confirmed. The OS session effect size was  $ES = 0.0537$ . Hypothesis III, was not confirmed.

## Secondary Analyses

The null results observed in the Main Analyses may have been due to a combination of psi-hitting and psi-missing, rather than an absence of psi. To test this, we assessed hit rate variability by grouping trials according to three factors that could produce significant variability in scoring: participants, targets and trial position within the session. Hit rate distributions for these three factors, for both OS and N-OS conditions, were tested against the null hypothesis using a Pearson chi-squared goodness-of-fit test and a Monte Carlo test of the variance. In this analysis, we obtained significantly low probability values for two of the six OS tests and none for the N-OS; a Monte Carlo simulation estimating the probability of finding 2 of 6 tests with  $p$ -values of 0.03 and 0.02, or less, is significant ( $p = 0.012$ ; 90% confidence interval of 0.007, 0.017). Thus, scoring specifically during the OS trials was anomalously variable, suggesting that the Optimized condition elicited psi-hitting / psi-missing patterns rather than no psi at all.

## Conclusions:

For this first study, we are encouraged by the successful integration of optimization procedures in an automated multiple-trial protocol, and by the positive feedback given by participants. While the main hypotheses were not confirmed, the post-hoc analyses provided some evidence that the Optimization protocol did elicit psi functioning, albeit in an unstable manner. Based on the quantitative and qualitative results, we are now working on improvements for the next Sharefield experiment.

## Keywords:

Parapsychology; Extrasensory perception (ESP); Telepathy; Assessment tools

## Indexed papers:

N/A

- Project:** 2010-191
- Title:** Lucid dream induction by transcranial cortex stimulation: A test of the prefrontal hypothesis of lucid dreaming
- Duration:** 2011/08 – 2012/10
- Researcher(s):** Prof. Michael Schredl, Dr. Claudia Schilling, Dr. Ahmed Karim, Dr. Daniel Erlacher, Ms. Birgit Schütz
- Institution:** Central Institute of Mental Health, Mannheim (Germany)
- Results:** Recent studies suggest that lucid dreaming (awareness of dreaming while dreaming) might be associated with increased brain activity over frontal regions during rapid eye movement (REM) sleep. By applying transcranial direct current stimulation (tDCS), we aimed to manipulate the activation of the dorsolateral prefrontal cortex (DLPFC) during REM sleep to increase dream lucidity. Nineteen participants spent three consecutive nights in a sleep laboratory. On the second and third nights they randomly received either 1 mA tDCS for 10 min or sham stimulation during each REM period starting with the second one. According to the participants' self-ratings, tDCS over the DLPFC during REM sleep increased lucidity in dreams. The effects, however, were not strong and found only in frequent lucid dreamers. While this indicates some preliminary support for the involvement of the DLPFC in lucid dreaming, further research, controlling for indirect effects of stimulation and including other brain regions, is needed.
- Keywords:** Psychophysiology; Sleep and dreams; Altered states of consciousness; Lucid dreaming; Transcranial direct current stimulation (tDCS)
- Indexed papers:** Stumbrys, T., Erlacher, D., & Schredl, M. (2013). Testing the involvement of the prefrontal cortex in lucid dreaming: A tDCS study. *Consciousness and Cognition*, 22(4), 1214-1222. doi: 10.1016/j.con-cog.2013.08.005

- Project:** 2010-196
- Title:** Emotional responses in patients with disconnection of the left and right brain hemispheres
- Duration:** 2011/04 – 2012/02

- Researcher(s): Dr. Lynn Kerlin Paul, Prof. Ralph Adolphs, Dr. Remya Nair  
 Institution: Caltech Emotion and Social Cognition Laboratory, California Institute of Technology, California (USA)
- Results: We examined the impact of disrupted brain connectivity on social cognition, by studying adults born with isolated agenesis of the corpus callosum (AgCC). 17 neutral and 17 negative images from the International Affective Picture System were shown to 15 adults with AgCC and 10 healthy controls (matched for age and intelligence). Images were presented for 6 seconds, during which eye-movements were recorded. After each image, participants rated emotional valence (negative = 1 to positive = 9) and arousal level (calm = 1 to exciting = 9). On valence ratings, adults with AgCC tended to over-estimate the negativity in emotionally ambiguous images, but accurately recognized it in clearly negative scenes. On arousal ratings, the AgCC group tended to under-estimate emotional intensity of negative scenes. This pattern was most evident for images of people. Relative to matched controls, the adults with AgCC gave lower arousal ratings overall for slides containing people, with a significant bias toward under-appreciating arousal in negative slides containing people. Eye-tracking results suggest that individuals with AgCC may spend less time focused on faces and eyes, particularly for negative images. It is possible that the social deficits in AgCC are a direct result of impaired coordination of the hemispheres. For example, according to the 'valence hypothesis,' the right hemisphere is relatively more specialized for processing negative emotions. In which case, verbal labelling of those emotions would depend most heavily on intact callosal connections and, as we found, would be most impaired in AgCC.
- Keywords: Psychophysiology; Diseases/Injuries; Agenesis of the corpus callosum (AgCC); Emotion; Social cognition
- Indexed papers: Brown, W. S., Anderson, L. B., Symington, M. F., & Paul, L. K. (2012). Decision-making in individuals with agenesis of the corpus callosum: expectancy-valence in the Iowa Gambling Task. *Archives of Clinical Neuropsychology*, 27(5), 532-544. doi: 10.1093/arclin/acs052  
 Marco, E. J., Harrell, K. M., Brown, W. S., Hill, S. S., Jeremy, R.

J., Kramer, J. H., ... Paul, L. K. (2012). Processing speed delays contribute to executive function deficits in individuals with agenesis of the corpus callosum. *Journal of the International Neuropsychological Society*, 18(3), 521-529. doi: 10.1017/s1355617712000045

Tyszka, J. M., Kennedy, D. P., Adolphs, R., & Paul, L. K. (2011). Intact Bilateral Resting-State Networks in the Absence of the Corpus Callosum. *Journal of Neuroscience*, 31(42), 15154-15162. doi: 10.1523/jneurosci.1453-11.2011

**Project: 2010-199**

Title: Psychophysiology of spiritual transmission

Duration: 2011/08 – 2013/06

Researcher(s): Dr. Cassandra Vieten, Dr. Dean Radin, Dr. Marilyn Schlitz, Dr. Arnaud Delorme

Institution: Institute of Noetic Sciences, California (USA)

Results: Practitioners from a variety of spiritual traditions occasionally report strong psychophysiological reactions when a spiritual teacher (“guru”) who has achieved some level of mastery directs his or her attention toward the practitioner. Close proximity between guru and practitioner is purportedly not a limitation in transmitting or receiving spiritual transmission. We asked a guru to periodically send energy remotely to six recipients, one at a time, while they were isolated in our lab’s electromagnetically shielded chamber some 50 meters away. We recorded the recipients’ EEG (32 channels) and several autonomic measures throughout the testing period. None of the recipients knew the guru, and all were blind to when he was sending energy. Analysis of the resulting data suggested that in some recipients the remote intervention by the guru appeared to produce significant variations in physiology. We also studied the effect on the recipients’ physiology to the physical proximity of the guru, as compared to a “sham guru,” i.e., an actor playing the part of a guru. Again we found indications of differences in physiological reaction in some of the participants depending on whether the guru was real or sham. This preliminary investigation indicates that it is possible to study claims about spiritual transmission effects using psychophysiological methods under controlled conditions, and it also suggests that at least some of the traditionally reported effects about shaktipat might be objectively measurable.



Keywords: Parapsychology and Psychophysiology; Psychokinesis (PK); Direct mental interactions with living systems (DMILS); Spiritualism; Spiritual traditions/experiences; Electroencephalogram (EEG)

Indexed papers: N/A

**Project: 2010-2011**

Title: The effects of audience size and audience rating on field random number generator output: A case study of Japanese professional baseball

Duration: 2011/03 – 2012/10

Researcher(s): Dr. Takeshi Shimizu, Prof. Masato Ishikawa, Dr. Tatsu Hirukawa

Institution: Science Communicatoin Laboratory, Meiji University, Tokyo (Japan)

Results: This project examined the association between the outputs of a true random number generator (RNG) and audience size during Japanese professional baseball games. We regarded an RNG as a signal detector of field consciousness and hypothesized that the number of signal sources might increase the ability of an RNG to detect signals. Experimenters and assistants voluntarily obtained 76 samples from a total of 78 baseball games during the 2010-2011 baseball seasons. The effects of audience size at the stadium ( $M = 38970 \pm 6058 SD, N = 78$ ) and TV audience ratings ( $M = 7.07 \pm 2.32 SD, N = 23$ ) were examined in relation to the measurements of multiple Random Streamer and Psyleron RNG devices. RNGs set at remote locations ran simultaneously during the games. Our results show a positive correlation between accumulated chi-squared statistics by Random Streamer and audience size at the stadium. Unexpectedly, identical RNGs showed strong negative correlations between different machines, which suggests that their outputs cancelled each other out.

Keywords: Parapsychology; Psychokinesis (PK); Field consciousness

Indexed papers: Shimizu, T., & Ishikawa, M. (2012). Audience size effects in field RNG experiments: The case of Japanese professional baseball games. *Journal of Scientific Exploration*, 26(3), 67-83.

Shimizu, T., & Ishikawa, M. (2012). Reliability of outputs of field random number generator movie experiments. *NeuroQuantology*, 10(3), 389-393.

**Project:** 2010-206

Title: Extrasensory perception, dissociation, and motor automatisms

Duration: 2011/04 – 2012/10

Researcher(s): Dr. John Palmer, Dr. Christine Simmonds-Moore

Institution: Rhine Research Center, North Carolina (USA)

Results: 80 volunteers completed Watson's Dissociative Processes Scale (DPS) prior to an ESP task preceded by a taped progressive relaxation exercise. Pasted on a computer writing tablet was a 4x4 grid of 16 1-inch squares each with a number 1-4. For 36 trials, participants (Ps) explored the grid with a computer pen, indicating their guess of the randomly selected target by stopping for 1 sec. There were 4 cells in a 2x2 design with the IVs being hand used for the ESP task (right vs. left) and an additional dissociation facilitator (simultaneously blanking the mind with eyes closed while moving the pen vs. reading quotations on a screen). The DV was "location hits," an unweighted combination of square and quadrant hits. The ANOVA revealed significant psi-missing in the quotations/left condition (QL) and significant psi-hitting elsewhere (EQR). A prediction that Ps experiencing the hand being moved by an outside force (OF) during some of the task would score higher than other Ps was suggestively confirmed, significantly in the EQR condition. OF responses were significantly predicted by the DPS Detachment (DET) subscale. Location hits correlated significantly with DPS Imagination (IMA) and suggestively with DET. IMA and DET correlated significantly with number hits across all conditions. The data were interpreted as reflecting psi mediation on different trials by (a) a motor process restricted to location hits in the EQR condition and predicted by the OF item and the independent variance of DET re IMA, and (b) by a cognition process operative in all conditions, predicted by the joint variance of DET and IMA and mediating number as well as location hits.

