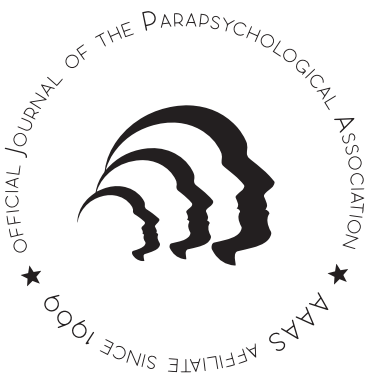
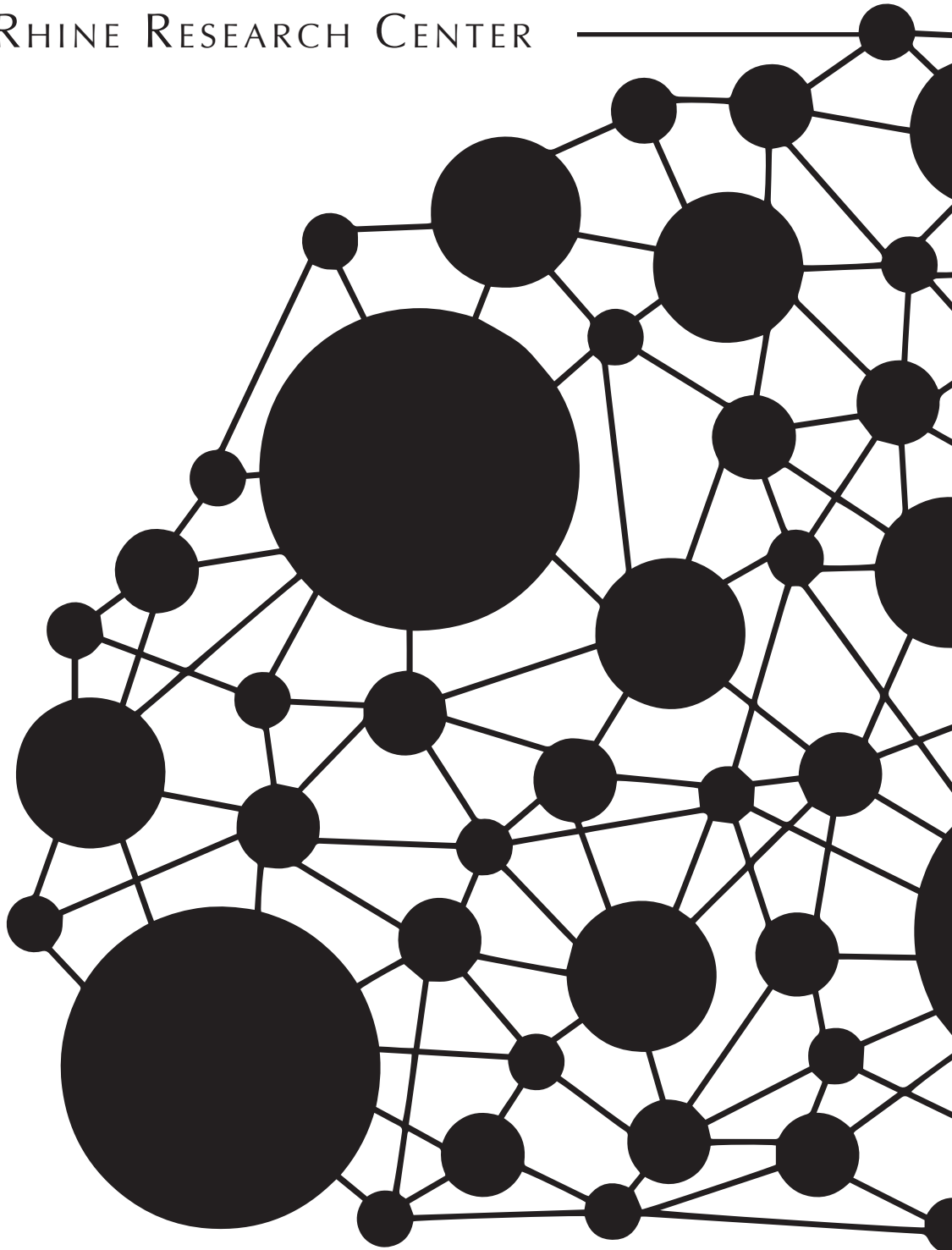


JOURNAL OF PARAPSYCHOLOGY

RHINE RESEARCH CENTER



Volume 84, Number 1 Spring 2020 ISSN 0022-3387

Journal
of
Parapsychology

Volume 84, Number 1
Spring 2020

ISSN 0022-3387

Journal of Parapsychology

Editor-in-Chief

Etzel Cardeña, Lund University, Sweden

Associate Editors

John Palmer, Rhine Research Center, USA

Chris A. Roe, University of Northampton, UK

Caroline Watt, University of Edinburgh, UK

Statistical Associate Editor

Jessica Utts, University of California, Irvine, USA

Book Reviews Editor

Carlos Alvarado, Sofia University.

Editorial Board

Carl Martin Alwood, University of Gothenburg, Sweden

Peter Bancel, Institute of Noetic Sciences

Pascal Baseilhac, Ki France, Tours, France

Vilfredo De Pascalis, Sapienza Università di Roma, Italy

Renaud Evrard, University of Lorraine, France

Miguel Farias, Coventry University, UK

Morris Freedman, University of Toronto, Canada.

Christopher C. French, Goldsmiths, University of London, UK

Harvey Irwin, Manchester Metropolitan University, UK

Graham Jamieson, University of New England, Australia

Menas Kafatos, Chapman University, USA

Edward F. Kelly, University of Virginia Health System, USA

Jeffrey J. Kripal, Rice University, USA

Mark Leary, Duke University, USA

Tanya Marie Luhrmann, Stanford University, USA

David Luke, University of Greenwich, UK

Steven Jay Lynn, Binghamton University (SUNY)

Markus Maier, Ludwig-Maximilians University, Germany

David Marcusson-Clavertz, Pennsylvania State University, USA

Gerhard Mayer, Institut für Grenzgebiete der Psychologie
und Psychohygiene, Germany

Christine Mohr, Université de Lausanne, Switzerland

K. Ramakrishna Rao, GITAM University, India.

Robert Rosenthal, Harvard University, USA

Stefan Schmidt, Universitätsklinikum Freiburg, Germany

Daniel P. Sheehan, University of San Diego

Christine Simmonds-Moore, University of West Georgia, USA

Jerry Solfvín, University of Massachusetts, Dartmouth, USA

Paul Stoller, West Chester University, USA

Rex G. Stanford, St. John's University, USA

Patrizio Tressoldi, Università di Padova, Italy

Mario Varvoglis, Institut Métapsychique International, Paris,
France

Max Velmans, Goldsmiths, University of London, UK

Robin Wooffitt, The University of York, UK

Wellington Zangari, Universidade de São Paulo, Brazil

Previous Editors

Founding editors: William McDougall and Joseph Banks

Rhine. Past editors: Betty M. Humphrey, Gardner F.

Murphy, John A. Palmer, Dorothy H. Pope, J. G. Pratt, K.

Ramakrishna Rao, Louisa E. Rhine, Bernard F. Riess, W. G.

Roll, C. E. Stuart

Editorial Staff

Nikolaos Koumartzis, *Layout Editing*

Robert Gebelein, *Business Manager*

John G. Kruth, *Finances*

The *Journal of Parapsychology*, founded in 1937, is published 2-3 times a year by Parapsychology Press, a subsidiary of the Rhine Research Center, www.parapsychologypress.org.

The *Journal* publishes original reports of experimental research in parapsychology, as well as research reviews, methodological, theoretical, and historical papers, abstracts, and selected invited addresses from Parapsychological Association conventions, book reviews, and letters.

Print and electronic version of the *Journal* are available. Information on subscriptions: <http://www.rhine.org/what-we-do/journal-of-parapsychology.html>. Orders for subscriptions or back issues, correspondence, and changes of address: journal@rhine.org, or *Journal of Parapsychology*, 2741 Campus Walk Ave., Building 500, Durham, NC 27705. Postmaster: Send address changes to the *Journal of Parapsychology*, 2741 Campus Walk Ave., Building 500, Durham, NC 27705. Subscribers: Send change of address notice 30 days before the change of address. The *Journal* will not replace undelivered copies resulting from address changes.

Copyright and permission. Authorization to photocopy items for internal or personal use, or the internal or personal use of specific clients, is granted by the Rhine Research Center, provided that the base fee is paid directly to Copyright Clearance Center, 222 Rosewood Dr., Danvers, MA 01923, www.copyright.com. For organizations that have been granted a photocopy license by CCC, a separate system of payment has been arranged. The *Journal* is the official publication of the Parapsychological Association, and is indexed in CROSSREF, EBSCO, PSYCINFO and SCOPUS.

Copyright © 2020 by Parapsychology Press

ISSN: 0022-338

Table of Contents

Editorial

Pieces of the Psi Puzzle and a Recipe for Ganzfeld Success

Etzel Cardeña

5

In Memoriam

Mary Rose Barrington

Peter Mulacz

8

Donald J. West

Zofia Weaver

12

Invited Editorial

Ganzfeld-ESP: Three Reports and Looking Ahead

Rex G. Stanford

14

Articles

Testing Precognition and an Altered State of Consciousness with
Selected Participants in the Ganzfeld

Caroline Watt, Emily Dawson, Alisdair Tullo, Abby Pooley, and Holly Rice

21

Performance at a Precognitive Remote Viewing Task, with and without
Ganzfeld Stimulation: Three Experiments

*Chris A. Roe, Callum E. Cooper, Laura Hickinbotham, Andrew Hodrien,
Laurie Kirkwood, and Hanna Martin*

38

Changes in State of Consciousness and Psi in Ganzfeld and Hypnosis Conditions

Etzel Cardeña and David Marcusson-Clavertz

66

Parapsychological Association 2019 Presidential Address

Making Sense of Psi: Seven Pieces of the Puzzle

Dean Radin

85

Predictors of Hearing Electronic Voice Phenomena in Random Noise:
Schizotypy, Fantasy Proneness, and Paranormal Beliefs

Kenneth Drinkwater, Andrew Denovan, Neil Dagnall, and Andrew Parker

96

Tolerance of the Unknown: Negative Capability, the Problem of Demarcation,
and the Truzzi-Gardner Dialogue **114**
Renaud Evrard and Bevis Beauvais

Book Reviews

Perceiving the Future. A Review of **130**
*The Premonition Code: The science of Precognition: How Sensing the Future
Can Change your Life*
By Theresa Cheung and Julia Mossbridge
Roger Nelson

A Comprehensive History of Parapsychology in France. A Review of **133**
Enquête sur 150 Ans de Parapsychologie: La Légende de l'Esprit
By Renaud Evrard
Massimo Biondi

A Far Ranging Tour of All Things Psi. A Review of **136**
*Our Secret Powers: Telepathy, Clairvoyance, and Precognition.
A Short History of (Nearly) Everything Paranormal*
By Terje G. Simonsen
George R. Williams

Parapsychology and the Nervous System. A Review of **140**
*Neurociencias en la Frontera con lo Paranormal: Comprender
lo Inexplicable en las Redes del Cerebro*
By Alejandro Parra
Carlos S. Alvarado

A Kulturträger Keeps Time. A review of **143**
Altered States of Consciousness: Experiences out of Time and Self
By Marc Wittmann
Etzel Cardeña

Manuscript Preparation Guidelines **146**

We thank the following for their translations of the abstracts: *Eberhard Bauer*
(German), *Etzel Cardeña* (Spanish), and *Renaud Evrard* (French)

Editorial

Pieces of the Psi Puzzle and a Recipe for Ganzfeld Success

Etzel Cardeña

Lund University

A particularly exciting issue this is in many aspects. I heard Dean Radin deliver his talk on potential pieces of the psi puzzle. It was a daring sojourn through philosophy, physics, neurology, and systems theory, giving the complexity of psi phenomena their due. I do not believe that all of his proposed pieces will be equally useful and that more are missing, but as a synthesizer of informed, creative, and playful speculations on psi Dean was at its best.

In addition, I was able to corral three research papers on ganzfeld along with an invited editorial. The bottom line is that not only is ganzfeld research alive and well, but overall the studies in this issue support the conclusions of previous meta-analyses (Storm et al., 2010; Williams, 2011), in one case with a prospective, preregistered, and very well-designed study. This is a good answer to those who think that psi results are just the product of “questionable research practices” (QRP; see Cardeña, 2018). Here is my personal take on what I think are important ingredients of a well-seasoned ganzfeld study, based on the studies and the invited editorial:

1. Use a precognition design (it has been successful repeatedly and it helps avoid methodological somersaults and potential charges of fraud).
2. Screen your participants and select those with a positive attitude to the experiment, some type of mental or artistic discipline, and so on (see the great effect size difference of chosen samples vs. general ones in Baptista et al., 2015). Watt et al. have a screening form that I would urge all researchers to use from now on, at least until they have a good reason to change it.
3. Expose participants to at least 30 min of ganzfeld, as shorter intervals may not be enough to facilitate psi, and use specific instructions such as the one in the paper by Roe et al.
4. Use enthusiastic and “fresh” researchers, to avoid potential boredom and lack of motivation.
5. If evaluating alterations of consciousness, consider using change scores from baseline to the ganzfeld experience, to measure the actual effect of the stimulation, and try to discern what aspects of altered consciousness relate to psi hitting (or missing).

And some promising seasonings for future research include:

- Evaluating with quantitative and qualitative methods the syntactic and semantic linguistic aspects of ganzfeld mentation and how they relate to psi hitting. There are scattered references in the literature to what would seem to be features that make psi information salient, but very little systematic research.

- Considering potential asymmetrical carry-over effects when comparing two or more techniques, as Stanford discusses in his invited editorial.
- Taking full advantage of what participants have to contribute beyond their mentation, for instance by continuing to work with them long-term, if possible (as it has been done with some of the psi “stars” of the past). *N* = 1 studies with gifted participants might incite more ideas than yet another garden-variety ganzfeld study.
- Instead of thinking that there is a methodological homogeneity “purity test,” explore what strategies may work better for specific individuals. Although every variation of a procedure should have a rationale and be documented, a flexible and somewhat individualized approach may yield better results than a “one size fits all” approach (see Varvoglis & Bancel, 2015, for a discussion of a very successful PK researcher using this strategy).
- If using a brain-imaging technique, use a neurophenomenological approach to specify which specific brain dynamics relate to which specific experience/report (e.g., Cardeña et al., 2013). Instead of collapsing all of the various changes and random variations of brain activity within a large span of time (whether in ganzfeld or another stimulation), we should look for brain activity during specific, potentially psi-related episodes.

In my opinion, the case for the ganzfeld as a psi-conducive context has already been made, so we need now to understand better what elements are most important, including taking a systems-approach and looking at the interaction with, and variables of, the researchers (revisit Dean’s paper). For instance, I suspect that rather than looking at “extroversion” as a participant variable, it may be better to look at the match of participant and researcher traits. Overall, the field needs to think more in terms of interactions among many variables, both psychological and physical (e.g., Ryan, 2015), than of simple effects. A gifted participant may perform better than chance given circumstances *X* and *Y*, but not circumstance *X* alone. And of course there will always be random and other elements that had not been foreseen and will affect the outcome, as happens in mainstream research with living beings (Lewontin, 1994).

The attentive reader will notice that new ribbons, which indicate whether the study was preregistered and/or has open data, accompany some papers. They show that research on *JP* adheres to the highest methodological standards present in top mainstream journals. Although preregistration and open data are not required for publication in the *JP* at this point, I strongly encourage researchers to adopt them.

The *JP* offers its sympathies to the relatives and friends of Mary Rose Barrington and Donald West, whose obituaries are included in this issue.

And lest we become overconfident about having more pieces of the psi puzzle than we actually do, and in a nod to the paper by Evrard and Beauvais on negative capability (see also Cardeña, 2011), I end my editorial with the words of a graceful poet and essayist (Hirshfield, 2015, p. 139): “Over-certainty and single-mindedness irritate as well as bore; the idea that one can know what is right, or that a general truth is possible, affronts the true complexity of the real.”

References

- Baptista, J., Derakhshani, M., & Tressoldi, P. E. (2015). Explicit anomalous cognition: A review of the best evidence in ganzfeld, forced choice, remote viewing and dream studies. In E. Cardeña, J. Palmer, & D. Marcusson-Clavertz (Eds.), *Parapsychology: A handbook for the 21st century* (pp. 192–214). McFarland.
- Cardeña, E. (2011). On wolverines and epistemological totalitarianism. (Guest editorial). *Journal of Scientific Exploration*, 25, 539-551.
- Cardeña, E. (2018). The experimental evidence for parapsychological phenomena: A review. *American Psychologist*, 73, 663-677. doi: 10.1037/amp0000236
- Cardeña, E., Jönsson, P., Terhune, D. B., & Marcusson-Clavertz, D. (2013). The neurophenomenology of neutral hypnosis. *Cortex*, 49, 375-385. <http://dx.doi.org/10.1016/j.cortex.2012.04.001>
- Hirshfield, J. (2015). *Ten windows: How great poems transform the world*. Alfred A. Knopf.
- Lewontin, R. (1994). A rejoinder to William Wimsatt. In J. Chandler, A. I. Davidson, & H. D. Harootunian (Eds.), *Questions of evidence: Proof, practice, and persuasion across the disciplines* (pp. 504–509). University of Chicago Press.
- Ryan, A. (2015). Physical correlates of psi. In E. Cardeña, J. Palmer, & D. Marcusson-Clavertz (Eds.), *Parapsychology: A handbook for the 21st century* (pp. 181-191). McFarland.
- Storm, L., Tressoldi, P. E., & Di Risio, L. (2010b). Meta-analysis of free-response studies, 1992–2008: Assessing the noise reduction model in parapsychology. *Psychological Bulletin*, 136, 471–485. <http://dx.doi.org/10.1037/a0019457>
- Williams, B. J. (2011). Revisiting the ganzfeld ESP debate: A basic review and assessment. *Journal of Scientific Exploration*, 25, 639–661.

In Memoriam Mary Rose Barrington, M. A. (1926 –2020)

It caused me great sorrow to learn of the passing of my esteemed colleague and friend of many years, veteran British psychical researcher Mary Rose Barrington, who died in the morning hours of Friday, Feb 20th. The saddening announcement did, however, not come entirely unexpected: a few months ago, Mary Rose felt forced to resign from a parapsychological discussion group on the Internet due to her failing eyesight which was a major blow to her as communication with colleagues was significantly reduced, and on later phone calls she announced more than once that the time for her to go would come soon.



© Rosemarie Pilkington

We came to know another in the early 1990s when I attended the SPR Annual Conference held at Nottingham. The lectures were interesting and so were the discussions of several topics, for instance the sittings with Eusapia Palladino at Naples, which, in the person of Mary Rose, found a staunch defender of their “genuineness.” When I mentioned that not long ago I was shown the Kluski moulds at the Institut Métapsychique International in Paris, Mary Rose became very aroused, and, as I learned only later, travelled to Paris at her earliest convenience to view these unique pieces with her own eyes.

Yet physical mediumism was not the only topic within the field she was interested in. Take ESP as another example: on the famous Polish clairvoyant, Stefan Ossowiecki she published a book together with Zofia Weaver and Ian Stevenson. She suggested an analogy between retrocognition and remote viewing as the remote viewer goes to a certain defined place in space while the clairvoyant goes back to a certain point in time, both of them experiencing the situation like observers physically present at the spot. She saw crisis telepathy as cases of kappa-telepathy (in the sense of the original Wiesner-Thouless psi model) and deduced that such psychic processes impacting on other people necessarily have an implicate aspect of “force” by which reasoning she arrived at kind of dual-aspect monism (while she acknowledged that substance dualism could be defended as well). So, it was rather jokingly—she was a charming, very witty yet thoughtful and humorous person—when she posed the (rhetorical) question whether she would see the pony she possessed in her youth once she had crossed that border. That brings me to other aspects of her biography, her life apart from psychical research, and her relation to the animal world; however, let me first add a few more words to her as a parapsychologist.

She was very interested in phenomena beyond plain ESP & PK, such as solid objects disappearing and reappearing (some of them perhaps apports, other simply inexplicable), for which she introduced the acronym JOTT, time slips (one case she investigated herself), and other strange occurrences. Most of these are of course spontaneous cases, some of considerable magnitude, some of smaller size yet likewise posing a problem for a rational explication; for covering those she coined the telling phrases “Broken Threads in the Fabric of Physical Reality” or, more specifically, “Rifts in the Fabric of Causality.” On the theoretical side, Mary Rose gave much consideration to the question “What is Proof?”, a question she had to deal with a lot during her professional life as a lawyer putting her into the position to apply similar deliberations to psi phenomena.

I should single out the case of Iris Farczády that we (i. e., Mary Rose, Titus Rivas, and I) went to investigate to Hungary in 1997; it is a strange case, very difficult to classify—something in between dissociative identity disorder and reincarnation. Eventually, the report of our joint investigation was published in the SPR’s Journal in 2005.

In April 1999, Mary Rose gave a talk—in impeccable German, by the way—to the Austrian Society for Parapsychology on “The Normality of the Paranormal and the Para-Normality of the Normal.” The content of her brilliant and well-received talk was already similar to the topics of her two latest books. Even better than her German was her French; she used to translate articles from older issues of the *Révue Métapsychique* and publish them under the heading “From the Archives.” She took a particular interest in the psychic Alexis Didier and his phenomena.

Summarizing, she entertained very original ideas on parapsychological issues, had a sharp intellect and was always critically minded. During the heated debate on the (alleged) Scole phenomena—almost causing a rift in the SPR—she, too, sided with the critics. Nonetheless she did not allow herself to get lost in small details; her approach was a broad one. What she was ultimately interested in was the very nature of reality, and she was deeply convinced that parapsychology has an important role in the a broader understanding of nature.

Born on Jan 31st, 1926 in London, Mary Rose developed an interest in the paranormal already at childhood, enjoying reading ghost stories. Later, she worked her way to serious literature such as the works by Sir Oliver Lodge (yet still remaining somehow reserved vis-à-vis spiritualism). At Oxford University she did not only enroll in English but also joined the Oxford University Society for Psychical Research becoming their president. Her favorite sports at that time were tennis and horseback riding. As she was interested in housing and real estates she resolved to learn the trade of a barrister at law; later on, she switched to solicitor, which she felt was more rewarding due to the closer contact with people. She was also a charity administrator (combining law practice with assisting in the management of a large group of almshouses for the aged), an engagement fitting her well as she was a very generous person.

In the voluntary sector she engaged actively—again applying her legal resources to these causes—in animal protection (not limited to pet animals though she had some: when thinking of her I still could feel the smell of her cats in my nose) and she operated as the honorary secretary of an animal rights group. On another issue, she was an advocate of voluntary euthanasia; once she even served as a chairperson of the British Voluntary Euthanasia Society *Exit*. She was deeply convinced that humans have the

right to determine the manner and timing of departing this life, and supported rational suicide and the notion of “planned death,” somewhat ironically as she has been the administrator of those almshouses for the elderly.

One final aspect of her personality is that she was fond of classical music; she played cello very well, in a string quartet meeting regularly. Playing an instrument came to an end when she became unable to read printed music.

Back to parapsychology. In 1957 she joined the Society for Psychical Research, participated in many investigations and experiments of which only a fraction could be mentioned here, and became a Council member in 1962. Since its inception, she served on the Spontaneous Cases Committee, an area she was particularly interested in. In 1995 she was elected one of the Vice Presidents of the Society, a position she held until her death. Her multi-faceted contributions to the field are most valuable. As a person, she was remarkable, unique, and lovely; she will live on in my memory forever.

References

- Barrington, M. R. (1966). Swan on a black sea: How much could Miss Cummins have known? *Journal of the Society for Psychical Research*, 43, pp. 289–300.
- Barrington, M. R. (1981). Apologia for suicide. In M. Pabst Battin & D. I. Mayo (Eds.), *Suicide, the philosophical issues* (pp. 90-103). St. Martins Press.
- Barrington, M. R. (1999). What is proof? The assessment of past events. http://parapsychologie.ac.at/programm/ss1999/barringt/proof_txt.htm
- U. Nohoogh (pseudonym of Barrington) (1999). Why I must give up flute research. <http://parapsychologie.ac.at/programm/ss1999/barringt/flute.htm>
- Barrington, M. R., Mulacz, P., & Rivas, T. (2005). The case of Iris Farczady: A stolen life. *Journal of the Society for Psychical Research*, 69, 44–77. https://www.academia.edu/768149/The_case_of_Iris_Farczady-A_stolen_life
- Barrington, M. R., Stevenson, I., & Weaver, Z. (2005). *A world in a grain of sand: The clairvoyance of Stefan Ossowiecki*. McFarland.
- Barrington, M. R. (2013). Beyond the boggle threshold: Confessions of a macro-addict. In R. Pilkington (Ed.), *Men and women of parapsychology. Personal reflections, ESPRIT Vol. 2* (pp. 7-27). Anomalist Books.
- Barrington, M. R. (2018): *JOTT: when things disappear ... and come back or relocate – and why it really happens*. Anomalist Books.
- Barrington, M. R. (2019): *Talking about psychical research: Thoughts on life, death and the nature of reality*. White Crow Books.

Video Sources available on YouTube:

The Scole Experiment: SPR – The Scole Debate 1999 – London – Introduction from Chair
https://www.youtube.com/watch?v=Ls_qNMw5O2A&t=154s
 (Basic remarks to the Scole issue)

Ghosthunters UK Series pt 17 – Ripples in time

https://www.youtube.com/watch?v=Zx_IQInNDiU&t=793s

(A commercial program on time slips featuring Mary Rose Barrington in one case)

Mary Rose Barrington. Interview by Gayle Kimball. July 2019

<https://www.youtube.com/watch?v=LQBKXH7PUJA>

(Mary Rose Barrington's last interview. Though the quality is poor, particularly the audio is extremely noisy, it is worth watching)

Peter Mulacz, Lecturer, Sigmund Freud Privatuniversität, Vienna, peter@mulacz.at

In Memoriam Donald J. West, M. D., D. litt., FRCPsych (1924-2020)

Donald West, Emeritus Professor of Clinical Criminology and Fellow of Darwin College at Cambridge University, had a long and distinguished career in psychology and psychiatry. The world at large will remember him for his wide-ranging contributions in these areas, perhaps particularly to the cause of decriminalizing homosexuality.

His contributions to the world of parapsychology were no less wide-ranging and significant. Having joined the Society for Psychical Research in 1941, he served the Society in many roles, including membership of the Management Committee of the Perrott-Warrick Fund at Trinity College, Cambridge. He was elected SPR's President more than once, and his contributions to the subject were recognized by the McDougall Award in 1958, and the SPR's Myers Memorial Medal in 1997. His first official role was as Society's Research Officer (1946-49) and he continued to be involved in research throughout his life, organizing surveys and experiments, and critically examining the evidence for spontaneous cases. The first article he published in the *Journal of the Society for Psychical Research* in 1941 dealt with his own experiments in telepathy, but perhaps his best-known experimental contribution involved a series of tests for clairvoyance using clock-face cards with participants based at home. Experimenting as a team (West & Fiske, 1953), he and G. W. Fisk prepared half the targets each but only Fisk obtained significant results while West's targets came in at chance, even though Fisk was the only one to communicate with the participants (by post). Since West did not have any contact with those involved, this has been seen as an early example of experimenter psi. Yet this evidence of negative influence did not match his attitude to the subject; those who knew him and worked with him, myself included, could testify that he was genuinely positive about it.



Another valuable contribution to the field was his modified replication of the SPR's famous Census of Hallucination from 1894 (West 1990), which obtained, on a much smaller scale, results in some ways similar to the original census. Alongside his many publications on criminology and psychiatry, he published many articles and book reviews in parapsychology periodicals. His books relating to parapsychology included *Tests for Extrasensory Perception: An Introductory Guide* (1954), *Eleven Lourdes Miracles* (1957), and *Psychical Research Today* (1954, revised 1962). His last book-length contribution, a critical re-examination of the work of Soal (West & Markwick 2018), has the same characteristics as all of his publications over a period of nearly 80 years: an unflinching but fair and clearly thought-out probing of

evidence for weak spots, presented in a most readable manner. A skeptic in the best sense of the word, he was a most likeable, helpful person with an impish sense of humor and, it seemed to me, hopeful that one day the evidence would measure up to the standard he set for it.

References

- West, D. J. & Fisk, G.W. (1953). A dual ESP experiment with clock cards. *Journal of the Society for Psychical Research* 37, 185-197.
- West, D. J. (1990). A pilot census of hallucinations. *Proceedings of the Society for Psychical Research* 57, 163-207.
- West, D. J. and Markwick, B. (2018). Dr Soal: A psychic enigma. *Proceedings of the Society for Psychical Research* volume 60 part 224.

Zofia Weaver, Ph. D., SPR, zofiewe@ntlworld.com

Invited Editorial

Ganzfeld-ESP: Pondering Three Reports and Looking Ahead¹

Rex G. Stanford

St. John's University

This issue of the *Journal of Parapsychology* provides three reports of ganzfeld-ESP research, each providing findings and commentary that can usefully inform future work in that domain and potentially in other domains using the same or similar methods. The comments below on specific studies reported in this issue are in alphabetic order by surname of the report's senior author. A General Discussion follows, focused on improving construct validity in work investigating internal attention states and psi-task performance, but that discussion often will have broader applicability.

“Changes in State of Consciousness and Psi in Ganzfeld and Hypnosis Conditions” (Cardeña & Marcusson-Clavertz, 2020)

This richly informative paper might be deemed something of a mini-dissertation. It begins with an extended –but not highly detailed– overview of evidence related to altered states of consciousness (ASC) and psi, divided into several categories of evidence, some far less scientifically rigorous than others. Some sections are jam-packed with lists of correlational figures whose *p*-value plethora at times came close to exhausting my attention in the absence of something more substantively integrative for such information (e.g., meta-analysis). Any ennui thus engendered was, though, effectively mitigated by the extended remarks near the end of the paper that provide well-informed, thoughtful commentary aimed at trying to understand the very mixed research outcomes relative to psi and altered states. Those remarks might well inspire some valuable conceptual and methodological innovation. They include the important insight that psi-task performance may be dependent on characteristics of the respondent interacting with the methodological features of the study (i.e., trait x situation interaction). There is also the acknowledgment that an ASC might not be needed for some individuals to evince psi. These authors seem to be suggesting that discovering the particular way(s) psi naturally functions (or is thwarted) in specific individuals in particular settings might support conceptual advance and replicability. We are left wondering why certain state-related predictor variables performed notably more successfully in their hypnosis/ganzfeld condition than in the one with hypnotic suggestions sans ganzfeld accoutrements. Some possibilities in that regard were noted. Scatterplots (Figures 1 and 2) are a helpful feature of this report's data presentation, each related to correlational findings displayed separately for ganzfeld and hypnosis conditions.

¹ Address correspondence to Professor Emeritus Stanford, calidris.bairdii@gmail.com.

“Performance at a Precognitive Remote Viewing Task, With and Without Ganzfeld Stimulation: Three Experiments” (Roe et al., 2020)

This is a well written, thoughtful report on a carefully planned and executed series of three deliberately very similar studies intended to allow comparison of results from two well-known extrasensory research paradigms, ganzfeld and remote viewing (within-subjects design) and to assess the possible role of internal attention states in extrasensory performance. Pooling across those three very similar studies, the sum-of-ranks analysis for ESP in ganzfeld was highly significant. Remarkably, ganzfeld scoring also was, with that pre-specified primary analysis of psi success, significant in all three studies!

This report well justifies the conclusion of free-response precognitive success with geographical targets in a ganzfeld precognition setting, but not in the case of the remote viewing (RV) paradigm. A major problem with the RV condition might have been the difficulty of novices to grapple with the highly complex cognitive demands of the verbal RV guidance and instructions. The authors’ remarks reflecting on poorer performance in the RV condition are very graphic relative to the participants’ expressed frustration with the demands of that condition’s instructions, and they merit readers’ attention.

Back to ganzfeld: Following relaxation suggestions, the volunteers heard what, to my mind, was a masterful set of instructions! It lets them know that what they will be experiencing is very natural, like sleep or daydreaming, and it will happen on its own. One simply needs to watch and report what transpires without trying to make something happen. The well-framed instructions might well have played a substantial role in the significant psi outcomes in all three studies (and overall). They seem a well-blended verbal potion for a pleasant and psi-productive mental trip.

Worthy of special consideration are that: (a) participants saw only their target, never the foils, at session’s end; and (b) that the rating of session mentation relative to target and foils was done by an independent judge. As Roe et al. note, this might have played a role in the success of the ganzfeld studies, at least in part by obviating precognitively driven displacement onto foils.

Both this work and that of Cardeña and Marcusson-Clavertz employed a within-subjects design. Given also that within-subjects was the dominant design (21/25 studies) in the Stanford and Stein (1994) meta-analysis of ESP in hypnosis/comparison work, my General Discussion (below) ponders some statistical and conceptual ramifications of such designs.

“Testing Precognition and Alterations of Consciousness with Selected Participants in the Ganzfeld” (Watt et al., 2020)

It is refreshing to read a report bringing strongly into question, with exceptionally high-quality methodology and pre-registration, what may be for some a psi-research myth, namely that a telepathic agent is somehow central to psi success in ganzfeld. It was gratifying to see this major effort rewarded by a significant overall hit rate with a high-security design, joining a small number of other researchers’ earlier successful ganzfeld-precognition results (studies cited in their Table 1).

This clearly written report of carefully described work is thoughtful and rewardingly informative, including the justification, in-part on security grounds, for using a precognition design. The design was

well-informed by past research (including meta-analyses) that led to its sizeable ($N = 60$) participant sample consisting, by very large majorities, of individuals self-designated as: creative/artistic, having practiced some form of mental discipline, and/or having had some prior experience thought to involve psi. Potentially very important, care was taken to make the laboratory's physical ambience pleasant and social interactions welcoming and friendly. It was gratifying to learn that potential participants were screened via a query about mental health in the preceding five years, given that the study invited and encouraged opening oneself up to viewing and talking about inner experience in what might be deemed an altered-states-favorable setting. The use of dynamic targets might be deemed another major "plus" of this study.

General Discussion

Methodology: Enhancing Construct Validity plus Some Statistical Considerations

What do you hope to learn from your study? Some Important things to consider before selecting a between-subjects design

The following discussion, for simplicity and psi-research typicality, assumes two experimental conditions manipulated in a same-subjects design.

Despite the much acclaimed value of same-subjects designs relative to effort, cost, and statistical power (but re. power, see "major caveat" below), there are several reasons why using, instead, a between-subjects design (i.e., random assignment to conditions) allows a clearer conceptual understanding of the consequences of the experimental manipulation.

Misconceptions about effectiveness of counterbalancing: Some investigators seem to think that counterbalancing the order of conditions across volunteers can rid one's analyses of bias related to practice (and other undesired across-conditions influences of the design such as differential liking, affect, and/or exertion), but the validity of that assumption depends on there being *symmetry of transfer* (SOT) across testing orders. In other words, counterbalancing is intended to control for cross-condition influences but can, in principle, do so optimally *only* when something about condition A affects subsequent performance under condition B in the same manner (direction) and degree as going from condition B to A. SOT is a conveniently favorable assumption that may or may not be valid in the case at hand. There may, instead be asymmetry of transfer (AOT), which can strongly cloud the interpretation of differences of means related to the experimental manipulation. For example, Poulton (1982) provided a series of meticulously explained examples of how one particular, but widely manifest, type of AOT (related to test-taking strategies) might have produced confounding in published cognitive psychology studies of several kinds, leading to unjustified conceptual interpretation of the independent-variable outcomes.

The bottom line regarding choice of design: between- or within- subjects: A well-designed, thoughtfully large-sample, random-assignment study stands a good chance of illuminating the consequence(s) of a given independent-variable condition (or level, if quantitative) *in its own right* and can support examination of the comparability of outcomes across independent-variable conditions (or levels); but (b) one cannot justifiably assume that the same kinds (and/or magnitudes) of outcomes will

occur if one uses, instead, a within-subjects design. The latter often provides a decidedly different and more complex psychological milieu on account of temporally juxtaposed conditions—a set of circumstances too often ripe for unwanted and unsuspected influence(s) on variables measured during the session (including, potentially, both the dependent variable and predictor variables). The most conceptually justifiable reason for using same-subjects designs is to learn the consequence(s) of task juxtaposition, but for full understanding of that one also needs data from a comparable between-subjects study.

The acclaimed superior statistical power of within-subjects designs – a major caveat: *The statistical power for comparing condition means in a within-subjects design is influenced, sometimes very profoundly, by the magnitude and direction of the correlation across the dependent-variables scores for the manipulated conditions.* The larger a positive correlation, the greater the test statistic's power to detect a difference of means. If the correlation is negative, the larger it is, the less the statistical power for evaluating the difference of means. *Psi researchers contemplating using a within-subjects design should therefore consider that between-conditions correlations of psi-task scores often are notably less than optimally large.* In that case, the smaller sample sizes in same-subjects designs may mean surprisingly deficient statistical power. Authors of same-subjects studies always should report inter-condition correlations, which potentially have value in understanding what has happened in the study, both statistically and psychologically.

