

## **Study Registration**

### **For the Koestler Parapsychology Unit Study Registry**

#### **1. The title or name of the experiment (for listing the experiment in the registry).**

EVALUATION OF ALTERATIONS OF CONSCIOUSNESS AND THE MODEL OF PRAGMATIC INFORMATION IN A GANZFELD PROTOCOL

#### **2. The name, affiliation, and email address for the lead experimenter(s) for the study.**

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#### **3. A short description or abstract of the purpose and design of the experiment.**

Highly hypnotizable individuals (“highs”) show marked alterations in consciousness and meta-analyses have found that hypnosis is related to psi-hitting, but only one study systematically measured hypnotizability (hypnotic responsiveness, which varies across the population) and alterations of consciousness during the actual session. In a recent experiment, belief in personal success in the experiment, report of previous psi experiences, and a number of alterations of consciousness during ganzfeld correlated strongly or very strongly with psi performance for the subgroup of high hypnotizables (Marcusson-Clavertz, & Cardeña, 2010). This same sub-group also showed a significant correlation in the rating of certainty given to the target, and the target when it was chosen as the first or second choice (unpublished data). In the present study, we will have a group of highs who report at least some belief that they will succeed in the experiment and previous ostensible psi experiences undergo a telepathy test under two conditions: automated ganzfeld and hypnosis with eyes closed. The model of pragmatic information will also be evaluated.

**4. A statement or list of the specific hypothesis or hypotheses being tested, and whether each hypothesis is confirmatory or exploratory.**

- 1) Test whether individuals likely to be successful (i.e., highly hypnotizable and with at least some belief that they can succeed in the experiment and that they have had experiences that could be thought of as psi) in a ganzfeld telepathy test perform at a better than chance level. This is a confirmatory hypothesis of ganzfeld meta-analytic studies showing significant psi hitting with special populations (Storm, Tressoldi, & De Risio, 2010).
- 2) Evaluate if the ganzfeld setup is superior to a hypnotic condition. This is exploratory as we are not aware that this specific hypothesis has been tested before. We do not expect strong differences between ganzfeld and the just hypnosis condition.
- 3) Evaluate the association between experiencing alterations in consciousness during the experimental conditions and psi z-scores. Confirmatory hypothesis, since we previously reported strong positive correlations between these two variables.
- 4) Test the Model of Pragmatic Information. We predict that a matrix of the experimental data will show more significant correlations with the dependent variables (i. e., psi performance) than a dummy matrix of psi performance with variables that we do not expect to relate to them. Exploratory, since this model has not been applied before to ganzfeld data.
- 5) We will evaluate the exploratory hypothesis of whether the first third of trials will be significantly higher than the second third, as we have witnessed in-study decline effects in the past.
- 6) Another exploratory hypothesis is that higher task related re-appraisals/interferences (e.g., “ I thought about the purpose of the experiment”, “ I thought about how much time I had left”) during mentation will be associated with lower psi z scores, in accord with the noise reduction model (Braud, 1978).
- 7) We predict that the psi z-score of the target will correlate with an independent query about how certain the person is of his/her rating. This is a confirmatory hypothesis since we found such a relationship in our previous study.

**5. The planned number of participants and the number of trials per participant.**

As initially planned, we expect to have circa 35 participants, each one completing two trials. We have tested now around 1500 participants to arrive to this number of high hypnotizables who also believe that they will succeed in the experiment, mention some psi experience, and are interested in participating.

**6. A statement that the registration is submitted prior to testing the first participant, or indicating the number of participants tested when the registration (or revision to the registration) was submitted.**

Although this registration is not being submitted prior to testing the first participant, note that:

1) all hypotheses and procedure were in a sense already registered because this study is funded by the Bial Foundation (grant 747/10), so the information provided here is essentially the same as that provided with the grant application and before any participant had been tested, 2) the study started before the registration was in operation, and, most importantly, 3) at the moment of submitting this registration the main co-researchers are completely masked as to any results. They will become aware of individual and group results only after they have finished testing the final individual, so our hypotheses are not post-hoc.

**7. The specific statistical test method that is planned for each hypothesis, including which statistical test will be used, whether the unit of analysis is the participant or the individual random event, what  $p$  value (or confidence interval level) is significant, whether the statistical test (or confidence interval) is one or two-tailed, and any adjustment for multiple analyses. For example, “to analyze overall  $\psi$ , a  $z$ -score binomial test with continuity correction will evaluate whether the overall rate of direct hits for all trials in the experiment is greater than 25%, with significance set at  $p \leq .05$  one-tailed,” or “the difference between the two conditions will be analyzed with a two-sample  $t$ -test with the number of hits for each participant as the unit of analysis and significance set at  $p \leq .05$  two-tailed.” (This information can be included in section 4 above.)**

For all analyses,  $p \leq .05$  will be the criterion for significance, one tailed for confirmatory analyses (considering the relatively low power for the study), two tailed for exploratory ones, and effect sizes will be reported. The main dependent variable will be  $\psi$   $z$ -scores, although direct hits and ranks will also be estimated to have a large correlation matrix to compare with a dummy matrix (see fourth hypothesis).