Keywords: Parapsychology; Extrasensory perception (ESP); Altered states of consciousness

Indexed papers: N/A

**Project: 2010-215**

Title: Vestibular contributions to self-awareness

Duration: 2011/03 – 2012/11

Researcher(s): Prof. Patrick Haggard, Dr. Elisa Raffaella Ferre

Institution: Institute of Cognitive Neuroscience, University College London (UK)

Results: Information from the vestibular peripheral organs in the inner ear is integrated with several other classes of signals about the body, generated by eyes, muscles and joints. The resulting signals provide a coherent sense of body posture and orientation in surrounding space.

In this project, the vestibular organs of healthy volunteers were stimulated non-invasively. Participants made judgements about sensory stimuli, bodily sensations, and the relation between the body and the environment both under vestibular stimulation, and under control conditions.

Our results revealed that the vestibular system influences bodily self-awareness in at least four ways. First, vestibular inputs influence primary processing of both touch and pain. This influence may involve multisensory regulation of gains in somatosensory cortical processing pathways. Second, vestibular inputs influence higher order somatosensory representation, namely the localisation of somatosensory stimuli onto a map of the body. They do not alter the “body image”, or knowledge about the spatial organisation of the body as a physical object. Third, vestibular inputs are crucial in maintaining the differentiation between the self and the world, particularly in coding the distance between one’s own body and external objects. Finally, vestibular stimulation affects the active relation with the external environment, by adjusting the balance between explorative behaviours, i.e. discovering new possibilities and varying choices, and stereotyped behaviours. Taken together

our results confirmed that the vestibular system has a pervasive influence on several interactions between the organism and the environment, and also a constitutive influence on the representation of the body and self.

Keywords: Psychophysiology; Somatosensory system; Cognitive processes; Perception; Self; Body awareness

Indexed papers: N/A

**Project: 2010-223**

Title: Exploring the relationship between the synaesthasias and anomalous experiences

Duration: 2011/09 – 2013/05

Researcher(s): Dr. Christine Simmonds-Moore, Dr. Carlos Alvarado, Dr. Nancy Zingrone, Mr. Ferrell Carpenter

Institution: University of West Georgia (USA)

Results: 1628 people (63% female; age range 18-80+) began the survey. Types of synaesthesia varied in incidence and occur under a variety of circumstances. The Synaesthesia Experiences Questionnaire (SEQ) was not normally distributed. It was internally reliable (Cronbach's  $\alpha = .98$ ) and loaded onto 1 factor. SEQ scores correlated with Anomalous Experiences Inventory scores,  $rho = .49$ ,  $p < .0001$ . Those who have traditional paranormal experiences scored higher on the SEQ than non-experiencers. SEQ scores correlated with positive schizotypy,  $rho = .46$ ,  $p = .001$ . There was no systematic relationship between synaesthesia and well-being. This relationship appears to be mediated by schizotypy cluster membership. Twenty-seven synaesthetes (3 male and 24 female, age range 18-70) were age and gender matched to 27 controls. Each completed the SEQ, the TimeStyle™ inventory (Fortunato & Furey, 2011), the synaesthesia subscale of the Tellegen Absorption Scale, Bem's precognitive memory task (2011), a Mental time travel task (D'Argenbeau & Van Der Linden, 2004) and an interview. There was no evidence for psi in the combined group ( $d = .05$ ), the controls ( $d = -.014$ ) or the synaesthetes ( $d = -.00$ ). Neither the difference in scoring between synaesthetes and controls or

correlation between scoring on the SEQ and psi were significant. Synaesthetic associators scored higher on psi than projectors ( $z = -2.00$ ,  $p = .047$ ; post hoc). Future thinking correlated with scoring on the SEQ,  $\rho = .35$ ,  $p = .011$  but not with psi. Past thinking correlated with psi ( $r = -.277$ ,  $p = .043$ ). Mental time travel did not relate to psi but some variables were stronger in synaesthetes. An IPA suggests that ability to represent is important in synaesthesia and anomalous experiences.

Keywords: Parapsychology; Anomalous cognition/experiences; Extrasensory perception (ESP); Personality factors; Assessment tools

Indexed papers: N/A

PROJETOS EM CURSO  
*ONGOING PROJECTS*

## 2004/05 Projects

- Project:** 2004-108
- Title:** A pilot study into the incidence of deathbed phenomena in nursing homes and hospices in Hampshire England, and in Rotterdam Holland
- Estimated duration:** 2008/11 - 2014/04
- Researcher(s):** Prof. Peter Fenwick, Dr. Sue Brayne, Dr. Shirley Firth, Dr. Bart van de Lugt, Dr. Julian Candy, Dr. Frans Reynders, Mr. Frans Baar
- Institution:** University Department of Mental Health, Royal Southampton Hospital, Hampshire (UK)
- Results:** N/A
- Keywords:** Parapsychology; Survival after bodily death; Deathbed phenomena; Near-death experience; Intervention
- Indexed papers:**
- Fenwick, P., & Brayne, S. (2011). End-of-life experiences: Reaching out for compassion, communication, and connection-meaning of deathbed visions and coincidences. *American Journal of Hospice and Palliative Medicine*, 28(1), 7-15. doi: 10.1177/1049909110374301
- Fenwick, P., Lovelace, H., & Brayne, S. (2010). Comfort for the dying: Five year retrospective and one year prospective studies of end of life experiences. *Archives of Gerontology and Geriatrics*, 51(2), 173-179. doi: 10.1016/j.archger.2009.10.004
- Fenwick, P., Lovelace, H., & Brayne, S. (2010). Non local effects in the process of Dying: Can quantum mechanics help? *Neuroquantology*, 8(2), 142-154.
- 
- Project:** 2004-109
- Title:** Extra-sensory perception under the condition of continuous sensory feedback (CSF) to the agent
- Estimated duration:** 2008/11 - 2014/04
- Researcher(s):** Prof. Peter Mulacz, Dr. Gunther Fleck, Prof. Erich Neuwirth, Eng. Hans Georg Schutz, Ms. Helena Bedenicec

Institution: Austrian Society for Parapsychology and Border Areas of Science, Vienna University (Austria)

Results: N/A

Keywords: Parapsychology; Extrasensory perception (ESP); Telepathy

Indexed papers: N/A

### **2008/09 Projects**

**Project:** 2008-20

Title: Beyond anthropocentric empathy: ERP dynamics of empathy for non-human beings and ecosystems

Estimated duration: 2009/11 – 2014/04

Researcher(s): Dr. José Raúl Naranjo Muradás, Dr. Verónica Sevillano Triguero, Prof. Juan I. Aragonés, Prof. Shihui Han

Institution: Department of Environmental Health Sciences, University Medical Centre Freiburg (Germany)

Results: N/A

Keywords: Psychophysiology; Emotion; Empathy

Indexed papers: N/A

**Project:** 2008-29

Title: Emotional processing from language and music: Comparative neurocognitive and functional neuroimaging studies

Estimated duration: 2009/01 – 2013/12

Researcher(s): Prof. Maria de São Luís de Vasconcelos Fonseca e Castro Schöner, Dr. Armando César Ferreira Lima, Prof. António José de Bastos Leite, Prof. Maria Carolina Lobo Almeida Garrett



- Institution: Centro de Psicologia da Universidade do Porto, Grupo de Investigação em Linguagem (Portugal)
- Results: N/A
- Keywords: Psychophysiology; Emotion; Cognitive processes; Language; Perception; Neurodegenerative disorders; Parkinson's disease
- Indexed papers: Lima, C. F., & Castro, S. L. (2011). Emotion recognition in music changes across the adult life span. *Cognition and Emotion*, 25(4), 585-598. doi: 10.1080/02699931.2010.502449  
 Lima, C. F., & Castro, S. L. (2011). Speaking to the trained ear: Musical expertise enhances the recognition of emotions in speech prosody. *Emotion*, 11(5), 1021-1031. doi: 10.1037/a0024521  
 Castro, S. L., & Lima, C. F. (2010). Recognizing emotions in spoken language: A validated set of Portuguese sentences and pseudo-sentences for research on emotional prosody. *Behavior Research Methods*, 42(1), 74-81. doi: 10.3758/BRM.42.1.74
- Project:** 2008-85
- Title: Embodied Emotions. The impact of expertise in mindfulness on the automaticity in emotion regulation strategies detected by psychophysiological parameters and self-report in a laboratory setting
- Estimated duration: 2009/09 – 2014/04
- Researcher(s): Dr. Susanne Müller, Prof. Ulrike Halsband
- Institution: Department of Psychology/Neuropsychology, University of Freiburg (Germany)
- Results: N/A
- Keywords: Psychophysiology; Emotion; Altered states of consciousness; Meditation; Brain; Functional magnetic resonance imaging (fMRI)
- Indexed papers: N/A

**Project:** 2008-118  
**Title:** An interpretative phenomenological analysis of anomalous experience at the end-of-life  
**Estimated duration:** 2009/11 – 2014/04  
**Researcher(s):** Dr. Craig D. Murray, Dr. Joanne Murray  
**Institution:** Division of Health Research, Lancaster University (UK)  
**Results:** N/A  
**Keywords:** Parapsychology; Survival after bodily death; Apparitions/ Haunting; Deathbed phenomena  
**Indexed papers:** Keen, C., Murray, C., & Payne, S. (2013). A qualitative exploration of sensing the presence of the deceased following bereavement. *Mortality: Promoting the interdisciplinary study of death and dying*, 18(4), 339-357. doi: 10.1080/13576275.2013.819320  
Keen, C., Murray, C., & Payne, S. (2013). Sensing the presence of the deceased: A narrative review. *Mental Health, Religion & Culture*, 16(4), 384-402. doi: 10.1080/13674676.2012.678987  
McDonald, C., Murray, C., & Atkin, H. (2013). Palliative-care professionals' experiences of unusual spiritual phenomena at the end of life. *Mental Health, Religion & Culture*, 1-15. doi: 10.1080/13674676.2013.849668

**Project:** 2008-119  
**Title:** Comparação entre falsas memórias e estimulação subliminar no paradigma DRM  
**Estimated duration:** 2009/02 – 2014/06  
**Researcher(s):** Prof. Maria de Fátima de Jesus Simões, Dr. Isabel Maria Barbas dos Santos, Eng. Paulo Joaquim Fonseca da Silva Farinha Rodrigues  
**Institution:** Centro de Investigação em Educação e Ciências do Comportamento, Departamento de Ciências da Educação, Universidade de Aveiro (Portugal)  
**Results:** N/A  
**Keywords:** Psychophysiology; Cognitive processes; Memory  
**Indexed papers:** N/A

**Project: 2008-134**

Title: How does cognitive enrichment impact on neuronal networks and behavioral performance?