More on Protecting and Enhancing Construct Validity plus Learning More from Research Participants

Reducing method-driven artifacts when studying traits as predictor variables: Trait measures are intended to measure the strength of the respondent's relatively stable response disposition(s) in trait-relevant situations. In a research situation where the trait-measurement item(s) are unbuffered (i.e., not intermixed with same-format trait measures for other traits), the disposition under study may well be inferred by participants, and they may then correctly infer the investigator's expectations, given what they know about the trait and the other elements of the study. *If so, there may be artifact-driven participant concurrence with the researcher's expected outcomes related to that trait.* A plausible mediational route for such an artifact in a psi study is that if participants, thus knowledgeable about the investigator's expectations, believe that those expectations reflect expert knowledge and insight and that they apply to self, then such a *belief* might automatically favor one's producing the hypothesized psi-task performance. Another mediational possibility for non-psi dependent variables is deliberate compliance with the inferred hypothesis.

How might such an artifact be obviated? On a date not far preceding the session that measures the dependent variable, the predictor-trait scale (e.g., Tellegen Absorption Scale, TAS) is administered in a different setting by another experimenter (fully in accord with informed consent). It may be a good idea, additionally, to *moderately* buffer the TAS items in the earlier session—but not so many total items as to bore or bother the respondent. If independent-setting administration is not possible, one still can buffer the predictor-trait items. Kirsch and Council (1982) included trait-transparency-related correlational artifacts (also called *context effects*) in their review of work on the TAS as a predictor of hypnotizability. They also noted context-dependent relations as having been reported in studies evalu-

ating trait hypnotizability and five other personalistic measures (including belief in paranormal events). Alas, studies that involved predictor-trait transparency were common. They concluded their review of TAS-hypnotizability context-effects (p. 272) with a strong warning that those who use transparent trait measures but do not obviate context effects may obtain artifact-produced significant effects. A review by de Groh (1989, p. 60) reached similar conclusions. To study psychological traits as predictor variables in psi studies, we must strive for the same level of predictor-variable construct validity as we do for the psi-task dependent variable.

Foster construct validity and replicability through thoughtfully selected unobtrusive—hence, non-reactive—objective measurement of key constructs: It can be easy to forget that the use of subjective, self-report measures—whether of traits or states—can necessitate extensive introspection that often may require attribution (i.e., interpreting experiences as meriting a construct label, such as “altered state,” “absorption,” or whatever). Such introspection and its reporting are subject to the vagaries of memory, social desirability/undesirability of particular response(s), and experiment-related demand characteristics (relative to understood or supposed investigator expectations). Research participants may, with too much testing, become tired, bored, aggravated or even apathetic, potentially adversely affecting what follows. Very importantly, the queries that provide such data potentially can be *reactive* (i.e., produce unwanted and even unanticipated effects on later thinking and responding in the study). One example of this reactivity may appear if one administers the same inventory (or other measures) more than once in a session and the participant’s thinking and responding in the later administration(s) are influenced by reflections upon the earlier one(s).

There is great potential value in learning about mental and psi functioning via unobtrusively acquired temporally logged data from session recordings (e.g., of EEG measures and verbal utterances) made during critical parts of the session (e.g., during pretest relaxation/meditation and psi testing). Unobtrusively acquiring such data is non-reactive, for it is based simply on the analysis of records of what was transpiring—without any query—during the session. Verbal transcript analysis may be useful for investigating whether and, if so, in what ways verbal-behavior patterns covary with psi-task performance. Some years ago (Stanford et al., 1989a; Stanford et al., 1989b; Stanford & Frank, 1991) research assistants and I did ganzfeld-ESP research aimed at assessment, through verbal transcript analysis, of spontaneity, arousal level, and internal attention state and used these indices to try to predict receptive-psi performance. Future studies seem warranted and might be aided by computerized transcript analysis. Also, bringing selected EEG measures into the picture, as potentially convergent (or supplementary) indices of mental function may prove useful.

Unobtrusively acquired, hence nonreactive, data reflecting conceptually targeted variables, may decidedly favor enhanced replicability. The most replicable of my personal research findings relative to internal attention state and extrasensory response have come from using, as psi-task predictor variables: (a) frequency (in Hz) of EEG alpha rhythms during pretest relaxation/meditation (significant negative correlation in Stanford & Lovin, 1970 and Stanford & Stevenson, 1972); and (b) pretest-to-psi test *shift* in frequency of such rhythms (significant positive correlation in Stanford & Lovin, 1970, Stanford, 1971, and Stanford & Stevenson, 1972). Suggesting methodological robustness, such findings have emerged not only in between-subjects work with forced-choice ESP testing (Stanford & Lovin, 1970;

Stanford, 1971), but also in a within-subject (i.e., single-subject) 80-trial study with free-response ESP testing (Stanford & Stevenson, 1972). Moreover, such findings seem conceptually interpretable, based on concepts derived from non-psi EEG-alpha work).

Potential high importance of end-of-session interviews: If we only gather the kinds of information that are part of the formal study, we may be missing highly revealing, important participant thoughts, memories, and insights that might enhance our understanding of the study and suggest areas for improvement. The post-session interview could begin by letting the participant know that learning about his or her personal experiences in and reactions to the study as a whole or any of its elements is greatly valued and the information, unique—that no one else can supply that information, which can help in understanding the study and its outcomes. The experimenter should invite, relative to any aspect of the study, questions, comments, good or bad experiences in it, concerns about it, and anything else that seems worth sharing. One should mention that the information reported in the interview will have the same level of anonymity as the data of the formal study and that participation in the interview or any part of it is not required, but that any information the participant might provide would be deeply appreciated. Do not rush things. Allot ample time for such interviews. Give the participant time to ponder the queries and to try to recall and put into words the reactions and experiences to be disclosed. Be attentive to any nonverbal signs that perhaps should inform the discourse. The tone should be inviting (not commanding) and friendly, much as if one were asking a good friend for help.

References

- Cardeña, E., & Marcusson-Clavertz, D. (2020). Changes in state of consciousness and psi in ganzfeld and hypnosis conditions. *Journal of Parapsychology*, *84*, 66-84.
- de Groh, M. (1989). Correlates of hypnotic susceptibility. In N. P. Spanos & J. F. Chaves (Eds.), *Hypnosis: The cognitive-behavioral perspective* (pp. 32-63). Prometheus.
- Kirsch, I., & Council, J. R. (1982). Situational and personality correlates of hypnotic responsiveness. In E. Fromm & M. R. Nash (Eds.), *Contemporary hypnosis research* (pp. 267-291). Guilford.
- Poulton, E. C. (1982). Influential companions: Effects of one strategy on another in the within-subjects designs of cognitive psychology. *Psychological Bulletin*, *91*, 673-690. doi.org/10.1037/0033-2909.91.3.673
- Roe, C., Cooper C., Hickinbotham, L., Hodrien, A., Kirkwood, L., & Martin, H. (2020). Performance at a pre-cognitive remote viewing task, with and without ganzfeld stimulation: Three experiments. *Journal of Parapsychology*, *84*, 38-65.
- Stanford, R. G. (1971). EEG alpha activity and ESP performance: A replicative study. *Journal of the American Society for Psychical Research*, *65*, 144-154.
- Stanford, R. G., Frank, S., Kass, G., & Skoll, S. (1989a). Ganzfeld as an ESP-favorable setting: Part I. Assessment of spontaneity, arousal, and internal attention state through verbal-transcript analysis. *Journal of Parapsychology*, *53*, 1-42.
- Stanford, R. G., Frank, S., Kass, G., & Skoll, S. (1989b). Ganzfeld as an ESP-favorable setting: Part II. Prediction of ESP-task performance through verbal-transcript measures of spontaneity, suboptimal arousal, and internal attention state. *Journal of Parapsychology*, *53*, 95-124.
- Stanford, R. G., & Frank, S. (1991). Prediction of Ganzfeld ESP-task performance from session-based verbal indicators of psychological function: A second study. *Journal of Parapsychology*, *55*, 349-376.

- Stanford, R. G., & Lovin, C. (1970). EEG alpha activity and ESP performance. *Journal of the American Society for Psychical Research*, *64*, 375-384.
- Stanford, R. G., & Stein, A. (1994). A meta-analysis of ESP studies contrasting hypnosis and a comparison condition. *Journal of Parapsychology*, *58*, 235-269.
- Stanford, R. G., & Stevenson, I. (1972). EEG correlates of free-response GESP in an individual subject. *Journal of the American Society for Psychical Research*, *66*, 357-368.
- Watt, C., Dawson, E., Tullo, A., Pooley, A., & Rice, H. (2020). Testing precognition and alterations of consciousness with selected participants in the ganzfeld. *Journal of Parapsychology*, *84*, 21-37.



Testing Precognition and Alterations of Consciousness with Selected Participants in the Ganzfeld¹

Caroline Watt, Emily Dawson, Alisdair Tullo, Abby Pooley, and Holly Rice

University of Edinburgh

Abstract. This study is the first to contribute to a registration-based prospective meta-analysis of ganzfeld Extrasensory Perception (ESP) studies. We sought to maximize the anticipated psi effect size by selecting participants for self-reported creativity, prior psi experience or belief, or practice of a mental discipline. We also employed an automated precognition design for simplicity and security, and to add to the small database of precognitive ganzfeld studies. Targets and decoys were short video clips randomly selected with replacement from a pool of 200. As well as predicting overall significant scoring on the ganzfeld precognition task, the study tested the assumption that the ganzfeld method elicits a psi-conducive altered state of consciousness, by correlating two measures of an Altered State of Consciousness (ASC) with precognition task performance. We predicted higher target similarity ratings would be associated with greater evidence of ASC during the session. Three experimenters each conducted 20 trials. Twenty-two direct hits were obtained (37% hit-rate), thus significantly supporting the planned test of the ganzfeld precognition task (exact binomial $p = .03$, 1-tailed). No relation was found between ASC and psi task performance, contrary to prediction. We conclude by discussing the reasons why further ganzfeld ESP research is justified. *Keywords:* Ganzfeld, precognition, meta-analysis, prospective meta-analysis, study registration

Parapsychologists have tested for extra-sensory perception (ESP) using a mild sensory isolation procedure known as the ganzfeld that was pioneered in the mid-1970s by Adrian Parker and Charles Honorton. Honorton's aim was that "the ganzfeld would provide a way of approximating the kinds of 'altered states' that have traditionally been associated with psi, particularly dreaming" (Stanford, 1993, p. 245). Honorton and the skeptical psychologist Ray Hyman published competing meta-analyses of the early ganzfeld ESP database in 1985 (Honorton, 1985; Hyman, 1985). This led to considerable debate over how to interpret the results of these meta-analyses and during the next few years researchers at several laboratories conducted ganzfeld ESP experiments (e.g., Bem & Honorton, 1994).

Milton and Wiseman evaluated 30 studies published between 1987 and February 1997. They con-

1 The authors are grateful to Laurène Vuillaume and Paul Nothdurft for their assistance in creating the target pool for this study. We wish to thank the Editor and reviewers for their helpful comments on the paper. Send correspondence to: Professor Caroline Watt, Department of Psychology, School of Philosophy, Psychology and Language Sciences, 7 George Square, Edinburgh EH8 9JZ, UK, Caroline.Watt@ed.ac.uk

cluded that the combined results from these studies were at chance (27% hit rate, where Mean Chance Expectation - MCE - is 25%) and therefore did not support the existence of ESP (Milton & Wiseman, 1999). Around a decade later, Storm and colleagues picked up from where Milton and Wiseman's work left off, reviewing an additional 30 ganzfeld studies published between March 1997 and 2008 (Storm et al., 2010). Discarding one positive study that was judged to be a statistical outlier, Storm and colleagues found an overall statistically significant result (32% hit rate) and claimed that the data supported the existence of ESP. When all these studies are combined, the overall hit rate is 30%.

Registration-based prospective meta-analysis. Bierman, Spottiswoode, and Bijl (2016) used simulations to argue that the ganzfeld database hit rate is probably inflated by questionable research practices (QRPs), though the database remains statistically significant when QRPs are accounted for. Watt and Kennedy (2017) recommend that many QRPs in the conduct of individual studies (such as data-mining or selective reporting) as well as in the conduct of meta-analysis (such as determining inclusion criteria to include or exclude particular studies after study results are known), can be eliminated by prospectively planning and pre-registering a meta-analysis of pre-registered studies, before any individual studies have been conducted. By using this method, key decisions in the conduct of the meta-analysis are made before individual study results are known, minimizing the possible effects of researcher bias.

At the 2016 Parapsychological Association convention, Watt and Kennedy (2016) promoted the idea of prospective meta-analysis, choosing ganzfeld ESP research as an exemplar because this is a relatively mature line of research. The decision to include a ganzfeld study in the meta-analysis and decisions about qualifications for the evaluation of study data are specified prospectively at the time the study is registered, which eliminates biases (pro or con) from methodological decisions after the study results are known and also allows adaptation to the unique characteristics of a study (unlike a large multi-center collaboration). Watt subsequently posted a prospective meta-analysis of ganzfeld studies on the Koestler Parapsychology Unit (KPU) Study Registry (Watt, 2017a), and the present study is the first to contribute to that endeavor (Watt, 2017b).

Maximizing effect size in the ganzfeld. Although four out of the five ganzfeld meta-analyses mentioned above yielded significant hit rates consistent with the ESP hypothesis, the effect sizes at the individual study level are quite variable (for example ranging from -0.26 to 0.47 in the Storm et al. database). Storm and colleagues reported one variable that could be an important contributor to this heterogeneity: participant type. They found a significantly lower effect size for studies with unselected participants, compared to those whose participants were selected on various criteria including previous experience in ESP experiments, psi belief, psi training, creative/artistic ability, or practice of a mental discipline such as meditation or relaxation [unselected $ES = 0.05$, selected $ES = 0.26$, $t(27) = -3.44$, $p = .002$ (2-t)]. Derakhshani (2014) confirmed that by splitting Storm, Tressoldi, and di Risio's studies into selected (14 studies) and unselected (16 studies) groups, the results for each group became homogeneous. Storm, Tressoldi, and di Risio (2010, p. 480) concluded that "34 years of ganzfeld research has more often than not produced a communications anomaly worth investigating further". However, they cautioned that researchers considering conducting ganzfeld research should note the near zero effect for studies employing unselected participants. Similar conclusions were reached in the review of ganzfeld ESP research by Baptista, Derakhshani, and Tressoldi (2015, p.198), who recommended that the expect-

ed effect size for ganzfeld ESP studies could be boosted through “exclusive use of selected participants.” In other words, if the internal patterns seen in the ganzfeld database are valid, then the use of selected participants should increase statistical power, meaning that fewer trials would be needed to detect a significant effect, compared to a study with unselected participants.

Precognition in the ganzfeld. Most ganzfeld ESP studies have employed either a telepathy or clairvoyance design, though the reason for this may vary from researcher to researcher. Discussing Charles Honorton’s approach, his friend Don McCarthy wrote that “He told me, not long ago, that in designing the ganzfeld procedure, a primary reason for his choosing a telepathy protocol was that it might lead to more ready acceptance, since people seemed less threatened by the idea of ‘mental radio’ than by other ways of conceptualizing psi” (McCarthy, 1993, p.9). Similarly, in discussing so-called sender/no-sender ganzfeld studies, Roe, Sherwood, and Holt (2004) concluded that the receiver’s expectancy as to whether or not a sender was involved in their session might be more important than whether or not a sender was actually involved. Most no-sender studies have adopted a clairvoyance design, however a few studies have tested for precognition in the ganzfeld.

As D. Scott Rogo has said: “Based on the hypothesis that psi represents a unified process there seems no a priori reason that the ganzfeld could not be adapted for the elicitation of precognitive-mediated imagery” (1977, p. 60). Indeed, Rogo is one of the handful of researchers who have used a precognition ganzfeld design, so far as we are aware. In these studies, the target is generated after the participant’s mentation has been reported, and in some cases after the judging has been completed. Significant positive scoring was found in all but one of these studies (see Table 1), though the methods and outcome measures used varied considerably within even this small sample of studies. (We therefore did not attempt to statistically combine these studies in a meta-analysis.) Compared to telepathy and clairvoyance designs, precognition protocols have the advantage of minimizing possible leakage of target-related information that could artifactually inflate hit rates. We suggest that the precognition ganzfeld might be a useful method to adopt, perhaps particularly for studies conducted by trainee experimenters, for those who do not have access to a separate sender room, or who do not have the resources to minimize the security risks that accompany telepathy or clairvoyance designs (e.g., Dalton et al., 1994). This latter point is even more acute nowadays given the ubiquity of mobile communication devices. In order to build on this small database, the present study employed a precognition design.

Table 1

Ganzfeld studies employing a precognition design.

Author	Results summary
Dunne et al., 1977	Mean rank sum 13.17 (6 trials, $p < .04$)
Rogo, 1977	Total correct scores 87/200 (MCE = 100; 20 trials, MCE = 5 per trial, $p = .07$)
Sargent & Harley, 1982	42% hit rate (24 trials, $p < .05$)

Wezelman et al., 1997 "eigensender"(pre-cognition/telepathy blend)	44% (32 trials, $p = .012$)
Roe et al., 2020, experiment 1	35% hit-rate (40 trials, $p = .038$)
Roe et al., 2020, experiment 2	40% hit-rate (40 trials, $p = .007$)
Roe et al., 2020, experiment 3	43% hit-rate (30 trials, $p = .001$)

Evaluating Alterations of Consciousness in the Ganzfeld

In his discussion of the role of altered states of consciousness (ASCs) in extrasensory experiences, Roe (2009, p.40) notes that there is only "meager" physiological evidence to support the assumption that the ganzfeld typically produces a state equivalent to the hypnagogic state that occurs as people drift off to sleep. Indeed there is both observational (Stanford, 1993) and physiological (Wackermann et al., 2001) evidence to suggest that there are wide individual differences in response to ganzfeld stimulation. For the most part, however, ganzfeld researchers neglect to take any measures to test the assumption that the participant is in an ASC during the psi session, or to evaluate whether there is any relation between degree of ASC and psi task performance (Cardeña & Marcusson-Clavertz, 2015).

Physiological measures such as EEG can be invasive and uncomfortable, making it less likely for the participant to be able to relax in the ganzfeld. However there are other self-report measures, such as Pekala's Phenomenology of Consciousness Inventory (PCI, Pekala 1991) and measures of distortions in the perception of time (Stanford, 1984), that may be useful to researchers seeking to establish whether there is any relation between degree of ASC and psi performance in the ganzfeld. Glicksohn's (2001) Retrospective Estimate of Duration task, for instance, may be used as a measure of the degree to which participants were absorbed in the ganzfeld session. Glicksohn suggests that "The more absorbed the subject becomes in his or her subjective experience (due to a predisposition for high absorption and/or via an experimental technique such as introspection or concentrative meditation), the slower time appears to be" (2001, p.9). In the context of the ganzfeld, Glicksohn's reasoning implies that the absorbed participant under-estimates the duration of the impression period.

A few ganzfeld studies have employed questionnaire indices of ASC. Marcusson-Clavertz and Cardeña (2011) investigated how hypnotizability and alterations of consciousness might be associated with scoring in a ganzfeld telepathy task. Alteration of consciousness was measured using the PCI, which has 12 major dimensions of consciousness and 15 sub-dimensions (note that one PCI sub-dimension is Time Sense, however that includes questions about both perceived speeding-up and slowing-down of time, so it cannot be used as an alternative measure of the under-estimation of time). The PCI is a state rather than trait measure, in that participants are directed to complete it with reference to their subjective experiences during a preceding time period. To give a more sensitive measure of psi task performance

than hit or miss, psi z-scores were calculated from each participant's target ratings. The experiment had two sessions. In the first session, participants completed the PCI following a ganzfeld stimulation period that did not involve a psi task. In the second session, which took place on a different day, participants did a ganzfeld telepathy task. Participants were split into high and low hypnotizable groups, and correlations were calculated between these groups and the 12 PCI major dimensions and 15 sub-dimensions (therefore 54 correlations were conducted). Most of the correlations were non-significant, however significant positive correlations were found only for the high hypnotizable group, between psi scoring and the major PCI dimensions of Altered State and Altered Experience, and also between psi scoring and the PCI Altered Experience sub-dimensions of both Altered Perception and Time Sense. Unfortunately it is difficult to know how to interpret these findings, because the correlation was between first session PCI scores following ganzfeld stimulation without a psi task, and second session ganzfeld psi task scores. We do not know whether participants experienced the same altered state the second time they experienced the ganzfeld, particularly given that they knew the second ganzfeld session was a psi task.

Cardeña and Marcusson-Clavertz (2020) addressed this limitation by conducting a study where the PCI and the ganzfeld psi task were administered in the same session. They found a significant correlation between PCI scores (greater attentional focus and low arousal during the ganzfeld stimulation period) and psi task performance. This finding is in line with a study (Experiment 1 of Roe et al., 2020) that found performance on a ganzfeld precognition task correlated with greater absorption with subjective experience, lower arousal, and reduced internal dialogue. However a follow-up study (Experiment 2 of Roe et al., 2020) found that only alterations in time sense significantly correlated with ganzfeld performance, and Roe et al.'s experiment 3 found no association between PCI dimensions and ganzfeld performance (Roe & Hickinbotham, 2015). Interestingly, Cardeña and Marcusson-Clavertz (2020) administered the PCI before and after the ganzfeld session, enabling them to explore whether there was any correlation between *shift* in Altered State and psi task performance, and indeed a significant positive correlation was found. From the above literature, it seems that currently there is not a clear relation between PCI scoring and ganzfeld task performance.

Objective

Our study aims to add to this small literature by assessing the relation between participants' state of consciousness in the ganzfeld (measured by PCI and Glicksohn's time estimation task) and psi performance (indexed by session z-scores). Selected participants were recruited, following the recommendations of Storm et al. (2010) and Baptista et al. (2015) to increase anticipated effect sizes. This study was designed, pre-registered, and supervised by Watt and sessions were conducted by Dawson, Pooley, and Rice. Watt conducted analyses independently (confirming the analyses by Dawson, Pooley, and Rice). A precognitive protocol was employed for simplicity, for security against leakage of target information, and to add to the small but positive database of precognitive ganzfeld studies. Tullo (a member of the University's IT support staff) wrote the program to control presentation and selection of targets and to record and upload session data, conducted randomness tests, and independently checked the number of direct hits at the end of data collection. The study was pre-registered on the KPU Registry (Watt, 2017b) and, as it meets the inclusion criteria, is the first study to contribute to the prospective meta-analysis of ganzfeld ESP studies (Watt, 2017a).

Method

Materials

Participant Information Questionnaire (PIQ). The PIQ, developed for research at the Koestler Parapsychology Unit, includes demographic questions as well as questions regarding paranormal beliefs and experiences, practice of mental disciplines, and self-reported creativity. A copy is available from the corresponding author on request.

Australian Sheep-Goat Scale (ASGS; Thalbourne, 1995). This 18-item scale includes statements about belief in and experience of putatively psychic phenomena including survival, precognitive dreams, extrasensory perception, and psychokinesis. Participants indicate their attitude to each statement, responding either 0=false; 1=uncertain; 2=true. Therefore scores can range from 0 to a maximum of 36.

Time estimation task. At the end of the exposure period, participants were asked to estimate the session duration from the onset of the relaxation exercise, as follows: "In your estimation, how long did this experiment take in minutes?" This measure was based on Glicksohn's (2001) Retrospective Estimation of Duration task. The participant's monitor displayed a sliding bar that ranged from 0-90 minutes. Below this was the direction, "Move the mouse and click to give your answer." Once participants had clicked to submit their estimation, their responses were recorded on the server. Care was taken to ensure participants did not refer to any timepieces, and experimenters avoided precisely informing participants of the session duration beforehand – so participants knew their visit to the department would take about 90 minutes in total, but were not told how long the exposure period would be.

Phenomenology of Consciousness Inventory (PCI). The Phenomenology of Consciousness Inventory is a valid and reliable self-report questionnaire (Pekala, 1991). The participant rates each of the 53 items on a seven-point scale, with reference to a preceding period (in the present case, the period of ganzfeld stimulation). Each item provides two opposite statements that anchor the responses, for example "I was forever distracted and unable to concentrate on anything" and "I was able to concentrate quite well and was not distracted." The PCI assesses 12 major dimensions of consciousness and 14 sub-dimensions. The dimensions (and sub-dimensions) are: Positive Affect (PA: joy, sexual excitement, and love), Negative Affect (NA: anger, sadness, and fear), Altered Experience (AE: body image, time sense, perception, and meaning), Visual Imagery (VI: amount, vividness), Attention (ATT: direction, absorption), Self-Awareness (SA), Altered State (AS), Internal Dialogue (ID), Rationality (RA), Volitional Control (VC), Memory (ME), and Arousal (AR).

Relaxation and white noise track. When initiated, the computer program plays the participant an audio recording consisting of approximately 9 minutes of a progressive relaxation exercise, followed by guidance on reporting mentation lasting approximately one minute, followed by 25 minutes of white noise.

Target Pool. There are 50 target pools, each consisting of four dynamic visual targets (60-90-second color film clips with audio), which had been obtained from the Internet (e.g. YouTube clips, home movies, arts media projects) grouped with the aim that they be orthogonal to one another (seeking to

avoid overlapping content). During the experiment, the target pools and targets were sampled with replacement. The target pool was created by visiting student research interns.

Random Number Generator. The TrueRNG3 (USB hardware RNG produced by ubld.it) was used whenever a source of randomness was needed in this study (for target pool selection, order of presentation of target pool on screen for judging, and for target selection.) The RNG was tested by Tullo before formal data collection began, simulating 1,500,000 trials. The relative frequency of each of 4 clips being selected as target did not deviate from MCE (1/4) by more than 0.03%. The relative frequency of each of the 50 pools being selected did not deviate from MCE (1/50) by more than 0.03%. The relative frequency of each of the 200 clips being selected as target did not deviate from MCE (1/200) by more than 0.02%.

Participant Recruitment and Selection Criteria

Participants were primarily recruited from the KPU volunteer panel (mostly consisting of individuals who have visited the Koestler Parapsychology Unit website and submitted their contact details via the “participate” button), and also through social media and personal contacts of the experimenters. They were selected on the basis of their responses to the KPU Participant Information Questionnaire. Participants under 18 and those who reported a mental health disorder currently or within the past 5 years were excluded from participation. Volunteers were selected for participation if they reported at least one of: practice of a mental discipline; previous psi belief or experience; and creative/artistic ability (“How would you rate yourself for level of creative/artistic ability?” 5-point scale anchored Low and High), scoring at least 3 on this question.

Experimenter Characteristics and Lab “Ambience”

The three experimenters who had contact with participants were female final year undergraduate psychology students in their 20s, and rated their belief that the psi hypothesis in this study would be supported as 3, 4, and 5 (where 5 = strongly supportive). Watt, who rated her belief that the psi hypothesis in this study would be supported as 4, had no contact with participants other than initially emailing to thank those who had volunteered themselves for research participation via the KPU website. Watt monitored the progress of the experiment to ensure that it was on schedule, and periodically copied the recordings of the session mentations for later transcription, all the while remaining unaware of the session outcome. Considerable efforts were made to create a welcoming and friendly atmosphere for participants. The reception room was decorated with art prints of Edinburgh, had comfy seats around a small coffee table, and refreshments were provided. To help provide a pleasant environment in the ganzfeld chamber, lighting was kept low, the walls were draped with fabric wall hangings, and a blanket was provided to help participants feel comfortable in the reclining chair. The experimenters sought to be welcoming and friendly with participants.

Procedure

The experiment was approved by the University of Edinburgh School of Philosophy, Psychology and Language Sciences ethics committee. It was conducted on the premises of the Psychology department between December 2017 and March 2018.

The experimenter prepared the ganzfeld laboratory, initiating the experiment program, inputting the date and time, and indicating whether the session was formal or informal (date and time was automatically collected by the program as well). Initial practice sessions were labeled as informal and were excluded from analysis; all sessions included in this study were formal, and no formal sessions were excluded. The initial session information was uploaded to a remote server by the program before the rest of the session progressed.

On arrival, participants were taken to the reception room and briefed about the procedure, including tips on free-response judging (Delanoy et al., 2004), and any questions were answered. They then completed the ASGS (in paper-and-pencil form) and were taken to the ganzfeld laboratory (a windowless metal chamber that has no adjoining rooms) located about 100 meters away from the reception room in a garden outside the main psychology building. The participant reclined in a comfortable chair in the chamber. The experimenter monitored the participant from within the same chamber. Adjacent to the reclining chair was a small table with a computer keyboard, monitor, and digital audio recorder. A floor-standing anglepoise lamp was also adjacent to the chair.

The lamp was directed towards the participant who wore the translucent red eye-mask, and the distance was adjusted to a comfortable level, so that with eyes open the participant perceived a uniform red field. The experimenter briefly reiterated the procedure, making sure that the participant understood it was a precognition study and that the goal was for their mentation to relate to the randomly chosen target that they would see at the very end of the session. The experimenter answered any remaining questions. The participant donned the headphones and the program then played a few seconds of white noise so the participant could adjust the volume to a comfortable level. The experimenter activated the recorder and recorded the experimenter's name, the participant's ID number, and the date and time. The experimenter remained in the room with the participant as the session proceeded.

The audio recording first delivered the relaxation exercise and then played the white noise during which time participants reported their thoughts, feelings, and imagery (the mentation period). Just prior to the mentation period, the audio recording directed the participant to make a gentle wish that their thoughts and impressions during the session would relate to the target. The participant's mentation was audio recorded and the experimenter also took notes of the mentation as the participant spoke.

At the conclusion of the mentation period, participants removed their headphones and eye-mask. Participants' monitors prompted them to estimate the duration of the session. The experimenter then reviewed the mentation with the participant and invited them to make any further comment or elaboration on their impressions. When the participant was ready to judge the target possibilities, the computer program randomly selected a target pool and then randomly ordered the four clips for presentation to the participant for judging. The participant viewed each clip and rated each clip from 1 (= no correspondence) to 100 (= perfect correspondence) to reflect the perceived similarity between the mentation and the clip. No tied ratings were permitted. The experimenter could remind the participant of their mentation report during the judging (the experimenter and participant were still blind to the target identity at this point.) The participant could review any of the clips and make changes to their

ratings until the point that they finally decided to submit their ratings. When the ratings were submitted, the program uploaded the participant's ratings in duplicate (locally and to a distant server). The PCI was then administered as a paper-and-pencil measure.

Finally, as this was a precognition design, when the participant was ready to discover the identity of the target the target clip was randomly selected by the program. The target identity was uploaded to the remote server before it was revealed to the participant and the experimenter.

Precautions against Fraud and Error

This study took several precautions to attempt to minimize experimenter and participant fraud and error.

1. There were three experimenters (one per session, 20 trials per experimenter). Mentations were recorded for later transcription.
2. During the session, the data were automatically dated and time-stamped and kept in duplicate, both locally on the lab PC, and uploaded to a remote University of Edinburgh server. The time stamp was added by the server and so could not be faked by the experimenter. The IP address of the incoming message was also recorded, so messages sent from anywhere other than the experiment PC would be detected. The experimenters and lead researcher did not have access to the remote server because only the programmer had the password to the server. The programmer was a member of the IT support staff for the School of Philosophy, Psychology and Language Sciences, and had no affiliation to the KPU or vested interest in a particular study outcome.
3. There were three data uploads. The first occurred at the start of the session (recording experimenter ID, participant ID and demographics, and whether the session was classified as formal or informal). The second occurred when the participant's target ratings had been completed and submitted, before the target identity was randomly selected, and included the time estimation task score. The third occurred after the target was selected and before the experimenter or participant had seen the target identity. All formal trials were reported.
4. To prevent the risk of leakage of target information before the target judging was completed, a precognition design was used. Therefore the judging was completed, recorded, and uploaded before the computer randomly selected the target.
5. To prevent bias or patterning in the target selection, a commercially available RNG (TrueRNG3) was used to randomly select the target pool, the order of presentation of the target clips during judging, and the target. The study RNG was tested to make sure there was no bias in the relative frequency of target pool selection (1/50), of target clip selection (1, 2, 3, or 4), or of target selection (1/200).
6. After conclusion of the data collection, the programmer independently verified the number of direct hits by checking the duplicate data held on the remote server, unaware of the number of hits the experimenters had recorded on the computer running the experiment. No discrepancy was found.

Hypotheses

The study was pre-registered on the KPU Study Registry (Watt, 2017b). The planned number of participants was 60, with one trial per participant. Both hypotheses were exploratory for three reasons: 1. It is the first study run using a new automated ganzfeld testing program at the KPU; 2. There are few previous ganzfeld studies using a precognition design. 3. Limited resources mean that the study has a sub-optimal power for a confirmatory study.

H1: Participants will correctly identify the randomly selected target clip at greater than chance expectation (tested using exact binomial probability, where $p_{\text{hit}} = .25$, $\alpha p \leq 0.05$, one-tailed).

H2a and 2b: Those participants showing alterations of consciousness during the ganzfeld session (as indexed by the PCI and the time estimation task) will have higher scores on the precognition task (tested by correlating PCI scores and time estimation scores against session z-score calculated from target and decoy ratings, $\alpha p \leq 0.05$, one-tailed). It was predicted that those participants who under-estimated the duration of the session would have better psi performance than those who were accurate or who thought that the session lasted longer than it actually did.

Results

Participant Demographics

Sixty volunteers (28 male, 32 female, $M_{\text{age}} = 34.2$, $SD = 18.13$, Range 18-80 years) took part in the study, and 34 were students. The majority of participants had either self-reported as creative/artistic (83%), practiced a mental discipline (78%), and/or had previous psi experience (85%). Australian Sheep Goat Scale $M = 16.17$, $SD = 8.77$; 47% of participants scored ≥ 18 on the ASGS.

Missing Ratings

About three-quarters of the way through the experiment, AP inspected the computer records of the session results, and discovered that some target ratings were missing on four trials and reported this fact to CW. At this point CW did not know whether these trials had been hits or misses. While still unaware of the session outcomes, CW decided not to conduct any extra sessions to replace the affected trials, but to include the computer's hit or miss score for these four trials in the overall test of the precognition hypothesis, but to discard these four trials from the testing of the ASC hypotheses (because session z-scores could not be calculated with missing ratings.) Table 2 shows the details of the trials on which the computer record of clip ratings was incomplete.

Table 2

Trials where target ratings were not fully recorded.

Trial number	Clip1 rating	Clip2 rating	Clip 3 rating	Clip 4 rating	Highest rated clip	Target clip
8	1	-	-	-	3	3 (=hit)
20	-	-	-	-	1	4 (=miss)
30	70	80	-	-	2	2 (=hit)
40	-	1	-	-	4	4 (=hit)

Hypothesis 1: Precognition task performance. Participants had 22 direct hits out of 60 trials (37% hit-rate). The count of 22 hits recorded by the computer controlling the session was independently verified by checking the duplicate session data held on the remote server. This was statistically significant on the planned test (exact binomial $Z = 1.94$, $p = 0.03$, 1-t, $ES (Z/\sqrt{N}) = 0.25$), thus supporting Hypothesis 1 that participants could correctly identify the precognitive target from among the decoy targets. Table 3 shows the ranks allocated to the target (due to the software error, the target ranking was not available for one trial where a miss occurred therefore $N=59$ for this table).

Table 3

Target rankings

Rank of target video	First	Second	Third	Fourth
Frequency	22	14	9	14
Rate (%)	37	23	15	23

Hypothesis 2a, 2b: Relation between measures of ASC and psi task performance.

As planned for the purposes of correlational tests, session z-scores were employed as a potentially more sensitive index of psi task performance than direct hits. Session z-scores were calculated from the participants' target and decoy ratings, using the following formula:

$$Z = \frac{X_i - \bar{X}}{\sqrt{S_x/N}}$$

where X_i is the rating assigned to the target, \bar{X} is the mean of all ratings in the trial, S_x is the standard deviation of the ratings, and N is the number of ratings in the trial (= 4). Session z-scores ranged from 17.14 to -15.61 ($M = 1.35$; $SD = 8.21$).

Phenomenology of Consciousness Inventory. To test Hypothesis 2a, session z-scores were correlated against the 12 major PCI dimensions. The correlations were either rather small or near-zero (see

Table 4), and no significant relation was found between psi task performance and PCI scores, therefore no support was found for Hypothesis 2a ($df = 54$ because in four sessions ratings were unavailable and z-score could not be calculated. No correction for multiple analyses has been applied.)

Table 4

Spearman correlations between PCI dimensions and session z-scores; $p(2-t)$

	AE	PA	NA	ATT	IM	SA	AS	AR	RA	VC	ME	ID
rho	.02	-.09	-.06	-.16	.14	.17	-.12	-.14	.12	.14	.09	.14
p	.90	.50	.670	.25	.30	.21	.38	.30	.38	.32	.52	.31

Time estimation. The objective duration of the combined relaxation exercise and impression period was about 35 minutes. Participants' estimates of the duration of the relaxation and impression period ranged from 8 to 90 minutes ($M = 26.30$ minutes, $SD = 13.49$).

To test Hypothesis 2b, session z-scores were correlated against participants' estimations of time duration for the session. It was predicted that participants who under-estimated the time of the session (and whose state of consciousness was apparently more altered from the normal waking state) would have better psi performance. Due to an outlier in the time estimation data, it was decided to use a non-parametric Spearman's correlation. The predicted relation was not found ($rho = 0.075$, $df = 54$, $p = 0.582$), so Hypothesis 2b was not supported.