For the first hypothesis, a cumulative  $z$  score above 1.64 will be considered significant.

For the second hypothesis, a  $t$ -test will be conducted.

For the third hypothesis, correlational analyses between  $\psi$   $z$  scores and scores on alterations of consciousness will be conducted.

For the fourth hypothesis, a comparison of the significant correlations between the experimental data matrix ( $\psi$  performance and alterations of consciousness during hypnosis and ganzfeld) and a dummy matrix ( $\psi$  performance and alterations of consciousness during baseline) will be estimated with  $Z = (CE - CD) / \sqrt{2 * CD * (1 - CD / NC)}$ , where CE = number of significant experimental correlations, CD = number of significant correlations of the dummy data, and NC = number of correlations in the correlation matrix. Data from cancelled or incomplete protocols will not be used in the analyses.

For the fifth hypothesis, a  $t$ -test will be conducted to evaluate the first and second thirds of the trials.

For the sixth and seventh hypotheses, correlational analyses will be carried out,

For non-normal data, non-parametric analogues of parametric tests will be conducted.

### **8. The power analysis or other justification for the number of participants and trials.**

Utts (1998) has previously estimated that for  $N = 100$  sessions the power for a ganzfeld study would be 0.54, but this was for unselected samples. We thus estimate that about 70 sessions to evaluate the hypothesis of  $\psi$  (i.e., circa 35 participants  $\times$  2) will be adequate in this sample as selected groups show in general a higher effect than unselected ones (Storm et al., 2010). Derakhshani (2013) has estimated that 56 trials with selected participants in a ganzfeld setup will provide 80% power.

### **9. The methods for randomization in the experiment.**

An automated randomization is applied to this project through a Java program. This program operates a pseudo-RNG called SecureRandom. The percipient/PI's computer randomly selects a target clip from a pool of 116 clips divided in 29 fixed sets of four clips named 1a, 1b, 1c, 1d, 2a, etc. After the target clip has been shown to the sender 10 times, the information is sent to the receiver's computer, for which SecureRandom has randomized the presentation order of the target and the three decoy clips from the same set. After the percipient submits his/her ratings, a data file is automatically stored with session ID, ratings, target identity, and presentation order. We previously tested a simulation with a large  $N$  that showed that target and distractors were equally distributed in the ordering of the film clips. We tested the pseudo-RNG before starting to run the experiment by simulating 1,500,000 trials. The relative frequency of each of clips a, b, c, and d being selected as targets did not deviate from MCE (1/4) by more than 0.1%. The relative frequency of each of the 29 sets being selected did not deviate from MCE (1/29) by more than 0.1%. The relative frequency of each of the 116 clips being selected as target did not deviate from MCE (1/116) by more than 0.1%.

We will also analyze the RNG-data from the study's empirical database by performing a Chi-Square test on the generated distribution of target clips (i.e., the number of times a, b, c, and d were targets). We will also perform a Chi-square test on the presentation order of target clip (i.e., the number of times the target was presented in the first, second, third, and fourth place).

### **10. A detailed description of the experimental procedure.**

Repeated measures design with a within-subjects variable (ganzfeld vs. hypnosis). First stage:

Part 1: Group hypnotizability tests. Because the percentage of those scoring as highs is around 10% and there are other inclusion criteria, we have tested more than 1500 individuals to obtain a current  $n$  of circa 35.

Part 2: High hypnotizables who believe that they will succeed in a psi experiment and report previous psi experiences undergo an individual hypnosis session, a measure of dissociation, and a psychological health inventory to measure these traits, and rule out those with noticeable distress. Selected participants undergo two sessions, in counterbalanced order, where they are asked to “receive” an image being seen by the PI. The images are from dynamic film clips randomly chosen by a computer in another building, through an automated protocol. One session is carried out during a ganzfeld protocol following a hypnotic induction, while in the other one participants only listen to the induction in a comfortable sofa with eyes closed. At the end of the session the computer shows the volunteers the target and 3 decoys arranged randomly and they are asked to give their percentage of confidence for each clipping. Alterations of consciousness during the sessions are also assessed at baseline and after the session with the Phenomenology of Consciousness Inventory. Participants receive feedback of the targets only after they have completed both sessions (feedback is given by one of two RAs, who does not communicate with the other experimenters about the outcome).

## References

Braud, W. G. (1978). Psi conducive conditions: Explorations and interpretations. In B. Shapin & L. Coly (Eds.), *Psi and states of awareness* (pp. 1–41). New York, NY: Parapsychology Foundation.

Derakhshani, M. (2013). *On the statistical replicability of ganzfeld studies*. Unpublished manuscript.

Marcusson-Clavertz, D. & Cardena, E., (2011). Hypnotizability, alterations in consciousness, and other variables as predictors of performance in a ganzfeld psi task. *Journal of Parapsychology*, 75, 235-259.

Storm, L., Tressoldi, P. E., & Di Risio, L. (2010). Meta-analysis of freeresponse studies, 1992–2008: Assessing the noise reduction model in parapsychology. *Psychological Bulletin*, 136, 471–485.

Utts, J. M. (1988). Successful replication versus statistical significance. *Journal of Parapsychology*, 52, 4, 305–320.