Estimated duration: 2010/05 – 2014/04

Researcher(s): Prof. João José Fernandes Cardoso de Araújo Cerqueira, Dr. Igor L. M. Spínola, Dr. Irene Melo Carvalho, Dr. Pedro Ricardo Luís Morgado, Dr. Ricardo Jorge Moreira Taipa

Institution: Life and Health Sciences Research Institute (ICVS), School of Health Sciences, University of Minho, Braga (Portugal)

Results: N/A

Keywords: Psychophysiology; Cognitive processes; Learning; Brain; Stress and health; Chronic stress; Intervention

Indexed papers: Oliveira, J. F., Dias, N., Correia, M., Gama-Pereira, F., Sardinha, V. M., Lima, A., ... & Sousa, N. (2013). Chronic stress disrupts neural coherence between cortico-limbic structures. *Frontiers in Neural Circuits*, 7: 10, 1-12. doi: 10.3389/fncir.2013.00010

**Project: 2008-135**

Title: Electrophysiological Correlates of Learning New Faces: A study with event-related potentials and skin-conductance responses

Estimated duration: 2009/05 – 2014/01

Researcher(s): Dr. Isabel Maria Barbas dos Santos, Dr. Christopher Alexander Longmore, Dr. Jorge Manuel Costa Oliveira

Institution: Laboratório de Psicologia Experimental e Aplicada (PsyLab) do Centro de Investigação em Educação e Ciências do Comportamento (CIECC), Universidade de Aveiro, Departamento de Ciências da Educação (Portugal)

Results: N/A

Keywords: Psychophysiology; Cognitive processes; Learning; Perception

Indexed papers: N/A

- Project:** 2008-142
- Title: Multi-centre study into the relationship of memories, consciousness and near death experiences during Cardiac Arrest
- Estimated duration: 2010/01 – 2015/08
- Researcher(s): Dr. Sam Parnia, Prof. Fritz Sterz, Prof. Roland Beisteiner, Dr. Harry Walmsley, Dr. Peter Doyle, Mr. Ken Spearpoint, Prof. Stephen Holgate, Ms. Susan Jones, Ms. Sue Hampshire, Ms. Celia Warlow, Mr. Russell Metcalf Smith, Ms. Leanne Smyth, Ms. Hayley Killingback, Ms. Salli Lovett, Mr. Paul Wills, Dr. Penny Sartori, Mr. Iain Mcleod, Mr. Jon Taylor
- Institution: University of Southampton Department of Medical Specialities, Southampton General Hospital (UK)
- Results: N/A
- Keywords: Parapsychology and Psychophysiology; Survival after bodily death; Out-of-body experience (OBE); Near-death experience
- Indexed papers: N/A
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- Project:** 2008-180
- Title: Emotional influences on psychophysiological indices of focused attention and response anticipation in social anxiety: A combined neuroimaging and electroencephalographic study
- Estimated duration: 2009/10 – 2014/04
- Researcher(s): Dr. Yoko Nagai, Prof. Hugo Critchley, Dr. Marcus Gray
- Institution: Clinical Imaging Sciences Centre, Brighton and Sussex Medical School, University of Sussex (UK)
- Results: N/A
- Keywords: Psychophysiology; Emotion; Mental health; Anxiety disorders; Cognitive processes; Attention; Brain; Functional magnetic resonance imaging (fMRI); Electroencephalogram (EEG)
- Indexed papers: N/A

**Project: 2008-192**

Title: Brain dynamics underlying motor awareness in language  
 Estimated duration: 2009/10 – 2011/10  
 Researcher(s): Dr. Francesca Carota, Dr. Angela Sirigu, Eng. Claude Delpuech, Eng. Andres Posada, Eng. Sylvain Harquel  
 Institution: Centre de Neuroscience Cognitive, Bron (France)

Results: N/A

Keywords: Psychophysiology; Cognitive processes; Language; Brain; Functional magnetic resonance imaging (fMRI); Magnetoencephalogram (MEG)

Indexed papers: Carota, F., Posada, A., Harquel, S., Delpuech, C., Bertrand, O., & Sirigu, A. (2010). Neural dynamics of the intention to speak. *Cerebral Cortex*, 20(8), 1891-1897. doi: 10.1093/cercor/bhp255

**Project: 2008-201**

Title: Posterior Parietal Cortex Involvement in Skill Learning  
 Estimated duration: 2010/02 – 2014/04  
 Researcher(s): Prof. Sara Marta Pereira dos Santos Cavaco, Prof. Steven Wayne Anderson, Dr. Pedro Soares Pinto, Dr. Ricardo Taipa  
 Institution: Laboratory of Neurobiology of Human Behavior of Hospital de Santo António, Porto (Portugal), Division of Behavioral Neurology and College of Medicine of the University of Iowa, Carver College of Medicine (USA)

Results: N/A

Keywords: Psychophysiology; Cognitive processes; Learning; Brain; Diseases/Injuries

Indexed papers: N/A

### **2010/11 Projects**

**Project:** 2010-61  
**Title:** Translation of neuron-glia interactions in complex cognitive functions  
**Estimated duration:** 2011/05 – 2014/05  
**Researcher(s):** Dr. João Filipe Pedreira de Oliveira, Dr. Nuno Sérgio Mendes Dias, Dr. Luís Ricardo Monteiro Jacinto  
**Institution:** Instituto de Investigação em Ciências da Vida e da Saúde (ICVS), Escola de Ciências da Saúde, Universidade do Minho, Braga (Portugal)  
**Results:** N/A  
**Keywords:** Psychophysiology; Cognitive processes; Brain  
**Indexed papers:** Lima, A., Sardinha V. M., Oliveira A. F., Reis M., Mota C., Silva, M., ... Oliveira, J. F. (2014). Astrocyte pathology in the prefrontal cortex impairs the cognitive function of rats. *Molecular Psychiatry* (1). doi:10.1038/mp.2013.182  
Oliveira, J. F., Dias, N., Correia, M., Gama-Pereira, F., Sardinha, V. M., ... Sousa, N. (2013). Chronic stress disrupts neural coherence between cortico-limbic structures. *Frontiers in Neural Circuits*, 7:10, 1-12. doi: 10.3389/fncir.2013.00010

**Project:** 2010-63  
**Title:** Mindful ageing. Avoiding age related cognitive decline  
**Estimated duration:** 2011/04 – 2014/04  
**Researcher(s):** Prof. Isabel Pavão Martins, Prof. Nuno Lunet, Dr. Carolina Maruta, Dr. Clara Loureiro, Dr. Vanda Freitas, Dr. Joana Morgado, Dr. Sofia Reimão, Dr. Joana Tavares  
**Institution:** Laboratório de Estudos de Linguagem, Unidade Neurológica de Investigação Clínica, Faculdade de Medicina de Lisboa e Instituto de Medicina Molecular, Universidade de Lisboa (Portugal)  
**Results:** N/A

Keywords: Psychophysiology; Developmental psychology; Cognitive processes; Neurodegenerative disorders; Dementia; Mild cognitive impairment (MCI); Assessment tools; Brain

Indexed papers: N/A

**Project: 2010-76**

Title: Transcendental meditation (TM) or hypnotherapy for the treatment of children with tension-type headache: A multi-centre randomized controlled clinical trial in the Netherlands

Estimated duration: 2011/10 – 2015-/03

Researcher(s): Dr. Miek C. Jong, Dr. E.P. van Wijk, Dr. I. Boers, Dr. A.M. Vlieger

Institution: The Louis Bolk Institute, La Driebergen (The Netherlands)

Results: N/A

Keywords: Parapsychology and Psychophysiology; Altered states of consciousness; Meditation; Hypnosis; Intervention; Diseases/Injuries

Indexed papers: N/A

**Project: 2010-100**

Title: Replicating von Lucadou's psycho-physical correlation matrices

Estimated duration: 2011/11 – 2014/03

Researcher(s): Prof. Harald Walach, Dr. Nikolaus von Stillfried

Institution: Institute for Transcultural Health Sciences (INTRAG), European University Viadrina, Frankfurt/Oder (Germany)

Results: N/A

Keywords: Parapsychology; Psychokinesis (PK)

Indexed papers: N/A

**Project:** 2010-119  
**Title:** Psychophysiological indicators of stress reactivity and disease adaptation: Attachment styles, coping and emotions regulation  
**Estimated duration:** 2011/03 – 2014/06  
**Researcher(s):** Prof. Sílvia Raquel Soares Ouakinin, Dr. Luísa Maria Vaqueiro Lopes, Dr. Susana Filipa Gonçalves Eusébio, Dr. Luísa Maria Vaqueiro Lopes, Dr. Marco Alberto Vicente Barreto Torrado, Dr. Isabel Maria Rolão Nabais, Dr. Graça Maria Vilhena da Cruz Gonçalves Costa Diogo  
**Institution:** Centro Multidisciplinar de Psicopatologia Barahona Fernandes, Faculdade de Medicina da Universidade de Lisboa (Portugal)  
**Results:** N/A  
**Keywords:** Psychophysiology; Stress and health; Attachment; Diseases/Injuries  
**Indexed papers:** Silva, H., Fred, A., Eusébio, S., Torrado, M., & Ouakinin, S. (2012). Feature extraction for psychophysiological load assessment in unconstrained scenarios. In *Proceedings of International Conference of the IEEE Engineering in Medicine and Biology Society - EMBC* (pp. 4784 - 4787). New York: IEEE. doi: 10.1109/EMBC.2012.6347037