Discussion

This study was the first to contribute to a registration-based prospective meta-analysis of ganzfeld ESP studies (Watt, 2017b). As recommended by recent reviewers of the ganzfeld ESP database (Baptista et al., 2015; Storm et al., 2010), we sought to maximize the anticipated effect size by selecting participants for any combination of self-reported creativity, prior psi experience or belief, or practice of a mental discipline. Our study employed an automated precognition design for simplicity and security, and to add to the small but positive database of precognitive ganzfeld studies. Three experimenters each conducted 20 trials, and 22 direct hits were obtained (37% hit-rate), significantly supporting the study hypothesis that participants would be able to correctly identify the randomly chosen future target video clip from amongst the decoy targets.

Addressing researchers' recommendations (Cardeña & Marcusson-Clavertz, 2015; Roe, 2009) to test the assumption that the ganzfeld method elicits a psi-conducive altered state of consciousness, we correlated two measures of ASC with psi task performance, predicting higher target similarity ratings would be associated with greater evidence of alterations of consciousness during the session. However, our results did not replicate the findings of Cardeña and Marcusson-Clavertz (2020), who found that ganzfeld task performance correlated positively with the PCI scale attention and negatively with the scale for arousal.

Like Roe et al. (2020), our study found no consistent relation between PCI and ganzfeld psi task performance. Considering why there seems to be some inconsistency in findings from studies that have sought to correlate PCI scores with ganzfeld task performance, it is possible that the studies reporting correlations between PCI and session z-scores (Cardeña & Marcusson-Clavertz, 2020; Roe et al., 2020 Experiments 1 and 2) obtained *some* spurious correlations due to Type I error. This is possible because there are 12 PCI major dimensions and 14 sub-dimensions, so without correction for multiple analyses spurious correlations are bound to occur just by chance. Furthermore, methodological variations such as administering the PCI in a separate session to the ganzfeld psi session (Marcusson-Clavertz & Cardeña, 2011) or having just 20 minutes of ganzfeld stimulation (Cardeña & Marcusson-Clavertz, 2020) could also introduce some extraneous factors that could make meaningful relations harder to detect. At this stage we can only conclude that there seems to be little consistency in how PCI scores relate to ganzfeld performance, and we would recommend correction for multiple analysis to reduce the risk of reporting spuriously significant correlations in future.

Furthermore, using Glicksohn's (2001) time estimation task, we did not find support for the hypothesis that participants who underestimated the duration of the session would perform better on the ganzfeld precognition task. Our results also fail to conceptually replicate those found in a ganzfeld study by Bierman (1988), whose participants were asked to do a time reproduction test that is conceptually similar to Glicksohn's task, after the ganzfeld stimulation ended. The 10 participants who were categorized by Bierman as time contractors obtained a 77% hit-rate (10 trials), compared to a 17% hit-rate for the 6 who were not contractors. Bierman identified "time contractors" as anyone who estimated a time that fell below the median. The median time estimation in the present study = 25 minutes. On this criterion, 28 of our participants deemed to be time contractors obtained 9 hits (32% hit-rate), and 32 participants deemed not to be time contractors obtained 13 hits (41% hit-rate), so if anything our results trended in the reverse direction to that expected following Bierman (1988). Nevertheless, we agree that there is a need for parapsychologists to continue to assess the assumptions underlying our research methods, and urge that future ganzfeld studies attempt to assess participants' state of consciousness during the experimental session.

Conclusion

Although many researchers have understandably shifted their interests to unconscious measures of psi (e.g., Bem, 2011), we feel that ganzfeld research deserves continued effort. First, despite using an environment (ping pong balls, white noise, red light) that some people might think is different from real life settings, the use of relaxation and mild sensory isolation to elicit possibly psi-conducive states of consciousness maps onto the characteristics of many spontaneously reported paranormal experiences (e.g., Rhine, 1961; Roe, 2009). When designing our studies, we think it is important not to lose sight of how extrasensory experiences appear to manifest in the real world. Second, there is the opportunity to build upon the considerable work that has already been done with the ganzfeld method. This includes: recruiting selected participants, as indicated by trends in prior studies; using techniques such as study registration and prospective meta-analysis (PMA) to increase confidence in study outcomes; and adopting more process-oriented research efforts such as assessments of altered state of consciousness in the

ganzfeld. Finally, our study adds to the small database of ganzfeld studies with a *precognition* design that have nearly all obtained positive results. Researchers may be deterred from using a telepathy design partly due to the difficulty nowadays of ensuring no leakage of information about the target, so it is encouraging to find that the more simple and secure precognition method has so far proved fruitful.

References

- Baptista, J., Derakhshani, M., & Tressoldi, P. (2015). Explicit anomalous cognition: A review of the best evidence in ganzfeld, forced-choice, remote viewing and dream studies. In E. Cardeña, J. Palmer, and D. Marcusson-Clavertz (Eds.) *Parapsychology: A handbook for the 21st Century*. McFarland.
- Bem, D. J. (2011). Feeling the future: Experimental evidence for anomalous retroactive influences on cognition and affect. *Journal of Personality and Social Psychology*, *100*, 407-425. <https://doi.org/10.1037/a0021524>
- Bem, D. J., & Honorton, C. (1994). Does psi exist? Replicable evidence for an anomalous process of information transfer. *Psychological Bulletin*, *115*, 4-18. <https://doi.org/10.1037/0033-2909.115.1.4>
- Bierman, D. J. (1988). A test on possible implications of the OTs for Ganzfeld research. *European Journal of Parapsychology*, *7*, 1-12.
- Bierman, D. J., Spottiswoode, J. P., & Bijl, A. (2016). Testing for questionable research practices in a meta-analysis: An example from experimental parapsychology. *PLoS ONE*, *11*: e0153049. <https://doi.org/10.1371/journal.pone.0153049>
- Cardeña, E., & Marcusson-Clavertz, D. (2015). States, traits, cognitive variables, and psi. In E. Cardeña, J. Palmer, & D. Marcusson-Clavertz (Eds.), *Parapsychology: A handbook for the 21st century*. McFarland.
- Cardeña, E., & Marcusson-Clavertz, D. (2020). Changes in state of consciousness and psi in ganzfeld and hypnosis conditions. *Journal of Parapsychology*, *84*, 66-84.
- Dalton, K., Morris, R. L., Delanoy, D., Radin, D., Taylor, R., & Wiseman, R. (1994). Security measures in an automated ganzfeld system. *Proceedings of the 37th Annual Convention of the Parapsychological Association*, pp.114-123.
- Delanoy, D. L., Morris, R. L., & Watt, C. A. (2004). A study of free-response ESP performance and mental training techniques. *Journal of the American Society for Psychical Research*, *98*, 28-67.
- Derakhshani, M. (2014). On the statistical replicability of ganzfeld studies. Unpublished paper.
- Dunne, B. J., Warnock, E., & Bisaha, J. P. (1977). Ganzfeld techniques with independent rating for measuring GESP and precognition. In J. D. Morris, W. G. Roll, and R. L. Morris (Eds.), *Research in parapsychology 1976* (pp. 41-43). Scarecrow.
- Glicksohn, J. (2001). Temporal cognition and the phenomenology of time: A multiplicative function for apparent duration. *Consciousness and Cognition*, *10*, 1-25. <https://doi.org/10.1006/ccog.2000.0468>
- Honorton, C. (1985). Meta-analysis of psi ganzfeld research: A response to Hyman. *Journal of Parapsychology*, *49*, 51-91.
- Hyman, R. (1985). The ganzfeld psi experiment: A critical appraisal. *Journal of Parapsychology*, *49*, 3-49.
- Marcusson-Clavertz, D., & Cardeña, E. (2011). Hypnotizability, alterations in consciousness, and other variables as predictors of performance in a ganzfeld psi task. *Journal of Parapsychology*, *75*, 235-259.
- McCarthy, D. (1993). To boldly go: An appreciation of Charles Honorton. *Journal of Parapsychology*, *57*, 7-23.
- Milton, J., & Wiseman, R. (1999). Does psi exist? Lack of replication of an anomalous process of information transfer. *Psychological Bulletin*, *125*, 387-391. <https://doi.org/10.1037/0033-2909.125.4.387>
- Pekala, R. J. (1991). *Quantifying consciousness: An empirical approach*. Plenum. <https://doi.org/10.1007/978-1-4899-0629-8>
- Rhine, L. E. (1961). *Hidden channels of the mind*. William Morrow & Co.

- Roe, C. A. (2009). The role of altered states of consciousness in extrasensory experiences. In M. Smith (Ed.), *Anomalous experiences: Essays from parapsychological and psychological perspectives* (pp. 25-49). McFarland.
- Roe, C., Cooper C., Hickinbotham, L., Hodrien, A., Kirkwood, L., & Martin, H. (2020). Performance at a precognitive remote viewing task, with and without ganzfeld stimulation: Three experiments. *Journal of Parapsychology*, 84, 38-65.
- Roe, C. A., Sherwood, S. J., & Holt, N. J. (2004). Interpersonal psi: Exploring the role of the sender in ganzfeld GESP tasks. *Journal of Parapsychology*, 68, 361-380.
- Rogo, D. S. (1977). A preliminary study of precognition in the ganzfeld. *European Journal of Parapsychology*, 60-67.
- Sargent, C. L. & Harley, T. A. (1982). Precognition testing with free-response techniques in the ganzfeld and the dream state. *European Journal of Parapsychology*, 4, 243-256.
- Stanford, R. G. (1984). Recent ganzfeld-ESP research: A survey and critical analysis. In S. Krippner (Ed.) *Advances in Parapsychological Research 4* (pp. 83-111). McFarland.
- Stanford, R. G. (1993). ESP research and internal attention states: Sharpening the tools of the trade. In L. Coly and J. D. S. McMahan (Eds.), *Psi research methodology. A re-examination*. Parapsychology Foundation.
- Storm, L., Tressoldi, P. E., & DiRisio, L. (2010). Meta-analysis of free-response studies, 1992–2008: Assessing the noise reduction model in parapsychology. *Psychological Bulletin*, 136, 471-485. <https://doi.org/10.1037/a0019457>
- Thalbourne, M. A. (1995). Further studies of the measurement and correlates of belief in the paranormal. *Journal of the American Society for Psychical Research*, 89, 234-247.
- Wackermann, J., Pütz, P., Miener, M., & Schmitz-Gropengieser, F. (2001). Electrophysiological correlates (EEG) of ganzfeld stimulation and ganzfeld imagery. *Proceedings of Presented Papers: The Parapsychological Association 44th Annual Convention*, 423-426.
- Watt, C. A. (2017a). A prospective meta-analysis of pre-registered Ganzfeld ESP studies. http://www.koestler-parapsychology.psy.ed.ac.uk/Documents/KPU_Registry_1024.pdf
- Watt, C. A. (2017b). Exploring individual differences in ganzfeld precognition task performance with selected participants. http://www.koestler-parapsychology.psy.ed.ac.uk/Documents/KPU_Registry_1039.pdf
- Watt, C. A., & Kennedy, J. (2016). Stimulating progress in parapsychology: Prospective meta-analysis. *Abstracts of the 59th Annual Convention of the Parapsychological Association, and 35th Annual Convention of the Society for Scientific Exploration*, p. 49.
- Watt, C., A. & Kennedy, J. E. (2017). Options for prospective meta-analysis and introduction of registration-based prospective meta-analysis. *Frontiers in Psychology*, 7, 2030. <https://doi.org/10.3389/fpsyg.2016.02030>
- Wezelman, R., Gerding, J. L. F., & Verhoeven, I. (1997). Eigensender ganzfeld psi: An experiment in practical philosophy. *European Journal of Parapsychology*, 13, 28–39.

Test de la Précognition et des États Modifiés de Conscience avec des Participants Sélectionnés dans le Ganzfeld

Résumé. Cette étude est la première à contribuer à une série d'études de la perception extra-sensorielle dans le Ganzfeld intégrées dans une méta-analyse prospective pré-enregistrée. Nous avons cherché à maximiser la taille d'effet psi anticipée en sélectionnant des participants à partir de la créativité au-

to-rapportée, les expériences ou croyances psi préalables, et la pratique d'une discipline mentale. Nous avons également employé un protocole automatisé de précognition à des fins de simplification et de sécurité, et également pour l'inclure dans la base de données des rares études précognitives en Ganzfeld. Les cibles et les leurres étaient de courts clips vidéo sélectionnés aléatoirement avec remplacement dans une réserve de 200. En plus de prédire le score global significatif sur la tâche précognitive au Ganzfeld, l'étude testait l'hypothèse selon laquelle la méthode Ganzfeld favorise un état modifié de conscience favorisant le psi, en corrélant deux mesures d'états modifiés de conscience avec les performances à la tâche précognitive. Nous avons prédit des meilleures évaluations de similitudes des cibles corrélées avec des manifestations plus claires d'états modifiés de conscience durant la session. Les trois expérimentateurs ont chacun conduit 20 essais. Vingt-deux réussites directes furent obtenues (taux de succès de 37 %), ce qui vient soutenir le test planifié de performance à la tâche précognitive (binomiale exacte $p = .03, 1-t$). Aucune relation ne fut trouvée entre les états modifiés de conscience et les performances à la tâche psi, contrairement à ce qui était prédit. Nous concluons en discutant l'intérêt des futures recherches sur la perception extra-sensorielle en Ganzfeld.

Zur Überprüfung von Präkognition und veränderten Bewusstseinszuständen mit ausgewählten Teilnehmern im Ganzfeld

Zusammenfassung. Diese Studie ist die erste, die zu einer prospektiven Metaanalyse von zuvor registrierten Ganzfeld-Studien zur Außersinnlichen Wahrnehmung (ASW) beiträgt. Wir versuchten, einen erwarteten Psi-Effekt zu maximieren, indem wir Teilnehmer aufgrund ihrer selbstberichteten Kreativität, früherer Psi-Erfahrungen oder -Überzeugungen oder der Ausübung einer mentalen Disziplin auswählten. Aus Gründen der Einfachheit und Sicherheit verwendeten wir auch ein automatisiertes Präkognitionsdesign, um zusätzlich zur Erweiterung der geringen Datenbasis präkognitiver Ganzfeldstudien beizutragen. Ziel- und Kontrollbilder waren kurze Videoclips, die zufällig aus einem Pool von 200 Bildern mit Zurücklegen ausgewählt worden waren. Neben der Vorhersage eines signifikanten Gesamteffektes der Ganzfeld-Präkognitionsaufgabe sollte die Studie auch die Annahme testen, dass die Ganzfeld-Methode einen psi-förderlichen veränderten Bewusstseinszustand hervorruft, indem zwei Maße des veränderten Bewusstseinszustands (Altered State of Consciousness, ASC) mit dem Ergebnis der Präkognitionsaufgabe korreliert wurden. Wir sagten vorher, dass die Ähnlichkeit der Übereinstimmungen mit den Zielbildern mit dem Grad der Ausprägung des ASC während der Sitzung verknüpft war. Drei Experimentatoren führten jeweils 20 Einzelversuche durch. Es wurden zweiundzwanzig direkte Treffer erzielt (37% Trefferquote), was den geplanten Test der Ganzfeld-Präkognitionsaufgabe signifikant unterstützt (exakter Binomialtest $p = .03, 1-t$). Entgegen der Vorhersage wurde kein Zusammenhang zwischen dem ASC und der Psi-Aufgabe gefunden. Abschließend diskutieren wir die Gründe, die für eine Fortsetzung der Ganzfeld-ASW-Forschung sprechen.

Evaluación de Precognición y Alteraciones de Consciencia en Ganzfeld con Participants Seleccionados

Resumen. Este es el primer estudio en contribuir a un meta-análisis prospectivo basado en registro de estudios de Percepción Extrasensorial (PES) en ganzfeld. Intentamos maximizar el tamaño anticipado del efecto psi seleccionando participantes con creatividad autoinformada, experiencia o creencia psi previa, o práctica de una disciplina mental. También empleamos un diseño de precognición automatizado por simplicidad y seguridad, y para agregar a la pequeña base de datos de estudios precognitivos de ganzfeld. Los objetivos y los señuelos fueron segmentos de 200 video seleccionados al azar con reemplazo. Además de predecir una puntuación general significativa en la tarea de precognición en ganzfeld, el estudio evaluó la hipótesis de que el método ganzfeld provoca un estado alterado de consciencia facilitador de psi, correlacionando dos medidas de estados alterados de consciencia (EAC) con el rendimiento en la tarea de precognición. Predijimos que las puntuaciones de similitud de objetivos más altas se asociarían con una mayor evidencia de EAC durante la sesión. Tres experimentadores realizaron cada uno 20 ensayos. Se obtuvieron 22 aciertos directos (37% de aciertos), lo que respalda significativamente la prueba planificada de la tarea de precognición en ganzfeld (probabilidad binomial exacta = 0.03, 1-t). No encontramos relación entre el rendimiento de la tarea EAC y psi, contrariamente a nuestra predicción. Concluimos discutiendo las razones por las que se justifica investigación adicional de PES en ganzfeld.



Performance at a Precognitive Remote Viewing Task, with and without Ganzfeld Stimulation: Three Experiments¹

Chris A. Roe, Callum E. Cooper, Laura Hickinbotham,
Andrew Hodrien, Laurie Kirkwood, and Hannah Martin

University of Northampton

Abstract. Recent research by the lead author has sought to incorporate ganzfeld stimulation as part of a remote viewing protocol. An initial exploratory experiment (Roe & Flint, 2007) suggested that novice participants can successfully describe a randomly selected target location while in the ganzfeld context but did not make a direct comparison with performance in a waking state. This paper describes a series of three subsequent experiments that compared performance at a remote viewing task in a waking condition with a ganzfeld stimulation condition using a counterbalanced repeated measures design. There were only minor variations in design across the three experiments to enable combination of data in a summary analysis. In total, 110 participants produced 43 hits in the ganzfeld stimulation condition (39%), giving a highly significant positive deviation from chance expectation (sum of ranks = 225, $p = .000012$), whereas in the waking RV condition they achieved 30 hits (27.5%), which is marginally better than chance expectation (sum of ranks = 253, $p = .034$). The difference in z scores for target ratings in the two conditions approached significance ($t[39] = 1.86$, $p = .065$). In experiment 1, individual difference measures identified as predictors of psi performance were unrelated to target ratings. Participants completed Pekala's (1991) Phenomenology of Consciousness Inventory (PCI) in order to gauge their responsiveness to the ganzfeld protocol and of the 12 sub-dimensions tested, ganzfeld performance correlated significantly with greater absorption in their subjective experience, lower arousal, and less internal dialogue. In experiments 2 and 3 individual differences measure were replaced by measures of transliminality, openness to experience, and dissociative experiences, but these were unrelated to task success. Data from experiment 2 did not confirm the findings using the PCI from experiment 1, though a significant association was found with the time sense dimension. In experiment 3 no PCI dimensions correlated with task performance, a pattern that was confirmed when data were combined across all three experiments.

Remote viewing (RV) can be defined as “the ability to perceive and to be able to describe what would be experienced if one were at some specified distant location” (after Hansel, 1989, p. 160). Al-

¹ We should like to thank the Perrott-Warrick Fund, the Society for Psychical Research Research Grants Committee and the Parapsychological Association Research Endowment (PARE) Fund for their kind financial support of the experiments included in this series. Address correspondence to: Prof. Chris Roe, Faculty of Health, Education & Society, The University of Northampton, University Drive, , Northampton NN1 5PH, UK.

though the method can vary in practice (cf. Schwartz, 2015; Utts & May, 2003), experimental work typically involves a protocol in which the sender visits a randomly selected remote location and actively engages with the target material by attending to the features of the site and participating in activities appropriate to it (see Targ, 1994, for a more detailed description). Meanwhile, the receiver is led through a series of visualization techniques while in an ordinary waking state of consciousness by an experimenter who, masked to the identity of the target, directs them to describe particular features of the site using an interview format (Baptista, Derakshani, & Tressoldi, 2015).

From its inception at SRI as a means of testing for ESP with Ingo Swann and its first published formal testing with Pat Price (Targ & Puthoff, 1974, 2005), the method seems to have been remarkably successful; so much so that when Utts (1996) was asked to review the evidence accumulated under the SRI and SAIC programs, she asserted: “Using the standards applied to any other area of science it is concluded that psychic functioning has been well established” (p. 3). Some of the early work at SRI has been criticized (Marks & Kamman, 1980), particularly with respect to potential problems with the randomization and editing of transcripts, which might have left cues to the order in which sites served as targets. These concerns were challenged by Tart, Puthoff, and Targ (1980), who demonstrated that when cues were removed a new independent judge was still able to match transcripts to target sites to a highly significant degree. Later, successful replications (e.g., Schlitz & Gruber, 1980, 1981; Schlitz & Haight, 1984), similarly took great care to ensure that neither the order of target selection nor of the transcripts could be inferred from material they contained. However, part of that solution involves either editing the transcripts, which itself can be grounds for criticism (e.g., Marks & Kamman, 1980, p. 16), or deferring feedback about target identities until the end of the series, which may be de-motivating (see, e.g., Tart, 2007). Of course, these concerns only apply to studies in which the same participant serves as viewer for a number of trials in the series, and thus is potentially able to refer in their transcripts to earlier targets and later planned sessions — this would not be possible if one were to adopt a design in which a larger number of participants contributed just one trial each.

Militating against the use of a larger sample of participants is the difficulty in finding a sufficient number of able persons; for example, Utts (1996) estimated that only around 1% of those screened were suitable for RV work. This might be overcome if an induction procedure could be identified that facilitated the performance of novice participants. One candidate is the ganzfeld induction procedure. Although the ganzfeld does not necessarily induce a hypnagogic state (Wackermann et al., 2002), it does seem to share properties with other psi-conducive states that distinguish it from a “standard” RV protocol, such as systematically reducing external sensory stimulation and passively shifting the participants’ attention to internal sources of information (Braud & Braud, 1973; Honorton, 1977; Parker, 1975). There is some evidence to suggest that novice participants may be able to succeed at a free response ESP task under laboratory conditions where it incorporates a ganzfeld-induced altered state of consciousness (ASC; e.g., Baptista et al., 2015; Storm et al., 2010).²

The lead author conducted a pilot study (Roe & Flint, 2007) to test the speculation that ganzfeld stimulation might enable novice participants to succeed at a remote viewing task. Fourteen sender-receiver pairs of novice participants each contributed one remote viewing trial. Receivers underwent a

² This is not to say that unselected participants are necessarily able to perform at similar levels as selected participants, but rather to note that unselected participants may be able to perform above chance expectation when conditions are conducive.

progressive relaxation induction procedure followed by ganzfeld stimulation, during which they reported their sensory experiences, with the intention of describing a randomly-selected target site to which their sender partner had been sent. On completion of the trial the sender returned to provide feedback about the nature of the target. An independent judge ranked all 8 possible locations against each mentation, producing 12 binary hits across the 14 trials and a combined sum of ranks that was significant ($SOR = 42, p = .008$), suggesting that this approach might overcome the weaknesses just outlined.

Although the study was successful, it was not clear whether this was a consequence of incorporating a ganzfeld protocol for our novice participants, since we did not have a comparison condition in which those participants attempted to generate impressions about a target location without the assistance of ganzfeld stimulation. The current experimental series was designed to address this shortcoming.

Recruiting a wide range of participants allows researchers to explore various individual differences factors (such as personality, belief, and prior experiences) to determine whether they are associated with task success. Given that extant remote viewing research had paid relatively little attention to individual differences, we took our lead from other free response literature. We speculated (after Honorton, 1997; Roe, Jones & Maddern, 2007) that performance might be related to practice of a mental discipline, personal psi experience, paranormal belief, Feeling-Perceiving personality type as measured by the Myers-Briggs Type Indicator, extraversion, and self-rated creativity (see Cardeña & Marcusson-Clavertz, 2015, for a more thorough review of individual differences variables associated with psi).

Additionally, working with a range of participants allows us to consider individual differences in responsiveness to ganzfeld stimulation. The lead author has been a vocal advocate (e.g., Roe, 2009) of Stanford's criticism of ganzfeld researchers for implicitly assuming that this induction procedure elicits a uniform response from all participants. In practice it is clear that some participants experience no shift at all from their ordinary waking state so that they will not benefit from any psi-conducive properties it supposedly confers. We therefore planned to investigate whether subjective shifts in state of consciousness, as measured using Pekala's (1991) Phenomenology of Consciousness Inventory (PCI) were associated with better performance at the remote viewing task.

Finally, it is difficult with a telepathy design to unequivocally rule out collusion between sender and receiver; the sound attenuated laboratory available to us at the University of Northampton does not have electromagnetic shielding so that a participant who is determined to cheat could conceivably bring a hidden device with them. Although an experimenter remains with the receiver during the session so that normal communication would be impossible, more subtle signals (for example based on silent vibration of calls) could go undetected. These hypothetical concerns can be readily addressed by adopting a precognitive design in which the target has not yet been randomly selected at the time that the mentation is generated.

We therefore pre-specified the following hypotheses:

H_1 : Performance in the ganzfeld condition will be better than mean chance expectation (MCE) as measured by sum of ranks analysis of the independent judge's ranking of the target³

³ In free response ESP experiments at the University of Northampton, sum of ranks has always been our primary outcome measure in preference to direct hits analysis (e.g., Roe et al., 2003; Roe et al., 2007; Roe et al., 2004).

H₂: Performance in the waking remote viewing condition will be better than MCE as measured by sum of ranks analysis of the independent judge's ranking of the target

H_{3a}: Participants who practice a mental discipline will perform better than those who do not, as measured by z-scores of the independent judge's similarity ratings for the target site in the ganzfeld condition.⁴

H_{3b}: Participants who practice a mental discipline will perform better than those who do not, as measured by z-scores of the independent judge's similarity ratings for the target site in the waking remote viewing condition.

H_{4a}: Participants who report personal psi experiences will perform better than those who do not, as measured by z-scores of the independent judge's similarity ratings for the target site in the ganzfeld condition.

H_{4b}: Participants who report personal psi experiences will perform better than those who do not, as measured by z-scores of the independent judge's similarity ratings for the target site in the waking remote viewing condition.

H_{5a}: Participants who report belief in psi will perform better than those who do not, as measured by z-scores of the independent judge's similarity ratings for the target site in the ganzfeld condition.

H_{5b}: Participants who report belief in psi will perform better than those who do not, as measured by z-scores of the independent judge's similarity ratings for the target site in the waking remote viewing condition.

H_{6a}: Participants who are categorized as Feeling-Perceiving types on the Myers-Briggs Type Indicator will perform better than those who do not, as measured by z-scores of the independent judge's similarity ratings for the target site in the ganzfeld condition.

H_{6b}: Participants who are categorized as Feeling-Perceiving types on the Myers-Briggs Type Indicator will perform significantly better than those who do not, as measured by z-scores of the independent judge's similarity ratings for the target site in the waking remote viewing condition.

H_{7a}: Participants who are categorized as Extraverts on the Myers-Briggs Type Indicator will perform better than those who do not, as measured by z-scores of the independent judge's similarity ratings for the target site in the ganzfeld condition.

H_{7b}: Participants who are categorized as Extraverts on the Myers-Briggs Type Indicator will perform better than those who do not, as measured by z-scores of the independent judge's similarity ratings for the target site in the waking remote viewing condition.

⁴ Z-scores can be calculated by subtracting the target similarity rating from the mean of all ratings (target and decoys) and dividing this by the standard deviation for all ratings (cf. Palmer, 1986). Although a number of these hypotheses are directional, all analyses were conservatively set as 2-tailed.

H_{8a} : Participants who identify as creative will perform better than those who do not, as measured by z-scores of the independent judge's similarity ratings for the target site in the ganzfeld condition.

H_{8b} : Participants who identify as creative will perform better than those who do not, as measured by z-scores of the independent judge's similarity ratings for the target site in the waking remote viewing condition.

Method: Experiment 1⁵

Design

This study adopted a related design to compare precognition performance in ganzfeld stimulation and waking remote viewing conditions using a counterbalanced design. The primary outcome measure was pre-specified to be sum of ranks allocated to target sites by an independent judge. Further analyses were planned that would look for associations between scores on individual differences measures and z-scores of target similarity ratings.

Participants

Two research assistants (CC and HM) were appointed to work on this project. Although no formal measures were taken, all co-researchers in the three experiments reported here had taken an optional third year module in Parapsychology and the Psychology of Anomalous Experience and had contacted the principal author to express a desire to be more actively involved in research. All were at least open to the possibility of psi being demonstrated in their experiment. A convenience sample of 40 volunteers participated (28F, 12M; mean age = 26.2, range = 18-54 years), consisting of friends, family, and other students. Participants were not selected on the basis of prior belief or experience.

Materials

A participant information form (PIF) comprised standard briefing instructions and questions concerning biographical and contact details (6-items); belief in PK (3-items); previous participation in parapsychological studies (2-items); practice of mental/physical disciplines (1-item); creativity (2-items); and self-perceived happiness (1-item). Participants also completed the Keirsey Temperament Sorter (Keirsey & Bates, 1978) — a variant of the Myers Briggs Type Indicator. The MBTI is a commonly used measure in clinical and consulting psychology and is adopted here because it has proven popular with ganzfeld researchers, although psychometric assessments have cast doubt on its reliability and validity (e.g., Boyle, 1995; Pittenger, 2005).

To measure shifts in state during ganzfeld stimulation, participants completed Pekala's (1991) Phenomenology of Consciousness Inventory, Form 1. At 53 items, the full scale was considered too long for current purposes so the two highest loading items from each of the following subscales were retained as the most relevant dimensions given the claimed effects upon subjective experience of ganzfeld stimulation: body image; time sense; direction of attention; absorption; imagery amount;

⁵ An account of this study was given by Roe et al. (2010).

imagery vividness; self-awareness; altered state of awareness; arousal; rationality; volitional control; and internal dialogue.

Two pools of 20 target locations were identified to reflect a wide range of geographical features (see the Appendix for a full list). Each pool consisted of five sets, each containing four sites that were intended to incorporate distinct elements (e.g., a desert area versus a waterfall), so that they could be easily discriminable for the independent judge when rating against mentations. Two pools were used so that participants could not have the same location selected as the target for both trials while ensuring that they could not improve their performance on the second trial by simply avoiding elements of their first target site (i.e., both pools had waterfalls, deserts, city scenes, etc.). Targets were accessed using Google Earth so as to allow participants an opportunity to interact with the site, virtually travelling around it and viewing from different perspectives as well as opening photographs that had been taken there (see Figure 1).

Procedure

The project received approval from the Faculty Research Ethics Panel. This entailed providing a full description of what participation involved and of how data would be anonymized. Participants were reminded that they were free to withdraw at any time during the experiment without having to give a reason. All participants completed a consent form before data collection commenced.

Participants were recruited individually and completed the PIF before attending the laboratory to complete their trials. On arrival they were met by the participant's experimenter (PE), introduced to the two tasks, and given an opportunity to ask questions or discuss their own personal experiences that might have motivated their participation. Participants completed both a remote viewing and a ganzfeld condition with the order of completion counterbalanced across trials. Both trials took place in a sound attenuated laboratory.

In the ganzfeld condition the participants made themselves comfortable in a reclining armchair, PE placed eye shields over their eyes and fitted headphones over which white noise would be played. A standard desk lamp with a 40W red light was shone in the face of the receiver from a distance of approximately 1m, giving a warm and relatively uniform visual field. Progressive relaxation instructions involving tensing and releasing muscles in different parts of the body and noticing the difference (after Dalton, 1997) were played in order to enable the participant to relieve muscular tension. Toward the end of the relaxation instructions, the participant instructions advised as follows:

You are now in a very relaxed, peaceful state. While you are in this relaxed state you find that from time to time you will experience images, sounds and bodily sensations. This is perfectly natural, as your unconscious produces its own imagery when there isn't much outside stimulation, much like a daydream or when drifting off to sleep. Just like drifting off to sleep, don't try and force this process, just relax and let things happen naturally — the images will appear at the appropriate time, and they will be related to the target location that you will get to visit later. When the impressions do occur, think out loud. Report all the distinctive images, thoughts and feelings you have as they occur, and continue to share them throughout the session.

PE remained with the participant in the sound attenuated laboratory during the ganzfeld period and made a record of the ongoing commentary using a ganzfeld mentation sheet. The relaxation induction lasted about 7 minutes and the exposure to ganzfeld 30 min. Towards the end of the session the Target Experimenter (TE) randomly selected a target location for that trial using the randomization function in Excel to choose a target set and a target location from within that set. TE had no contact with the participant.



Figure 1. Example target location presented using Google Earth

Once the session was over, PE reviewed the mentation with the participants and gave them the opportunity to add to it or correct any errors. The participant was then given the abridged PCI to complete while PE took the mentation sheet to TE and together they made a copy of the record sheet, with the original being filed away and the copy used during participant feedback. Once the mentation had been photocopied, TE would inform PE of the target identity and the participant would view the location in the sound attenuated laboratory with PE, who remained with them and encouraged them to look for correspondences between their mentation and the target site, even where these were relatively tenuous. Care was taken to ensure that participants spent some time engaging with their intended precognitive target.

For the remote viewing condition, participants returned to the sound attenuated laboratory and sat in the armchair in the upright condition and with lighting at normal levels. They were given the following instructions (adapted from Subbotsky & Ryan, 2009):

Thank you for agreeing to participate in this remote viewing experiment. Remote viewing is a technique that helps you form a mental image of a distant location. The remote viewing procedure that you will be using was developed during a highly successful 20-year research

program sponsored by the US government, and we are looking to see if it can be used successfully with ordinary members of the public.

In this experiment you will be asked to remote view a location that you will be shown at the end of the session. You will register your impressions about the target site by listing words that describe features of it and by drawing sketches. You will later be able to compare these against the actual location to look for possible correspondences, and afterwards an independent judge will give her own ratings.

Before you start your task, I will talk you through an exercise to clear your mind of clutter and background mental noise that might get in the way of any impressions about the target. Your experimenter will give you a blank sheet of paper and I would like you to jot down anything that might be on your mind. This could be everyday concerns, such as worries about an exam that's coming up, or anxiety about a row that you had with a friend recently, or worries about taking part in this experiment and doing well for the researcher. Be as honest as you can in writing down your concerns — no-one but you will see what you have written. Once you have written them down, we want you to crumple up your piece of paper into a ball and set aside those worries for now. At the end of the experiment you can take the sheet of paper away with you or you may decide to throw it away in the bin. The experimenter will stop this recording now and restart it after the mind clearing exercise.

Thank you for completing the mind clearing exercise. I will now tell you about the target location that you will remote view. The location will be an outdoor scene and can be anywhere in the world. It can be somewhere you have never heard of, so don't worry about trying to recognize or name it – we just want you to describe its features.

Remote viewing is a natural process like normal perception, but ordinarily when we describe our perceptions we tend to internally edit things before we speak. For example, if you have cats and you see a movement out of the corner of your eye then you will tend to label that experience as your cat walking by, when in fact all you experienced was a particular color and a particular movement. When we interpret an experience rather than just describe it, that's when mistakes can creep in. Likewise, in remote viewing this kind of editing or interpreting often leads to misinterpretation, so it important to stick with your first impressions without analyzing them too much. To help you do that, we will be asking you to describe basic features such as colors, tastes and smells, rather than asking you for very detailed or specific images. This procedure is a bit like a word association task in psychology where you might be asked to respond without thinking with the first word that pops into your head after hearing a stimulus word.

To begin, in the top right of your record sheet you should write the date, time and a signifier. This is a name, word or number that has some personal meaning for you and which symbolically connects you to the session without compromising your anonymity. Your experimenter will not ask you what your signifier means. You could use someone's initials, a favorite pet's

name, a special date, or whatever you want. When you have done this you will be asked to put your pen on the paper at the top left of the record sheet. Your experimenter will then read out the coordinates for the target. You should write this number down and repeat the coordinate out loud to ensure that you have it correctly. As soon as you complete the coordinate you should immediately and without thinking about it produce a very brief sketch or scribble. This will be your connection with the target location. You should then describe the squiggle in terms of its basic features, such as whether the line goes up or down, whether it curves or changes direction abruptly, producing angles. You can also describe any immediate associations it suggests to you.

When you are ready you can move on to the next stage which is to describe your impressions of the target in terms of the different senses: colors, sounds, textures, tastes, smells, and so on. Keep in mind that different parts of the target might have different qualities, so don't worry if some of your descriptors seem contradictory. It can sometimes be useful to touch different parts of your sketch with your pen when you are trying to get impressions of different parts of the location. If you find that you don't have any further impressions you can ask your experimenter to give you the coordinates again and you can repeat the process of writing this number down and immediately scribbling a sketch that represents some aspect of the target.

When you feel you have enough descriptors, you can go on to draw freehand sketches that help you arrange those descriptors in space — which elements seem to go together and which seem to be quite separate. Please produce as many drawings as you like — your experimenter has lots of extra sheets of paper that you can use.

When you have completed the drawings, you should summarize your impressions by giving a short written description at the end of the record sheet.

The experimenter will now answer any questions you may have and then the remote viewing session will begin. Thanks again for taking part.

Following this introduction, participants first noted the session date and location, and then recorded the target site's co-ordinates as they were read out by PE. These co-ordinates were arbitrary (but unique) numbers rather than actual geographical co-ordinates.⁶ As soon as the co-ordinates were recorded the participant produced a quick freehand doodle denoted as the ideogram. Thereafter they provided a description of aspects of the designated site in terms of single-word adjectives that related to different sensory modalities (e.g. "blue", "cold", "grainy", "fresh", etc.). Participants were encouraged by PE to switch often between modalities (e.g. from visual to tactile descriptors). Once this list was exhausted the participant attempted to combine these descriptors into some kind of arrangement by drawing as many freehand sketches as they required. When participants felt that they had completed sufficient sketches, they provided a written summary of the site. Once the session was over, PE again gave them the opportunity to add to the account or correct any errors. PE again took the mentation sheet to TE and the procedure was similar to that for the ganzfeld session. The order of conditions was counterbalanced across participants.

