Can the conscious observer affect the collapse of the wavefunction?

ABSTRACT:

Background
Radin and colleagues have found that human attention and intention seems to affect quantum processes at the most basic level. Several other researchers have found similar results. These results, if true, would have significant implications regarding the fundamental nature of consciousness and its role in quantum processes.

Aims
We aimed to replicate and extend Radin et al.'s findings. In two experiments we aimed for direct replications, in one experiment we investigated the possible underpinning of Radin et al.'s findings. Moreover, in one of our replication attempts we measured EEG to possibly correlate psychophysical influences with neural activity.

Method
In Experiments 1 and 3 subjects received direct feedback on the variance in luminance of an interference pattern produced by a 2-slit set-up. In Experiment 3 EEG was measured. In both experiments the subjects were instructed to increase the variance. In Experiment 2 entangled photons were either directed at a camera, or at the head of the participant. Subjects performed a 2-back task, or a listened to a guided meditation.

Results
None of the experiments yielded reliably significant results. However, in Experiment 1, where we tested a relatively large number of experienced meditators (unlike in Experiment 3), results trended in the expected direction. Moreover, if we only included participants who subjectively felt that they could affect the interference pattern, then we replicated the findings of Radin et al.

Conclusions
The results of our experiments are inconclusive. Although we did not replicate the findings of Radin and colleagues, we did uncover some results that seem to support their claims. We aim to conduct more rigorous replication attempts in the future.

Keywords
Measurement problem, Collapse of the wavefunction, Psychophysical interaction, Interference pattern

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