**Project:** 2010-128  
**Title:** Extending the spiritual healing paradigm to explore distant mental interaction effects with Wiccan healers  
**Estimated duration:** N/A  
**Researcher(s):** Dr. Chris Roe, Dr. Charmaine Marie Sonnex  
**Institution:** Centre for the Study of Anomalous Psychological Processes (CSAPP), University of Northampton, Psychology Division, Northampton (UK)  
**Results:** N/A  
**Keywords:** Parapsychology; Healing; Distant healing; Spiritualism; Spiritual traditions/experiences  
**Indexed papers:** N/A



**Project: 2010-141**

Title: Pattern classification of emotion-induced physiological changes

Estimated duration: 2011/04 – 2014/03

Researcher(s): Dr. Julia Mossbridge, Dr. David Little

Institution: Northwestern University Visual Perception, Cognition, and Neuroscience Laboratory, Evanston (USA)

Results: N/A

Keywords: Parapsychology and Psychophysiology; Extrasensory perception (ESP); Presentiment; Precognition; Assessment tools; Electroencephalogram (EEG)

Indexed papers: Mossbridge, J., Tressoldi, P., & Utts, J. (2012). Predictive physiological anticipation preceding seemingly unpredictable stimuli: A meta-analysis. *Frontiers in Psychology*, 3, 390, 1-18. doi: 10.3389/fpsyg.2012.00390

**Project: 2010-144**

Title: Nonlinear processing of emotional information: Behavioral evidence and neurophysiological correlates

Estimated duration: 2011/10 – 2014/10

Researcher(s): Prof. Manuel Fernando Santos Barbosa, Prof. João Eduardo Marques Teixeira, Dr. Joana Maria Barbosa Vieira, Dr. Ana Cristina Basto Abreu

Institution: Laboratório de Neuropsicofisiologia da Faculdade de Psicologia e Ciências da Educação, Universidade do Porto (Portugal)

Results: N/A

Keywords: Psychophysiology; Emotion; Cognitive processes; Perception

Indexed papers: N/A

**Project:** 2010-155  
Title: Memory for personal experience and the parietal cortex  
Estimated duration: 2011/07 – 2014/03  
Researcher(s): Dr. Charlotte Russell, Dr. Paresh Malhotra, Dr. Adrian Williams  
Institution: Centre for Cognition and Neuroimaging, Department of Psychology, Brunel University, Uxbridge (UK)  
Results: N/A  
Keywords: Psychophysiology; Cognitive processes; Memory; Brain  
Indexed papers: Malhotra, P., Soto, D., Li, K., & Russell, C. (2013). Reward modulates spatial neglect. *Journal of Neurology, Neurosurgery & Psychiatry*, 84(4), 366-369. doi: 10.1136/jnnp-2012-303169

**Project:** 2010-157  
Title: Control of cognitive and emotional processing of faces by the frontal theta Rhythm  
Estimated duration: 2011/04 – 2014/04  
Researcher(s): Dr. Alberto João Rodrigues Leal, Dr. Ricardo Jorge de Pina Ramos Machado Lopes, Dr. Patrícia Arriaga, Prof. Francisco Gomes Esteves  
Institution: Centro de Investigação e Intervenção Social, ISCTE-IUL, Lisboa (Portugal)  
Results: N/A  
Keywords: Psychophysiology; Emotion; Cognitive processes; Brain  
Indexed papers: N/A

**Project:** 2010-161  
Title: Investigating the function of synaptic competition in memory formation and mental retardation  
Estimated duration: 2011/09 – 2014/09

- Researcher(s): Dr. Inbal Israely, Dr. Anna Hobbiss, Dr. Ana Vaz  
 Institution: Champalimaud Foundation, Lisboa (Portugal)
- Results: N/A  
 Keywords: Psychophysiology; Brain; Cognitive processes; Memory; Childhood and adolescent disorders; Mental retardation
- Indexed papers: N/A
- Project: 2010-166**  
 Title: Judgements of moral wrongdoings and emotions: A neuro-psychophysiological study  
 Estimated duration: 2012/01 – 2014/12  
 Researcher(s): Dr. Paulo Sousa, Prof. João Eduardo Marques-Teixeira, Prof. Carlos Eduardo Evangelisti Mauro, Dr. Fernando Ricardo Ferreira-Santos  
 Institution: Faculdade de Economia e Gestão, Universidade Católica Portuguesa, Centro Regional do Porto (Portugal)
- Results: N/A  
 Keywords: Psychophysiology; Emotion; Social interaction/norms
- Indexed papers: N/A
- Project: 2010-167**  
 Title: Elucidating the molecular mechanisms mediating feeding behavior  
 Estimated duration: 2011/05 – 2014/05  
 Researcher(s): Dr. Carlos Vidal Ribeiro, Dr. Maria Teresa Montez, Dr. Laura Belmonte, Dr. Samantha Herbert  
 Institution: Champalimaud Foundation, Lisboa (Portugal)
- Results: N/A  
 Keywords: Psychophysiology; Brain; Motivation; Eating behavior

Indexed papers: Itskov, P. M., & Ribeiro, C. (2013). The dilemmas of the gourmet fly: the molecular and neuronal mechanisms of feeding and nutrient decision making in *Drosophila*. *Frontiers in Neuroscience*, 7: 12. doi: 10.3389/fnins.2013.00012

**Project: 2010-172**

Title: Attitudes sensitivity to context: Presence of other and physiological evidences

Estimated duration: 2011/05 – 2015/08

Researcher(s): Prof. Teresa Maria F. T. de Morais Garcia-Marques, Dr. Ricardo Fonseca, Prof. Marília Prada, Dr. Alexandre Fernandes

Institution: Unidade de Investigação em Psicologia Cognitiva, do Desenvolvimento e da Educação (UIPCDE), ISPA - Instituto Universitário, Lisboa (Portugal)

Results: N/A

Keywords: Psychophysiology; Social cognition; Motivation

Indexed papers: N/A

**Project: 2010-176**

Title: Dopaminergic regulation of dietary learning in humans and rodents

Estimated duration: 2011/07 – 2014/07

Researcher(s): Dr. Albino Jorge Carvalho de Sousa Oliveira Maia, Dr. Rui M. Costa

Institution: Champalimaud Foundation, Lisboa (Portugal)

Results: N/A

Keywords: Psychophysiology; Cognitive processes; Learning; Diseases/Injuries; Obesity; Brain

Indexed papers: Bugalho, P., & Oliveira-Maia, A. J. (2013). Impulse control disorders in Parkinson's disease: crossroads between neurology, psychiatry and neuroscience. *Behavioural Neurology*, 27(4), 547-557. doi: 10.3233/BEN-129019

Castro-Rodrigues, P., & Oliveira-Maia, A. J. (2013). Exploring the effects of depression and treatment of depression in reinforcement learning. *Frontiers in Integrative Neuroscience*, 7: 72. doi: 10.3389/fnint.2013.00072

**Project: 2010-193**

Title: Attachment and exceptional experiences amongst twins reporting "exceptional experiences"

Estimated duration: 2013/10 – 2015/06

Researcher(s): Dr. Göran Brusewitz, Prof. Adrian Parker, Dr. Lynn Cherkas

Institution: Department of Psychology, University of Gothenburg (Sweden) and Department of Twin Research and Genetic Epidemiology, King's College, London (UK)

Results: N/A

Keywords: Parapsychology; Extrasensory perception (ESP); Anomalous cognition/experiences; Attachment

Indexed papers: N/A

**Project: 2010-217**

Title: Anomalous physiological responses to local and remote emotive stimulation

Estimated Duration: 2011/03 – 2014/12

Researcher(s): Dr. Edward Justin Modestino, Prof. W. J. Ross Dunseath, Prof. Edward F. Kelly, Eng. James E. Lenz, Dr. Frank Applin, Dr. Lori L. Derr

Institution: Cedar Creek Institute/DOPS UVa, Virginia (USA)

Results: N/A

Keywords: Parapsychology and Psychophysiology; Extrasensory perception (ESP); Presentiment; Electroencephalogram (EEG)

Indexed papers: N/A

**Project: 2010-226**

Title: Brain decoding of spontaneous memory processes

Estimated duration: 2011/10 – 2014/10

Researcher(s): Dr. Pierre Maquet, Eng. Christophe Phillips, Eng. Jessica Schrouffs, Dr. Caroline Kussé

Institution: Cyclotron Research Centre, University of Liège (Belgium)

Results: N/A

Keywords: Psychophysiology; Cognitive processes; Memory; Brain; Assessment tools; Functional magnetic resonance imaging (fMRI)

Indexed papers: N/A

**Project: 2010-227**

Title: Evaluation of alterations of consciousness and the model of pragmatic information in a ganzfeld protocol

Estimated duration: 2011/04 – 2014/09

Researcher(s): Prof. Etzel Cardeña, Dr. David Marcusson-Clavertz

Institution: CERCAP, Dept. of Psychology, Lund University (Sweden)

Results: N/A

Keywords: Parapsychology; Ganzfeld studies; Altered states of consciousness

Indexed papers: N/A

**Project: 2010-231**

Title: Toward understanding visual awareness: An intracranial EEG study on transient suppression phenomena of conscious visual perception

Estimated duration: 2011/08 – 2014/04  
 Researcher(s): Dr. Tonio Ball, Prof. Andreas Schulze-Bonhage, Prof. Ad Aertsen, Dr. Jörn Rickert, Mr. Markus Kern  
 Institution: Epilepsy Center, University Hospital, Freiburg (Germany)  
 Results: N/A  
 Keywords: Psychophysiology; Cognitive processes; Perception; Vision; Brain  
 Indexed papers: N/A

**Project: 2010-238**

Title: Effect of the comprehensive Art of Living yogic breathing programme on brain function in correlation with physiological and psychological well-being  
 Estimated duration: 2011/11 – 2013/12  
 Researcher(s): Dr. Sanja Kostrun, Dr. Irena Svenda, Dr. Kresimir Jergovic, Dr. Drazen Durch, Prof. Jagoda Doko Jelinic, Prof. Fahri Saatvcioğlu, Dr. Alen Pticar, Dr. Sanja Kordic  
 Institution: Art of Living Croatia, Zagreb (Croatia)  
 Results: N/A  
 Keywords: Parapsychology and Psychophysiology; Altered states of consciousness; Meditation; Intervention; Brain; Stress and health  
 Indexed papers: N/A

**2012/13 Projects**

**Project: 2012-10**

Title: Enhancing Psychokinesis Task Performance Through the Practice of Imagery Strategies: New Psychophysiological Approach (Stage 2)  
 Estimated duration: 2013/02 – 2014/12