⁶ Using actual co-ordinates leaves open the possibility that a participant may be exploiting savant-like capacities to memorize map co-ordinates. Targ and Puthoff (1977) found in their work with Ingo Swann that arbitrary number strings were just as effective.

Record sheets were sent to an independent judge who was informed of the pool and set to which the target site belonged.⁷ She ranked all four locations in the set in terms of their applicability to the participant’s description and gave each a similarity rating on a scale from 0 (no correspondence) to 99 (exact correspondence). Given the different methods for recording target descriptions, the independent judge was not masked as to the condition each trial belonged to.

Results: Experiment 1

Data from the experiments described in this paper are available through the Psi Open Data repository (<https://open-data.spr.ac.uk/search/type/dataset>). The ranks given to the actual target location on each of the 40 trials are given in Table 1. In terms of first place ranks for targets, the direct hit rate for the ganzfeld condition is 35% (binomial $p = .10$) and for the remote viewing condition is 30% (binomial $p = .29$), so that although both hit rates approximate values reported in previous studies they do not deviate significantly from MCE of 25%. The primary outcome measure was pre-specified to be sum of ranks; by this measure, performance in the ganzfeld condition was significantly better than chance ($z = 1.77, p = .038$); performance in the remote viewing condition was suggestively better than chance ($z = 1.63, p = .052$) but was not significant.⁸

Z-scores were calculated using the independent judge’s similarity ratings for target locations compared with ratings for decoys so as to look for co-variation in performance across participants that might be associated with personality and individual difference measures. We speculated that performance might be related to practice of a mental discipline, personal psi experience, more general paranormal belief, FP personality type, extraversion, and self-rated creativity. We can see from Table 2 that none of the predicted differences occurred; indeed, slightly better performance in the ganzfeld was achieved by those who did not practice a mental discipline, were not FP types, and rated themselves as less creative.

Table 1.

Sum of ranks for target locations for ganzfeld and remote viewing trials

	Rank				Sum of Ranks	z-score	p	ES ¹¹
	1	2	3	4				
Ganzfeld trials	14 (35%)	10 (25%)	11 (28.5%) ¹²	5 (12.5%)	87	1.77	.038	.28
Waking RV trials	12 (30%)	16 (40%)	4 (10%)	8 (20%)	88	1.63	.052	.26

⁷ We should like to thank Jacqui Wilson for her assistance as the independent judge.

⁸ We are aware that it is imprudent to make dichotomous decisions based solely on a p value. The primary aim of this suite of experiments was to explore whether effects could be replicated and to produce effect size estimates based on cumulative data.

⁹ ES was calculated using z/\sqrt{n} .

¹⁰ All percentages are rounded to the closest .5.

Table 2.

Mean z-scores and independent t-test statistics for trial outcome categorized by individual differences measures

		<i>Mean z scores</i>		<i>t</i>	<i>p</i>	<i>ES(r)</i>
		Yes	No			
<i>Practice of a mental discipline?</i>	<i>Ganzfeld</i>	.17	.32	.52	.61	.08
	<i>Waking RV</i>	.33	.06	-.93	.36	.15
<i>Personal psi experience?</i>	<i>Ganzfeld</i>	.32	.21	-.40	.69	.06
	<i>Waking RV</i>	.20	.14	-.20	.84	.03
<i>Belief</i>	<i>Ganzfeld</i>	.25	.26	.03	.97	.01
	<i>Waking RV</i>	.16	.18	.08	.94	.01
<i>FP personality type</i>	<i>Ganzfeld</i>	.10	.32	-.68	.51	.11
	<i>Waking RV</i>	-.05	.25	-.99	.33	.16
<i>Extraversion</i>	<i>Ganzfeld</i>	.29	.18	.39	.70	.06
	<i>Waking RV</i>	.20	.16	.11	.91	.02
<i>Creativity</i>	<i>Ganzfeld</i>	.22	.28	.23	.82	.04
	<i>Waking RV</i>	.06	.23	.56	.58	.09

We were also interested to see whether individual differences in shifts in consciousness brought about by sensory habituation might have a bearing on the success of the session. Participants completed the PCI and subscale scores were correlated with z-scores from ganzfeld trial similarity ratings. These data are given in Table 3. Variables that were expected to correlate negatively with psi performance are shaded. We can see that 3 of the 12 sub-dimensions gave rise to significant associations;¹¹ greater success was achieved by participants who reported greater absorption in their subjective experience (AB), who reported lower arousal (AR), and who experienced less internal dialogue (ID). Associations with other sub-dimensions are small and do not approach significance.

¹¹ Given the exploratory nature of these analyses and the intention to conduct confirmatory experiments, no correction was made for multiple analyses.

Table 3.
Correlations between ganzfeld trial outcome and participants' ratings for the PCI

	PCI Dimension											
	BI	TS	DR	AB	IA	IV	SA	AS	AR	RA	VC	ID
<i>r</i>	.01	.17	.10	.34	-.09	.10	-.20	.03	-.34	-.06	.03	-.42
<i>p</i>	.94	.31	.56	.04	.58	.54	.24	.84	.04	.72	.85	.01

Note: Body Image (BI), Time Sense (TS), Direction of Attention (DR), Absorption (AB), Imagery Amount (IA), Imagery Vividness (IV), Self-Awareness (SA), Altered State of Awareness (AS), Arousal (AR), Rationality (RA), Volitional Control (VC) and Internal Dialogue (ID)

Discussion: Experiment 1

For the ganzfeld condition participants achieved an overall sum-of-ranks profile that was significant, confirming our earlier finding (Roe & Flint, 2007); however, performance in the waking-state remote viewing condition gave a sum-of-ranks profile that was not (quite) significant. While this might be interpreted as supporting the claim that ganzfeld stimulation does facilitate performance among novices, the difference between the two conditions is not significant (post hoc paired t-test on z-scores of similarity ratings gives $t[39] = .45, p = .657, 2\text{-tail}$), and further work is needed to elucidate whether ganzfeld stimulation does, in fact, enhance performance in tasks such as this.

We administered Pekala's (1991) PCI to see if one might distinguish between responders and non-responders and gauge whether this had an effect on their success at the remote viewing task. Although not offering wholehearted support for the notion that a shift in consciousness is psi conducive, 3 of the 12 sub-dimensions of the PCI were significantly related to task success in a manner consistent with previous literature. The PCI dimension of arousal measures degree of muscular tension (Pekala, 1991, p. 132), and decreased tension was associated here with better performance, consistent with Braud and Braud's (1973) characterization of the psi-conductive features of the ganzfeld technique. The PCI dimension of absorption was positively related to ganzfeld outcome, supporting earlier work suggesting that absorption is associated with ESP (Roe, 2009; Marcusson-Clavertz & Cardeña, 2011, report on the related constructs of hypnotizability and dissociation). Third, participants reporting lower levels of internal dialogue performed better, reminiscent of Carpenter's (2001) finding that reduced intellectualization was indicative of success in a ganzfeld ESP task. We determined, then, to see whether these patterns could be replicated in a second experiment.

Additionally, we intended to build on efforts to construct a model comprising psychological predictors of ESP performance. Since relatively little material from the remote viewing literature bears on this issue, we took our lead from ganzfeld and dream ESP research (Honorton, 1997; Roe et al., 2007) because it also incorporated free response ESP methods. Thus we concentrated on: practice of a mental discipline; personal psi experience; belief in the paranormal; FP personality type, extraversion; and self-reported creativity. However, none of these variables exhibited any association

with performance in either the remote viewing or ganzfeld condition. In consequence, we decided that subsequent replications should focus on other measures that also have had some success in free response ESP testing: dissociative experiences, openness to experience, and transliminality. We therefore hypothesized:

H_1 : Performance in the ganzfeld condition will be better than mean chance expectation (MCE) as measured by sum of ranks analysis of the independent judge's ranking of the target

H_2 : Performance in the waking remote viewing condition will be better than mean chance expectation (MCE) as measured by sum of ranks analysis of the independent judge's ranking of the target

H_{3a} : Scores on the transliminality scale will correlate positively with performance in the ganzfeld condition, as measured by z-scores of the independent judge's similarity ratings for the target site.

H_{3b} : Scores on the transliminality scale will correlate positively with performance in the waking remote viewing condition, as measured by z-scores of the independent judge's similarity ratings for the target site.

H_{4a} : Scores on the openness to experience scale will correlate positively with performance in the ganzfeld condition, as measured by z-scores of the independent judge's similarity ratings for the target site.

H_{4b} : Scores on the openness to experience scale will correlate positively with performance in the waking remote viewing condition, as measured by z-scores of the independent judge's similarity ratings for the target site.

H_{5a} : Scores on the dissociative experiences scale will correlate positively with performance in the ganzfeld condition, as measured by z-scores of the independent judge's similarity ratings for the target site.

H_{5b} : Scores on the dissociative experiences scale will correlate positively with performance in the waking remote viewing condition, as measured by z-scores of the independent judge's similarity ratings for the target site.

H_6 : Scores on dimensions of the Phenomenology of Consciousness Inventory will correlate with performance in the ganzfeld condition, as measured by z-scores of the independent judge's similarity ratings for the target site.

Method: Experiment 2¹²

Design

The design was as for experiment 1, but with different individual differences measures as outlined above.

Participants

Two research assistants (AH and LK) were appointed to work on this project. A convenience sample of 40 volunteers (20F, 20M; mean age = 30.3, range = 19-69 years), consisting of friends, family, and other students, participated in this study. Participants were not selected on the basis of prior belief or experience.¹³

Materials

Materials were as for experiment 1 except that the PIF included measures of transliminality, openness to experience, and dissociation.

The Transliminality Scale: Form B (Thalbourne, 1998) is a 29-item measure using a T/F response format.

The Dissociative Experiences Scale (DES; Bernstein & Putnam, 1986) is a 28-item self-report measure that assesses the frequency of dissociative experiences on a response scale that starts at 0% and increases by 10% increments up to 100%. Responses across all items are averaged to obtain a mean DES score (range 0–100), with higher scores indicating greater tendency to dissociation.

Openness to Experience was measured using Goldberg's scale (IPIP: Goldberg et al., 2006), and has subscale alphas that range from .77 to .86 (Goldberg, 1999). It was chosen for use here because it is a public domain measure intended to represent the domain constructs of the NEO personality inventory (Buchanan, Johnson, & Goldberg, 2005). Correlations between the IPIP and NEO scales for the openness to experience dimension range from .70 to .80 (Goldberg, 1999), suggesting that these instruments measure the same personality dimension.

Procedure

The procedure was as for experiment 1.

Results: Experiment 2

The ranks given to the target location on each of the 40 trials are given in Table 4. The direct hit rate for the ganzfeld condition is 40%, which is greater than mean chance expectation of 25% (binomial $p = .026$), whereas for the remote viewing condition it is exactly at chance level (binomial $p = .560$). Sum of ranks calculation confirms this pattern, with the ganzfeld condition scoring significantly better than chance ($z = 2.47, p = .007$); performance in the remote viewing condition approximated chance

¹² An account of this study was given by Roe, Hodrien, and Kirkwood (2012).

¹³ We should like to thank Glenn Hitchman for his assistance as the independent judge for experiment 2.

expectation ($z = 1.06, p = .145$), as in experiment 1. However, the z-scores for target ratings do not differ significantly between ganzfeld and waking RV conditions ($t [39] = 1.13, p = .265$).

Table 4.

Sum of ranks for target locations for ganzfeld and remote viewing trial

	Rank				Sum of Ranks	z-score	p value	ES
	1	2	3	4				
Ganzfeld trials	16 (40%)	11 (27.5%)	8 (20%)	5 (12.5%)	82	2.47	.007	.39
Waking trials	10 (25%)	12 (30%)	14 (35%)	4 (10%)	92	1.06	.145	.17

Z-scores were calculated as previously and were correlated against participants' scores on measures of transliminality, openness to experience, and dissociation. Results are given in Table 5.¹⁴ Positive correlations were hypothesized between personality dimensions and performance metrics. None of the associations approached significance.

Finally, we correlated PCI subscale scores against z-scores from ganzfeld trial similarity ratings as in experiment 1 (Table 6). The previous associations with absorption (AB), arousal (AR) and internal dialogue (ID) were not confirmed. The sole significant correlation (uncorrected for multiple analyses) was for time sense (TS).

Table 5.

Pearson correlations (and 2-tailed p values) between trial outcome and participants' scores on measures of Transliminality, Openness to Experience, and Dissociative experience

	Ganzfeld trials	Waking RV trials
Transliminality	-.22 (.18)	-.11 (.49)
Openness to experience	.15 (.35)	.07 (.66)
Dissociative experiences	.21 (.19)	.04 (.82)

¹⁴ Figures given here are different from those presented in earlier conference proceedings as a result of correcting scoring errors.

Table 6.
Correlations between ganzfeld trial outcome and ratings for PCI dimensions

	PCI Dimension											
	BI	TS	DR	AB	IA	IV	SA	AS	AR	RA	VC	ID
<i>r</i>	.14	.32	.17	-.02	-.04	.01	.01	.04	.12	.08	.06	.21
<i>p</i>	.41	.05	.32	.89	.83	.98	.97	.82	.48	.65	.72	.21

Discussion: Experiment 2

Experiment 2 replicated our significant hitting in the ganzfeld condition whereas performance in the waking RV condition fell to chance levels. It is clear from conversations with participants during debrief that they found the RV activity difficult, leaving them feeling quite self conscious and out of their comfort zone, which may have acted to inhibit any psi component.

We incorporated measures of transliminality, openness to experience, and dissociation. However, these were not associated with z-scores for target ratings. Our initial analysis of these findings (Roe et al., 2012) did suggest moderate associations between openness to experience and waking RV performance, and for dissociation and ganzfeld performance, although the effects diminished when a calculation error was corrected during the preparation of this paper. These ostensible effects made psychological sense at the time, given that the awkwardness of the waking RV trial might lead those who value imaginistic and creative practices to be more comfortable with a task in which they are asked to cultivate psychic impressions while in a normal waking state, while the ganzfeld condition might be particularly suited to those who are predisposed to become deeply absorbed in their experience and might benefit most from participating in a ganzfeld study. On these grounds we considered it appropriate at the time to retain these measures in experiment 3.

Experiment 1 showed some promise in identifying PCI subscales that might relate to ganzfeld success, but the dimensions of arousal, absorption and internal dialogue were not confirmed here, although there was a significant positive association with time sense. This latter is reminiscent of Harley and Sargent’s (1982) finding that successful participants gave significantly higher scores on a measure of state-shift than did those who were unsuccessful ($U = 16.5, p < .05$). Such distortions in time perception might be associated with general state-shifts that may be psi conducive (see Stanford, 1984, §6.3, for a discussion).

Thus a second replication was planned that would adopt the same design as experiment 2 and would test the same hypotheses.

Method: Experiment 3¹⁵

Design

The design was as for experiment 2

Participants

One of the research assistants originally appointed to run this study withdrew before data collection began. As a consequence, the number of pre-planned sessions was reduced from 40 to 30 so that the workload was manageable for the remaining researcher (LH). A convenience sample of 30 volunteers (17F, 13M; Mean age: 26.9, range: 19-55 years), consisting of friends, family, and other students, participated in this study. All collected data are included in this report. Participants were not selected on the basis of prior belief or experience.¹⁶

Materials

Materials were as for experiment 2.

Experiment 3 Results

The ranks given to the actual target location on each of the 30 trials are presented in Table 7. In terms of first place ranks for targets, the direct hit rate for the ganzfeld condition is 43.5%, which is again greater than chance expectation (binomial $p = .022$), whereas for the remote viewing condition it is 26.5% (binomial $p = .486$). By sum of ranks analysis, performance in the ganzfeld condition was significantly better than chance; performance in the remote viewing condition approximated chance expectation.¹⁷

Table 7.

Sum of ranks for target locations for ganzfeld and remote viewing trials

	Rank				Sum of Ranks	z-score	p value	ES
	1	2	3	4				
Ganzfeld trials	13 (43.5%)	9 (30%)	7 (23.5%)	1 (3.5%)	56	3.02	.001	.55
Waking RV trials	8 (26.5%)	8 (26.5%)	7 (23.5%)	7 (23.5%)	73	0.24	.405	.04

¹⁵ An account of this study was given by Roe and Hickinbotham (2015).

¹⁶ We should like to thank Jacqui Wilson for her assistance as the independent judge.

¹⁷ We would like to thank an anonymous referee for suggesting that we compare these z-scores to see if they differ significantly. Dividing the difference by $\sqrt{2}$ (Rosenthal & Rubin, 1979) gives $Z_{diff} = 1.97$, $p = .024$. However, when individual participant z-scores for target ratings for the ganzfeld and waking RV conditions are compared, they do not differ significantly between conditions ($t[29] = 1.799$, $p = .082$).

Z-scores based on the independent judge’s similarity ratings were used to look for covariation in performance across participants that might be associated with measures of transliminality, openness to experience, and dissociation, as in study 2. Results are given in Table 8. Again, none of these came close to significance.

We again explored associations between ganzfeld performance and scores on PCI subscales. These data are presented in Table 9. We can see that none of the 12 sub-dimensions gave rise to significant associations, and so earlier findings have not been confirmed.

Table 8.

Pearson correlations (and p values) between z-scores for independent judge’s similarity ratings and participant scores on measures of Openness to Experience and Dissociative Experiences

	Ganzfeld trials	Waking RV trials
Transliminality	-.13 (.51)	.15 (.44)
Openness to experience	.15 (.45)	.20 (.30)
Dissociative experiences	-.04 (.84)	-.05 (.80)

Table 9.

Correlations between ganzfeld trial outcome and PCI ratings

	PCI Dimension											
	BI	TS	DR	AB	IA	IV	SA	AS	AR	RA	VC	ID
<i>r</i>	.06	-.25	-.04	.04	.12	.01	.02	.01	.25	.02	-.01	-.02
<i>p</i>	.75	.18	.82	.85	.54	.98	.91	.96	.19	.94	.99	.90

Summary and Discussion

The primary aim of the present suite of experiments was to confirm and extend earlier findings by Roe and Flint (2007) that had suggested that novice participants could perform better than mean chance expectation at a remote viewing task when ganzfeld stimulation was used. In these replications, performance at a precognition task that used geographical locations as targets was compared under ganzfeld and waking RV conditions. The designs of these experiments were purposely kept constant so as to allow data to be combined and benefit from the increased statistical power associated with larger sample sizes without compromising the motivation of experimenters and participants, which can be a consequence of designing large studies. To test whether there were significant differences between the outcomes of the three experiments that would preclude their combination, a mixed ANOVA with

experiment as between subjects IV and condition (ganzfeld versus waking RV) as within subjects IV was conducted. This confirmed that there were no differences between experiments in z-scores based on target ratings, $F(2,107) = .159, p = .853$. Combined data for target ranks across all three experiments are thus given in Table 10.

We can see that the ganzfeld condition produced a cumulative hit rate of 39% (binomial $p = .0007$). A sum of ranks analysis — our preferred outcome measure — produced an overall z-score of 4.22, which is significant. Notably, participants in the ganzfeld condition performed significantly better than chance expectation in all three experiments, demonstrating a degree of replicability that is relatively unusual in parapsychology. We would encourage others to consider utilizing this method, which combines the advantages of ASC induction with a location-based feedback mode that participants find engaging, while avoiding problems of displacement that might occur with protocols in which participants are presented with a target and decoys during a judging phase. Of course, some of those features can also be found in the waking remote viewing condition, yet performance across a number of studies has been close to chance levels (cumulative hit rate = 27.5%; binomial $p = .325$). However, the sum of ranks analysis did yield a z-score of 1.83, which is significant.

Table 10.

Combined ranks for target locations for ganzfeld and remote viewing trials

	Rank				Sum of Ranks	z-score	p value	ES
	1	2	3	4				
Ganzfeld trials	43 (39%)	30 (27.5%)	26 (23.5%)	11 (10%)	225	4.22	.000012	0.40
Waking RV trials	30 (27.5%)	36 (32.5%)	25 (22.5%)	19 (17.5%)	253	1.83	.034	0.17

It is noteworthy that the effect size for the ganzfeld condition across 110 trials (0.40) is only a little higher than that for experienced SRI remote viewers and for experienced PRL ganzfeld participants (0.385 and 0.35 respectively — all comparison figures are taken from Baptista et al., 2015, p. 202), whereas the effect size for the waking state RV trial (0.17) is remarkably similar to figures reported for novice SRI viewers and novice PRL ganzfeld participants (0.164 and 0.17), which perhaps reflects the difficulty felt by some participants in acclimatizing to the protocol.

Additionally, there may be something particularly psi conducive about ASC intervention; indeed, Baptista et al. (2015) argue that despite the depiction of remote viewing as a waking state method, experienced viewers at SRI and SAIC did in practice employ methods intended to induce altered states of consciousness. The nature of such an advantage is unclear, however, given the failure of Pekala's (1991)

Phenomenology of Consciousness Inventory to predict psi task success. When we combine data from all 110 participants (Table 11), we find that none of the dimensions relates to trial outcome.¹⁸

Table 11.
Correlations between ganzfeld trial outcome and ratings for PCI dimensions

	PCI Dimension											
	BI	TS	DR	AB	IA	IV	SA	AS	AR	RA	VC	ID
r	.05	-.08	.10	.11	-.01	.05	-.03	-.01	-.02	.04	.06	-.09
p	.61	.39	.33	.26	.90	.62	.80	.89	.83	.68	.53	.37

A reviewer suggested that the repeated measures design adopted here could have led to asymmetrical order effects that would not be addressed simply by counterbalancing across trials. Indeed, given the very different nature of the two trials, it is plausible that exposure to one trial type could have had unexpected effects upon participants' openness to and comfort with the second trial type. To explore this, mean z-scores for the two conditions were calculated separately for trials in which it was completed first and second (see Table 12). It is clear that participants fared better within a condition type when it was presented second rather than first, suggesting a carry-over effect perhaps related to becoming acclimatized to the experiment or more comfortable with the experimenter, and that this improvement is independent of trial type (though it should be noted that the magnitude of improvement is small relative to the degree of variance within each cell). A 2x2 mixed ANOVA confirms this impression, giving a significant main effect for condition type, $F(1,47) = 4.906, p = .032$, a nonsignificant order effect, $F(1,47) = 1.769, p = .190$, and nonsignificant interaction effect, $F(1,47) = .011, p = .918$. This could be seen as an argument for adopting repeated measures designs in which participants are given time to get used to the circumstances of the experiment.

Table 12.
Mean z-scores (and standard deviations) for target ratings by condition type and order of completion

	Ganzfeld trials	Waking RV trials
Completed first	.26 (.80)	.01 (.82)
Completed second	.46 (.76)	.21 (.90)

¹⁸ The value of bivariate correlations is, of course, dependent on the degree of variance in each of the variables. As one reviewer commented, it is possible that none of the participants experienced much alteration in their state of consciousness as a result of ganzfeld stimulation and this could have imposed a ceiling on the effect sizes of observed correlations against task performance. PCI responses were given on a 7-point scale. Each dimension score where '0' indicated an ordinary waking state and '7' indicated a major shift. Each dimension score was the sum of two items so that scores could range from 0 to 14 (some items are reverse scored). Summing across the three studies, average dimension scores ranged from 4.64 (volitional control) to 9.54 (direction of attention), with standard deviations from 2.47 (volitional control) to 5.11 (time sense), indicating that participants did experience some shift in their phenomenology of consciousness and that this varied across participants.

Table 13 summarizes findings combined across experiments 2 and 3 that tested for associations between psi task performance and measures of transliminality, openness to experience, and dissociation. Effect sizes remain small and nonsignificant and do not give much encouragement that they might act as screening measures for identifying psi-conducive participants.

Table 13.

Correlations (and p values) for experiments 2 and 3 trial outcome and participants' scores on measures of Transliminality, Openness to Experience, and Dissociative experience

	Ganzfeld trials	Waking RV trials
Transliminality	-.14 (.25)	.04 (.72)
Openness to experience	.15 (.22)	.14 (.26)
Dissociative experiences	.11 (.38)	.03 (.84)

A number of commentators have speculated on which of the features of ganzfeld stimulation might be particularly psi conducive. For example, Honorton's (1977) influential noise reduction model required a sufficient level of cortical arousal to maintain conscious awareness, muscular relaxation (to reduce somatic noise), reduction of exteroceptive input from peripheral receptors, and deployment of attention toward internal mentation processes. In contrast, Braud and Braud (1973) argued that methods for facilitating ESP "are successful to the extent that they produce a shift toward the relaxation state" (p. 242), and showed that physical and mental relaxation alone can increase task success. These studies still included very low intensity white noise playing in the background, which could have encouraged attention to be focused internally, but performance was related to self-ratings and physiological measures of degree of relaxation per se, suggesting this was a primary factor. Schmeidler (1994, p. 116) adds that ASCs commonly enhance imagery and also encourage uncritical acceptance of whatever impressions come to mind, and elsewhere she emphasized their tendency to shift the percipient away from a reality-orientation and towards a suspension of disbelief (Schmeidler, 1988). These speculations fit reasonably well with mainstream characterizations of ASCs generally (e.g., Ludwig, 1966; Vaitl et al., 2005), and with the phenomenology of specific ASCs (cf. Cardeña, 2005; Sherwood, 2002; Wackermann et al., 2008). More provocatively, Stanford (1987) has questioned whether *any* of these elements is essential to the action of ESP, suggesting that success might have more to do with lab atmosphere, social interaction and excitement/expectancy rather than ASC induction itself, so that we might not expect any consistency with scales that measure such shifts. However, it is unclear how this account would explain the relatively poor performance of participants in the waking RV condition, which shares many of these properties.

Induction methods used in parapsychology can be quite unusual and involved, and might even be effective only in so far as they constitute an elaborate ritual, such that none of the elements plays an active role in facilitating ESP but when combined together they impress upon the participant the belief that ESP can occur in this situation in a self-fulfilling manner akin to a placebo effect. So long as these

aspects are constantly incorporated together it is not possible to determine which of the component parts might be effective and which not.

This can be readily achieved in experiments that contrast conditions with and without certain of these elements while holding all other features constant. But although there have been some notable attempts to do just this (e.g., Braud et al., 1975; Rock et al., 2012), this kind of analytical approach focusing on the ASC itself has rather fallen out of favor (see Alvarado, 1998, for criticism of this). A return to a more critical analysis of the relation between ASCs and psi is certainly needed, in combination with a more systematic attempt to show that participants are consistently and reliably entering those supposed ASCs in the first place, for example using analysis of phenomenology in the tradition of Carpenter (2001), or using direct EEG measures. Techniques for achieving the latter have become much less invasive, and so are less susceptible to criticism around failing to reproduce the authentic ganzfeld experience (Parker, 2005).

References

- Alvarado, C.S. (1998). ESP and altered states of consciousness: An overview of conceptual and research trends. *Journal of Parapsychology*, 62, 27-63.
- Baptista, J., Derakhshani, M., & Tressoldi, P. (2015). Explicit anomalous cognition. In E. Cardeña, J. Palmer, & D. Marcusson-Clavertz (Eds.). *Parapsychology: A handbook for the 21st century* (pp. 192-214). McFarland.
- Bernstein, E. M., & Putnam, F. W. (1986). Development, reliability and validity of a dissociation scale. *Journal of Nervous and Mental Diseases*, 74, 727-735. <https://doi.org/10.1097/00005053-198612000-00004>
- Boyle, G.J. (1995). Myers-Briggs Type Indicator (MBTI): Some psychometric limitations. *Australian Psychologist*, 30, 71-74. <https://doi.org/10.1111/j.1742-9544.1995.tb01750.x>
- Braud, W.G. (1978). Psi-conducive conditions: Explorations and interpretations. In B. Shapin & L. Coly (Eds.) *Psi and states of awareness: Proceedings of the 26th annual conference of the Parapsychology Foundation* (pp. 1-41). Parapsychology Foundation.
- Braud, W. G., & Braud, L. W. (1973). Preliminary explorations of psi-conducive states: Progressive muscular relaxation. *Journal of the American Society for Psychical Research*, 67, 6-46.
- Braud, W.G., Wood, R., & Braud, L.W. (1975). Free response GESP performance during an experimental hypnagogic state induced by visual and acoustic ganzfeld techniques: A replication and extension. *Journal of the American Society for Psychical Research*, 71, 409-427.
- Cardeña, E. (2005). The phenomenology of deep hypnosis: Quiescent and physically active. *Journal of Clinical and Experimental Hypnosis*, 53, 37-59. <https://doi.org/10.1080/00207140490914234>
- Cardeña, E., & Marcusson-Clavertz, D. (2015). States, traits, cognitive variables, and psi, In E. Cardeña, J. Palmer, & D. Marcusson-Clavertz (Eds.). *Parapsychology: A handbook for the 21st century* (pp. 110-124). McFarland.
- Carpenter, J. (2001). A psychological analysis of ganzfeld protocols. *Proceedings of presented papers: Parapsychological Association 44th annual convention*. (pp. 38-55)
- Dalton, K. (1997). Exploring the links: Creativity and psi in the ganzfeld. *Proceedings of presented papers: Parapsychological Association 40th annual convention*. (pp. 119-134)
- Goldberg, L.R. (1999). A broad-bandwidth, public domain, personality inventory measuring the lower facets of several five-factor models. In I. Mervielde, I. Deary, F. De Fruyt, & F. Ostendorf (Eds.), *Personality psychology in Europe (Vol. 7)* (pp. 7-28). Tilburg University Press. <https://doi.org/10.1016/j.jrp.2005.08.007>

- Goldberg, L.R., Johnson, J.A., Eber, H.W., Hogan, R., Ashton, M.C., Cloninger, C. R., & Gough, H.G. (2006). The international personality item pool and the future of public domain personality measures. *Journal of Research in Personality, 40*, 84-96.
- Hansel, C.E.M. (1989). *The search for psychic power: ESP & parapsychology revisited*. Prometheus Books.
- Harley, T.A., & Sargent, C.L. (1980). Trait and state factors influencing ESP performance in the ganzfeld. In W.G. Roll (Ed.) *Research in parapsychology 1979* (pp. 126-127). Scarecrow.
- Honorton, C. (1977). Psi and internal attention states. In B. B. Wolman (Ed.), *Handbook of parapsychology* (pp. 435-472). Van Nostrand Reinhold.
- Honorton, C. (1997). The ganzfeld novice: Four predictors of initial ESP performance. *Journal of Parapsychology, 61*, 143-158.
- Keirse, D., & Bates, M. (1978). *Please understand me: Character and temperament types*. Prometheus Nemesis Books.
- Ludwig, A.M. (1966). Altered states of consciousness. *Archives of General Psychiatry, 15*, 225-234.
- 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.
- Marks, D., & Kamman, R. (1980). *The psychology of the psychic*. Buffalo, NY: Prometheus books.
- Palmer, J. (1986). Statistical methods in ESP research. In H.L. Edge, R.L. Morris, J. Palmer, & J.H. Rush (Eds.), *Foundations of parapsychology: Exploring the boundaries of human capability* (pp. 138-160). Routledge & Kegan Paul.
- Parker, A. (1975). *States of mind: ESP and altered states of consciousness*. Malaby.
- Parker, A. (2005). Psi and altered states of consciousness. In M.A. Thalbourne & L. Storm (Eds.) *Parapsychology in the twenty-first century: Essays on the future of psychical research* (pp. 65-89). Jefferson, NC: McFarland.
- Pekala, R.J. (1991). *Quantifying consciousness: An empirical approach*. New York: Plenum Press. <https://doi.org/10.1007/978-1-4899-0629-8>
- Pittenger, D.J. (2005). Cautionary comments regarding the Myers-Briggs Type Indicator. *Consulting Psychology Journal Practice and Research, 57*, 210 –221. DOI: 10.1037/1065-9293.57.3.210
- Rock, A. J., Storm, L., Harris, K., & Friedman, H. (2012). Shamanic-like journeying and psi-signal detection: I. In search of the psi-conducive components of a novel experimental protocol. *Journal of Parapsychology, 76*, 321-347.
- Roe, C. A. (2009). The role of altered states of consciousness in extrasensory experiences. In M. Smith (Ed.), *Developing perspectives on anomalous experience* (pp. 25-49). McFarland.
- Roe, C. A., Cooper, C. E., & Martin, H. (2010). A comparison of ESP performance under remote viewing and Ganzfeld conditions. *Abstracts of Presented Papers: The 53rd Parapsychological Association Annual Convention*, (pp.21-22)
- Roe, C. A., & Flint, S., (2007). A remote viewing pilot study using a ganzfeld induction procedure. *Journal of the Society for Psychical Research, 71*, 230-234.
- Roe, C. A., & Hickinbotham, L. (2015). Performance at a precognitive Remote viewing task, with and without ganzfeld stimulation. *Abstracts of presented papers: Parapsychological Association 58th Annual Convention & 39th SPR International Conference, University of Greenwich, London, July 16-19, 2015.* (pp. 31-32)
- Roe, C. A., Hodrien, A., & Kirkwood, L. (2012). Comparing remote viewing and ganzfeld conditions in a precognition task. *Abstracts of presented papers: Parapsychological Association 55th Annual Convention, Durham, North Carolina, August 9-12, 2012.* (pp. 36-38)
- Roe, C. A., Jones, L., & Maddern C. (2007). A preliminary test of the “four factor model” using a dream ESP protocol. *Journal of the Society for Psychical Research, 71*, 35-42.

- Schlitz, M., & Gruber, E. (1980). Transcontinental remote viewing. *Journal of Parapsychology*, 44, 305-317.
- Schlitz, M., & Gruber, E. (1981). Transcontinental remote viewing: A rejudging. *Journal of Parapsychology*, 45, 233-237.
- Schlitz, M., & Haight, J. (1984). Remote viewing revisited: An intrasubject replication. *Journal of Parapsychology*, 48, 39-49.
- Schmeidler, G. R. (1994). ESP experiments 1978-1992: The glass is half full. In S. Krippner (Ed.) *Advances in Parapsychological Research* 7 (pp.104-197). McFarland.
- Schwartz, S. (2015). Through time and space: The evidence for remote viewing. In D. Broderick & B. Goertzel (Eds.), *Evidence for psi: Thirteen empirical research reports* (pp. 168-212). McFarland.
- Sherwood, S. J. (2002). Relationship between the hypnagogic/hypnopompic states and reports of anomalous experiences. *Journal of Parapsychology*, 66, 127-150.
- Stanford, R.G. (1984). Recent ganzfeld-ESP research: A survey and critical analysis. In S. Krippner (Ed.), *Advances in parapsychological research* 4 (pp. 83-111). McFarland.
- Stanford, R.G. (1987). Ganzfeld and hypnotic-induction procedures in ESP research: Toward understanding their success. In S. Krippner (Ed.) *Advances in parapsychological research* 5 (pp. 39-76). McFarland.
- Storm, L., Tressoldi, P. E., & Di Risio, L. (2010). Meta-analysis of free-response studies, 1992–2008: Assessing the noise reduction model in parapsychology. *Psychological Bulletin*, 136, 471-485. <https://doi.org/10.1037/a0019457>
- Subbotsky, E., & Ryan, A. (2009). Motivation, belief and geomagnetic activity in a remote viewing task. *Paper presented at the Society for Psychical Research 33rd International Conference*, Nottingham University, 31 Aug-2 Sept.
- Targ, R. (1994). Remote-viewing replication: Evaluated by concept analysis. *Journal of Parapsychology*, 58, 271-284.
- Targ, R., & Puthoff, H. (1974). Information transmission under conditions of sensory shielding. *Nature*, 252, 602-607. <https://doi.org/10.1038/251602a0>
- Targ, R., & Puthoff, H. E. (2005). *Mind reach: Scientists look at psychic abilities*. Charlottesville, VA: Hampton Roads.
- Tart, C.T. (2007). Letter to the Editor. *Journal of the Society for Psychical Research*, 71, 193.
- Tart, C.T., Puthoff, H.E., & Targ, R. (1980). Information transmission in remote viewing experiments. *Nature*, 284, 191. <https://doi.org/10.1038/284191a0>
- Thalbourne, M. A. (1998). Transliminality: Further correlates and a short measure. *Journal of the American Society for Psychical Research*, 92, 402-419.
- Utts, J. (1996). An assessment of the evidence for psychic functioning. *Journal of Scientific Exploration*, 10, 3-30.
- Utts, J., & May, E. (2003). Non-sensory access to information: Remote viewing. In W. B. Jonas & C. C. Crawford (Eds.), *Healing, intention and energy medicine: Science, research methods and clinical implications* (pp. 59-73). Churchill Livingstone. <https://doi.org/10.1016/B978-0-443-07237-6.50011-5>
- Vaitl, D., Birbaumer, N., Gruzelier, J., et al. (2005). Psychobiology of altered states of consciousness. *Psychological Bulletin*, 13, 98–127. <https://doi.org/10.1037/0033-2909.131.1.98>
- Wackermann, J., Pütz, P., Büchi, S., Strauch, I., & Lehmann, D. (2002). Brain electrical activity and subjective experience during altered states of consciousness: Ganzfeld and hypnagogic states. *International Journal of Psychophysiology*, 46, 123-146. [https://doi.org/10.1016/S0167-8760\(02\)00070-3](https://doi.org/10.1016/S0167-8760(02)00070-3)
- Wackermann, J., Pütz, P., & Allefeld, C. (2008). Ganzfeld-induced hallucinatory experience, its phenomenology and cerebral electrophysiology. *Cortex*, 44, 1364-78. <https://doi.org/10.1016/j.cortex.2007.05.003>

Appendix: List of targets used in the studies

Pool 1

Set	Site 1	Site 2	Site 3	Site 4
1	The Pentagon, Arlington, Virginia	Easter Island	London Zoo, London, UK	Uluru (Ayers' Rock), Australia
2	Duomo Cathedral Florence, Italy	Mount Everest, Nepal	Kirishi Oil Refinery, Surgutneftegas, Russia	Alcatraz Island
3	New York Central Station	Al-Kufrah aquifer, Libya	Arusha National Park, Tanzania	Niagara Falls
4	Eiffel Tower	Norfolk Naval Base, US (ships docked to left)	Victoria Falls, Zimbabwe	Eden Project, Cornwall, UK
5	Bellecôte ski resort, France	Spaghetti junction, Birmingham, UK	London Eye	St Peter's Basilica

Pool 2

Set	Site 1	Site 2	Site 3	Site 4
1	Palm Islands, Dubai	Epsom Downs Racecourse	Atomium Brussels, Belgium	Piazza San Marco, Venice
2	Lake Windermere, UK	Grand Canyon	Three Mile Island Nuclear plant	Bahá'í House of Worship, Delhi, India
3	Sequoia National Park, California	Edinburgh Castle, Scotland	Cerro Verde copper mine, Arequipa, Peru	Bird's Nest Stadium, Beijing, China
4	Bondi Beach, NSW	Estadio Nou Camp, Barcelona	Walshtown beg, Ireland	Iguazu falls, Argentina
5	Liberty Island	Giza pyramids	Union Square, Hong Kong	Frankfurt Am Main International Airport

Performance à une Tâche de Remote Viewing Précognitif, avec et sans Stimulation Ganzfeld: Trois Expérimentations

Résumé. Les recherches récentes conduites par le premier auteur ont cherché à incorporer la stimulation Ganzfeld au sein d'un protocole de remote viewing. Une expérimentation exploratoire initiale (Roe & Flint, 2007) suggérait que des participants novices pouvaient décrire avec succès la localisation d'une cible sélectionnée aléatoirement au sein du dispositif Ganzfeld, sans marquer une comparaison directe avec la performance en état d'éveil. Cet article décrit une série de trois expérimentations subséquentes qui ont comparé la performance à une tâche de remote viewing dans une condition d'éveil avec une condition de stimulation Ganzfeld en utilisant un protocole de mesures répétées et contrebalancées. Il n'y a que des variations mineures dans le protocole entre les trois expérimentations, afin d'assurer la combinaison des données dans l'analyse générale. Au total, 110 participants ont produit 43 succès dans la condition de stimulation Ganzfeld (39%), donnant une déviation positive s'écartant significativement du hasard (somme des rangs = 225, $p = .000012$), tandis que la condition de remote viewing éveillé a obtenu 30 succès (27.5%), ce qui est marginalement meilleur que le résultat attendu par le hasard (somme des rangs = 253, $p = .034$). La différence des scores z pour le classement des cibles dans les deux conditions a approché du seuil significatif ($t[39] = 1.86$, $p = .065$). Dans l'expérimentation 1, les mesures de différences inter-individuelles identifiées en tant que prédicteurs des performances psi n'étaient pas corrélées à l'évaluation des cibles. Les participants ont rempli l'Inventaire de phénoménologie de la conscience de Pekala (1991) afin de mesurer leur réactivité au protocole Ganzfeld et, parmi les douze sous-dimensions testées, les performances Ganzfeld étaient corrélées significativement avec une plus grande absorption dans leur expérience subjective, un éveil plus faible, et moins de dialogue interne. Dans les expérimentations 2 et 3, des mesures de transliminalité, d'ouverture à l'expérience et d'expériences dissociatives ont remplacé les précédentes mesures, sans obtenir davantage de corrélations aux succès dans la tâche. Les données de l'expérimentation 2 n'ont pas confirmé les découvertes utilisant le PCI de l'expérience 1, bien qu'une association significative fût trouvée avec la dimension du sens du temps. Dans l'expérimentation 3, aucune dimension du PCI ne fut corrélée avec la performance à la tâche, un pattern qui se confirma en combinant l'ensemble des données obtenues dans les trois expérimentations.

Zur Leistung bei einer präkognitiven Fernwahrnehmungsaufgabe mit und ohne Ganzfeld-Stimulation: Drei Experimente

Zusammenfassung. Der neue Forschungsansatz des Hauptautors hat versucht, die Ganzfeld-Stimulation als Teil eines Fernwahrnehmungsprotokolls zu integrieren. In einem ersten explorativen Experiment (Roe & Flint, 2007) wurde vorgeschlagen, dass Neulinge erfolgreich einen zufällig ausgewählten Zielort im Ganzfeld-Kontext beschreiben können, aber es stellte keinen direkten Vergleich mit der Leistung im Wachzustand dar. In diesem Beitrag wird eine Reihe von drei aufeinander folgenden Experimenten beschrieben, die die Leistung bei einer Fernwahrnehmungsaufgabe im Wachzustand mit einer Ganzfeld-Stimulationsbedingung unter Verwendung eines ausbalancierten Designs mit Messwiederholun-

gen vergleicht. Es wurden nur geringfügige Variationen im Design der drei Experimente vorgenommen, um eine Auswertung der Daten in einer zusammenfassenden Analyse zu ermöglichen. Insgesamt erzielten 110 Teilnehmer 43 Treffer in der Ganzfeld-Stimulationsbedingung (39%), was eine hochsignifikante positive Abweichung von der Zufallserwartung darstellt (Rangsummen = 225, $p = .000012$), während sie im Wachzustand 30 Treffer (27,5%) erzielten, was geringfügig besser als die Zufallserwartung ist (Rangsummen = 253, $p = .034$). Die Differenz der z-Scores für die Targeteinstufungen in den beiden Bedingungen näherte sich der Signifikanz ($t[39] = 1,86$, $p = .065$). In Experiment 1 waren die individuellen Unterschiede, die als Prädiktoren der Psi-Leistung identifiziert wurden, nicht mit den Targeteinstufungen verbunden. Die Teilnehmer füllten Pekalas (1991) Fragebogen zur Phänomenologie des Bewusstseins (PCI) aus, um ihre Reaktionsbereitschaft auf das Ganzfeld-Protokoll zu messen, und von den 12 getesteten Subdimensionen korrelierte die Ganzfeld-Leistung signifikant mit einer stärkeren Absorption in ihrer subjektiven Erfahrung, geringerer Erregung und geringerem innerem Dialog. In den Experimenten 2 und 3 wurden die individuellen Unterschiede durch Maße der Transliminalität, der Offenheit für Erfahrung und der dissoziativen Erfahrungen ersetzt, die jedoch in keinem Zusammenhang mit der Trefferleistung standen. Die Daten aus Experiment 2 bestätigten nicht die Ergebnisse aus Experiment 1 unter Verwendung des PCI, obwohl ein signifikanter Zusammenhang mit der Dimension Zeitsinn gefunden wurde. In Experiment 3 korrelierten keine PCI-Dimensionen mit der Trefferleistung, ein Muster, das sich bei der Kombination der Daten aus allen drei Experimenten bestätigte.

Rendimiento en una Tarea de Visión Remota Precognitiva con y sin Estimulación de Ganzfeld: Tres Experimentos

Resumen. Investigaciones recientes del primer autor han tratado de incorporar la estimulación de ganzfeld como parte de un protocolo de visualización remota (remote viewing o RV). Un experimento exploratorio inicial (Roe y Flint, 2007) sugirió que los participantes novatos pueden describir con éxito la ubicación de destino seleccionada aleatoriamente en el contexto de ganzfeld, pero no se hizo una comparación directa con el rendimiento en un estado de vigilia. Este artículo describe una serie de tres experimentos posteriores que compararon el rendimiento en una tarea de visualización remota en una condición de vigilia con una condición de estimulación ganzfeld utilizando un diseño de medidas repetidas contrabalanceadas. Sólo hubo variaciones menores en el diseño en los tres experimentos para permitir combinar los datos en un análisis conjunto. En total, 110 participantes produjeron 43 aciertos en la condición de estimulación de ganzfeld (39%), dando una desviación positiva muy significativa de la expectativa de azar (suma de rangos = 225, $p = .000012$), mientras que en la condición de vigilia RV se obtuvieron 30 aciertos (27.5%), marginalmente mejor que la expectativa de probabilidad (suma de rangos = 253, $p = .034$). La diferencia en las puntuaciones z comparando las dos condiciones casi fue significativa ($t[39] = 1.86$, $p = .065$). En el experimento 1, las medidas de diferencia individual identificadas como predictores del rendimiento psi no se relacionaron con los aciertos. Los participantes completaron el Inventario de Fenomenología de la Consciencia (PCI) de Pekala (1991) para evaluar su capacidad de respuesta al protocolo de ganzfeld y a las 12 subdimensiones evaluadas, el rendimiento de ganzfeld correlacionó significativamente con una mayor absorción, menor excitación, y menor diálogo interno. En los experimentos 2 y 3, las medidas de diferencias individuales fueron reemplazadas por medidas de transliminalidad, apertura a la experiencia, y experiencias dissociativas, pero no se correla-

cionaron con los aciertos. Los datos del experimento 2 no confirmaron los resultados utilizando el PCI del experimento 1, aunque se encontró una asociación significativa con la dimensión del sentido del tiempo. En el experimento 3, ninguna dimensión del PCI correlacionó con el rendimiento de la tarea, un patrón que se confirmó cuando los datos de los experimentos se combinaron.



Changes in State of Consciousness and Psi in Ganzfeld and Hypnosis Conditions¹

Etzel Cardeña and David Marcusson-Clavertz

Lund University

Abstract. In a previous experiment with participants high (Highs) and low (Lows) in hypnotizability, psi z scores had moderate to strong correlations with percipients' belief of their success and their previous ostensible psi experiences, experiencing an Altered State of Consciousness and other alterations of consciousness during a non-psi ganzfeld session, but only among the Highs. The current pre-registered study had a larger N of only Highs, evaluated in hypnosis and hypnosis + ganzfeld procedures. Participants (N = 35) served as "receivers" in two 20 min sessions of ganzfeld or hypnosis in counterbalanced order. Both sessions used hypnosis verbalizations, but only one of them had sensory homogenization. The authors served as "sender" and "experimenter" in different buildings. As an index of experienced alterations of consciousness, participants filled out the Phenomenology of Consciousness Inventory (PCI) at the beginning and end of the sessions, and gave a rating of 0-100 to 4 film clips (one of them the target), from which psi z scores were derived. Overall, participants did not score better than chance and there was no difference between the conditions. However, for the ganzfeld sessions psi scores correlated moderately ($r = .40$, $p = .02$) with the PCI Altered State shift scores (ganzfeld - baseline scores). Although the overall psi rate was not significant, we found a relation between psi scoring and experiencing an Altered State in ganzfeld psi sessions.

There is converging but not unequivocal evidence that changes in alterations of consciousness can facilitate performance in psi tasks with designs using participants or groups deemed likely to perform well in a psi experiment, although the actual measures for such alterations have been at times non-validated instruments. We start by summarizing research on altered consciousness and psi, including shifts in consciousness.

Studies of Alterations of Consciousness and Psi with Individuals

Some of the most accurate mediums in the early psychical research were impervious to painful stimuli (Gauld, 1982) and their different "trance states" were described by researchers (Hodgson, 1898; Troubridge, 1922; see also Cardeña & Alvarado, 2011). For more recent examples, the gifted participant Van Dam performed best during a "passive state," as determined by physiological observations (Schouten & Kelly, 1978, p. 278), probably indicating low arousal. Similarly, the widely tested psychic

¹ The acting editor for this paper was Caroline Watt. Address correspondence to: Etzel Cardeña, Ph. D., CERCAP, Department of Psychology, Lund University, Lund, 22100, Sweden, etzel.cardena@psy.lu.se. We thank Professors Chris Roe and Caroline Watt for sharing some of their data with us, and Professor Rex Stanford for a helpful review. This study was supported by Bial Foundation grant #227-10.

Lalsingh Harribance's performance correlated with greater density of alpha brainwaves and a presumed relaxed state (Morris et al., 1972). In a summarizing paper, Morris (1977) concluded that an abundance of alpha activity (and presumed relaxation) related to psi success, but in a later review Broughton (2015) found the relation to be inconsistent across studies.

In a comprehensive review of the evidence to that time, Palmer (1978) concluded that for the few studies that had collected phenomenological reports with gifted participants, there was consistent evidence of significantly higher or lower psi scoring related to "the most pronounced" alterations of consciousness (p. 119), suggesting that alterations of consciousness may affect the deviation from chance rather than the direction of scoring. Unfortunately, systematic case research with gifted individuals has almost disappeared from the field in the last few years.

Studies of Alterations of Consciousness and Psi with Groups

A meta-analysis indicated that techniques that may induce alterations of consciousness produced larger psi effects than the ordinary state, particularly with selected samples (Storm et al., 2010). More specific alterations of consciousness related to psi include:

- a. Loss of body awareness, changes in body image, and other somatic alterations, with a sample of meditators (Palmer et al., 1979);, and with high hypnotizables (Marcusson-Clavertz & Cardeña, 2011). In unselected samples the correlations between alterations of consciousness and psi were negative though (Palmer et al., 1977; Stanford & Neylon, 1975); Palmer et al. had predicted that the correlations would be negative with psi scores below chance.
- b. Increased imagery and changes in perception/hallucinations (Honorton et al., 1971; Marcusson-Clavertz & Cardeña, 2011; Palmer et al., 1977, 1979; Rock et al., 2013; Sargent, 1980, 1982, Sargent et al., 1982),
- c. Experiential and EMG indexes of relaxation (Braud & Braud, 1974; *contra* Palmer et al., 1977),
- d. A sense of self-transcendence (Carpenter, 2004).

With respect to time alterations, Bierman (1988) reported a strong 77% psi hitting (MCE = 25%) in the 10 volunteers who experienced greater time contraction (i. e., an event experienced as lasting less than it chronologically does) in a ganzfeld protocol. Other studies have also reported a relation between time contractions or other alterations and psi scoring (Marcusson-Clavertz & Cardeña, 2011; Palmer et al., 1977; Rock et al., 2013; Sargent, 1980; Schmeidler, 1982; Stanford & Neylon, 1975). Nonetheless, some studies have not replicated this relation (Palmer et al., 1979; Watt et al., 2020). One study reported that psi scoring during ganzfeld was higher than in a non-ganzfeld condition (33% vs. 18%), but it did not find a relation between general alterations of consciousness and psi scores, although using an instrument to assess changes in consciousness (GEEF), whose specific items and psychometric properties were not described (da Silva et al., 2003). A study reported a significant relation between a factor involving alterations of consciousness (including imagery and relaxation) and *psi missing* (Palmer et al., 1977; see also Pérez-Navarro & Cox, 2012, who used questionable items to assess changes of consciousness). It is also important to mention that Blackmore (1987) visited Sargent's lab and criticized some procedures and "urged caution" (p. 186) in interpreting their results, to which members of the lab responded (Harley & Matthews, 1987; Sargent, 1987). In any event, other laboratories whose procedures have not been questioned have also reported all of the findings by Sargent and collaborators mentioned in this paper.

Shifts in States of Consciousness and Psi Scores

A related but different issue is whether psi scoring relates to measured changes from the baseline state of consciousness. Some decades ago, following an idea from Gardner Murphy (1966), Honorton and colleagues evaluated the relation between shifts of consciousness and psi in a series of studies. Honorton, Davidson, and Bindler (1971) reported that greater shifts of consciousness during a biofeedback generation/suppression protocol related to higher card-guessing scores. In this as in the following two papers, Honorton et al. used a state report scale ranging from 0 (normally alert) to 4 (more or less oblivious to your surroundings). In a study using hypnotic or waking imagination conditions with groups of varying suggestibility, Honorton (1972) found that in the hypnosis conditions those with higher than average mean state reports had significantly higher psi scores than those below average, and those with higher than average shifts in state in hypnosis had significantly more psi hits than the others. In another study in the series, Honorton, Drucker, and Hermon (1973) used a partial sensory deprivation technique contraption called the “witches’ cradle.” Although there was no overall psi effect for the 30 participants, there were significantly more psi hits from those reporting above average state shifts than from those below average, and hits were significantly associated with larger state shifts as compared with misses. One study concluded that there was no relation between hypnotic depth reports and psi, but did not provide descriptive or inferential statistics for their conclusion (Parker & Beloff, 1970). Finally, Sargent (1980, p. 111), found in his Study V with ganzfeld that psi scores correlated strongly with experiencing a change in state of consciousness, $r(28) = .51, p = .004$. abundant visual imagery, $r(28) = .48, p < .01$, and low estimates of time elapsed $r(28) = .38, p < .05$.

Ganzfeld Studies of Alterations of Consciousness and Psi

Different procedures that seek to affect the state of consciousness offer indirect support for a relation between altering consciousness and psi scores. For instance, meta-analyses for the use of hypnosis found it to be a facilitatory condition (Honorton, 1977), although the results might have been mediated by order effects (Stanford & Stein, 1994). In the last few decades, the most often used technique to induce alterations of consciousness has been the sensory homogenization setup known as ganzfeld, which has provided meta-analytic support for the evidence of psi (Storm et al., 2010), even after taking into consideration potential artifacts (Baptista, Derakhshani, & Tressoldi; Cardeña, 2018). Furthermore, studies directly comparing ganzfeld versus no-ganzfeld stimulation have shown an advantage of the former (e.g., da Silva et al., 2003; Roe et al., 2020). In this section, we emphasize research on specific alterations of consciousness and psi scoring in ganzfeld, beside the Sargent (1980) study on shifts in consciousness mentioned above.

Research with transcendental meditators derived two experiential factors through exploratory factor analysis, one of which measured loss of body awareness and regressive imagery and correlated significantly with the psi ratings of independent judges but not the meditators (Palmer et al., 1979). A previous study by the authors (Marcusson-Clavertz & Cardeña, 2011) with individuals high and low in hypnotizability, employed a telepathy ganzfeld setup with acquaintances of the percipients as “telepathic agents.” Alterations of consciousness were measured with the Phenomenology of Consciousness Inventory (PCI; Pekala, 1991) on a first ganzfeld session evaluating psychological variables, and were then correlated with performance on the second ganzfeld session, which included the telepathy trial.

The psi z-scores had moderate to high correlations with: belief in individual success ($r = .50, p < .01$), and prior psi experiences ($r = .41, p < .05$). The *Altered State* (of consciousness) scale of the PCI had a strong correlation with psi-scores among Highs ($r = .74, p = .002$), but not among Lows ($r = -.10, p = .75$). At the exploratory level, the following scales had small to large correlations among the Highs: *Altered Experience* ($r = .65, p = .01$) and its subscales evaluating alterations in *perception* ($r = .65, p = .01$), *time sense* ($r = .60, p = .02$), *meaning* ($r = .50, p = .07$), and *body image* ($r = .33, p = .25$). For the full sample, there was a moderate negative correlation with psi scores for *Self-awareness* ($r = -.46, p < .05$). In sum, the results suggested that among the Highs having the sense of being in an altered state of consciousness and specific alterations of consciousness related to giving higher ratings of the target. There are, however, some caveats to that study. First, the N was small, particularly when dividing the group in two, which may produce overestimation of size effects and less reliable replications (Button et al., 2013), particularly considering the large number of dimensions of the PCI. Second, the PCI was evaluated after a ganzfeld session other than the one in which the psi task occurred, so it should be considered an indirect measure of how participants might have felt in the psi session.

Other ganzfeld (precognitive) studies have also used the PCI, conducted after this one and with unselected samples. In three different studies with unselected participants evaluating remote viewing with and without ganzfeld stimulation, all ganzfeld procedures produced sizeable and significant results above chance (Roe et al., 2020). In one of the studies the authors found moderate correlations between psi outcomes and three PCI dimensions: *absorption*, $r = .34, p = .04$, *arousal*, $r = -.34, p = .04$, and *internal dialogue*, $r = -.42, p = .01$. In the second study, the only moderate correlation was between *alterations in time sense* and psi outcomes, $r = .32, p = .05$, and in the third study none of the PCI scales correlated with psi scores. Watt, Dawson, Tullo, Pooley, and Rice et al. (2020), with a selected sample (practitioners of the arts or other mental discipline and/or with previous psi experience) found an overall significant psi effect, but no correlation reaching .2 for any of the PCI dimensions and psi scores.

In sum, across procedures geared to instigate alterations of consciousness, psi scoring has related, albeit inconsistently, with specific alterations of consciousness (e.g., alterations in time experience and somatic experience), a general sense of being in an altered state, and experiencing larger shifts from baseline in state of consciousness. However, earlier research was largely exploratory, with non-validated instruments (except the studies using the PCI recently), and without pre-registration of the hypotheses.

In addition to potentially inducing alterations of consciousness, ganzfeld reduces perceptual noise due to the homogeneous, unchanging sensory stimuli. According to the noise reduction model this change may increase psi effects in ganzfeld (Honorton & Harper, 1974, see also Storm et al., 2010). However, little attention has been paid to internal distractions in the ganzfeld setting, including thoughts about the purpose of the procedure, the challenges it presents, and evaluations of one's own performance. These task re-appraisal thoughts have been termed task-related interferences (Matthews et al., 1999) and are associated with poor performance in signal detection tasks (Smallwood et al., 2004), and might also impact negatively psi performance.

We also noticed in our earlier study that there seemed to be a decline effect, in which the initial sessions showed considerable higher psi scoring than in the second third. Pratt, Rhine, Smith, Stuart, and

Greenwood (1940, p. 198) estimated that for a collection of many studies there was a rank correlation = .51 between the psi score and number of trials, with smaller trials producing greater effects. Although Baptista, Derakhshani, and Tressoldi (2015) did not find that the effect size of ganzfeld research has declined across time, a different question is whether it declines within a study. We decided to test whether psi scoring would decline during the 2nd third of the sessions, to perhaps recover later.

Objectives

Our objectives in this ganzfeld telepathy study were to:

1. Test whether individuals likely to be successful (i.e., Highs with at least some belief that they could succeed in the experiment and reporting some ostensible psi experience) would 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 et al., 2010).
2. Evaluate if the ganzfeld setup is superior to a hypnotic condition. This was an exploratory hypothesis as we are not aware that this hypothesis has been tested before, and we did not expect significant differences between the conditions.
3. Investigate the association between experiencing an altered state during the experimental conditions and psi z-scores. This is a confirmatory hypothesis since we previously reported a strong positive correlation between these two variables.
4. Evaluate the exploratory hypothesis of whether the first third of trials would be significantly higher than the second third, as we had observed ostensible in-study decline effects in the previous study.
5. Test the exploratory hypothesis 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 would be associated with lower psi z scores, in accord with the noise reduction model.
6. Assess whether psi scores of the target would correlate with an independent query about how certain the person was of his/her rating. This was a confirmatory hypothesis since we had observed such a relation in our previous study.

Method

Participants. After careful and lengthy screening, individuals scoring as high hypnotizables (about 5-10% of the population), open to the possibility of psi, and without current distress were selected for the study. Mostly current or recent university students ($N = 35$) participated, of which 25 were women, $M_{age} = 25.06$ ($SD = 8.61$, range 19-61). The first author, a non-Swede professor, served as “sender” whereas the second author, a Swedish doctoral student at the time, carried out the experimental procedures in another building. There was also an RA, a female undergraduate student, who showed participants the target for both sessions at the end of the second session. All three people in the team and the RA are supportive of the psi hypothesis. The study had been approved by the appropriate Swedish official agency and all participants signed consent forms. Participants in the whole procedure got two cinema tickets at the end as compensation.

Procedure. We conducted a repeated measures design with a within-subjects variable (ganzfeld vs. hypnosis) in two stages. The first one involved screening with a group hypnotizability test (Harvard Group Scale of Hypnotic Susceptibility; Shor & Orne, 1962) to identify participants scoring as High hypnotizables (Highs). Because the percentage of those scoring as Highs is around 10% and there were other inclusion criteria, we tested circa 1,650 individuals to identify 190 Highs, whom we tried to contact (some had completed the hypnosis test some time before this experiment and had left the area). Those who were interested in participating, believed that they might in principle succeed in a psi experiment, and reported at least one ostensible previous psi experience underwent individual hypnosis testing to ascertain that they were indeed Highs (using the Stanford Hypnotic Susceptibility Scale: C; Weitzenhoffer & Hilgard, 1962). They also completed a confidential brief questionnaire (the Brief Symptom Inventory or BSI; Derogatis, 1975) to rule out those who were experiencing marked distress in any item of the questionnaire without a temporary reason such as the death of a close one. If participants continued to score as High, they were invited to go onto the second stage and filled out a consent form then. Purposefully, for confidentiality reasons, no data were kept on the handful of people who were not invited to the second stage of the study. Most of them were not invited because they did not continue to perform as Highs, with one or two people expressing some distress during the previous week. The reason why they were not invited to continue was mentioned to them and they were invited to ask any questions about it. None of them seemed to be troubled by not continuing with the project according to the first author's observations.

On the second stage, selected participants underwent two sessions, in counterbalanced order. Before each session there was a short informal meeting with the researchers in the building where the "sender" was located to create a friendly atmosphere. We mentioned that there is experimental evidence for psi and encouraged participants to: 1) aim to obtain the information that would be seen by the "sender," 2) remain open to what they might experience, and 3) notice if something came to their minds that seemed to stand out for any reason (the statements were not written to have a more natural interaction) (see White, 1964). They were encouraged to ask any question and then the second author and the participant went to a lab in a separate building.

Each session began with a 2-min resting baseline with lights turned off and eyes closed. Subsequently the PCI was completed with reference to the 2 min period. Participants were then asked to become cognizant of a film clip being seen by the first author in another building at that moment. The dynamic film clips were randomly chosen by a computer in another building, through an automated protocol. One session was carried out during a ganzfeld protocol including 20 min of exposure to a red, dim light through halved ping pong balls and listening to pink noise through headphones (9 min of a hypnotic induction, then 10 min of thinking out loud reporting, and 1 min deinduction). The other, hypnotic, session differed by having no lights or noise and asking participants to close their eyes for the session (although the induction in ganzfeld had a remark about keeping the eyes open, we have observed in various ganzfeld projects that participants often spontaneously close their eyes while still maintaining the experience of redness). Other than asking participants in ganzfeld to keep their eyes open, the inductions were identical in both conditions, including a suggestion to go into a "deep hypnotic state" and suggestions to focus on the recorded induction's voice and go through a progressive

tensing and relaxation set of instructions, with a background of wavesound. The sender listened to the recorded induction to try to be in a more similar state as the receiver.

Participants were asked if they wanted the experimenter to be seated outside the room during the experiment. Because most did not have a preference, he stayed in the room. At the end of the 20 min stimulation, participants were asked to review their mental activity during the thinking out loud reporting phase before the computer showed them four video clips (one was the target), each about 1 min, arranged randomly by a computer. Participants were asked to give their rating of confidence for each clipping on a 0-100 scale and no clips could be given identical scores. After submitting response to the computer software, but before given feedback, participants were asked to complete the PCI in reference to the hypnosis/ganzfeld condition, as well as a few questions on confidence of success and strategies used. Participants were told by the RA at the end of the second psi session which clips had been the targets, which the RA found out just before telling them.

An automated randomization was applied to this project through a Java program. This program operates a pseudo-RNG called SecureRandom. The percipient/PI's computer randomly selected a target clip from a pool of 116 clips divided in 29 fixed sets of four clips named 1a, 1b, 1c, 1d, 2a, 2b, etc. After the target clip has been shown to the sender 10 times, the information was sent to the receiver's computer, for which SecureRandom had randomized the presentation order of the target and the three decoy clips from the same set. After percipients submitted their ratings, a data file was automatically stored with session ID, ratings, target identity, and presentation order.

We had 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, and 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%.

Measures

The *Brief Symptom Inventory* (BSI; Derogatis, 1975) is a 53-item measure of general distress with a scale from 0 (*not at all*) to 4 (*extremely*) for each item. The scores were purposefully not entered as data but used only to screen out potential participants who reported distress during the week preceding the evaluation.

The *Dundee Stress State Questionnaire* (DSSQ) is a self-report instrument of which we used the scale measuring task-related cognitive interferences (Matthews et al., 1999, 2002). This scale has eight items (e.g., "I thought about my level of ability", "I thought about how much time I had left") answered on a scale from 1 (*never*) to 5 (*very often*). We summed all item scores to measure task-related interferences (TRIs). In this study we adapted it to refer to the 10-min reporting phase. Cronbach's α was .85 for ganzfeld and .80 for hypnosis.

The *Harvard Group Scale of Hypnotic Susceptibility* (Shor & Orne, 1962) is a group measure of hypnotizability. Participants indicate whether they responded to a given suggestion. The scale consists of 12 items and the score is the sum of all responses. Respondents who scored at least 8 on this scale and also had high scores on a related subjective scale were then tested with a more stringent individual scale to ascertain their high hypnotizability (see below).

The *Phenomenology of Consciousness Inventory* (PCI, Pekala, 1991) is a valid and reliable self-report questionnaire completed in reference to a preceding stimulus condition. Each of the 53 items provides two opposite statements in a seven-point scale. The PCI assesses 12 major dimensions of consciousness and 14 sub-dimensions. The dimensions (and sub-dimensions) are: positive affect (joy, sexual excitement, and love), negative affect (anger, sadness, and fear), altered experience (body image, time sense, perception, and meaning), visual imagery (amount, vividness), attention (direction, absorption), self-awareness, altered state, internal dialogue, rationality, volitional control, memory, and arousal.

The *Stanford Hypnotic Susceptibility Scale, Form C* (Weitzenhoffer & Hilgard, 1962), is considered the “gold standard” of hypnotic susceptibility measurement, and those scoring 9 or higher in a scale of 0-12 are considered to be high hypnotizables.

Analyses. The dependent measure was psi z-scores, calculated by subtracting the mean score of all four ratings from the target score and then dividing that value by the SD for all four ratings (Marcusson-Clavertz & Cardeña, 2011; Stanford & Sargent, 1983). Utts (1988) had previously estimated that for $N = 100$ sessions the power for a ganzfeld study would be 0.54, for unselected samples. We thus estimated that 70 sessions to evaluate the hypothesis of psi (i.e., 35 participants \times 2) would be adequate in this sample as selected groups show in general higher effects than unselected ones (Storm et al., 2010). Derakhshani (2013) estimated that 56 trials with selected participants in ganzfeld should provide 80% power (but see Bierman, Spottiswoode, & Bijl, 2016). We pre-registered the study in the Koestler Parapsychology Unit (http://www.koestlerparapsychology.psy.ed.ac.uk/Documents/KPU_Registry_1006.pdf).

We used repeated measures ANOVAs and t tests to compare group means, and correlations to assess the strength of relation between variables. For effect sizes we report correlations and eta squares. We report here all the preregistered hypotheses, with the exception of the exploratory one on Pragmatic Information, which could not be evaluated precisely. Following the pre-registration we tested the three confirmatory hypotheses with one-tailed parametric tests ($\alpha = .05$). For the exploratory analyses we report two-tailed tests and follow the American Statistical Association (Wasserstein, 2016) recommendation of not basing our conclusions solely on whether a p -value exceeds a threshold, whether .05 or another, but rather report the relevant statistic and probability value. We avoid using “significant” criteria other than in reporting our preregistered confirmatory hypotheses and previous results. Our raw data are stored at <https://open-data.spr.ac.uk/node/48/submission/129>.

Results

Hypothesis 1 was not supported, with the mean of z scores during ganzfeld being slightly below chance, $M = -0.09$ ($SD = 0.91$), $t(34) = -0.60$, $p = .72$, one-tailed, and those for hypnosis being slightly

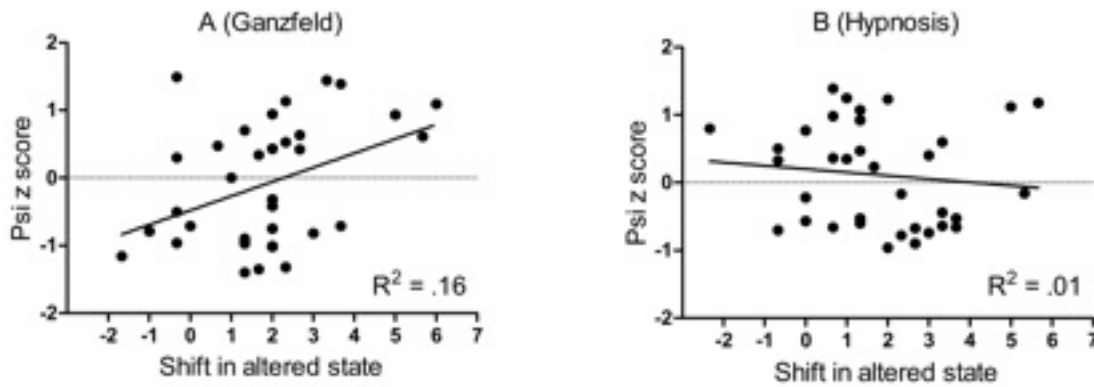
above, $M = 0.11$ ($SD = 0.76$), $t(34) = 0.90$, $p = .19$, one-tailed. Thus, there was no evidence for overall psi scoring. For hypothesis 2 we did not expect a significant difference between ganzfeld and hypnosis, and the difference was trivial, $t(34) = -0.98$, $p = .33$. Psi z-scores in ganzfeld and hypnosis were not correlated with each other, $r(33) = -.11$, $p = .52$. We also evaluated potential condition order effects on psi z scores by performing an ANOVA with one within-subjects factor (Condition: ganzfeld vs. hypnosis) and one between-subjects factor (Order: ganzfeld first vs. hypnosis first). There was no main effect of Order, $F(1,33) = 1.11$, $p = .30$, $\eta_p^2 = .03$, nor an interaction between Condition and Order, $F(1,33) = 0.22$, $p = .64$, $\eta_p^2 = .01$.

The third, confirmatory, hypothesis, proposed that there would be a relation between experiencing an altered state and psi scores. First, a manipulation check showed that in both ganzfeld and hypnosis participants reported expected changes in consciousness in the PCI as compared with the respective baselines. We conducted MANOVA with the 12 PCI dimensions as outcomes and Induction (pre vs. post) and Condition (ganzfeld vs. hypnosis) as within-subjects factors. As expected, there was a main effect of Induction, $F(12, 23) = 8.92$, $p < .001$, $\eta_p^2 = .82$, showing that the PCI pre- and post-measures were different, with the following showing independent significant effects at $p < .01$: increased Altered Experience ($\eta_p^2 = .45$), Altered State ($\eta_p^2 = .62$), Attention ($\eta_p^2 = .27$), and Negative Affect ($\eta_p^2 = .38$), and decreased Self-Awareness ($\eta_p^2 = .58$), Rationality ($\eta_p^2 = .40$), and Voluntary Control ($\eta_p^2 = .60$); increased Imagery ($\eta_p^2 = .12$) and reduced Internal Dialogue ($\eta_p^2 = .13$) differed from baseline at $p < .05$. The interaction between induction and condition on the PCI dimensions did not differ significantly, $F(12, 23) = 1.26$, $p = .30$, $\eta_p^2 = .40$.

The results supported hypothesis three about a relation between experiencing an altered state and psi scoring, but only in the ganzfeld condition. The Pearson correlation between PCI ganzfeld altered state shift and ganzfeld psi z score was $r(33) = .40$, $p = .009$ (one-tailed, see Figure 1; Spearman's, $r(33) = .42$, $p = .006$, one-tailed.) whereas the correlation between hypnosis altered state shift and hypnosis psi z score was negative and non-significant, $r(33) = -.12$, $p = .75$ (one-tailed).

Figure 1. Scatterplot of psi z-scores and shift in altered state scores in (A) ganzfeld, and (B) hypnosis. Mean chance expectation for psi z scores is indicated by the horizontal line at zero.

Exploratory correlations with the other PCI scales (and subscales of interest) are shown in Table 1. Using Cohen's convention (1988) for interpreting correlations, for ganzfeld there were medium correlations between psi and experiencing an altered state, being in an absorbed state, amount of imagery, and being less aroused, with small to medium correlations for attention and its subscales. For hypnosis



there was only a small correlation between psi scores and less arousal. We also examined whether ganzfeld and hypnosis induced different shifts in altered state, altered experience, imagery, arousal, and attention, but there were no significant differences between the conditions, $t_s < 1.5, p_s > .10$.