Researcher(s): Dr. Alejandro Parra, Dr. Juan Corbetta  
Institution: Instituto de Psicología Paranormal, Asoc. Civil, Buenos Aires (Argentina)  
Keywords: Parapsychology and Psychophysiology; Psychokinesis (PK); Paranormal belief; Electroencephalogram (EEG)  
Indexed papers: N/A

**Project: 2012-21**  
Title: The depersonalized brain: Psychophysiological correlates of cortical hyperexcitability associated with signs of depersonalization, derealization and dissociation, in non-clinical samples  
Estimated duration: 2013/06 – 2015/06  
Researcher(s): Dr. Jason John Braithwaite  
Institution: Behavioural Brain Sciences Centre, School of Psychology, University of Birmingham (UK)  
Keywords: Psychophysiology and Parapsychology; Mental health; Dissociative disorders; Anomalous cognition/experiences  
Indexed papers: N/A

**Project: 2012-28**  
Title: A Test of Thermodynamic Entropy Effects in Anomalous Cognition  
Estimated duration: 2013/03 – 2014/09  
Researcher(s): Dr. Edwin May, Dr. Sonali Bhatt Marwaha  
Institution: Laboratories for Fundamental Research, Palo Alto, California (USA)  
Keywords: Parapsychology; Extrasensory perception (ESP); Precognition; Remote viewing  
Indexed papers: N/A



**Project: 2012-30**

Title: Regularity encoding and deviance detection in the human auditory brainstem

Estimated duration: 2013/07 – 2015/03

Researcher(s): Prof. Carles Escera, Eng. Katarzina Zarnowiec, Dr. Lilla Náfrádi

Institution: Institute for Brain, Cognition and Behavior (IR3C), University of Barcelona (Spain)

Keywords: Psychophysiology; Audition; Brain

Indexed papers: N/A

**Project: 2012-38**

Title: Testing a Methodological Formula for Consistent Hit Rates: Matching Psi Ability to Task Difficulty

Estimated duration: 2013/02 – 2014/03

Researcher(s): Dr. James Houran, Dr. Rense Lange

Institution: Integrated Knowledge Systems, Inc., Illinois (USA)

Keywords: Parapsychology; Paranormal belief; Transliminality; Extrasensory perception (ESP)

Indexed papers: N/A

**Project: 2012-41**

Title: The Body beyond the body

Estimated duration: 2013/03 – 2014/03

Researcher(s): Prof. Marcello Costantini, Dr. Francesca Ferri

Institution: Department of Neuroscience and Imaging, University “G. d’Annunzio”, Chieti (Italy)

Keywords: Psychophysiology; Somatosensory system; Self; Body awareness; Brain

Indexed papers: Ferri, F., Chiarelli, A. M., Merla, A., Gallese, V., & Costantini, M. (2013). The body beyond the body: expectation of a sensory event is enough to induce ownership over a fake hand. *Proceedings of the Royal Society B: Biological Sciences*, 280(1765). doi: 10.1098/rspb.2013.1140

**Project: 2012-46**

Title: Motivational Intensity in the Prefrontal Cortex  
Estimated duration: 2013/03 – 2014/03  
Researcher(s): Prof. Stephen Fairclough, Dr. Christopher Burns  
Institution: School of Natural Sciences and Psychology, Liverpool John Moores University (UK)  
Keywords: Psychophysiology; Motivation; Cognitive processes; Memory; Brain; Electroencephalogram (EEG)  
Indexed papers: N/A

**Project: 2012-47**

Title: Out-of-body experiences: An exploration of phenomenological features and development of an experience screening questionnaire  
Estimated duration: 2013/04 – 2014/09  
Researcher(s): Dr. David Wilde  
Institution: Nottingham Trent University - NTU (UK)  
Keywords: Parapsychology; Survival after bodily death; Out-of-body experience (OBE); Assessment tools  
Indexed papers: N/A

**Project: 2012-48**

Title: Inferring Memory Strength Through “Mind Reading”  
Estimated duration: 2013/11 – 2015/03  
Researcher(s): Dr. Christoph T. Weidemann, Dr. Ting Wang

Institution: College of Human and Health Sciences, Swansea University (UK)

Keywords: Psychophysiology; Cognitive processes; Memory; Brain; Electroencephalogram (EEG)

Indexed papers: N/A

**Project: 2012-51**

Title: The interpretation and evaluation of meaningful coincidences suggestive of psi communication in everyday life

Estimated duration: 2013/09 – 2016/06

Researcher(s): Prof. Robin Wooffitt, Dr. Germaine Gunther

Institution: Anomalous Experiences Research Unit, Dep. of Sociology, University of York (UK)

Keywords: Parapsychology; Anomalous cognition/experiences; Spontaneous cases

Indexed papers: N/A

**Project: 2012-52**

Title: The embodied experience of time: modulations of mindfulness meditation

Estimated duration: 2013/03 – 2014/06

Researcher(s): Dr. Marc Christoph Wittmann, Dr. Karin Meissner, Prof. Stefan Schmidt

Institution: Institute for Frontier Areas of Psychology and Mental Health, Freiburg, Institute of Medical Psychology, University of Munich - LMU (Germany)

Keywords: Psychophysiology; Cognitive processes; Perception; Attention; Altered states of consciousness; Meditation; Self; Body awareness

Indexed papers: N/A

**Project:** 2012-53  
Title: Libet revisited - The effects of mindfulness meditation training on voluntary action and on time perception: a controlled study with experienced meditators  
Estimated duration: 2013/05 – 2014/12  
Researcher(s): Prof. Stefan Schmidt, Dr. Han-Gue Jo, Dr. Marc Christoph Wittmann  
Institution: Dep. of Psychosomatic Medicine, University Medical Center Freiburg (Germany)  
Keywords: Psychophysiology; Cognitive processes; Perception; Altered states of consciousness; Meditation  
Indexed papers: N/A

**Project:** 2012-54  
Title: A Rasch Scaling Validation of a Core “Near-Death Experience (NDE)” A Critical Replication and Extension  
Estimated duration: 2013/02 – 2014/01  
Researcher(s): Dr. Rense Lange  
Institution: Integrated Knowledge Systems, Inc., Illinois (USA)  
Keywords: Parapsychology; Survival after bodily death; Near-death experience  
Indexed papers: N/A

**Project:** 2012-56  
Title: Psychophysical interactions with a single-photon double-slit optical system  
Estimated duration: 2013/06 – 2014/06  
Researcher(s): Dr. Dean Radin, Dr. Arnaud Delorme, Dr. Leena Michel  
Institution: Institute of Noetic Sciences, Petaluma, CA (USA)  
Keywords: Parapsychology; Psychokinesis (PK)

Indexed papers: N/A

**Project:** 2012-57

Title: Neurophysiological mechanisms of aging: novel view of old concepts

Estimated duration: N/A

Researcher(s): Prof. Maria José de Oliveira Diógenes Nogueira, Prof. Alexandre de Mendonça, Dr. Antonina Pereira, Dr. Bruno Teixeira da Silva, Dr. Raquel Dias

Institution: Instituto de Medicina Molecular, Lisboa (Portugal)

Keywords: Psychophysiology; Brain; Cognitive processes; Memory; Neurodegenerative disorders

Indexed papers: N/A

**Project:** 2012-60

Title: To See or Not to See? Hallucinations in Multidisciplinary Perspective

Estimated duration: 2013/09 – 2015/03

Researcher(s): Dr. Mattia Riccardi, Dr. Frank Larøi, Prof. Sofia Miguens, Dr. Tommaso Piazza, Dr. Ana Pinheiro, Prof. João Pinto, Dr. Manuela Teles, Prof. Charles Travis

Institution: Instituto de Filosofia, Faculdade de Letras da Universidade do Porto (Portugal)

Keywords: Parapsychology; Altered states of consciousness; Hallucinations; Cognitive processes

Indexed papers: N/A

**Project:** 2012-62  
Title: Autobiographical memory or just information in cases of the reincarnation type? A field-study in Thailand and Turkey for research training and development  
Estimated duration: N/A  
Researcher(s): Dr. Herbert Hans Jürgen Keil, Dr. Roderick Garton  
Institution: School of Psychology, University of Tasmania (Australia)  
Keywords: Parapsychology; Survival after bodily death; Reincarnation; Extrasensory perception (ESP)  
Indexed papers: N/A

**Project:** 2012-63  
Title: Forefeeling guilty knowledge - An innovative approach in presentiment research  
Estimated duration: 2013/03 – 2015/12  
Researcher(s): Dr. Wolfgang Ambach, Dr. Alexander Siller  
Institution: Institute for Frontier Areas of Psychology and Mental Health (IGPP), Freiburg (Germany)  
Keywords: Parapsychology; Extrasensory perception (ESP); Presentiment; Paranormal belief; Personality factors; Assessment tools  
Indexed papers: N/A

**Project:** 2012-64  
Title: Hematological and Psychophysiological Correlates of Anomalous Information Reception in Mediums  
Estimated duration: 2013/05 – 2015/05  
Researcher(s): Dr. Julie Beischel, Dr. Shawn Tassone, Dr. Mark Boccuzzi  
Institution: The Windbridge Institute for Applied Research in Human Potential, Tucson (USA)

Keywords: Parapsychology; Survival after bodily death; Mediumship

Indexed papers: N/A

**Project: 2012-66**

Title: Body and soul: A computational neurophysiological and qualitative investigation of Ganzfeld-induced imagery

Estimated duration: 2013/03 – 2014/09

Researcher(s): Dr. Alexander Sumich, Dr. Daniel Wilson, Dr. Nicholas Blagden

Institution: Nottingham Trent University (NTU), Division of Psychology (UK)

Keywords: Psychophysiology and Parapsychology; Ganzfeld studies; Brain; Personality factors; Altered states of consciousness; Hallucinations

Indexed papers: N/A

**Project: 2012-72**

Title: The psychophysiology of human attachment and stress

Estimated duration: 2013/10 – 2014/10

Researcher(s): Prof. Angela Clow, Dr. Lisa Thorn, Dr. Andrea Oskis, Dr. Nina Smyth

Institution: Department of Psychology, University of Westminster, London (UK)

Keywords: Psychophysiology; Attachment; Psychoneuroimmunology; Endocrinology; Stress and health

Indexed papers: N/A

**Project:** 2012-74  
Title: Mechanisms of self-other distinction in mirror-touch synaesthesia  
Estimated duration: 2013/10 – 2015/10  
Researcher(s): Dr. Michael Joseph Banissy, Dr. James Moore  
Institution: Department of Psychology, Goldsmiths University of London (UK)  
Keywords: Psychophysiology; Self; Body awareness; Somatosensory system  
Indexed papers: N/A

**Project:** 2012-77  
Title: Human motor re-learning – the use of sensor information fusion  
Estimated duration: 2013/06 – 2015/06  
Researcher(s): Dr. Sandra Maria Caldas da Silva Mouta, Prof. Miguel Velhote Correia, Prof. Carolina Vila-Chá, Dr. Cláudia Silva, Dr. Ana Silva, Dr. Carla Borges, Dr. António Salazar, Dr. Dominic Noy  
Institution: INESC - Porto (Portugal)  
Keywords: Psychophysiology; Diseases/Injuries; Stroke; Movement; Assessment tools; Intervention  
Indexed papers: N/A

**Project:** 2012-78  
Title: Cerebral activity associated with telepathy: a controlled, blinded, high-field functional magnetic resonance imaging block design echoplanar imaging blood oxygen level-dependent study of cerebral blood oxygenation  
Estimated duration: N/A  
Researcher(s): Dr. Simon Dein, Prof. Basant Puri



Institution: University College London and Department of Imaging, Hammersmith Hospital, London (UK)

Keywords: Parapsychology and Psychophysiology; Extrasensory perception (ESP); Telepathy; Brain; Functional magnetic resonance imaging (fMRI)

Indexed papers: N/A

**Project: 2012-83**

Title: The Impact of Future Relevance on Dream Content and Sleep-Dependent Memory Processing

Estimated duration: 2013/05 – 2015/04

Researcher(s): Dr. Erin J. Wamsley, Prof. Robert Stickgold, Mr. Nam Nguyen

Institution: Furman University, Greenville (USA)

Keywords: Psychophysiology; Sleep and dreams; Cognitive processes; Memory

Indexed papers: N/A

**Project: 2012-84**

Title: Neural bases of time processing: combining neuroimaging techniques and clinical evidence

Estimated duration: 2013/03 – 2016/03

Researcher(s): Prof. Patrizia S. Bisiacchi, Prof. Gianna Maria Toffolo, Dr. Vincenza Tarantino, Dr. Elias Casula, Dr. Giovanni Mento, Dr. Demis Basso

Institution: Dipartimento di Psicologia Generale, Università di Padova (Italy)

Keywords: Psychophysiology; Cognitive processes; Brain; Childhood and adolescent disorders; Autism spectrum disorder (ASD); Neurodegenerative disorders; Parkinson's disease; Electroencephalogram (EEG); Transcranial direct current stimulation (tDCS)

Indexed papers: N/A

**Project: 2012-87**

Title: Can we enhance couples' empathic capacity using neuro-feedback training?

Estimated duration: 2013/05 – 2016/03

Researcher(s): Dr. Joana Fernandes Pereira Coutinho, Dr. Cledna Patricia de Oliveira Silva, Prof. Jean Decety, Prof. Kristin Perrone McGovern, Prof. Óscar F Gonçalves, Prof. Vânia Andrea Sousa Gonçalves Moreira de Lima

Institution: Centro de Investigação em Psicologia, Escola de Psicologia, Universidade do Minho (Portugal)

Keywords: Psychophysiology; Emotion; Empathy; Conjugality; Brain; Intervention; Functional magnetic resonance imaging (fMRI)

Indexed papers: N/A

**Project: 2012-89**

Title: Interaction of medial and lateral temporal lobe in memory expression: insights from patient and fMRI data

Estimated duration: 2013/04 – 2015/03

Researcher(s): Dr. Ana Luísa Nunes Raposo, Prof. José Frederico Henzler Ferreira Marques, Prof. José Guilherme Cortez Pimentel

Institution: Faculdade de Psicologia, Universidade de Lisboa (Portugal)

Keywords: Psychophysiology; Cognitive processes; Memory; Diseases/Injuries; Epilepsy; Brain

Indexed papers: N/A

- Project:** 2012-91  
**Title:** Psychophysiological studies into task-set inertia in switching paradigms  
**Estimated duration:** 2013/04 – 2014/10  
**Researcher(s):** Dr. Lisa Helen Evans, Prof. Edward Wilding  
**Institution:** School of Psychology, Cardiff University (UK)
- Keywords:** Psychophysiology; Cognitive processes; Memory  
**Indexed papers:** N/A
- Project:** 2012-92  
**Title:** Dissociating familiarity and conceptual priming with event-related potentials  
**Estimated duration:** 2013/04 – 2014/10  
**Researcher(s):** Prof. Edward Wilding, Dr. Lisa Helen Evans  
**Institution:** School of Psychology, Cardiff University (UK)
- Keywords:** Psychophysiology; Cognitive processes; Memory; Brain  
**Indexed papers:** N/A
- Project:** 2012-94  
**Title:** The Neurochemistry of Gambling-Related Impulsive Cognition and Decision-Making: a Multimodal Imaging Approach  
**Estimated duration:** 2013/08 – 2015/05  
**Researcher(s):** Dr. Frederic Boy, Dr. Simon Dymond, Ms. Paola Griffiths  
**Institution:** Wales Institute of Cognitive Neuroscience, Department of Psychology, College of Human and Health Sciences, Swansea University and Institute of Life Science (ILS2) – Imaging Centre, College of Medicine (UK)
- Keywords:** Psychophysiology; Cognitive processes; Decision-making; Brain; Personality; Functional magnetic resonance imaging (fMRI)

Indexed papers: N/A

**Project: 2012-98**

Title: Eye-Brain dynamics during the emergence of three-dimensional perceptual awareness in Humans

Estimated duration: 2013/07 – 2016/07

Researcher(s): Prof. Rafael Malach, Dr. Amos Arieli

Institution: Department of Neurobiology - The Weizmann Institute of Science, Rehovot (Israel)

Keywords: Psychophysiology; Cognitive processes; Perception; Vision; Brain; Electroencephalogram (EEG)

Indexed papers: N/A

**Project: 2012-103**

Title: Psychological and psychophysiological factors in sexual desire and behavior

Estimated duration: 2013/04 – 2015/03

Researcher(s): Dr. Rui Miguel dos Santos Amaro da Costa, Dr. Tânia F. Oliveira

Institution: ISPA, CRL, Lisboa (Portugal)

Keywords: Psychophysiology and Parapsychology; Sexual behavior; Spiritualism

Indexed papers: N/A

**Project: 2012-108**

Title: Clinical parapsychology: Counselling experiences of clients who report anomalous experiences and the training needs of therapists

Estimated duration: 2013/07 – 2015/01

Researcher(s): Dr. Elizabeth Roxburgh  
 Institution: Centre for the Study of Anomalous Psychological Processes (CSAPP), Division of Psychology, School of Social Sciences, The University of Northampton (UK)  
 Keywords: Parapsychology; Anomalous cognition/experiences; Intervention  
 Indexed papers: N/A

**Project: 2012-112**  
 Title: Retinotopic reorganization of the auditory cortex of congenitally deaf individuals due to neuroplasticity  
 Estimated duration: 2013/05 – 2015/04  
 Researcher(s): Prof. Jorge Manuel Castelo Branco de Albuquerque Almeida, Prof. Bradford Zack Mahon, Dr. Yanchao Bi, Prof. Óscar Gonçalves  
 Institution: Faculdade de Psicologia e Ciências da Educação, Universidade de Coimbra (Portugal)  
 Keywords: Psychophysiology; Diseases/Injuries; Audition; Brain; Functional magnetic resonance imaging (fMRI); Transcranial direct current stimulation (tDCS)  
 Indexed papers: N/A

**Project: 2012-119**  
 Title: Dynamic cortical and nucleus accumbens networks in humans: combining intracranial and MEG recordings  
 Estimated duration: 2013/06 – 2015/09  
 Researcher(s): Dr. Bryan A. Strange, Dr. Javier J. Gonzalez-Rosa, Prof. Juan A. Barcia, Dr. Stephan Moratti, Dr. Raffael Kaplan, Dr. Marijn Kroe

Institution: Laboratory for Clinical Neuroscience, Centre for Biomedical Technology (CTB), Technology University of Madrid (UPM), Fundación para la Investigación Biomédica del Hospital Clínico San Carlos - Universidad Complutense de Madrid. Instituto de Investigación Sanitario IdISSC (Spain)

Keywords: Psychophysiology; Mental health; Anxiety disorders; Brain; Cognitive processes; Intervention; Electroencephalogram (EEG); Magnetoencephalogram (MEG)

Indexed papers: N/A

**Project: 2012-122**

Title: EEG Analysis of Auditory and Visual Stimuli in Normal Controls

Estimated duration: 2013/05 – 2015/03

Researcher(s): Prof. William E Bunney, Prof. Blynn Bunney, Dr. James Fallon, Dr. Julie Patterson, Dr. Steven G Potkin, Dr. Richard Stein, Dr. Joseph Wu

Institution: Department of Psychiatry & Human Behavior, The Regents of the University of California, Irvine (USA)

Keywords: Psychophysiology and Parapsychology; Extrasensory perception (ESP); Presentiment; Emotion; Vision; Audition; Brain; Electroencephalogram (EEG)

Indexed papers: N/A

**Project: 2012-124**

Title: EEG correlates of mental entanglement at distance

Estimated duration: 2013/03 – 2016/03

Researcher(s): Dr. Patrizio Tressoldi, Dr. Francesco Salvadori, Dr. Patrizio Caini, Dr. Simone Melloni, Dr. Giorgio Gagliardi, Dr. Mirko de Vita, Dr. Alessandro Ferrini

Institution: Dipartimento di Psicologia Generale, Università di Padova and Laboratorio Interdisciplinare di Ricerca Biopsicocibernetica, Bologna (Italy)

Keywords: Parapsychology and Psychophysiology; Extrasensory perception (ESP); Telepathy; Assessment tools; Electroencephalogram (EEG)

Indexed papers: N/A

**Project: 2012-126**

Title: Implicit and explicit processing of emotion in healthy adult ageing

Estimated duration: 2013/08 – 2014/07

Researcher(s): Dr. Sarah Elizabeth MacPherson

Institution: Human Cognitive Neuroscience Unit, Department of Psychology, PPLS, The University of Edinburgh, Scotland (UK)

Keywords: Psychophysiology; Emotion; Cognitive processes; Attention; Perception; Brain; Developmental psychology

Indexed papers: N/A

**Project: 2012-127**

Title: An Investigation of the I Ching Using the Q-Sort Method and a PK-RNG Design

Estimated duration: 2013/03 – 2014/03

Researcher(s): Dr. Lance Storm

Institution: Brain and Cognition Centre, School of Psychology, University of Adelaide, Australian Institute of Parapsychological Research, Incorporated, Gladesville (Australia)