Table 1.
Correlations (two-tailed p values) between psi scores and PCI scales and subscales by Condition

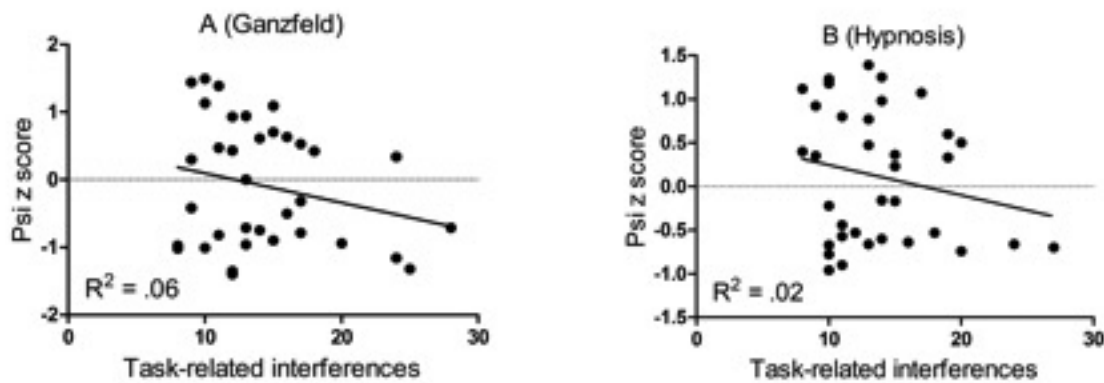
	AE	PA	NA	ATT	Da	Ab	IM	Am	Viv	SA	AS	AR	RA	VC	ME	ID
Gan	.08 (.65)	-.01 (.95)	.07 (.70)	.29 (.09)	.23 (.18)	.30 (.09)	.21 (.23)	.31 (.07)	.08 (.65)	.12 (.48)	.40 (.02)	-.32 (.06)	.05 (.76)	-.09 (.60)	.004 (.98)	-.004 (.98)
Hyp	.07 (.67)	-.20 (.25)	.13 (.44)	-.16 (.36)	-.15 (.39)	-.10 (.57)	-.03 (.84)	-.15 (.40)	.12 (.51)	.13 (.46)	-.12 (.51)	.27 (.11)	.06 (.74)	.07 (.70)	.20 (.25)	-.19 (.27)

The fourth, exploratory, hypothesis was not supported since the first third of the sessions ($n = 12$) did not differ noticeably from the next third ($n = 12$) in ganzfeld, $t(22) = 0.28, p = .78$, or hypnosis conditions, $t(22) = 1.16, p = .26$.

The next exploratory hypothesis, that higher task related re-appraisals or interferences (TRI) would interfere with psi performance had small correlations in the direction expected for ganzfeld, $r = -.24, p = .17$ and hypnosis, $r = -.21, p = .23$. As can be seen in Figure 2, there were quite a few participants who reported high TRI in ganzfeld ($M = 14.3, SD = 5.0$) and hypnosis ($M = 13.8, SD = 4.5$). TRI during ganzfeld and hypnosis had a large correlation, $r = .50, p < .01$, showing that those individuals who reported greater amount of TRI in one condition were also likely to report greater amount in the other.

Figure 2. Scatterplots of psi z scores and task-related interferences in (A) ganzfeld and (B) hypnosis.

The last exploratory hypothesis, that individuals' subjective ratings of their success in the session would correlate with the psi z-scores was not supported either for ganzfeld, $r = -.05, p = .76$, or hypnosis, $r = -.13, p = .46$, indicating that their self-evaluation of success was not accurate.



Discussion

To summarize the results, two confirmatory hypotheses were not supported (no overall psi effect, no correlation between self-confidence and actual success), whereas one confirmatory hypothesis was (a correlation with experiencing being in an altered state, but only in ganzfeld, not hypnosis). Ganzfeld and hypnosis conditions did not show any significant difference in PCI or psi scoring.

First, we should discuss possible explanations for the lack of an overall psi effect. We thought that by using a select group of high hypnotizables without a negative expectation for the psi experiment, we would obtain sizeable psi effects such as those found in research with other select samples (e.g., Schlitz & Honorton, 1992). Our lack of a supportive result can be explained in a number of ways. First, it could be that there was no evidence of psi to begin with (Alcock, 2003). However, this does not fit with the non-trivial correlation between psi scoring and shifts in altered state, consistent with some previous research (e.g., Sargent, 1980).

Another possibility is that our procedure discouraged the emergence of an overall psi effect, and, in retrospect, it had some limitations. First, we chose a ganzfeld exposure of 20 min because high hypnotizables get into a deeper altered state more quickly than those less hypnotizable (e.g., Cardeña et al., 2013), but this may not have been enough to fully exploit some of the other presumed effects of ganzfeld stimulation (e.g., greater alteration of consciousness with time, greater stimulus hunger), thus failing to attain an overall psi effect. We discovered after we started our study that when Honorton (1977, p. 465) dichotomized successful vs. non-successful ganzfeld studies to that date, he found that the mean duration of *successful* ganzfeld exposure was 37 minutes, compared with a mean of 22 minutes for the unsuccessful ones, although only a few studies had been conducted by that time. An updated meta-analytic study on ganzfeld duration and psi outcomes could shed light on this issue. Our 20 min might have been insufficient to obtain an overall noticeable psi effect. On the other hand, analyses showed that both conditions produced expected changes in reports of alterations of consciousness, with the only surprise being increased negative affect. A plausible explanation is that participants during the conditions experienced negative effect due to the pressure to perform well in the psi task.

We also conducted an ANOVA to compare the scores of the AS scale at the end of the session

between our study and the studies by Roe et al. (2020) and the one by Watt et al. (2020) for which data were provided to us by the authors, Mean scores for our sample, $M = 4.26$, $SD = 1.31$, were higher ($p < .001$, unadjusted for multiple comparisons, $p < .05$ after Bonferroni adjustments) than those for Watt et al.'s, $M = 3.18$, $SD = 1.41$, and Roe et al.'s study 1, $M = 2.32$, $SD = 1.00$, and Roe et al.'s study 2, $M = 2.69$, $SD = 1.00$. These results are consistent with the general finding that hypnosis and ganzfeld elicit reports of greater alterations of experience among high than among medium or low hypnotizables (e.g., Cardeña & Terhune, 2018; Marcusson-Clavertz et al., 2012; Pekala & Kumar, 2007).

However, even for Highs some alterations of consciousness related to psi scoring, such as changes in imagery, may require a certain amount of time after an induction (see Cardeña, 2005; Cardeña et al., 2013). In an ongoing data collection using ganzfeld for a non-psi project, the first author has observed that the experience of complete darkness that Honorton (1977) had also described tends to require more than 10 min post-induction, even for Highs.

The relation between experiencing a shift in altered state and psi scores only occurred for ganzfeld, which is consistent with previous research comparing ganzfeld with a silent condition (cf. Stanford, 1987, p. 52). It should be mentioned, though, that the hypnosis condition did not include specific suggestions that might have increased psi scoring, such as experiencing an expansion of consciousness, something that will be worth exploring in the future.

A potential explanation for some studies finding a relation between altered consciousness and psi and others not is that the relation may occur only for high hypnotizables, who are more likely to experience alterations of consciousness (Cardeña & Terhune, 2014). For a subgroup of them this alteration may mediate successful scoring through a greater sense of interconnectedness and a lowering of critical thinking (Cardeña, 2005, 2010). The discrepant findings for the recent studies using the PCI in ganzfeld suggest that there may be different paths to achieve psi effects, along the lines of T. X. Barber's theory (1999) to explain high hypnotizability. He proposed that there are three groups who can achieve high suggestibility: fantasy-prone, dissociative-prone, and those who are very motivated but do not readily experience alterations of consciousness. It may be that high scoring in psi tasks may also be accomplished through different processes: experienced alterations of consciousness, including dissociative processes for some, and high motivation and attentional focus for others. This multiple path approach would bring greater harmony to studies that include procedures to alter consciousness such as ganzfeld with those that do not and may only require some attention and focus (e.g., remote viewing). (Cardeña, 2006). Already in 1896 William James had mentioned that a hypnotic state was not in itself psychic but might facilitate psi phenomena, as might dissociative processes ("alternate personality," 1896, in Taylor, 1983, pp. 92-93). The exploratory correlations between psi scores and imagery, absorption, and reduced arousal in this study match previous individual and group studies of relaxation and psi, and partly some of the results of Roe et al (2010), and may signal processes other than being in an altered state that facilitate psi scoring.

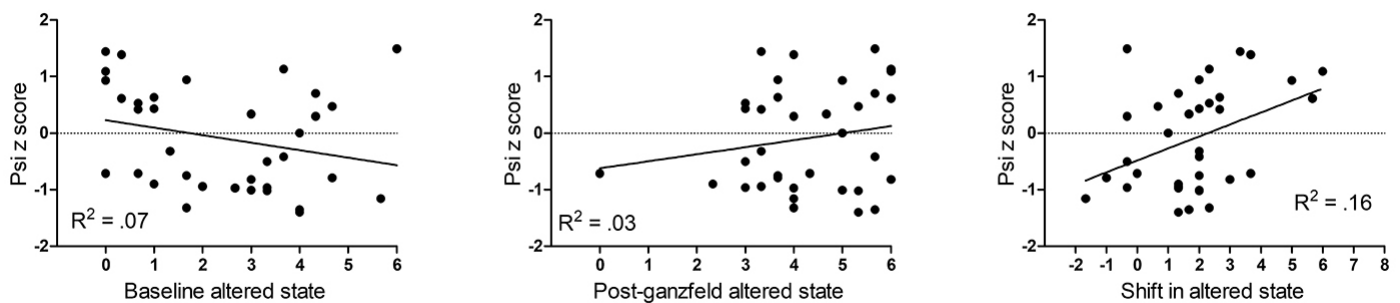
Another plausible explanation for the lack of an overall effect is that the "sender," was a stranger to the participants. Two ganzfeld studies that systematically compared dyads of people close with each other reported non-significant effects for stranger dyads and significant ones for dyads formed by peo-

ple close to each other (Broughton & Alexander, 1997; Sargent, 1980, experiment V, page 76). A way to solve this issue would be to favor precognition experiments, in which the person only needs to think about “communicating” with him/herself in the future, greatly simplifying logistics, and with a very good track record, as Watt et al. (2020) propose. Another potential explanation is that our two studies may just show a psychological or parapsychological experimenter effect (Palmer & Millar, 2015) in which only the preferred hypothesis of the researchers gets support. Finally, showing participants only the clip of the target (to avoid possible contamination of other clips) and using independent judges to evaluate potential hits is worth considering in future research (cf. Palmer et al., 1979).

The discrepant findings of this study and those of Roe et al.’s and Watt et al.’s may also be due to our using shift scores. Using shifts in consciousness rather than a measure at the end of the session may be a more sensitive indicator (cf. Stanford, 1987). To reinforce this point, here is a graph showing the correlations between PCI ganzfeld baseline, end of session, and shift scores. The relation with psi scores only attains for the last one. A possible explanation for our results is that baseline scores may show inflated ratings of being in an altered state, given the demand characteristics of ganzfeld studies, and using shift scores may help correct this bias. Furthermore, using only post-ganzfeld scores greatly reduces the variability of scores. In our data almost everyone reported a score of 3 or higher in a scale of 0-6 (see Fig. 3).

Figure 3. Scatterplots with psi z scores and PCI scores at baseline, at the end of the ganzfeld session, and shift scores (i.e., differences scores; ganzfeld - baseline).

As for higher task related re-appraisals interfering with psi performance, the correlations were small and difficult to evaluate properly as there was a floor effect (i.e., many participants reporting none or extremely few task-related reappraisals), but it is consistent with the unreliable relations between absorption (i. e., less mental interference) and psi scoring. The construct might be worth pursu-



ing further in a more detailed design with greater time-on-task and more opportunity for task-related interferences, greater statistical power, and a more heterogeneous population. Using experience sampling methods to evaluate interferences would be a way to test this idea without relying on long term memory.

Some paths for future research are worth considering. First, it is important to specify which alterations of consciousness are relevant to increased psi scoring and why. Second, it is important to evalu-

ate shifts of consciousness as an independent variable of psi performance, and not just end-of-session measures. To make this idea more feasible, it would be a good idea to choose only those scales or items of the PCI that have been related to psi, to make testing less onerous, and/or to develop a shorter questionnaire with the most promising items. There is some consistency in various research findings, so more precise evaluations of such dimensions as time estimation, body image, and imagery that are not exclusively self-reports ought to be developed. And, although we used a counterbalanced presentation and found no order effect, it cannot be assumed that results with a within-subject design will generalize to a between-subjects one.

Another option is to return to more intensive repeated investigation of promising individuals (e.g., individuals who experience large shifts in altered states and perform well on a preliminary ganzfeld test) to evaluate conditions that may increase effect sizes. It may also be fruitful to employ mixed-methods designs with these individuals to evaluate how their alterations of consciousness and potentially related neurodynamics relate to scoring in a psi task. For instance, Honorton (1972) proposed that content analysis of participants' mentations could be a more sensitive way to detect potential psi information than merely taking an overall judgment, but his call has gone largely unheeded. Intensive, theoretically-driven small N studies might advance the field (cf. Smith & Little, 2018).

At the other end, large N, multi-laboratory ganzfeld studies with selected populations (e.g., highs) can test the reliability and generalizability of specific association between altered state and psi performance and evaluate additional variables, such as time contraction or imagery, which may mediate/moderate the relation between alterations of consciousness and psi. Multisite efforts could clarify two very important questions that merit revisiting: 1) Which variables consistently predict success in ganzfeld across laboratories? Earlier proposals (e.g., Dalton, 1997; see also Cardeña & Marcusson-Clavertz, 2015, for a more recent review) such as the advantage of using select groups continue to receive support (e.g., Baptista et al, 2015), although selecting them based on the Myers-Briggs FP (Feeling Perception) preference clashes with the questionable psychometrics of that measure (e.g., Pittenger, 1993). 2) It behooves us to test different, but not necessarily incompatible, processes predicting success in ganzfeld. Proposed mediators of psi success in ganzfeld include: "noise reduction" (Honorton, 1977), changes in expectancy (Braud, 1978), reduction of encoding constraints/lability (Stanford, 1987), and experiences of transcendence (Cardeña, 2006; Carpenter, 2004). Besides measuring these processes, future projects may also manipulate them to help advance our understanding.

References

- Alcock, J. (2003). Give the null hypothesis a chance. Reasons to remain doubtful about the existence of psi. *Journal of Consciousness Studies*, 10, 29-50.
- Baptista, J., Derakhshani, M., & Tressoldi, P. E. (2015). Explicit anomalous cognition: A review of the best evidence in ganzfeld, forced choice, remote viewing and dream studies. In E. Cardeña, J. Palmer, & D. Marcusson-Clavertz (Eds.), *Parapsychology: A handbook for the 21st century* (pp. 192-214). McFarland.
- Barber, T. X. (1999). A comprehensive three-dimensional theory of hypnosis. In I. Kirsch, A. Capafons, E.

- Cardeña-Buelna, & S. Amigo (Eds.), *Clinical hypnosis and self-regulation: Cognitive-behavioral perspectives* (pp. 21-48). American Psychological Association.
- Bierman, D. J. (1988). A test on possible implications of the OTs for Ganzfeld research. *European Journal of Parapsychology*, 7, 1-12.
- Bierman D. J., Spottiswoode J. P., & Bijl, A. (2016). Testing for questionable research practices in a meta-analysis: An example from experimental parapsychology. *PLoS ONE* 11(5): e0153049. <https://doi.org/10.1371/journal.pone.0153049>
- Blackmore, S. (1987). A report of a visit to Carl Sargent's laboratory. *Journal of the Society for Psychical Research*, 54, 186-198.
- Braud, L. W., & Braud, W. G. (1974). Further studies of relaxation as a psi-conducive state. *Journal of the American Society for Psychical Research*, 68, 229-245.
- Braud, W. G. (1978). Psi conducive conditions: Explorations and interpretations. In B. Shapin & L. Coly (Eds.), *Psi and states of awareness* (pp. 1-41). Parapsychology Foundation.
- Broughton, R. S. (2015). Psi and biology: An evolutionary perspective. In E. Cardeña, J. Palmer, & D. Marcusson-Clavertz (Eds.), *Parapsychology: A handbook for the 21st century* (pp. 139-148). McFarland.
- Broughton, R. S., & Alexander, C. H. (1997). Autoganzfeld II: An attempted replication of the PRL ganzfeld research. *Journal of Parapsychology*, 61, 209-226.
- Button, K. S., Ioannidis, J. P. A., Mokrysz, C., Nosek, B. A., Flint, J., Robinson, E. S. J., & Munafò, M. R. (2013). Power failure. Why small sample size undermines the reliability of neuroscience. *Nature Reviews Neuroscience*, 14, 365-376. doi.org/10.1038/nrn3475
- Cardeña, E. (2005). The phenomenology of deep hypnosis: Quiescent and physically active. *International Journal of Clinical and Experimental Hypnosis*, 53, 37-59. doi.org/10.1080/00207140490914234
- Cardeña, E. (2006). T. X. Barber's typology implications for parapsychology. *Proceedings of the 49th Annual Convention of the Parapsychological Association*, 370.
- Cardeña, E. (2010). Presidential address: A look at the potential future of parapsychology with help from a regression to the hypnotic past. *Journal of Parapsychology*, 74, 15-30.
- Cardeña, E., & Alvarado, C. (2011). Altered consciousness from the age of Enlightenment through mid 20th Century, In E. Cardeña & M. Winkelmann (Eds.), *Altering consciousness. Multidisciplinary perspectives*. Vol. 2. (pp. 89-112). Praeger.
- Cardeña, E., Jönsson, P., Terhune, D. B., & Marcusson-Clavertz, D. (2013). The neurophenomenology of neutral hypnosis. *Cortex*, 49, 375-385. <http://dx.doi.org/10.1016/j.cortex.2012.04.001>
- Cardeña, E., & Marcusson-Clavertz, D. (2015). States, traits, cognitive variables, and psi. In E. Cardeña, J. Palmer & D. Marcusson-Clavertz (Eds.), *Parapsychology: A handbook for the 21st century* (pp. 110-124). McFarland.
- Cardeña, E., & Terhune, D. (2014). Hypnotizability, personality traits, and the propensity to experience alterations of consciousness. *Psychology of Consciousness: Theory, Research, and Practice*, 1, 292-307. <https://doi.org/10.1037/cns0000026>
- Cardeña, E., & Terhune, D. (2018). The roles of response expectancies, baseline experiences, and hypnotizability in spontaneous hypnotic experiences. *International Journal of Clinical and Experimental Hypnosis*, 67, 1-27. doi.org/10.1080/00207144.2019.1553759.
- Carpenter, J. C. (2004). Implicit measures of participants' experiences in the ganzfeld: Confirmation of previous relationships in a new sample. *Proceedings of Presented Papers: The Parapsychological Association 47th Annual Convention*, pp. 1-11.
- Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.). Erlbaum.
- Dalton, K. (1997). Is there a formula to success in the ganzfeld? Observations on predictors of psi-ganzfeld performance. *European Journal of Parapsychology*, 13, 71-82.
- da Silva, F. E., Pilato, S., & Hiraoka, R. (2003). Ganzfeld vs. no Ganzfeld: An exploratory study of the effects of Ganzfeld conditions on ESP. *Proceedings of Presented Papers: The Parapsychological Association 46th Annual Convention*, 31-49.

- Derakhshani, M. (2013). *On the statistical replicability of ganzfeld studies*. Unpublished manuscript.
- Gauld, A. (1982). *Mediumship and survival: A century of investigation*. Academy Chicago Publishers.
- Harley, T., & Matthews, G. (1987). Cheating, psi, and the appliance of science: A reply to Blackmore. *Journal of the Society for Psychical Research*, 54, 199–207.
- Hodgson, R. (1898). A further record of observations of certain phenomena of trance. *Proceedings of the Society for Psychical Research*, 13, 284–582.
- Honorton, C. (1972). Significant factors in hypnotically-induced clairvoyant dreams. *Journal of the American Society for Psychical Research*, 66, 86-102.
- Honorton, C. (1977). Psi and internal attention states. In B. B. Wolman (Ed.), *Handbook of parapsychology* (pp. 435-472). Van Nostrand Reinhold.
- Honorton, C., Davidson, R., & Bindler, P. (1971). Feedback augmented EEG Alpha, shifts in subjective state and ESP card-guessing performance. *Journal of the American Society for Psychical Research*, 65, 308-323.
- Honorton, C., Drucker, S., & Hermon, H. (1973). Shifts in subjective state and ESP under conditions of partial sensory deprivation. *Journal of the American Society for Psychical Research*, 67, 191-196.
- Honorton, C., & Harper, S. (1974). Psi-mediated imagery and ideation in an experimental procedure for regulating perceptual input. *Journal of the American Society for Psychical Research*, 68(2), 156-168.
- Marcusson-Clavertz, D., & Cardeña, E., (2011). Hypnotizability, alterations in consciousness, and other variables as predictors of performance in a ganzfeld psi task. *Journal of Parapsychology*, 75, 235-259.
- Marcusson-Clavertz, D., Terhune, D., & Cardeña, E. (2012). Individual differences and state effects on mind-wandering: Hypnotizability, dissociation, and sensory homogenization. *Consciousness and Cognition*, 21, 1097-1108. <https://doi.org/10.1016/j.concog.2012.04.002>
- Matthews, G., Campbell, S. E., Falconer, S., Joyner, L. A., Huggins, J., Gilliland, K., . . . Warm, J. S. (2002). Fundamental dimensions of subjective state in performance settings: Task engagement, distress, and worry. *Emotion*, 2, 315-340. doi:10.1037/1528-3542.2.4.315
- Matthews, G., Joyner, L., Gilliland, K., Campbell, S. E., Huggins, J., Falconer, S. (1999). Validation of a comprehensive stress state questionnaire: Towards a state “Big Three”? In I. Mervielde, I. J. Deary, F. De Fruyt, & F. Ostendorf (Eds.), *Personality psychology in Europe* (Vol. 7, pp. 335–350). Tilburg University Press. <https://doi.org/10.1037/t27031-000>
- Morris, R. L. (1977). Parapsychology, biology and ANPSI. In B. B. Wolman (Ed.), *Handbook of parapsychology* (pp. 687-715). Van Nostrand Reinhold.
- Morris, R. L., Roll, W. G., Klein, J. & Wheeler, G. (1972). EEG patterns and ESP results in forced-choice experiments with Lalsingh Harribance. *Journal of the American Society for Psychical Research*, 66, 253-268.
- Murphy, G. (1966). Research in creativeness: What can it tell us about extrasensory perception? *Journal of the American Society for Psychical Research*, 60, 8-22.
- Palmer, J. (1978). Extrasensory perception: Research findings. In S. Krippner (Ed.), *Advances in parapsychological research 2* (pp. 59–243). Plenum. https://doi.org/10.1007/978-1-4615-9092-7_3
- Palmer, J., Bogart, D. N., Jones, S. M., & Tart, C.T. (1977). Scoring patterns in an ESP Ganzfeld experiment. *Journal of the American Society for Psychical Research*, 71, 121-145.
- Palmer, J., Khamashta, K. K., & Israelson, K. (1979). An ESP ganzfeld experiment with transcendental meditators. *Journal of the American Society for Psychical Research*, 73, 333-348.
- Palmer, J., & Millar, B. (2015). Experimenter effects in parapsychological research. In E. Cardeña, J. Palmer & D. Marcusson-Clavertz (Eds.), *Parapsychology: A handbook for the 21st century* (pp. 293-300). McFarland.
- Parker, A., & Beloff, J. (1970). Hypnotically-induced clairvoyant dreams; A partial replication and attempted confirmation. *Journal of the American Society for Psychical Research*, 64, 432-442.
- Pekala, R. J. (1991). *Quantifying consciousness: An empirical approach*: Plenum Press. doi.org/10.1007/978-1-4899-0629-8
- Pekala, R. J., & Kumar, V. K. (2007). An empirical-phenomenological approach to quantifying consciousness

- and states of consciousness: With particular reference to understanding the nature of hypnosis. In G. A. Jamieson (Ed.), *Hypnosis and conscious states: The cognitive neuroscience perspective* (pp. 167–194). Oxford University Press.
- Pérez-Navarro, J. R., & 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*, 559-572. doi.org/10.5964/ejop.v8i4.507
- Pittenger, D. J. (1993). The utility of the Myers-Briggs Type Indicator. *Review of Educational Research*, *63*, 467-488. doi.org/10.3102/00346543063004467
- Pratt, J. G., Rhine, J. B., Smith, B. M., Stuart, C. E., & Greenwood J. A. (1940). *Extra-sensory perception after sixty years: A critical appraisal of the research in extra-sensory perception*. Henry Holt. doi.org/10.1037/13598-000
- Rock, A. J., Storm, L., Harris, K., & Friedman, H. L. (2013). Shamanic-like journeying and psi signal detection: II Phenomenological dimensions. *Journal of Parapsychology*, *77*, 249-270.
- Roe, C.A., Cooper, C., & Martin, H. (2020). Performance at a precognitive remote viewing task, with and without ganzfeld stimulation: Three experiments. *Journal of Parapsychology*, *84*, 38-65.
- Sargent, C. L. (1987). Sceptical fairytales from Bristol. *Journal of the Society for Psychical Research*, *54*, 208-218.
- Sargent, C. L. (1980). *Exploring psi in the ganzfeld*. Parapsychology Foundation.
- Sargent, C., L., Bartlett, H. J., & Moss, P. P. (1982). Response structure and temporal incline in ganzfeld free-response GESP testing. *Journal of Parapsychology*, *46*, 85-110.
- Schlitz, M. J., & Honorton, C. (1992). Ganzfeld psi performance within an artistically gifted population. *Journal of the American Society for Psychical Research*, *86*, 83-98.
- Schmeidler, G. R. (1982). A possible commonality among gifted subjects. *Journal of the American Society for Psychical Research*, *76*, 53-59.
- Schouten, S. A., & Kelly, E. F. (1978). On the experiment of Brugmans, Heymans and Weinberg. *European Journal of Parapsychology*, *2*, 247-290.
- Shor, R. E., & Orne, E. C. (1962). *Harvard Group Scale of Hypnotic Susceptibility: Form A*. Consulting Psychologists Press. doi.org/10.1037/t02246-000
- Smallwood, J., Davies, J. B., Heim, D., Finnigan, F., Sudberry, M., O'Connor, R., & Obonsawin, M. (2004). Subjective experience and the attentional lapse: Task engagement and disengagement during sustained attention. *Consciousness and Cognition*, *13*, 657-690. doi:10.1016/j.concog.2004.06.003
- Smith, P. L., & Little, D. R. (2018). Small is beautiful: In defense of the small-N design. *Psychonomic Bulletin & Review*, *25*, 2083-2101. doi.org/10.3758/s13423-018-1451-8
- Stanford, R. G. (1987). Ganzfeld and hypnotic induction procedures in ESP research: Toward understanding their success. In S. Krippner (Ed.), *Advances in parapsychology 5* (pp. 39-76). McFarland.
- Stanford, R. G., & Neylon, A. (1975). Experiential factors related to free-response clairvoyance performance in a sensory uniformity setting (ganzfeld) [Abstract]. In J. D. Morris, W. G. Roll, and R. L. Morris (Eds.), *Research in parapsychology 1974* (pp. 89-93). Scarecrow Press.
- Stanford, R. G., & Sargent, C. L. (1983). Z scores in free-response ESP methodology: Comments on their utility and correction of an error. *Journal of the American Society for Psychical Research*, *77*, 319–326.
- Stanford, R. G., & Stein, A. G. (1994). A meta-analysis of ESP studies contrasting hypnosis and a comparison condition. *Journal of Parapsychology*, *58*, 235–269.
- Storm, L., Tressoldi, P.E., & Di Risio, L. (2010). Meta-analysis of free-response studies, 1992–2008: Assessing the noise reduction model in parapsychology. *Psychological Bulletin*, *136*, 471–485. doi.org/10.1037/a0019457
- Taylor, E. (1983). *William James on exceptional mental states. The 1896 Lowell lectures*. University of Massachusetts Press.

- Troubridge, U. L. (1922). The modus operandi in so-called mediumistic trance. *Proceedings of the Society for Psychical Research*, 32, 344–378.
- Utts, J. M. (1988). Successful replication versus statistical significance. *Journal of Parapsychology*, 52, 4, 305–320.
- Wasserstein, R. L. (Ed.) (2016). ASA statement on statistical significance and p-values. *The American Statistician*, 70, 129-133. doi.org/10.1080/00031305.2016.1154108
- Watt, C., Dawson, E., Tullo, A., Pooley, A., & Rice, H. (2020). Testing precognition and altered states of consciousness with selected participants in the ganzfeld. *Journal of Parapsychology*, 21-37.
- Weitzenhoffer, A. M., & Hilgard, E. R. (1962). *Stanford Hypnotic Susceptibility. Scale. Form C*. Consulting Psychologists Press.
- White, R. A. (1964). A comparison of old and new methods of response to targets in ESP experiments. *Journal of the American Society for Psychical Research*, 58, 21-56.

Changements dans l'État de Conscience et le Psi dans les Conditions Ganzfeld et Hypnose

Résumé. Dans une précédente expérimentation avec des participants à l'hypnotisabilité élevée (les Élevés) et basse (les Bas), les scores z psi avaient des corrélations modérées à fortes avec la croyance des percipients quant à leur succès et leurs précédentes expériences psi supposées, le vécu d'un état modifié de conscience et d'autres modifications de la conscience durant une session de Ganzfeld non-psi, mais seulement chez les sujets Élevés. La présente étude préenregistré avait un nombre N plus élevé de sujets Élevés, évalués dans les procédures d'hypnose et d'hypnose + Ganzfeld. Les participants (N = 35) servaient de « récepteurs » dans deux sessions de Ganzfeld et d'hypnose durant 20 minutes, dans un ordre contrebalancé. Les deux sessions utilisaient des verbalisations hypnotiques, mais seule l'une des deux employait l'homogénéisation sensorielle. Les auteurs servaient d'« émetteurs » et d'« expérimentateurs » dans différents immeubles. Pour mesurer les vécus de modifications de la conscience, les participants remplissaient l'Inventaire de phénoménologie de la conscience (PCI), au début et à la fin des sessions, et donnait une évaluation entre 0 et 100 à quatre clips vidéo (l'un étant la cible), d'où on dérivait des scores z psi. De manière globale, les participants n'ont pas eu des scores supérieurs au hasard et il n'y a eu aucune différence entre les conditions. Toutefois, pour les scores psi des sessions Ganzfeld, nous avons observé une corrélation modérée ($r = .40$, $p = .02$) avec les scores de transition en état modifié du PCI (Ganzfeld – scores de base). Bien que le score psi global n'était pas significatif, nous avons trouvé une relation entre le score psi et le vécu d'un état modifié dans les sessions de Ganzfeld psi.

Veränderungen im Bewusstseinszustand und Psi unter Ganzfeld- und Hypnosebedingungen

Zusammenfassung. In einem früheren Experiment mit Teilnehmern mit hoher (Highs)- und niedriger (Lows)-Hypnotisierbarkeit korrelierten die Psi-z-Scores mäßig bis stark mit den Überzeugungen der Perzipienten hinsichtlich ihres Erfolgs, ihren früheren mußmaßlichen Psi-Erfahrungen, Erfahrungen von Veränderten Bewusstseinszuständen und anderen Bewusstseinsveränderungen während einer Ganzfeld-Sitzung ohne Psi, allerdings nur bei den Highs. Die aktuelle vorregistriert Studie hatte ein größeres

N von nur Highs, die in Hypnose- und Hypnose + Ganzfeld-Verfahren bewertet wurden. Die Teilnehmer ($N = 35$) dienten als „Empfänger“ in zwei 20-minütigen Ganzfeld- oder Hypnosesitzungen in ausbalancierter Reihenfolge. Beide Sitzungen verwendeten Hypnose-Verbalisierungen, aber nur eine von ihnen hatte eine sensorische Homogenisierung. Die Autoren fungierten als „Sender“ und „Experimentator“ in verschiedenen Gebäuden. Als Index für den Grad der Bewusstseinsveränderungen füllten die Teilnehmer zu Beginn und am Ende der Sitzungen den Fragebogen zur Phänomenologie des Bewusstseins (PCI) aus und stufen von 0-100 4 Filmclips ein (einer davon war das Zielobjekt), aus denen Psi-z-Scores abgeleitet wurden. Insgesamt schnitten die Teilnehmer nicht besser als der Zufall ab, und es gab auch keinen Unterschied zwischen den Bedingungen. Bei den Ganzfeld-Sitzungen korrelierten die Psi-Scores jedoch mäßig ($r = .40$, $p = .02$) mit den PCI-Scores Shift Veränderter Zustand (Scores Ganzfeld-Basis). Obwohl das Gesamt-Psi-Ergebnis nicht signifikant war, fanden wir in den Ganzfeld-Psi-Sitzungen eine Beziehung zwischen den Psi-Scores und dem Erleben eines veränderten Zustands.

Cambios en el Estado de Consciencia y Psi en Ganzfeld e Hipnosis

Resumen. En un experimento anterior con participants con hipnotizabilidad alta (Altos) o baja (Bajos), las puntuaciones psi z mostraron correlaciones moderadas a fuertes con la creencia de los perceptores en su éxito y sus presuntas experiencias psi previas, y con experimentar un estado alterado de consciencia y otras alteraciones de consciencia durante una sesión ganzfeld, pero solo entre los Altos. Este estudio pre-registrado tuvo una N mayor de solo Altos, evaluados en procedimientos de hipnosis e hipnosis + ganzfeld. Los participantes ($N = 35$) sirvieron como “receptores” en dos sesiones de 20 min de ganzfeld o hipnosis en orden alterna. Ambas sesiones utilizaron verbalizaciones de hipnosis, pero solo una de ellas tuvo homogeneización sensorial. Los autores sirvieron como “remitente” y “experimentador” en diferentes edificios. Como índice de alteraciones experimentadas de la consciencia, los participantes completaron el Inventario de Fenomenología de la Consciencia (PCI) al comienzo y al final de las sesiones, y otorgaron una calificación de 0-100 a 4 fragmentos de película (uno de ellos el objetivo), de lo que derivamos puntajes psi z. En general, los participantes no obtuvieron mejores puntuaciones que el azar y no hubo diferencias entre las condiciones. Sin embargo, para las sesiones de ganzfeld las puntuaciones psi correlacionaron moderadamente ($r = .40$, $p = .02$) con las puntuaciones de cambio del estado alterado de PCI (ganzfeld - puntajes de referencia). Aunque la tasa general de psi no fue significativa, encontramos una relación entre la puntuación de psi y experimentar un estado alterado en las sesiones de psi en ganzfeld.

Parapsychological Association 2019 Presidential Address Making Sense of Psi: Seven Pieces of the Puzzle

Dean Radin

Institute of Noetic Sciences

A popular theme of annual presidential addresses to the Parapsychological Association (PA) and the Society for Psychical Research (SPR) is the attempt to make sense of psi. These addresses often assume that most of the audience is satisfied that the ontological question is settled in the affirmative, so the next questions that naturally arise are the *what* and *why* of psi?

I will address this theme in terms of a jigsaw puzzle that, when fully assembled someday, will present a coherent picture that provides a satisfactory answer to these age-old questions. The puzzle we are dealing with undoubtedly consists of thousands of pieces, of which to date we have only identified a few dozen, but perhaps we can make some sense of the tiny fraction of the whole picture that is already visible.

In the process of thinking about these puzzle pieces, I reread many of the presidential addresses, including a 1975 address to the SPR presented by University of Edinburgh's John Beloff. One of the sentences in his talk that caught my eye was the following: "For reasons which I hope will become increasingly clear as I proceed, I see no prospect whatever of making sense of the paranormal in purely physical terms, however unorthodox" (Beloff, 1976, p. 176).

That sentence stood out to me, especially the last two words, because the concept of "purely physical" has evolved so much over the course of the 20th century – from matter, to energy, to information, to nonlocality, to dark matter and energy – that we are now presented with a degree of conceptual fluidity that many scientists in 1975 would have regarded as ridiculous fantasies. The rate of change among ideas that once seemed to rest on solid ground reminds us to remain humble in the face of the ever-expanding unknown, and to not dismiss the possibility that one day physics and psi may neatly converge.

The reason Beloff made that remark is related to the same reason why some scientists today will not even bother to look at the psi literature. That is, many today are trained in the philosophical position of *materialism*, the worldview that assumes that matter (or, after Einstein, energy) is the foundation of everything. It is probably fair to say that fledgling scientists today are not required to know much about the philosophy of science, nor that materialism is a set of assumptions rather than an absolute truth. So if one simply assumes that materialism is obviously the correct worldview, then chemistry is viewed as emerging from physics, and biology from chemistry, and psychology from biology. From this

“upwards causation” perspective, consciousness – meaning subjective awareness – is naturally imagined to be an emergent property of material processes. As such, consciousness is pronounced by some, like Daniel Dennett, to be a mere epiphenomenon. Dennett has planted his flag on this neobehaviorist idea by proposing that we are not really conscious after all, but rather we only give the impression of being conscious, like zombies. He asks and answers, “Are zombies possible? They’re not just possible, they’re actual. We’re all zombies.” (Dennett, 1991, p. 406). To Dennett, it is obvious that you are your brain activity, and that is the end of the story. This is today’s dogma in the neurosciences, which was enthusiastically supported by Nobel Laureate Francis Crick (Crick, 1995).

This position influences the mainstream view of psi by straightforwardly denying it, because if you are your brain, then how can your brain perceive or influence something distant in space and time? The answer is it cannot, unless we imagine that the brain is ultimately a “smart” quantum system, which many physicists today do not accept as possible. As Max Tegmark has argued, the brain is too warm and wet to sustain quantum coherence for more than a tiny fraction of a second, so appealing to quantum non-locality to understand psi is a non-starter (Tegmark, 2000).