Keywords: Parapsychology; Extrasensory perception (ESP); Precognition; Psychokinesis (PK); Paranormal belief

Indexed papers: N/A

**Project:** 2012-130  
Title: Neural mechanisms of cognitive bias  
Estimated duration: 2013/09 – 2016/09  
Researcher(s): Prof. Rui Filipe Nunes Pais de Oliveira, Dr. Ana Félix, Dr. Sara Cardoso  
Institution: ISPA, CRL, Lisboa, Instituto Gulbenkian de Ciência, Oeiras (Portugal)  
Keywords: Psychophysiology; Stress and health; Chronic stress; Cognitive processes; Brain  
Indexed papers: N/A

**Project:** 2012-132  
Title: A direct test of the binding by synchrony hypothesis in humans: the neural correlates of coherent object perception  
Estimated duration: 2013/11 – 2016/04  
Researcher(s): Prof. Miguel de Sá e Sousa de Castelo-Branco, Dr. Maria Ribeiro, Dr. João Duarte, Dr. Gabriel Costa  
Institution: IBILI, Faculdade de Medicina, Universidade de Coimbra (Portugal)  
Keywords: Psychophysiology; Cognitive processes; Perception; Brain; Electroencephalogram (EEG); Functional magnetic resonance imaging (fMRI)  
Indexed papers: N/A

**Project:** 2012-133  
Title: The role of the core and extended face networks in visual perception and high level social cognition  
Estimated duration: 2013/11 – 2016/04  
Researcher(s): Prof. Miguel de Sá e Sousa de Castelo-Branco, Dr. Marco Simões, Dr. Carlos Amaral, Dr. Gregor Philipiak, Dr. José Rebola, Dr. João Castelhanos



Institution: IBILI, Faculdade de Medicina, Universidade de Coimbra (Portugal)

Keywords: Psychophysiology; Cognitive processes; Perception; Attention; Social cognition; Brain; Electroencephalogram (EEG); Functional magnetic resonance imaging (fMRI)

Indexed papers: N/A

**Project: 2012-157**

Title: Contributions of parent-infant psychophysiology during dyadic interactions to child development

Estimated duration: 2013/10 – 2016/09

Researcher(s): Prof. Raquel Alexandra Gonçalves Costa, Dr. Iva Tendais, Prof. Ana Conde, Dr. Catarina Tojal

Institution: ISLA Campus Lisboa, Laureate International Universities, Lisboa (Portugal)

Keywords: Psychophysiology; Developmental psychology; Cognitive development; Psychosocial development; Physical development and health; Parenthood; Mental health

Indexed papers: N/A

**Project: 2012-158**

Title: Neuroendocrine underpinnings of social bonds to parents and peers in preschool children. Oxytocin and Cortisol on adopted children and non-adopted controls

Estimated duration: 2013/09 – 2016/08

Researcher(s): Prof. Nuno Manuel Correia Torres, Prof. Manuela Veríssimo, Prof. António J. Santos, Prof. Jaak Panksepp, Dr. Lígia Monteiro

**Institution:** Research Group on Developmental Psychology of UIPCDE (Unidade de Investigação em Psicologia Cognitiva, do Desenvolvimento e da Educação) of ISPA-IU, Lisboa (Portugal), Department of Veterinary and Comparative Anatomy, Pharmacology, and Physiology, Neuroscience Program, Washington State University (USA)

**Keywords:** Psychophysiology; Attachment; Developmental psychology; Cognitive development; Psychosocial development; Psycho-neuroimmunology; Endocrinology; Mental health

**Indexed papers:** N/A

**Project: 2012-167**

**Title:** Impact of body image related variables on the psychophysiological indicators of human sexual response: comparative study with a clinical and non-clinical sample

**Estimated duration:** 2013/03 – 2014/07

**Researcher(s):** Prof. Maria João Alvarez Martins, Prof. Pedro Nobre, Prof. Ellen Laan, Prof. Sandra Byers, Dr. Lisa Vicente, Prof. Nuno Monteiro Pereira

**Institution:** Faculdade de Psicologia da Universidade Lisboa and SEXLAB (Laboratórios de Investigação em Sexualidade Humana), Faculdade de Psicologia e Ciências da Educação da Universidade do Porto (Portugal)

**Keywords:** Psychophysiology; Sexual behavior; Body awareness

**Indexed papers:** N/A

**Project: 2012-178**

**Title:** How collaboration in psychotherapy becomes therapeutic: a study of interactive and psychophysiological processes in good and poor outcome cases

**Estimated duration:** 2013/06 – 2016/06

Researcher(s): Prof. Eugénia Maria Ribeiro Pereira, Dr. Adriana Sampaio, Dr. Cledna Patricia Silva, Dr. António P. Ribeiro, Dr. Adam O. Horvath, Prof. William B. Stiles, Prof. Inês Sousa, Dr. Joana Mourão, Dr. Dulce Pinto, Dr. Zita Sousa

Institution: Centro de Investigação em Psicologia (CIPsi/UM), Escola de Psicologia, Universidade do Minho (Portugal)

Keywords: Psychophysiology; Intervention; Assessment tools

Indexed papers: N/A

**Project: 2012-185**

Title: Circuit mechanisms of spatial attention in the zebrafish mid-brain

Estimated duration: 2013/06 – 2016/06

Researcher(s): Dr. Michael Brian Orger, Dr. Sabine L. Renninger

Institution: Fundação Champalimaud, Lisboa (Portugal)

Keywords: Psychophysiology; Cognitive processes; Attention; Brain

Indexed papers: N/A

**Project: 2012-188**

Title: Embodied cognition: the nature of time encoding in the brain?

Estimated duration: 2013/06 – 2016/06

Researcher(s): Dr. Joseph James Paton, Dr. Tiago Monteiro, Dr. Thiago Gouvêa, Dr. Sofia Soares

Institution: Fundação Champalimaud, Lisboa (Portugal)

Keywords: Psychophysiology; Brain; Cognition; Learning

Indexed papers: N/A

**Project:** 2012-190  
Title: Interfacing Technology with the Brain: Novel materials for implantable neural devices  
Estimated duration: 2013/06 – 2016/06  
Researcher(s): Dr. Adam Raymond Kampff, Dr. Elvira Fortunato, Dr. Pedro Barquinha, Dr. Joana Neto, Dr. Joana Nogueira  
Institution: Fundação Champalimaud and CENIMAT - Materials Research Center, Lisboa (Portugal)  
Keywords: Psychophysiology; Brain; Assessment tools  
Indexed papers: N/A

**Project:** 2012-191  
Title: Defining the functional architecture of motion vision sensitive visual-motor circuits  
Estimated duration: 2013/08 – 2015/12  
Researcher(s): Dr. M. Eugenia Chiappe, Dr. Tomás Cruz  
Institution: Fundação Champalimaud, Lisboa (Portugal)  
Keywords: Psychophysiology; Brain; Vision; Movement  
Indexed papers: N/A

**Project:** 2012-192  
Title: Effects of Conditional Foxp2 Deletion on Motor-Sequence Learning  
Estimated duration: 2013/06 – 2016/06  
Researcher(s): Dr. Catherine Ann French  
Institution: Fundação Champalimaud, Lisboa (Portugal)  
Keywords: Psychophysiology; Diseases/Injuries; Chromosomal abnormalities; Brain; Cognitive processes; Learning; Movement

Indexed papers: N/A

**Project: 2012-193**

Title: Bridging between events and their consequences: the role of prefrontal cortex

Estimated duration: 2013/11 – 2015/10

Researcher(s): Dr. Ekaterina Vinnik, Dr. Marta Moita, Dr. Alfonso Renart

Institution: Fundação Champalimaud, Lisboa (Portugal)

Keywords: Psychophysiology; Brain; Cognitive processes; Learning; Memory

Indexed papers: N/A

**Project: 2012-194**

Title: Characterising developmental trajectories of brain function from childhood into adolescence

Estimated duration: 2013/04 – 2015/03

Researcher(s): Dr. Kristin Robin Laurens, Dr. Ruth E. Roberts

Institution: Department of Forensic and Neurodevelopmental Sciences, Institute of Psychiatry, King's College London (UK)

Keywords: Psychophysiology; Developmental psychology; Mental health; Psychotic disorders; Brain

Indexed papers: N/A

**Project: 2012-198**

Title: Enhancing hypnotic suggestibility with transcranial direct current stimulation

Estimated duration: 2014/01 – 2015/01

Researcher(s): Dr. Devin Blair Terhune

Institution: The Chancellor, Masters and Scholars of the University of Oxford, Experimental Psychology (UK)

Keywords: Psychophysiology and Parapsychology; Brain; Altered states of consciousness; Hypnosis; Pain; Cognitive processes; Attention; Perception; Transcranial direct current stimulation (tDCS)

Indexed papers: N/A

**Project: 2012-199**

Title: Brain-to-Brain Communication Enabled with Intracortical Microstimulation

Estimated duration: 2013/04 – 2016/03

Researcher(s): Prof. Miguel Angelo Laporta Nicolelis, Dr. Miguel Santos Pais Vieira

Institution: Duke University, Durham (USA)

Keywords: Psychophysiology; Brain; Somatosensory system

Indexed papers: Pais-Vieira, M., Lebedev, M., Kunicki, C., Wang, J., & Nicolelis, M. A. (2013). A brain-to-brain interface for real-time sharing of sensorimotor information. *Scientific Reports*, 3: 1319. doi:10.1038/srep01319

**Project: 2012-203**

Title: Using Multisensory Illusions to Investigate Medically Unexplained Symptoms

Estimated duration: 2013/10 – 2016/10

Researcher(s): Dr. Roger Newport

Institution: School of Psychology, University of Nottingham (UK)

Keywords: Psychophysiology; Somatosensory system; Self; Body awareness

Indexed papers: N/A

**Project: 2012-209**

Title: Predicting your decision while you make up your mind – an intracranial human study of the neural underpinning of decision making

Estimated duration: 2013/05 – 2014/12

Researcher(s): Dr. Uri Muz Maoz, Dr. Liad Mudrik, Dr. Ian Ross, Dr. Adam Mamelak, Prof. Ralph Adolphs

Institution: California Institute of Technology, Pasadena and Cedars-Sinai Medical Center, Los Angeles (USA)

Keywords: Psychophysiology; Brain; Cognitive processes; Decision-making; Electroencephalogram (EEG); Functional magnetic resonance imaging (fMRI)