I do not want to give the impression that I am denying the value of materialism, because it has been proven to be an extremely effective way of understanding the nature of physical reality. But the evidence for psi is also increasingly persuasive, so an *exclusive* reliance on materialism is problematic and suggests that we’ve overlooked something important.

So, what’s missing? It would be nice if the pieces of the puzzle we are looking for provided a neat picture of reality that made psi and materialism easily and obviously compatible. Unfortunately, I suspect that as we slowly discover these pieces, we will be putting together a picture of an elephant, along the lines of the ancient parable of the blind men and the elephant. That is, each of us will resonate with a tiny piece of the whole, so the picture we perceive will inevitably be idiosyncratic. And even if we miraculously put the whole puzzle together correctly in every detail, the picture might well look like a multidimensional Rubik’s Cube drawn by M.C. Escher on a psychedelic trip. That is, it might require a 25th century science to even begin to understand.

Puzzle Piece 1

With the caveat of acknowledging our limitations, let us consider our first, and I think most important, puzzle piece. This piece is motivated by the question of how do we get from nothing to something? This is an interesting question because if you study the esoteric literature of both the East and the West, it basically comes down to what philosophers call *idealism* (Huxley, 1945). This is the flip-side of materialism, meaning it is not matter that is fundamental, but consciousness.

With idealism, rather than placing consciousness at the top of a hierarchy of emergent material properties, you place it at the bottom of the hierarchy, below physics. From this perspective, physics emerges out of consciousness, which we may imagine as some sort of primordial panpsychist “awareness substance,” which in turn is inextricably woven into the very fabric of spacetime (Sheldrake, 2013). Now psi is not only acceptable, it becomes easy to explain because consciousness is prior to physicality,

and thus our awareness transcends the limitations of the physical world. Such transcendent experiences are precisely what we call psi.

But how do you go from something as ephemeral and as personally intimate as conscious awareness into the hard, physical world? We do not have a solid answer yet, so we are obliged to speak in terms of metaphors. Let us use the metaphor of an iceberg, which is often used to represent the visible, everyday surface reality, versus a deeper, hidden reality below the surface. At the surface level, we have classical physics, including mechanics, thermodynamics, and so on. Nearly all core technologies from the 18th to early 20th centuries arose out of those concepts. As science advanced, we learned that if you dive below the surface using instruments that expand our ability to perceive, then you end up with new and often completely unexpected phenomena, such as nuclear physics and, later, quantum mechanics. From these latter discoveries, reality becomes increasingly abstracted into four forces, and then into concepts we call fermions, leptons, and quarks. Even deeper, many imagine that there is some kind of super-unified field, from which all of the above emerges in a lawful way.

Now let us draw a parallel between mind and matter. At the surface level, everyday awareness is analogous to classical physics. That is, most people think about their “mind” in everyday classical terms, but through developments in psychoanalysis and neuroscience we have learned about aspects of a deeper mind, including preconscious, subconscious, and unconscious processing (Garcia-Rill, 2015; Tsikandilakis et al., 2019).

There is a third parallel we can draw with mathematics. Mathematics begins with simple, everyday concepts like counting numbers. As we go into mathematics a bit more, we encounter integers and the concept of zero. And then as we dive deeper we find increasingly abstract ideas like fractions, irrational numbers, transcendental numbers, imaginary numbers, and transfinite numbers. Then there are operations that we can apply to these numbers, including algebra, linear algebra, calculus, tensors, group theory, Lie algebra, gauge theory, and set theory. With each advancement these operations become increasingly sophisticated and abstract.

The reason I am including the mathematical parallel is because you could not describe the leading edges of physical theory, such as quantum field theory, without these abstract mathematics. As we continue to dive deeper into increasingly abstract territory, it is not unreasonable to expect that someone will eventually gain the insight that the latest batch of super-abstract math describes whole new realms “below” quantum field theory.

How do these trio of parallels provide a clue about how we get from nothing to something? Imagine the experience of looking up at the stars. How do we understand what is going on from a scientific perspective? Taking the reductive materialistic approach, we might first examine the eye, and then the brain, and then neurons, synapses, DNA, atomic structure, quarks, and before long we discover that we are at a point that can only be known in terms of abstractions. At the presumed bottom of our investigation is aleph null, the smallest set of infinities. In other words, starting from a personal, subjective experience we have looked through the lens of science and found that experience can be traced all the way to infinity.

Now we can reverse this process. Start with concepts of nothing and infinity (which are related to each other within set theory), and from there we emerge into quarks, atoms, neurons, and so on, eventually ending with subjective experience. In short, we start with nothing and *somehow* end up with the everyday physical world as well as our experience of it.

How can we understand this mysterious “somehow” process? Mathematicians and logicians working at the edge of the known are delving into this question. One approach that I have found to be useful in helping me think about this is the book, *Laws of Form*, a “calculus of distinctions” (sometimes also called a calculus of indications) first published in 1969 by George Spencer Brown (Spencer-Brown, 1969).

This little book influenced developments in mathematics, logic, humanities, philosophy, system theories, and cybernetics. Interestingly, Spencer-Brown was also interested in parapsychology, and in fact he held a Perrott-Warrick Fellowship at Cambridge University, and he published an article in *Nature* about the use of statistics in psi research (Spencer-Brown, 1953).

A calculus of distinctions refers to a way of applying logical rules to the act of making distinctions, i.e. noting differences and similarities. For example, imagine the universe as a void, paradoxically full of nothing. In that void, make a simple distinction like drawing a line to distinguish between this side and that side, or drawing a box to indicate an inside and an outside. Spencer-Brown indicated these kinds of distinctions with a simple symbol he called a “mark.” Then he developed a set of rules on how marks interact and combine. One of the more important developments along the way was a means by which complex marks can form recursions – self-similar relations. It turns out that with that feature it becomes possible, as surprising as it may seem, to symbolically create space, time, and ultimately, the universe. Indeed, in the preface of the *Laws of Form* we find this statement:

The theme of this book is that a universe comes into being when a space is severed or taken apart.... By tracing the way we represent such a severance, we can begin to reconstruct, with an accuracy and coverage *that appear almost uncanny*, the basic forms underlying linguistic, mathematical, physical, and biological sciences (Spencer-Brown, 1969, p. v, emphasis added).

Some of you may know that Vernon Neppe and Edward Close have recently developed a more sophisticated calculus of distinctions that they claim not only explains everything we currently know about physics, but also encompasses everything we know about consciousness and parapsychology (Neppe & Close, 2020).

Most of us are familiar with imaginary and complex numbers. Modern engineering and physical theories are founded on the use of such numbers. But *Laws of Form* introduces even stranger realms, with concepts like imaginary Boolean values. Conventional Booleans are all about true versus false, 1s and 0s. But it turns out that one of the consequences of exploring advanced forms of logic is that there are not only imaginary Booleans, but even stranger things like negative probabilities. These concepts, which are quite foreign to ordinary ways of thinking, may be necessary to develop a theory of everything that includes psi.

Puzzle Piece 2

The second puzzle piece is related to the extraordinary logics developed in *Laws of Form*. The Indian sage Nagarjuna, who lived about 150 to 250 CE, proposed a four-valued logic, whereby the first two values are standard Aristotelian logic: “A exists” versus “A does not exist.” Four-valued logic includes those two values, but also includes: “A both exists and does not exist,” and “Neither does A exist nor does A not exist” (Ganeri, 2004). Most of us are not used to thinking about logic in this way, so consider the sentence, “The first Pope in the 22nd century will be African.” This statement is neither true nor false, because we do not know if the statement is true or not (assuming that the future is indeterminate, or that it is determinate but perfect precognition is not possible). Now consider another statement: “This statement is false.” That sentence is both true *and* false at the same time. Through such examples you can see that more comprehensive logics do exist, and you may begin to sense how they capture the complexities of the real world, rather than the “excluded middle” of Aristotelian logic that most of the Western world has adopted as sacrosanct.

Why are alternative logics important for understanding psi? An example is an experiment that was inspired by my colleagues Richard Shoup and Tom Etter. They were both very involved in a branch of physics derived from the forms of logic discussed in *Laws of Form* and proposed by Nagarjuna. They came up with a clever way to investigate the underlying mechanisms in successful experiments involving random number generators (RNG) (Shoup & Etter, 2002).

In RNG experiments, it seems as though the deviations from chance that are observed are causally produced via psychokinesis (PK), i.e., the mind *influences* the RNG in a causal, force-like way. But there is an alternative explanation in which the participant perceives and takes advantage of fortuitous random walks in the output of an RNG. These interpretations are at the root of the debates between explanations based on PK, precognition, goal-orientation, and DAT (decision augmentation theory) (May et al., 1995; Schmidt, 1963).

I conducted an experiment based on Shoup and Etter’s idea (Radin, 2006). On the surface, the experiment appeared to be an elementary PK-RNG study: A participant was asked to press a button, which caused an RNG to generate a 0 or 1. If the RNG produced a 1, then the participant heard a pleasing audio clip. If it produced a 0, then they heard a short click tone. This design encouraged the participant to try to make the RNG produce more 1s.

Behind the scenes, the experiment was more complicated. Rather than having the RNG make one random decision per trial, we programmed it to make a sequence of random decisions. This allowed us to trace how the random decisions unfolded through time. The experiment began with a random process generating a 1 or 0 with equal probability. We called those two possible decisions as resulting in a 1 or 0 *State*. After arriving in one of those States, a second RNG decision generated a decision with an 80/20 probability, meaning if you started out in the 1 (or 0) State the system remained in that state 80% of the time, and it switched to the 0 (or 1) State 20% percent of the time. This decision process was symmetric so it would not bias the RNG’s output. Now a third random decision was made using the 80/20 rule, and the result was again either a 1 or a 0. What is described so far is a single trial. A run consisted of

a collection of 100 trials, and an experiment of multiple runs. The outcome of interest in an experiment was the number of 1s produced after the third decision divided by the total number of trials.

The random sequential decisions in each trial were made very quickly, so the participants were only aware that when they pressed a button they immediately obtained an interesting feedback audio clip or a short click, corresponding to the final 1 or 0 State. This design is based on a mathematical structure called a Markov Chain, a mathematical way of modeling probabilistic processes in time.

What the experiment showed is that through this design one can obtain statistically significant deviations in RNG outputs that look very much like typical results reported in previous PK-RNG experiments. But now we could trace the temporal sequence of the random decisions, so we could test if the results were better explained as an ordinary *efficient cause* (in Aristotelian terms), i.e. a force-like forward-in-time influence, or as a retrocausal, *final cause* (again in Aristotelian terms), i.e. a goal-directed, teleological influence. The results clearly supported the latter explanation.

I conducted many more unpublished experiments based on similar designs. What they suggested is that final cause appears to be a more viable explanation for the effects observed in PK-RNG experiments than efficient cause (at least within designs using sequential random decisions). This implies that intentional influence – if *influence* is even the right word here – “ripples backwards” in time to retrocausally manifest what participants or experimenters intend. I hasten to add that some of these Markov Chain experiments produced RNG deviations opposite to what was expected. Those outcomes were valuable reminders that experimental models are simplistic cartoons of the real world, so surprises should not be unexpected. The lesson learned was that, by paying attention to more sophisticated logics, it may be possible to develop novel ways of studying the mechanisms of psi and to occasionally evoke surprises.

Puzzle Piece 3

Our third puzzle piece involves possible relations between psi performance and brain morphology and genetics. The first part of the puzzle piece is a study by Morris Freedman (Freedman et al., 2018), who found that certain brain-damaged patients with frontal lobe brain damage were able to repeatedly obtain successful results in PK-RNG studies, suggesting that some aspects of the frontal lobes might get in the way of effective psi performance, which in turn seems to support the “filter theory” of the brain/mind relationship (Kelly et al., 2007, p. 603-643).

That is, if illness or injury destroys a portion of the frontal lobes, perhaps what is also inhibited is the analytical filter that normally prevents us from being able to see the world the way it is, rather than what our learned biases present to our awareness. As another way to test this idea, with support from the Bial Foundation, Bierman and Jolij used transcranial magnetic stimulation (TMS) to momentarily inhibit the frontal lobes in healthy participants. That test (not yet published as of this writing) did not show significant results, so either the TMS approach needs to be refined to hit exactly the right spot in the frontal lobes, or perhaps the Freedman outcome was a fluke. We do not know yet, but it is a promising area worthy of continued investigation.

The second part of this puzzle piece is that there might be a genetic component to psi talent. Some years ago Shari Cohn conducted a study of possible inheritance of Scottish “second sight,” which suggested the presence of a genetic factor (Cohn, 1994, 1999). More recently, supported by a Bial Foundation grant, we began a study of the genetics of people who claim to have psychic ability and who come from families of psychics. We first identified 3,500 psychic candidates from a worldwide Internet search, and then we passed the candidates through multiple stages of questionnaires, performance tests, and interviews to confirm that they had some discernable psychic ability, that others in their families reported similar skills, and that they were psychologically well-grounded.

We then matched the resulting candidates against individuals who did not claim any psychic abilities, were not from psychic families, and who performed at chance in simple psychic tasks. We obtained DNA from the resulting 27 individuals and sequenced their full genomes. By comparing the psychic cases against the non-psychic controls, we found some intriguing genetic differences. As of this writing, these results are extremely preliminary because our sample size was so small, so before we publish anything about our findings we are pursuing another approach that will significantly expand our sample size using a method that is less expensive than sequencing full genomes. We hope before long to be able to discuss what we have found.

Puzzle Piece 4

The fourth puzzle piece is what I might call the “replication non-crisis.” This refers to the great gnashing of teeth in academic psychology today about how difficult is it to repeat effects observed in conventional psychological experiments. We see articles with titles like, “Psychology’s replication crisis is running out of excuses” (Yong, 2018), which complain that only half of previously reported conventional psychological studies can be repeated, even after all of the usual explanations given for such failures are controlled. Such reasons include the assertion that the investigators were sloppy or incompetent, or that the effects sizes were too small so the replication had insufficient statistical power, or the results reported were actually false-positives, or due to *p*-hacking, file drawer effects, experimenter differences, participant differences, and so on.

Does this sound familiar? They are the same set of criticisms often used to dismiss positive results in psi studies. But unlike conventional psychological research, after decades of criticism, psi research has been forced to pay attention to and control for such problems. As a result, we have also paid more attention to another factor that may be the actual explanation for replication difficulties, namely *tacit knowledge*.

Consider, for example, a study by sociologist Harry Collins, who explored difficulties in replicating the Transversely Excited Atmospheric pressure CO₂ laser, otherwise known as a TEA laser (Collins, 1974). The first lesson Collins learned was that no one succeeded in building this laser by only using information found in publications. Second, he found that no one succeeded in building a laser where the informant had not personally built a working TEA laser. In other words, if one simply read about the TEA laser, or even if one were present when someone else built one, it was still virtually impossible to build a working model. Everyone who was successful in building that laser attained crucially important

tacit knowledge from direct personal contact with somebody who actually built one. But even then, not everyone who tried was guaranteed to succeed.

Again, does this sound familiar? We are all aware that the experimenter is critically important in psi research. Probably the best-known modern example is the Schlitz-Wiseman “feeling of being stared at” series of experiments (Schlitz et al., 2006). Caroline Watt interviewed Marilyn Schlitz and Richard Wiseman to see if she could discern why Schlitz’s study outcomes were positive twice but Wiseman’s were not (Watt et al., 2002).

What Watt found is that when Schlitz began a staring study, she would pray, focus, create rapport, and prime the participants for success by using words like “divine,” “grace,” and “magic.” By comparison, Wiseman made no preparations, did not customize his interactions to the participants, maintained a cool, businesslike attitude, and did not attempt to establish rapport or prime for success. Such obvious interpersonal differences are not often reported, so independent attempts to replicate these effects based solely on what is found in publications might well have overlooked the most important factors.

Jule Eisenbud, who thought deeply about these interpersonal factors, pointed out that psi experiments are typically conducted assuming that participants would not use their psi abilities until they stepped into the lab, and then they would only use their abilities within the strict confines of the roles that they were assigned (Eisenbud, 1983). Likewise, experimenters are expected to not use their psi abilities, and everyone involved in the study would agree to stick to their assigned roles and take no notice of what anybody else was doing. Such assumptions are very likely wrong, and it is not difficult to see why making believe that the assumptions hold creates a huge amount of variance among replication attempts.

Fortunately, from a meta-analytic perspective parapsychology is not in a replication crisis after all unless one insists that robust psi effects should be produced by anyone, regardless of training, talent, motivation, or interpersonal styles.

Puzzle Piece 5

The fifth puzzle piece is quantum weirdness, which I would argue is not just associated with the weirdness of psi, but cut from the same cloth. Psi is considered peculiar because it suggests that there are aspects of human experience that transcend the classical boundaries of space and time, and that observation influences the physical world. Is it a coincidence that these features are also why quantum mechanics is considered weird? It is not fashionable in polite society to talk about these two topics in the same breath, because someone will invariably complain that it is illegitimate to use the weirdness of one realm to explain the weirdness of the other. To that I would say hold on a moment, because we are talking about *exactly* the same kinds of weirdness in both cases. So no, I do not think it’s a coincidence.

I must add that this does not mean that quantum mechanics, as we understand it today, adequately *explains* psi. That is like mistaking my finger for where I am pointing. Instead, I would say that quantum mechanics reveals that physical reality, as best as we can tell today, is *compatible* with the core

features of psi experience. That is, quantum mechanics is physics pointing in the right direction. By comparison, classical mechanics would argue that psi is physically impossible, and thus it is only understandable in terms of delusion or illusion, because nothing in classical mechanics would lead one to the existence of nonlocal connections, or to reality being dependent on observers.

Puzzle Piece 6

Until very recently, many mainstream physicists dismissed the possibility of a quantum-psi relation because of their belief that the fragile state of quantum coherence could not be sustained in the warm, wet environment of living systems (Tegmark, 2000). But that belief is beginning to dissolve as we find more and more realms of biology where quantum mechanics might not just exist, but be *required* for living systems to work the way they do. We see quantum effects associated with the rate of catalytic effects and protein folding, with how photosynthesis works in plants, and with magnetoreception in birds (Ball, 2011). New advancements in understanding quantum biology may well lead to evidence for a quantum brain processes, and when that happens – and I predict it will – the missing link in the quantum-psi connection will “suddenly” become acceptable, as proposed decades ago by investigators like Evan Harris Walker (Walker, 1976).

Puzzle Piece 7

My last puzzle piece is Indra’s Net, the metaphor derived from ancient Indian lore, which proposes that reality consists of an interconnected, holistic web of relations, interactions and influences that transcend space and time. Some physicists have interpreted the meaning of quantum mechanics in these terms (Kafatos & Nadeau, 2000). From this perspective, it is a major miracle that we find any evidence for psi at all. That is, in a holistic medium it is not possible to completely isolate one location in space-time from another. But that is precisely what psi experiments attempt to do (as alluded to by Eisenbud, among others). Thus, if psi is a reflection of a universe described metaphorically as Indra’s Net, then we are severely limited by our epistemology, and we will need much more clever ways to transcend holism – if that is even possible – to provide robust scientific evidence for psi.

This suggests that we may be overly myopic in the way we think about psi. This nearsightedness is not something that will be easy to overcome, because we are forced to be myopic when we design and conduct an experiment. Perhaps one way to get around this problem is to consider psi in terms of systems. Some years ago I conducted a few psi experiments that kept track of dozens of variables (Radin, 1996), similar to the von Lucadou quantum-inspired correlation matrix studies (von Lucadou, 1995; von Lucadou et al., 2007). The results of these complex system experiments were (and continue to be) promising and suggest that thinking of psi in holistic ways may be fruitful ways to study the nature of psi.

Conclusion

I could have mentioned more than seven puzzle pieces, but even with this small subset of clues in hand, what picture begins to arise when we put the pieces together? My best guess – and it is only a

guess – is that just below the everyday world of appearances, where the world seems to be made of separate objects, in fact we do reside in a holistic medium that is either composed entirely of consciousness, or where consciousness is an inextricable part of that medium. Of course, speaking of “parts” does not make sense in a holistic context, but that is a limitation of language and perhaps why mystical experiences are invariably described as ineffable, despite the millions of words used to attempt descriptions. I recognize that this is not a scientific way to talk about psi, but at this stage that is the best I can do.

A related picture that comes to mind is a reminder that the analytical approach to understanding hypercomplex topics is the time-honored scholarly tactic, but there are other ways of apprehending reality, for example through emotion, music, dance, and, in general, art. So, I will end with this artistic reminder, modified from a poem by Walt Whitman (Whitman, 1867):

When I heard the learn'd parapsychologist;

When the proofs, the figures, were ranged in columns before me;

When I was shown the charts and diagrams, to add, divide, and measure them;

When I, sitting, heard the psi researcher where he lectured with much applause in the lecture-room,

How soon, unaccountable, I became tired and sick;

Till rising and gliding out, I wander'd off by myself, In the mystical moist night-air, and from time to time,

Look'd up in perfect silence at the stars.

References

- Ball, P. (2011). Physics of life: The dawn of quantum biology. *Nature*, 474, 272–274.
- Beloff, J. (1976). On trying to make sense of the paranormal. *Proceedings of the Society for Psychical Research*, 56, 173–195.
- Cohn, S. A. (1994). A survey on Scottish second sight. *Journal of the Society for Psychical Research*, 59, 385–400.
- Cohn, S. A. (1999). Second sight and family history: Pedigree and segregation analyses. *Journal of Scientific Exploration*, 13, 351–372.
- Collins, H. (1974). The TEA Set: Tacit knowledge and scientific networks. *Science Studies*, 4, 165–186.
- Crick, F. (1995). *The astonishing hypothesis: The scientific search for the soul*. Scribner.
- Dennett, D. C. (1991). *Consciousness explained*. Little, Brown and Co.
- Eisenbud, J. (1983). *Parapsychology and the unconscious*. North Atlantic Books.
- Freedman, M., Binns, M., Gao, F., Holmes, M., Roseborough, A., Strother, S.,... Black, S. E. (2018). Mind–matter interactions and the frontal lobes of the brain: A novel neurobiological model of psi inhibition. *Explore*, 14, 76–85. <https://doi.org/10.1016/j.explore.2017.08.003>
- Ganeri, J. (2004). Indian logic. In D. M. Gabbay & J. Woods (Eds.), *Handbook of the history of logic* (Vol. 1, pp. 309–395). North-Holland. [https://doi.org/10.1016/S1874-5857\(04\)80007-4](https://doi.org/10.1016/S1874-5857(04)80007-4)

- Garcia-Rill, E. (2015). Preconscious awareness. In E. Garcia-Rill (Ed.), *Waking and the reticular activating system in health and disease* (pp. 209–226). Academic Press. <https://doi.org/10.1016/B978-0-12-801385-4.00010-0>
- Huxley, A. (1945). *The perennial philosophy*. Harper Colophon Books.
- Kafatos, M., & Nadeau, R. (2000). *The conscious universe: Parts and wholes in physical reality*. Springer-Verlag.
- Kelly, E. F., Kelly, E. W., Crabtree, A., Gauld, A., Grosso, M., & Greyson, B. (Eds.) (2007). *Irreducible mind: Toward a psychology for the 21st century*. Rowman & Littlefield.
- May, E., Utts, J., & Spottiswoode, S. J. P. (1995). Decision augmentation theory: Toward a model of anomalous mental phenomena. *Journal of Parapsychology*, *59*, 195–220.
- Neppe, V. M., & Close, E. R. (2020). The Neppe-Close triadic dimensional vortical paradigm: An invited summary. *International Journal of Physics Research and Applications*, *3*(3), 1–14. <https://doi.org/doi.org/10.29328/journal.ijpra.1001018>
- Radin, D. (2006). Experiments testing models of mind-matter interaction. *Journal of Scientific Exploration*, *20*, 375–401.
- Radin, D. I. (1996). Towards a complex systems model of psi performance. *Subtle Energies & Energy Medicine Journal Archives*, *7*(1), 35–69.
- Schlitz, M., Wiseman, R., Watt, C., & Radin, D. (2006). Of two minds: Sceptic-proponent collaboration within parapsychology. *British Journal of Psychology*, *97*, 313–322. <https://doi.org/10.1348/000712605X80704>
- Schmidt, H. E. (1963). Extrasensory perception or probability? *Perceptual and Motor Skills*, *16*, 185–186.
- Sheldrake, R. (2013). Setting science free from materialism. *Explore*, *9*(4), 211–218. <https://doi.org/10.1016/j.explore.2013.04.004>
- Shoup, R., & Etter, T. (2002). Can causal influence propagate backwards in time? A simple experiment in Markov chains and causality. <https://www.scribd.com/document/78366752/Richard-Shoup-and-Thomas-Etter-Can-Causal-Influence-Propagate-Backwards-in-Time-a-Simple-Experiment-in-Markov-Chains-and-Causality>
- Spencer-Brown, G. (1953). Statistical significance in psychical research. *Nature*, *171*, 154.
- Spencer-Brown, G. (1969). *Laws of form*. Allen and Unwin.
- Tegmark, M. (2000). Importance of quantum decoherence in brain processes. *Physical Review E*, *61*, 4194–4206. <https://doi.org/10.1103/PhysRevE.61.4194>
- Tsikandilakis, M., Bali, P., Derrfuss, J., & Chapman, P. (2019). The unconscious mind: From classical theoretical controversy to controversial contemporary research and a practical illustration of the “error of our ways.” *Consciousness and Cognition*, *74*, 102771. <https://doi.org/10.1016/j.concog.2019.102771>
- von Lucadou, W. (1995). The model of pragmatic information (MPI). *European Journal of Parapsychology*, *11*, 58–75.
- von Lucadou, W., Romer, H., & Walach, H. (2007). Synchronistic phenomena as entanglement correlations in generalized quantum theory. *Journal of Consciousness Studies*, *14*(4), 50–74.
- Walker, E. H. (1976). Quantum mechanics/psi phenomena: The theory and suggestions for new experiments. *Journal of Research in Psi Phenomena*, *1*(1), 38–52.
- Watt, C., Wiseman, R., & Schlitz, M. (2002). Tacit information in remote staring research: The Wiseman-Schlitz interviews. *Paranormal Review*, *24*, 18–25.
- Whitman, W. (1867). *Leaves of grass*. <https://whitmanarchive.org/published/LG/1867/poems/171>
- Yong, E. (2018, November 19). Psychology’s replication crisis is running out of excuses. *The Atlantic*. <https://www.theatlantic.com/science/archive/2018/11/psychologys-replication-crisis-real/576223/>

Predictors of Hearing Electronic Voice Phenomena in Random Noise: Schizotypy, Fantasy Proneness, and Paranormal Beliefs¹

Kenneth Drinkwater, Andrew Denovan, Neil Dagnall, and Andrew Parker

Manchester Metropolitan University

Abstract. This study used a modified White Christmas task to examine reports of electronic voice phenomena (EVP) within random noise. Following familiarization with the concept of EVP, 107 participants listened to an audio track combining white and pink noise. Instructions directed participants to press a keyboard button to indicate if they heard EVP. At the end of the track, participants provided an overall confidence rating of EVP perception. Thirty-nine participants (36%) reported the presence of EVP. Comparisons between EVP experiencers vs. non-experiencers on cognitive-perceptual (schizotypy, hallucinations, and fantasy proneness) and paranormal belief measures (general and haunting) revealed no significant differences. A path analysis indicated that belief in haunting mediated the relations between paranormal belief and hallucination proneness with EVP outcomes (number and confidence). However, fantasy proneness and schizotypy did not have significant relations with EVP. Results were consistent with previous findings, where participants imagine hearing the famous White Christmas song. Within this study, a non-trivial minority of participants experienced EVP as a form of belief congruent hallucination. These findings support the notion that anomalous beliefs provide a framework for structuring unusual cognitions and perceptions.

Keywords: Auditory hallucinations, belief in the paranormal, Electronic Voice Phenomena, fantasy proneness, White Christmas task.

Electronic voice phenomena (EVP) refer to the presence of anomalous speech-like sounds in recordings containing background or static noise (MacRae, 2004). Some believers in the paranormal posit that EVP represents a process by which the “normally” unheard voices of the dead or discarnate entities become audible via electronic media (MacRae, 2004). Interest in EVP historically derives from spiritualist attempts to communicate with the deceased (Alvarado, 2003). EVP has entered general awareness as evidenced by it featuring prominently in mainstream ghost hunting television programs (e.g., Ghost Hunters), where investigators typically claim that EVP provides objective evidence of paranormal activity.

Recognizing a distinction between continuously present and transient voices, Leary and Butler (2015) identified two types of EVP. Type 1 (transform) delineates intermittent EVP, whereas type 2 (live-voice or radio voice) describes persistent EVP. With Type 1, although people are present at the time of

¹ Address correspondence to: Dr. Kenneth Drinkwater, Department of Psychology, Manchester Metropolitan University, Brooks Building, 53 Bonsall Street, Manchester, M15 6GX, UK, K.Drinkwater@mmu.ac.uk

recording, perception of EVP occurs only during playback. In contrast, type 2 EVP is enduring and audible via electronic equipment (e.g., spirit box).

Researchers attribute the origin of contemporary EVP work to Raymond Bayless and Attila von Szalay (or Szalay) (Bayless, 1959). Later, Raudive amassed a significant number of voice recordings produced by seemingly paranormal (unexplained) sources (Raudive, 1971). Critics, however, argue that this formative work lacked methodological rigor (Leary & Butler, 2015). Explicitly, using Raudive's method, Smith (1974) was unable to eliminate mundane explanations such as word recognition arising from imagination, or sounds caused by foreign language stations (Keil, 1980). Further attempts to replicate Raudive's findings have also proved unsuccessful (Barušs, 2001).

Despite this, advocates of EVP point to myriad instances in which contemporary electronic communication devices (e.g., mobile telephones, televisions, and computers) have captured alleged voices, texts, and images. Observation of this phenomenon has led to the development of the term *instrumental transcommunication* (ITC). ITC signifies communication with deceased persons through instruments or technical devices (Laszlo, 2008). Paralleling EVP research, the study of ITC suffers from methodological issues (Bocuzzi & Beischel, 2011). Particularly, independent observers within controlled settings are not able to replicate findings, and researchers often fail to provide detailed experimental protocols. Accordingly, skeptics explain EVP using conventional explanations, such as *apophenia* (perceiving patterns in random information), erratic equipment functioning, and hoaxes (Leary & Butler, 2015).

Paranormal Belief and The Tendency to see Meaningful Patterns within Noise

Believers in the paranormal are prone to interpret causal relations within random stimuli (Dagnall et al., 2016, 2016a; Nees & Phillips, 2015). Correspondingly, Blackmore and Moore (1994) reported that higher levels of belief were associated with the willingness to make positive identifications of pictures with a high degree of background visual noise. This propensity manifests at both a cognitive and perceptual level.

Cognitively, believers in the paranormal are susceptible to statistical biases, particularly, misrepresentation of chance (Dagnall et al., 2016). Hence, believers are more likely to infer relations between unconnected events. Perceptually, believers in paranormal phenomena are more liable to interpretative bias, such as *pareidolia* (Riecki et al., 2013). *Pareidolia* is a specific form of *apophenia* denoting the perception of meaningful sounds or images in arbitrary stimuli.

Illustratively, Riecki et al. (2013) using a signal detection task found that believers in the paranormal (vs. non-believers) possessed a more liberal response bias. Specifically, believers identified ambiguous stimuli as 'face-like', but did not differ in degree of detection sensitivity. Similarly, Van Elk (2013) reported that believers (vs. skeptics) demonstrated a bias toward illusory perceptions of human motion. Collectively, these studies indicate that belief in the paranormal is associated with the tendency to infer agency in ambiguous stimuli (Nees & Phillips, 2015). Explicitly, that expectation and previous knowledge (top-down processing) facilitate incorrect interpretation of indiscriminate audio and visual noise (Nees & Phillips, 2015). Skeptics contend that this research is consistent with the notion that EVP is a form of auditory *pareidolia* ("Rorschach Audio") arising from the tendency to interpret random data as voices (Banks, 2012).

In this context, paranormal belief may provide a framework with which to interpret ambiguous stimuli. Particularly, beliefs influence cognitive-perceptual processes in such a way to produce interpretations consistent with the existence of paranormal phenomena (Houran & Lange, 1996). This includes searching for anomalies, labeling events as paranormal and deducing that irregularities provide evidence for supernatural forces (Houran & Lange, 1996). For example Terhune and Smith (2006), using a mirror-gazing task (psychomanteum), demonstrated that individuals given suggestions for anomalous experiences reported a greater number of visual and vocal hallucinations. Relatedly, Beck and Rector (2003) observed that patients with strong paranormal beliefs interpreted hallucinatory voices in a belief congruent manner.

Consistent with this view, researchers have noted that belief in the paranormal is associated with a range of cognitive-perceptual measures related to unusual perceptions, magical ideations, and distorted perception of causality (Cella et al., 2012). These include factors associated with productive experiences and perceptions (i.e., schizotypy, Dagnall et al., 2016; fantasy proneness, Smith, Johnson, & Hathaway, 2009; delusion-hallucination proneness, Lawrence & Peters, 2004).

The White Christmas Paradigm

Numerous studies report hallucination proneness within non-clinical populations, although incidence varies as a function of question phrasing and definition used. Allowing for disparities, Beck and Rector (2003) observed that between 4-24% of the population experience auditory hallucinations. Furthermore, within large samples approximately 10% of respondents report hallucinations (Bentall & Slade, 1985a).

Correspondingly, Bentall and Slade (1985b) found that 15% of participants reported hearing a voice when no voice was present, and 17% stated that they often heard their thoughts as if spoken aloud. These findings were consistent with research using suggestion, notably the White Christmas task. This involves asking participants to close their eyes and listen to a stimulus that is actually not present (e.g., the White Christmas song) (Barber & Calverley, 1964). Under these conditions, a significant proportion of non-clinical participants report perceiving a non-existent stimulus (Bowers, 1967; Spanos & Barber, 1968; Spanos & Stam, 1979).

More recently, Merckelbach and van de Ven (2001) used an adapted White Christmas task² with a group of 44 undergraduate students. Participants listened to white noise and pressed a button when they believed they heard the Bing Crosby version of White Christmas. Within the sample, fourteen participants (32%) responded at least once. Analysis revealed that participants who reported hearing White Christmas scored higher on fantasy proneness and the Launay–Slade Hallucination Scale (LSHS) (Bentall & Slade, 1985a). Further analyses revealed that fantasy proneness was the best predictor of experiences.

Van de Ven and Merckelbach (2003) extended the earlier findings with an undergraduate sample, in which 35% of participants indicated that they had heard the White Christmas song. Those reporting hallucination(s) had significantly higher fantasy proneness scores. However, scores on hallucination proneness and schizotypy did not differ significantly.

² There are several versions of the White Christmas paradigm. Within the Merckelbach and van de Ven (2001) study participants were told that the song might be embedded in white noise below the auditory threshold.

Our study used the White Christmas task to examine the degree to which participants report the presence of EVP within random noise. In line with previous research it was anticipated that around a third of the sample would hear meaningful sounds (EVP) (Merckelbach & van de Ven, 2001; van de Ven & Merckelbach, 2003). Additionally, this study investigated whether EVP experiencers (vs. non-experiencers) differed on cognitive-perceptual personality factors and belief in the paranormal (Nees & Phillips, 2015). In order to compare outcomes with those observed in previous studies the cognitive-perceptual personality factors comprised constructs employed by Merckelbach and van de Ven (2001) and van de Ven and Merckelbach (2003), particularly, propensity to hallucination, fantasy proneness, and schizotypy.

Preceding research has consistently reported that experiencers of the White Christmas song score higher on fantasy proneness (Merckelbach & van de Ven, 2001; van de Ven & Merckelbach, 2003), whereas differences in propensity to hallucination (Merckelbach & van de Ven, 2001) have not always been reproduced (van de Ven & Merckelbach, 2003). Moreover, van de Ven and Merckelbach (2003) failed to find differences on schizotypy.

Given inconsistent outcomes and the fact that the EVP and White Christmas tasks differ, this study examined whether experiencers (vs. non-experiencers) demonstrated differences across cognitive-perceptual measures. Accordingly, outcomes will add incrementally to those of earlier work and help to identify the conditions under which hallucinatory vs. imaginal experiences are most likely to occur. Hence, the researchers predicted cautiously higher scores for experiencers (vs. non-experiencers).

Finally, measures of paranormal belief were included (general and haunt-related). Inclusion of these factors allowed the researchers to assess the degree to which paranormal beliefs influenced EVP perception. Specifically, it facilitated testing of the assumption that unequivocal beliefs (i.e., the existence of ghosts) provide a framework for structuring unusual cognitions and perceptions (Dagnall et al., 2016). Compatible with this notion, and consistent with Williams and Irwin's (1991) supposition that belief in the paranormal facilitates organization and interpretation of atypical phenomena, the authors predicted that belief in haunting would best predict EVP perception and mediate relations between cognitive-perceptual factors, general paranormal belief, and EVP. Examining mediation in this context provided an explicit assessment of whether paranormal belief structured interpretation of ambiguous auditory stimuli.

Method

Participants

One hundred and seven participants took part in this study. The sample comprised 33 (30%) males ($M = 31.36$, $SD = 12.40$) and 74 (70%) females ($M = 27.08$, $SD = 12.39$); 71 participants were students (60 undergraduates and 11 postgraduates) and 36 non-students. Recruitment was via the Manchester Metropolitan University (MMU) Psychology Participant Pool and opportunity sampling (other university students and staff). Prior to participation, questions established that participants were at least 18 years of age, possessed normal hearing levels, and had not undertaken involvement with other electronic voice phenomenon (EVP) studies.