Indexed papers: N/A

**Project: 2012-217**

Title: Temporal modulation of the subventricular zone neural stem cell niche by choroid plexus-cerebrospinal fluid derived factors

Estimated duration: 2013/08 – 2015/07

Researcher(s): Prof. João Carlos Cruz de Sousa, Dr. Fernanda Marques, Prof. Joana Palha, Dr. Ana Luísa Falcão, Dr. Ashley Novais

Institution: ICVS/3B's - Laboratório Associado (ICVS/3B's), Universidade do Minho (Portugal)

Keywords: Psychophysiology; Brain

Indexed papers: N/A

**Project: 2012-220**

Title: Consciousness Disconnects During Sleep

Estimated duration: 2013/09 – 2015/04

Researcher(s): Dr. Giovanni Piantoni

Institution: Cortical Physiology Lab, Massachusetts General Hospital, Harvard Medical School (USA) and Netherlands Institute for Neuroscience, Amsterdam (The Netherlands)

Keywords: Psychophysiology; Brain; Sleep and dreams; Electroencephalogram (EEG)

Indexed papers: N/A

**Project: 2012-222**

Title: EEG functional connectivity in post-hypnotic amnesia

Estimated duration: 2013/06 – 2015/03

Researcher(s): Dr. Marios Kittenis, Dr. Graham Jamieson

Institution: Koestler Parapsychology Unit, The University of Edinburgh, Scotland (UK) and Neuropsychology Lab, School of Behavioural, Cognitive, and Social Sciences, The University of New England, Armindale (Australia)

Keywords: Psychophysiology and Parapsychology; Altered states of consciousness; Hypnosis; Personality factors; Cognitive processes; Memory; Brain; Electroencephalogram (EEG)

Indexed papers: N/A

**Project: 2012-224**

Title: The magic of perception: Investigating misdirection and change blindness in magic using the novel combination of gaze behaviour and ERPs

Estimated duration: 2013/04 – 2016/03

Researcher(s): Dr. Tim J. Smith, Dr. Rebecca Nako

Institution: Dynamic Visual Cognition (DVC) Lab, Dept. of Psychology, Birkbeck, University of London (UK)

Keywords: Psychophysiology; Cognitive processes; Attention; Perception; Vision; Electroencephalogram (EEG)



Indexed papers: Smith, T., Lamont, P., & Henderson, J. M. (2013). Change blindness in a dynamic scene due to endogenous override of exogenous attentional cues. *Perception*, 42(8), 884-886. doi: 10.1068/p7377

**Project: 2012-225**

Title: Roles of the reward system in sleep, dreaming, and the consolidation of emotional memories

Estimated duration: 2013/10 – 2015/11

Researcher(s): Prof. Sophie Schwartz, Dr. Lampros Perogamvros, Dr. Kristoffer Aberg, Dr. Virginie Sterpenich

Institution: Geneva Neuroscience Center, University of Geneva (Switzerland)

Keywords: Psychophysiology; Sleep and dreams; Mental health; Sleep disorders; Cognitive processes; Memory; Emotion; Brain; Electroencephalogram (EEG)

Indexed papers: N/A

**Project: 2012-227**

Title: System mechanisms of attention: toward the nature of hypnotizability

Estimated duration: 2013/03 – 2015/03

Researcher(s): Dr. Zinaida I. Storozheva, Dr. A.V. Kirenskaya, Dr. V.Y. Novototsky-Vlasov, A.N. Chistyakov, Dr. V.V. Myamlin, Dr. S.V. Solntseva

Institution: P.K. Anokhin Institute of Normal Physiology and Serbsky National Research Centre for Social and Forensic Psychiatry, Moscow (Russia)

Keywords: Psychophysiology; Cognitive processes; Attention; Mental health; Psychotic disorders; Personality; Brain

Indexed papers: N/A

**Project:** 2012-233  
Title: The Study of Experimenter Effects in the Replication of Psi Experiments: A Global Initiative  
Estimated duration: 2013/07 – 2014/12  
Researcher(s): Dr. Marilyn Schlitz, Prof. Daryl Bem, Dr. Arnaud Delorme  
Institution: Institute of Noetic Sciences, Petaluma, CA (USA)  
Keywords: Parapsychology; Paranormal belief  
Indexed papers: N/A

**Project:** 2012-234  
Title: Visual categorization of images of live and deceased individuals  
Estimated duration: 2013/06 – 2015/04  
Researcher(s): Dr. Arnaud Delorme, Dr. Dean Radin  
Institution: Centre de Recherche Cerveau et Cognition, Toulouse (France) and Institute of Noetic Sciences, Petaluma, CA (USA)  
Keywords: Parapsychology and Psychophysiology; Survival after bodily death; Mediumship; Brain; Electroencephalogram (EEG)  
Indexed papers: N/A

**Project:** 2012-248  
Title: Using hypnosis to distinguish between cognitive and meta-cognitive conscious experience  
Estimated duration: 2013/11 – 2014/09  
Researcher(s): Dr. Pedro Alexandre Magalhães de Saldanha da Gama, Prof. Axel Cleeremans, Prof. Zoltan Dienes, Prof. Amir Raz  
Institution: Université Libre de Bruxelles (Belgium)

Keywords: Psychophysiology; Cognitive processes; Decision-making; Consciousness; Altered states of consciousness; Hypnosis

Indexed papers: N/A

**Project: 2012-252**

Title: Sleep state misperception misperceived

Estimated duration: 2014/06 – 2015/05

Researcher(s): Prof. Eus J.W. Van Someren, Prof. J. Ramautar

Institution: Netherlands Institute for Neuroscience, Dept. Sleep & Cognition, Amsterdam (The Netherlands)

Keywords: Psychophysiology; Sleep and dreams; Mental health; Sleep disorders; Brain; Cognitive processes; Memory; Consciousness

Indexed papers: N/A

**Project: 2012-253**

Title: REM-sleep, the regulation of self-conscious emotion and hyperarousal in psychophysiological insomnia

Estimated duration: N/A

Researcher(s): Prof. Lucia Talamini, Dr. E. Georgopoulou, Prof. Eus Van Someren

Institution: University of Amsterdam, Psychology, Dept. Brain and Cognition and Netherlands Institute for Neuroscience, Dept. Sleep & Cognition, Amsterdam (The Netherlands)

Keywords: Psychophysiology; Sleep and dreams; Mental health; Sleep disorders; Emotion; Brain; Electroencephalogram (EEG); Functional magnetic resonance imaging (fMRI)

Indexed papers: N/A

**Project:** 2012-255  
Title: Telepathic Communication Wave Function Collapse  
Estimated duration: 2013/07 – 2015/07  
Researcher(s): Dr. Karla Galdamez, Dr. Dean Radin, Dr. Wolfgang Baer, Dr. Michael Ibison  
Institution: Nascent Systems Inc., Carmel Valley, CA and Institute for Advanced Studies at Austin, Texas (USA)  
Keywords: Parapsychology; Extrasensory perception (ESP); Telepathy; Ganzfeld studies  
Indexed papers: N/A

**Project:** 2012-256  
Title: Contemplative Development Mapping Project  
Estimated duration: 2013/07 – 2016/04  
Researcher(s): Prof. Willoughby Britton, Prof. Catherine Kerr, Prof. Harold Roth, Prof. Jared Lindahl, Dr. Jake Davis, Dr. Chris Kaplan, Dr. Nathan Fisher  
Institution: The Clinical and Affective Neuroscience Laboratory, Brown University and Department of Psychiatry and Human Behavior, Brown University Medical School, Providence (USA)  
Keywords: Parapsychology; Altered states of consciousness; Meditation; Spiritualism; Spiritual traditions/experiences; Assessment tools; Personality factors  
Indexed papers: Lindahl, J., Kaplan, C., Winget, E., & Britton, W. (2014). A phenomenology of meditation-induced light experiences: Traditional buddhist and neurobiological perspectives. *Frontiers in Psychology*, 4: 973, 1-16. doi: 10.3389/fpsyg.2013.00973

**Project:** 2012-262  
Title: The neural basis of Magical Ideation: a multimodal imaging study in twin subjects  
Estimated duration: 2014/01 – 2015/08

Researcher(s): Dr. Paolo Brambilla, Dr. Gioia A.L. Negri, Dr. Sara Piccin,  
Dr. Giuseppe Cabras, Dr. Corrado Fagnani

Institution: Department of Experimental and Clinical Medical Sciences  
(DISM), University of Udine and Unit of Epidemiology of  
the Italian Institute of Health, Rome (Italy)

Keywords: Psychophysiology and Parapsychology; Paranormal belief;  
Brain; Personality

Indexed papers: N/A

**Project: 2012-266**

Title: One ear is better than two; but why and when?

Estimated duration: 2013/03 – 2014/03

Researcher(s): Prof. Veena Kumari, Dr. Elena Antonova

Institution: Institute of Psychiatry (IoP), King's College, London (UK)

Keywords: Psychophysiology and Parapsychology; Altered states of con-  
sciousness; Meditation; Audition; Cognitive processes; At-  
tention

Indexed papers: N/A

**Project: 2012-270**

Title: Synchronicity and Psi: A Controlled Comparison

Estimated duration: 2013/03 – 2014/09

Researcher(s): Dr. John Palmer, Dr. Nick Edington

Institution: Rhine Research Center, Durham (USA)

Keywords: Parapsychology; Extrasensory perception (ESP); Intuition;  
Anomalous cognition/experiences

Indexed papers: N/A

**Project:** 2012-272  
**Title:** Exploring the interactions between paranormal belief and disbelief and subjective experiences with the Shakti helmet  
**Estimated duration:** 2013/09 – 2014/09  
**Researcher(s):** Dr. Christine Simmonds-Moore, Prof. Don Rice, Dr. Ron Hopkins, Dr. Richard LaFleur, Mr. Chase O’Gwin  
**Institution:** Psychology Department, University of West Georgia, Carrollton (USA)  
**Keywords:** Parapsychology; Paranormal belief; Anomalous cognition/experiences; Apparitions/Haunting  
**Indexed papers:** N/A

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*“Humans need beliefs in order to live, and great scientists are no exception. Great scientists produce right theories and wrong theories, and believe in them with equal conviction. Science is not concerned only with things that we understand. The most exciting and creative parts of science are concerned with things that we are still struggling to understand. Wrong theories are not an impediment to the progress of science. They are a central part of the struggle.”*

*Freeman Dyson, 2014*

*The New York Review of Books, Review of Mario Livio's Book “Brilliant Blunders”*