A female postgraduate research student, aged 38 years was the sole experimenter in the study. She possessed moderate belief in psi as a paranormal phenomenon, which represents 4 on a 1-5 scale (5 being strong belief). The research student advertised the study within the host university via flyers posted on notice boards, student/staff email, the Psychology Department Participation Pool, and social media. Recruitment information invited potential participants to take part in a two-phase study. The first required completion of self-report measures on beliefs/attitudes towards paranormal phenomenon and cognitive-perceptual personality measures. The second involved listening to short sound clips of background noise on a computer and reporting detection of voices.

The ethics process in the Psychology Department designated the project as routine and approved the study accordingly. Hence, formal submission to a second-tier ethics panel was not required. Prior to agreeing to contribute, potential participants read the study brief, this informed them of the study requirements, and stated that the research protocol adhered to The British Psychological Society Code of Human Research Ethics guidelines. Participants provided informed consent before participation.

Materials

Background visual and audio. To ensure that participants were familiar with EVP prior to the listening task, they watched video and listened to audio examples. Visual segments comprised three instances, lasting approximately two minutes, taken from the television show *Ghost Adventures*, which is readily available on the internet. Audio instances included excerpts from *The Ghost Orchid: An Exploration of EVP*, CD recordings from Raudive (1971) and Cass (1959), and the website of researcher Randall Keller (<https://thevoicesblog.wordpress.com/>) (Kellar, 2012). Text supporting messages appeared on the computer monitor as the audio played. In total, the audio was approximately three minutes in duration.

Stimulus audio track. A three minute stereo audio track combining white and pink noise was created using Audacity (version 2.1.0.). White noise (random signals possessing equal intensity at different frequencies) is predictable and consistent, whereas pink noise (random noise with equal energy per octave) is an algorithm of sound that corresponds more closely to human hearing curves. The mixture of white and pink noise produced a subtly varying, meaningless sound. Audio task presentation occurred via a desktop computer. PsychoPy software (version 1.82.01) controlled and regulated material throughout the auditory task. To eliminate external noise and ensure that volume levels were appropriate participants wore high specification headphones. Participants indicated when they heard EVP by pressing a keyboard space bar. At the end of the audio track, via a visual analogue scale (VSA) (0-100%), participants provided an overall confidence rating of EVP perception.

Cognitive-perceptual measures

Schizotypy. The Schizotypal Personality Questionnaire Brief (SPQ-B) (Raine & Benishay, 1995) is a shorter version of the 74-item Schizotypal Personality Questionnaire (SPQ) modeled on the DSM-III-R criteria for Schizotypal Personality Disorder (SPD) (Raine, 1991). SPQ scales assess schizotypal personality disorder, or dimensional schizotypy in non-clinical samples (Jahshan & Sergi, 2007). The SPQ-B contains 22 questions comprising three sub-scales: cognitive-perceptual, interpersonal, and disorganization. Items appear in the form of statements. For example, "People sometimes comment on my

unusual mannerisms and habits.” Participants answer each item with a “yes” or “no” response. Totaling yes responses produces scores ranging from 0-22; upper scores signify higher levels of schizotypy. The SPQ-B possesses established psychometric properties (i.e., internal consistency, test–retest reliability, and criterion validity) (Raine & Benishay, 1995).

Hallucination Proneness. The Launay-Slade Hallucination Scale Revised (LSHS-R) (Bentall & Slade, 1985a) assesses the inclination to hallucinate in normal individuals. The measure assumes that hallucination experience exists on a continuum of psychological functioning. The LSHS-R contains 12 items, which index visual and auditory hallucinations. For instance, “On occasions I have seen a person’s face in front of me when no one was in fact there” and “In my daydreams I can hear the sound of a tune almost as clearly as if I were actually listening to it.” Items appear as statements and respondents indicate the degree to which they endorse each item on a 5-point scale, from certainly does not apply = 0 to certainly applies = 4. Total scores range from 0 to 48; higher scores indicate a greater predisposition to hallucination-like experiences. The LSHS-R possesses satisfactory psychometric properties (Jones et al., 2009; Dagnall et al., 2015).

Fantasy Proneness. The Creative Experiences Questionnaire (CEQ) (Merckelbach, Horselenberg, & Muris, 2001) comprises 25 dichotomous items indexing fantasy proneness that originated from case descriptions of fantasy proneness (Wilson & Barber, 1983). Items appear as statements (e.g., “In general, I spend at least half of the day fantasizing or daydreaming”), and participants respond to each statement with “yes” or “no.” Hence, total scale scores range from 0-25 with higher scores representing greater propensity to fantasy proneness. The CEQ demonstrates good test-retest and internal reliability (Merckelbach et al., 2001).

Belief in the Paranormal. The Australian Sheep-Goat Scale (ASGS) (Thalbourne & Delin, 1993) measures belief in and alleged experience of, extrasensory perception, psychokinesis, and life after death. The ASGS contains 18 items, for example, “I believe in the existence of ESP” and “I believe I have marked psychokinetic ability.” Participants respond to each item on a three-point scale (false = 0, uncertain = 1, and true = 2). Raw scores range from 0-36, with higher scores indicating greater levels of belief in the paranormal. The ASGS designates believers as *sheep* and non-believers as *goats*. Drinkwater et al., (2018) in a recent review of the ASGS reported the scale possesses high reliability, $\alpha = 0.90$.

Haunting and Communication with the Dead Scale. The 8-item Haunting and Communication with the Dead Scale (Dagnall, Parker, Munley, & Drinkwater, 2010) assesses participants’ belief in the existence of ghosts, haunted locations, and the possibility of contacting the dead. Statements include “Some places are haunted by the souls of people now dead.” Participants indicate agreement with each item on a 7-point Likert scale ranging from 1 = strongly disagree to 7 = strongly agree. Scores range from 8 to 56 with higher scores indicating greater belief in ghosts and haunt-related phenomena. The scale has previously demonstrated excellent internal reliability (Dagnall et al., 2010).

Scale Properties

In the present study, the paranormal measures (ASGS and Haunting Scale) demonstrated excellent internal reliability, Cronbach’s alpha (α) = 0.91 and 0.94 respectively. The SPQ-B (α = 0.80) and the

LSHS-R ($\alpha = 0.84$) possessed good internal reliability. The CEQ ($\alpha = 0.77$) also demonstrated adequate reliability (see table 1 for descriptive statistics).

Procedure

To ensure that participants could hear sounds using the headphones, the researcher asked participants to listen to and respond to a series of tones (sound calibration). During this standardization phase, participants could adjust the sound to an appropriate level, where they could clearly detect the tones. EVP familiarization followed and involved watching, via a desktop computer, film of paranormal investigators detecting alleged EVP and then listening to auditory examples.

Before commencement of the test phase, the researcher administered instructions that asked participants to relax, close their eyes, and focus on the recording. Next, the researcher told participants to press the space bar whenever they perceived meaningful audible sound. Once participants confirmed that they understood the instructions, they placed the headphones over their ears and the researcher started the audio track. On completion of the track, participants indicated on a visual analogue scale (0-100) how confident they were that they had heard EVP.

After a break of five minutes, the researcher asked participants to fill in the self-report measures. Participants accessed the scales via a Qualtrics link on the desktop computer. Instructions directed participants to work through the measures at their own pace, complete all questions, and respond honestly. Additional ethical detail reaffirmed confidentiality and that participants could withdraw at any point during the study.

The measures comprised sections on demographic information (i. e., age, preferred gender, and course/occupation), belief in the paranormal, and cognitive-perceptual measures (schizotypy, hallucinations, and fantasy proneness). For the self-report measures, counter-balancing across participants prevented order effects. At the end of the testing session, the researcher debriefed participants and thanked them for engaging with the research.

Results

Analysis

Preceding analysis, screening for outliers and non-normality occurred. Following inspection of descriptive statistics, tests of difference for EVP detection and zero-order correlations, and path analysis (Amos 25) tested hypothesized relationships among the study variables using Maximum Likelihood (ML) estimation. Analyses specifically tested whether belief in haunting mediated relationships between cognitive-perceptual factors, general paranormal belief, and EVP.

In the model, exogenous variables were the cognitive-perceptual factors (schizotypy, propensity to hallucination, and fantasy proneness) and paranormal belief. The proposed mediator was belief in haunting, with EVP rating (confidence) and EVP number representing endogenous variables.

The χ^2 -distributed goodness-of-fit statistic assessed omnibus model (global) fit, with non-significant results indicative of good fit. Additionally, judgment of fit considered the comparative fit index (CFI), root-mean-square error of approximation (RMSEA), and the standardized root-mean-square residual (SRMR), with cut-offs more than 0.95 for CFI and less than 0.08 for RMSEA and SRMR (Browne & Cudeck, 1993). Assessment of fit for RMSEA also examined 90% confidence intervals (CI).

Following scrutiny of the omnibus model, hypothesis testing (local fit) involved appraising the standardized path coefficients with an established $p < 0.05$. The analytic procedure of bootstrapping tested indirect effects (mediation) by resampling the data 1000 times to create bias-corrected 95% confidence intervals. Akaike Information Criterion (AIC) compared models, with lower values indicating better fit.

EVP Incidence

Of the 107 participants who took part in the auditory task, 39 (36%) pressed the button to indicate they heard EVP in the soundtrack. The remaining participants, 68 (64%) did not report EVP. Number of space bar presses indicated frequency of EVP detection and EVP rating specified level of response confidence. Within the EVP group, the mean number of EVP responses (M) was 3.31 with a standard deviation (SD) of 2.76. The mean confidence rating was $M = 30.31$, $SD = 18.49$.

Table 1.
Descriptive statistics

	Mean	SD	Minimum	Maximum	Skew	Kurt
Cognitive-Perceptual						
SPQ-B	8.24	4.61	0.00	17.00	0.14	-0.79
LSHS-R	16.02	8.73	0.00	37.00	0.25	-0.64
CEQ	8.38	4.34	0.00	18.00	0.21	-0.63
Paranormal						
ASGS	12.03	8.27	8.10	32.00	0.40	-0.81
Haunting	31.93	13.94	8.00	56.00	-0.16	-1.04

Note. SPQ-B, Schizotypal Personality Questionnaire Brief; LSHS-R, Launay-Slade Hallucination Scale Revised; CEQ, Creative Experiences Questionnaire; ASGS, Australian Sheep Goat Scale; Haunting, Haunting and Communication with the Dead Scale.

Tests of difference

Table 1 displays descriptive statistics. A series of independent t -tests examined differences between EVP experiencers (vs. non-experiencers) on cognitive-perceptual (SPQ-B, LSHS-R and CEQ) and paranormal belief measures (ASGS and Haunting). These revealed no significant differences after Bonferroni correction for multiple comparisons of $p = 0.010$ (see table 2).

Table 2.
Tests of difference for EVP detection

Measures	EVP				<i>t</i>	<i>df</i>	<i>d</i>	<i>p</i>
	Yes		No					
	<i>M</i> (<i>n</i> = 39)	<i>SD</i>	<i>M</i> (<i>n</i> = 68)	<i>SD</i>				
Cognitive-Perceptual								
SPQ-B	7.62	4.92	8.60	4.42	-1.07	105	0.21	0.29
LSHS-R	17.33	9.94	15.26	7.93	1.18	105	0.23	0.24
CEQ	8.05	4.28	8.57	4.39	-0.59	105	0.12	0.55
Paranormal								
ASGS	13.18	8.73	11.37	7.99	1.09	105	0.22	0.28
Haunting	35.74	14.54	29.75	13.16	2.18	105	0.43	0.03

Note. SPQ-B, Schizotypal Personality Questionnaire Brief; LSHS-R, Launay-Slade Hallucination Scale Revised; CEQ, Creative Experiences Questionnaire; ASGS, Australian Sheep Goat Scale; Haunting, Haunting and Communication with the Dead Scale.

EVP detection and scales

Pearson's Product correlation examined relationships between EVP measures (number and rating) and scales (Haunting, ASGS and LSHS-R) (see table 3).

Table 3.
Inter-measure correlations

	1	2	3	4	5	6	7
1. EVP Number							
2. EVP Rating	0.71**						
3. SPQ-B	0.01	0.00					
4. LSHS-R	0.22*	0.16	0.56**				
5. CEQ	0.07	0.02	0.48**	0.48**			
6. ASGS	0.12	0.23*	0.28**	0.42**	0.28*		
7. Haunting	0.27*	0.35**	0.20*	0.44**	0.18	0.71**	

Note. SPQ-B, Schizotypal Personality Questionnaire Brief; LSHS-R, Launay-Slade Hallucination Scale Revised; CEQ, Creative Experiences Questionnaire; ASGS, Australian Sheep Goat Scale; Haunting, Haunting and Communication with the Dead Scale; * $p < 0.05$, ** $p < 0.001$

A large positive correlation existed between EVP number and EVP Rating. EVP number was weakly positively associated with belief in haunting and LSHS-R. Significant positive correlations were evident between EVP Rating and level of paranormal belief (ASGS) and belief in haunting.

The cognitive-perceptual measures (SPQ-B, LSHS-R, and CEQ) all correlated positively with one another. Finally, the paranormal belief measures were strongly positively associated, and correlated positively with SPQ-B and LSHS-R. CEQ was associated with only ASGS; there was no significant correlation between CEQ and haunting.

Model test

Prior to path analysis, assessment of normality (multivariate and univariate skewness and kurtosis) determined whether ML estimation was apposite. Based on Bollen (1989), a Mardia's coefficient less than $p(p + 2)$ (p is the quantity of observed variables) indicates multivariate normality. Mardia's coefficient was 8.69, which was considerably lower than 63, revealing acceptable normality. Furthermore, all univariate skewness statistics were less than 3.0 and univariate kurtosis values were below 7.0 inferring univariate normality (Finney & DiStefano, 2006).

The initial mediation model demonstrated poor overall fit, $\chi^2(1, N = 107) = 66.49, p < .001$, CFI = .74, RMSEA = 0.79 (90% CI of 0.63 to 0.95), SRMR = 0.11. Correlating the error term between EVP Number and EVP Rating, and eliminating the non-significant paths from schizotypy and fantasy proneness to haunting produced very good fit across indices, $\chi^2(2, N = 107) = 2.99, p = 0.224$, CFI = 0.99, RMSEA = 0.07 (90% CI of 0.01 to 0.09), SRMR = 0.02.

Inspection of the paths (Figure 1) revealed hallucination proneness and paranormal belief significantly predicted greater belief in haunting ($\beta = 0.17, p = 0.021$ and $\beta = 0.64, p < 0.001$ respectively). Belief in haunting predicted higher EVP Number and EVP Rating ($\beta = 0.35, p = 0.008$ and $\beta = 0.31, p = 0.021$ respectively). Neither schizotypy, fantasy proneness, paranormal belief, nor hallucination proneness predicted EVP outcomes. However, a test of mediation revealed significant indirect effects of paranormal belief (95% CI of 0.04 to 0.44, $p = 0.021$) and hallucination proneness (95% CI of 0.01 to 0.15, $p = 0.032$) on EVP Rating through belief in haunting. Similarly, there existed significant indirect effects of paranormal belief (95% CI of 0.04 to 0.41, $p = 0.025$) and hallucination proneness (95% CI of 0.01 to 0.16, $p = 0.039$) on EVP Number through belief in haunting. Variables explained 13% of the variance in EVP Rating and 11% of the variance in EVP Number.

As the study was cross-sectional, an alternative model examined reverse relations by inverting the paths between exogenous (cognitive-perceptual factors and paranormal belief) and endogenous variables (EVP outcomes). This model demonstrated weaker data-model fit, $\chi^2(3, N = 107) = 7.48, p = 0.058$, CFI = 0.98, RMSEA = 0.12 (90% CI of 0.01 to 0.23), SRMR = 0.05. Importantly, this existed after following analysis recommendations and correlating error terms among cognitive-perceptual factors. The explanatory variables accounted for 4% of fantasy proneness variance, 21% of hallucination proneness

variance, 4% of schizotypy variance, and 52% of paranormal belief variance. The constrained model had a lower AIC (68.99) than the reversed model (71.48), indicating superior fit.

Overall, the results revealed that belief in haunting mediated the relations between paranormal belief and hallucination proneness with EVP outcomes (number and rating). Fantasy proneness and schizotypy did not demonstrate any meaningful relation with EVP.

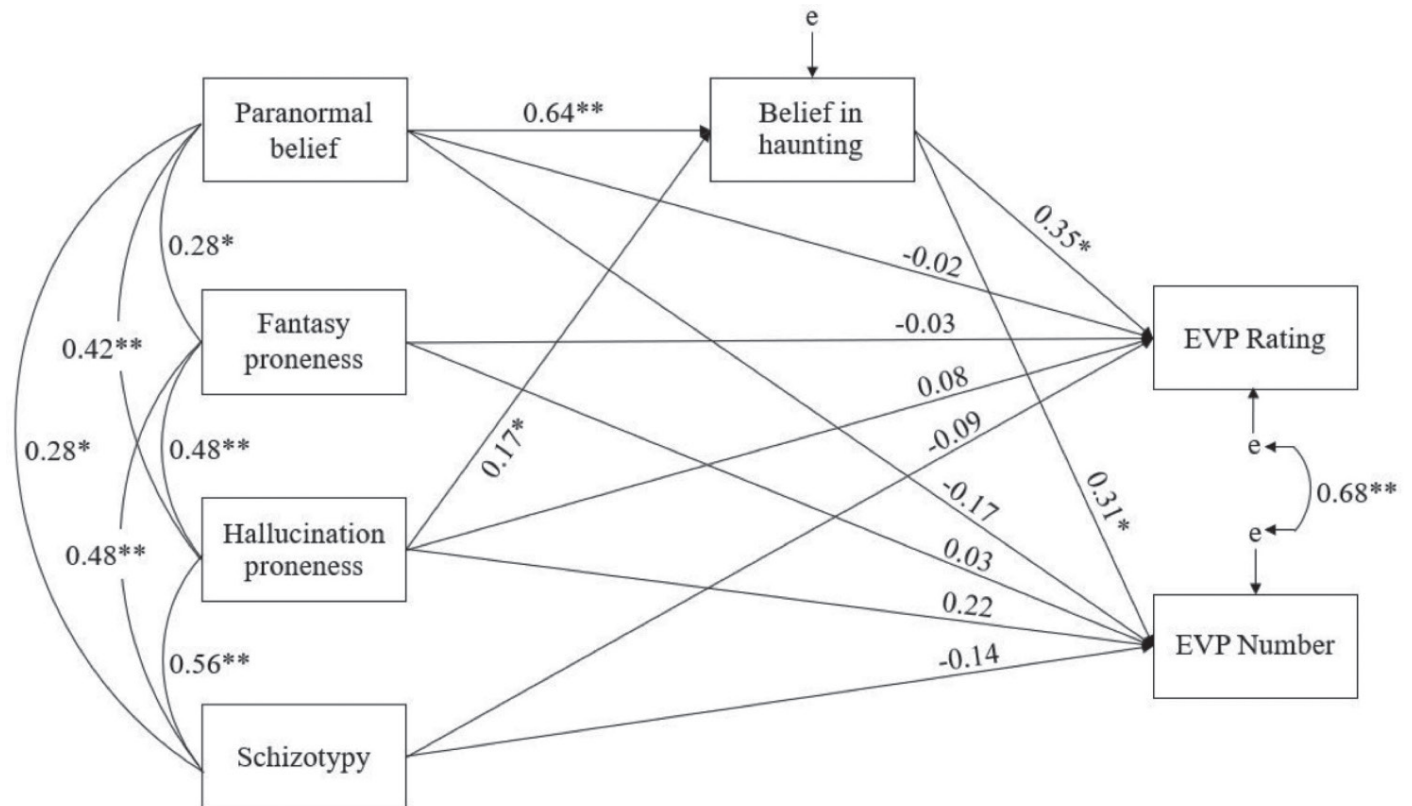


Figure 1. Path model depicting putative relationships between cognitive-perceptual factors, paranormal belief, belief in haunting and EVP outcomes. *Note.* Standardized regression coefficients and correlations between variables are shown; 'e' indicates error; * $p < .05$, ** $p < .001$

Discussion

Within this study, a non-trivial minority of participants (36%) indicated that they heard meaningful sounds (EVP) within random noise. This false detection rate accorded with previous research examining hallucinatory experiences in non-clinical samples. Specifically, reporting rate was comparable with Merckelbach and van de Ven (2001) and van de Ven and Merckelbach (2003) who, using the White Christmas task, observed that approximately one third of participants (32% and 35% respectively) imagined hearing the classic song when it was not present. The figure aligns also with Terhune and Smith's (2006) mirror-gazing study, in which between 20% (controls) and 40% (suggestion condition) of participants reported vocal hallucinations. More generally, the tendency to perceive non-present stimuli concurred with studies reporting moderate levels of hallucination proneness within non-clinical populations (between 4% and 24%) (cf. Beck & Rector, 2003; Bentall & Slade, 1985a).

In addition to this, the current study observed a weak correlation ($r = 0.35$) between EVP recognition and confidence. This indicated that the more responses participants made, the greater their level of confidence. However, consistent with van de Ven and Merckelbach (2003), overall levels of confidence within participants who believed that they had heard EVP were low ($M = 30.31$, $SD = 18.49$).

Previous work has established that auditory hallucinations are more likely to occur when participants encounter unstructured sensory stimuli (e.g., white noise), or experience partial sensory deprivation (McCreery & Claridge, 1996). In this context, because the present study asked participants to determine whether EVP was present within meaningless sound (a fusion of white and pink noise) and derived from the White Christmas paradigm, it was appropriate to conclude cautiously that the EVP task elicited hallucinatory experiences. Noting that it is difficult to establish the authenticity of hallucinations, subsequent studies, could interview participants, in order to explore the nature and content of their experiences. This would help to establish whether they arise from genuine hallucinations or originate from other factors, such as misinterpreted imagined stimuli or response bias.

Belief in haunting mediated the effects of general paranormal belief and proneness to hallucinations. Specifically, pathways through belief in haunting increased the relations between belief in the paranormal and hallucination proneness and EVP (reporting and confidence). Indeed, the direct effect of paranormal belief on EVP measures was non-significant. This view aligns with Williams and Irwin's (1991) supposition that belief in the paranormal facilitates organization and interpretation of atypical phenomena.

In the case of hauntings, this manifests as an interpretive bias where believers perceive ambiguous stimuli in a manner congruent with pre-existing beliefs about the reality of spirits. This notion concurs with Dagnall et al., (2015), who found that the extent to which participants believed a building had a history of being haunted mediated the relationship between paranormal belief and expectation of haunt-related phenomena. Additionally, Wiseman, Watt, Stevens, Greening, and O'Keeffe (2003), in their study of Hampton Court Palace and South Bridge Vaults, noted that participants reported significantly more unusual experiences in areas that had a reputation for being haunted. These findings accorded with earlier studies that observed that expectations and suggestion could facilitate haunt-like experiences (e.g., Lange & Houran, 1997; Wiseman et al., 2003).

Overall, our view is consistent with the model proposed by Houran, Wiseman and Thalbourne (2002), who postulated that hauntings may derive from psychological experiences arising from a combination of psychophysiological mechanisms (i.e., high scores on productive cognitive-perceptual factors, such as transliminality), and the misconstruing of physical/environmental changes in accordance with motivational and cognitive biases. This conceptual framework extends beyond haunting-related phenomena to other scientifically unsubstantiated beliefs. For instance, Dagnall et al. (2016) found that greater levels of belief in the paranormal and schizotypy were associated with the tendency to perceive unrelated events as connected and meaningful (causally related). This may explain why participants scoring higher on proneness to hallucinations and belief in the paranormal (especially haunting) report hearing meaningful sounds (EVP) within random auditory noise.

Within the present study, the only cognitive-perceptual factor associated with EVP detection was hallucination proneness. This contrasts with findings from the White Christmas test. Specifically, Merckelbach and van de Ven (2001) reported that participants who heard White Christmas also scored higher on fantasy proneness. Furthermore, van de Ven and Merckelbach (2003) observed that those reporting hallucinations had significantly higher fantasy proneness scores. These findings suggest that the contribution of cognitive-perceptual factors may vary as a function of task and context. Accordingly, further research is required to determine the conditions under which propensity to hallucination and fantasy proneness best predict false detection of non-presented auditory stimuli.

This conclusion corresponds with van de Ven and Merckelbach's (2003) inference that there is no straightforward connection between hallucinatory reports produced via the White Christmas paradigm and schizophrenia-like symptoms reported by normal participants. In this paper, the presence of background static noise may provide a basis for productive experiences related to the LSHS-R rather than facilitating eagerness to endorse unusual items when presented with suggestion. Congruent with this notion, when schizophrenic patients and normal controls encounter unstructured sensory stimuli, such as white noise, hallucinatory reports increase (van de Ven & Merckelbach, 2003).

Indeed, there is evidence that participants high in fantasy proneness do not typically have genuine, life-like hallucinations. Rather, they classify internal experiences as hallucinations using less stringent criteria (Lynn & Rhue, 1986). In the context of the White Christmas paradigm, this would manifest as the tendency to report inappropriately imagined stimuli as hallucination. Clearly, further work in this area is required.

Limitations

The conclusions reached within this paper require cautious interpretation and significant outcomes require replication. Moreover, there are limitations to note. Particularly, this study was cross-sectional, data collection occurred at only one time point and therefore it is not possible to infer causal relations because path analysis provides only correlational/predictive evidence. In order to produce complex causal models, subsequent research should test relations over time, conduct comparisons across modality, and employ sophisticated statistical techniques. This could involve assessing whether participants who detect auditory phenomena (EVP) are more likely to report meaningful noises (i.e., footsteps) and perceive visual anomalies (e.g., orbs).

It is worth noting that it is possible to draw predictive inferences when specification of tested models is a priori and researchers use structural equation modeling (SEM) (Hubbard & Mannell, 2001). In these circumstances, good fit provides evidence for model veracity. Explicitly, SEM enables directional inferences about relations (Bollen, 1989; Denovan et al., 2017). To promote use of SEM, future research needs to recruit larger samples of participants. As a rule of thumb, Kline (2015) recommends a minimum sample of 200.

An issue with the White Christmas paradigm, also pertinent to the EVP adaptation used within the present study, is that it is unclear whether reporting reflects response bias or a reality-testing deficit. Accordingly, future research should attempt to discern whether participants are reacting in unusual ways

to stimuli, or whether they are actually experiencing unusual things (van de Ven & Merckelbach, 2003). This is a problem with self-report measures generally. Reality testing deficits by nature are spontaneous and may not be available to conscious awareness. Hence, individuals may not have insight into their judgment processes or the authenticity of their experiences.

Finally, this paper adopted a unidimensional approach to hallucination proneness. This may only provide limited insight into the hallucinatory mechanisms underpinning EVP. Consequently, future research could adopt a multidisciplinary approach (Fonseca-Pedrero et al., 2010; Waters et al., 2006), which identifies three factors within the LSHS-R (vivid mental events, hallucinations with a religious theme, and auditory and visual hallucinatory experiences). Hence, subsequent work could investigate whether susceptibility to EVP detection varies as a function of the hallucination dimension. The researchers were not able to perform sophisticated latent modeling within the current paper due to relatively small sample size ($N = 107$).

References

- Alvarado, C. S. (2003). The concept of survival of bodily death and the development of parapsychology. *Journal of the Society for Psychical Research*, *67*, 65–95.
- Banks, J. (2012) *Rorschach Audio: Art and illusion for sound*. Strange Attractor Press.
- Barber, T. X., & Calverley, D. S. (1964). An experimental study of “hypnotic” (auditory and visual) hallucinations. *The Journal of Abnormal and Social Psychology*, *68*(1), 13–30. <https://doi.org/10.1037/h0042175>
- Baruš, I. (2001). Failure to replicate electronic voice phenomenon. *Journal of Scientific Exploration*, *15*(3), 355–367.
- Bayless, R. (1959). [Correspondence]. *Journal of the American Society for Psychical Research*, *53*(1), 35–38.
- Beck, A. T., & Rector, N. A. (2003). A cognitive model of hallucinations. *Cognitive Therapy and Research*, *27*(1), 19–52. <https://doi.org/10.1023/A:1022534613005>
- Bentall, R. P., & Slade, P. D. (1985a). Reality testing and auditory hallucinations: A signal detection analysis. *British Journal of Clinical Psychology*, *24*(3), 159–169. <https://doi.org/10.1111/j.2044-8260.1985.tb01331.x>
- Bentall, R. P., & Slade, P. D. (1985b). Reliability of a scale measuring disposition towards hallucination: A brief report. *Personality and Individual Differences*, *6*(4), 527–529. [https://doi.org/10.1016/0191-8869\(85\)90151-5](https://doi.org/10.1016/0191-8869(85)90151-5)
- Blackmore, S., & Moore, R. (1994). Seeing things: Visual recognition and belief in the paranormal. *European Journal of Parapsychology*, *10*, 91–103.
- Boccuzzi, M., & Beischel, J. (2011). Objective analyses of reported real-time audio instrumental transcommunication and matched control sessions: A pilot study. *Journal of Scientific Exploration*, *25*(2), 215–235.
- Bollen, K.A. (1989). *Structural equations with latent variables*. Wiley. <https://doi.org/10.1002/9781118619179>
- Bowers, K. S. (1967). The effect of demands for honesty on reports of visual and auditory hallucinations. *The International Journal of Clinical and Experimental Hypnosis*, *15*(1), 31–36. <https://doi.org/10.1080/00207146708407503>
- Browne, M. W., & Cudeck, R. (1993). Alternative ways of assessing model fit. In K. A. Bollen, & J. S. Long (Eds.), *Testing structural equation models* (pp. 136–162). Sage.
- Cass, R (1959). Correspondence. *The Journal of the American Society for Psychical Research*, *3*, 35–38.
- Cella, M., Vellante, M., & Preti, A. (2012). How psychotic-like are paranormal beliefs? *Journal of Behavior Therapy and Experimental Psychiatry*, *4*, 897–900. <https://doi.org/10.1016/j.jbtep.2012.01.003>

- Dagnall, N., Denovan, A., Drinkwater, K., Parker, A., & Clough, P. (2016). Toward a better understanding of the relationship between belief in the paranormal and statistical bias: The potential role of schizotypy. *Frontiers in Psychology, 7*, 1045. <https://doi.org/10.3389/fpsyg.2016.01045>
- Dagnall, N., Drinkwater, K., Denovan, A., & Parker, A. (2015). Suggestion, belief in the paranormal, proneness to reality testing deficits and perception of an allegedly haunted building. *Journal of Parapsychology, 79*, 87–104.
- Dagnall, N., Drinkwater, K., Denovan, A., Parker, A., & Rowley, K. (2016a). Misperception of chance, conjunction, framing effects and belief in the paranormal: A further evaluation. *Applied Cognitive Psychology, 30*, 409–419. <https://doi.org/10.1002/acp.3217>
- Dagnall, N., Drinkwater, K., Parker, A., Denovan, A., & Parton, M. (2015). Conspiracy theory and cognitive style: a worldview. *Frontiers in Psychology, 6*, 206. <https://doi.org/10.3389/fpsyg.2015.00206>
- Dagnall, N., Drinkwater, K., Parker, A., & Rowley, K. (2014). Misperception of chance, conjunction, belief in the paranormal and reality testing: A reappraisal. *Applied Cognitive Psychology, 28*(5), 711–719. <https://doi.org/10.1002/acp.3057>
- Dagnall, N., Parker, A., Munley, G., & Drinkwater, K. (2010). Common paranormal belief dimensions. *Journal of Scientific Exploration, 24*, 431–447.
- Denovan, A., Dagnall, N., Drinkwater, K., Parker, A., & Clough, P. (2017). Perception of risk and terrorism-related behavior change: Dual influences of probabilistic reasoning and reality testing. *Frontiers in Psychology, 8*, 1721. <https://doi.org/10.3389/fpsyg.2017.01721>
- Drinkwater, K., Denovan, A., Dagnall, N., & Parker, A. (2018). The Australian Sheep-Goat Scale: An evaluation of factor structure and convergent validity. *Frontiers in Psychology, 9*, 1594. <https://doi.org/10.3389/fpsyg.2018.01594>
- Finney, S. J., & DiStefano, C. (2006). Non-normal and categorical data in structural equation modeling. In G. R. Hancock & R. O. Mueller (Eds.), *Structural equation modeling: A second course* (pp.269–314). Information Age.
- Fonseca-Pedrero, E., Lemos-Giráldez, S., Paino, M., Sierra-Baigrie, S., Villazón-García, Ú., González, P. G. P., & Muñiz, J. (2010). Dimensionality of hallucinatory predisposition: Confirmatory factor analysis of the Launay-Slade Hallucination Scale-revised in college students. *Anales de Psicología/Annals of Psychology, 26*, 41–48.
- Houran, J., & Lange, R. (1996). Hauntings and poltergeist-like episodes as a confluence of conventional phenomena: A general hypothesis. *Perceptual and Motor Skills, 83*(3_suppl), 1307–1316. <https://doi.org/10.2466/pms.1996.83.3f.1307>
- Houran, J., Wiseman, R., & Thalbourne, M. (2002). Perceptual-personality characteristics associated with naturalistic haunt experiences. *European Journal of Parapsychology, 17*, 17–44.
- Hubbard, J., & Mannell, R. C. (2001). Testing competing models of the leisure constraint negotiation process in a corporate employee recreation setting. *Leisure Sciences, 23*(3), 145–163. <https://doi.org/10.1080/014904001316896846>
- Jahshan, C. S., & Sergi, M. J. (2007). Theory of mind, neurocognition, and functional status in schizotypy. *Schizophrenia Research, 89*, 278–286. <https://doi.org/10.1016/j.schres.2006.09.004>
- Jones, S. R., Fernyhough, C., & Meads, D. (2009). In a dark time: development, validation, and correlates of the Durham Hypnagogic and Hypnopompic Hallucinations Questionnaire. *Personality and Individual Differences, 46*, 30–34. <https://doi.org/10.1016/j.paid.2008.08.021>
- Keil, J. (1980). The voice on tape phenomena: Limitations and possibilities. *European Journal of Parapsychology, 3*, 287–296.
- Kellar, R. (2012). *EVP samples*. [Online] [Accessed 1st September 2015] <http://www.randallkeller.com/evp/index.html>

- Kline, R. B. (2015). *Principles and practice of structural equation modeling*. Guilford.
- Lange, R., & Houran, J. (1997). Context-induced paranormal experiences: Support for Houran and Lange's model of haunting phenomena. *Perceptual and Motor Skills*, *84*, 1455–1458. <https://doi.org/10.2466/pms.1997.84.3c.1455>
- Laszlo, E. (2008). An unexplored domain of nonlocality: Toward a scientific explanation of instrumental transcommunication. *EXPLORE: The Journal of Science and Healing*, *4*, 321–327. <https://doi.org/10.1016/j.explore.2008.06.003>
- Lawrence, E., & Peters, E. (2004). Reasoning in believers in the paranormal. *The Journal of Nervous and Mental Disease*, *192*, 727–733. <https://doi.org/10.1097/01.nmd.0000144691.22135.d0>
- Leary, M. R., & Butler, T. (2015). Electronic Voice Phenomena. In E. Cardeña, J. Palmer, & Marcusson-Clavertz (Eds.), *Parapsychology: A handbook for the 21st century* (pp. 341–349). McFarland.
- Lynn, S. J., & Rhue, J. W. (1986). The fantasy-prone person: Hypnosis, imagination, and creativity. *Journal of Personality and Social Psychology*, *51*, 404–408. <https://doi.org/10.1037/0022-3514.51.2.404>
- McCreery, C., & Claridge, G. (1996). A study of hallucination in normal subjects—I. Self-report data. *Personality and Individual Differences*, *21*, 739–747. [https://doi.org/10.1016/0191-8869\(96\)00115-8](https://doi.org/10.1016/0191-8869(96)00115-8)
- MacRae, A. (2004). *EVP and new dimensions* (3rd ed.). Sanctuary Press.
- Merckelbach, H., Horselenberg, R., & Muris, P. (2001). The Creative Experiences Questionnaire (CEQ): A brief self-report measure of fantasy proneness. *Personality and Individual Differences*, *31*(6), 987–995. [https://doi.org/S0191-8869\(00\)00201-4](https://doi.org/S0191-8869(00)00201-4)
- Merckelbach, H., & van de Ven, V. (2001). Another White Christmas: Fantasy proneness and reports of 'hallucinatory experiences' in undergraduate students. *Journal of Behavior Therapy and Experimental Psychiatry*, *32*(3), 137–144. [https://doi.org/10.1016/S0005-7916\(01\)00029-5](https://doi.org/10.1016/S0005-7916(01)00029-5)
- Nees, M. A., & Phillips, C. (2015). Auditory pareidolia: Effects of contextual priming on perceptions of purportedly paranormal and ambiguous auditory stimuli. *Applied Cognitive Psychology*, *29*(1), 129–134. <https://doi.org/10.1002/acp.3068>
- Raine, A. (1991). The SPQ: A scale for the assessment of schizotypal personality based on DSM-III-R criteria. *Schizophrenia Bulletin*, *17*, 555–564. <https://doi.org/10.1093/schbul/17.4.555>
- Raine, A., & Benishay, D. (1995). The SPQ-B: A brief screening instrument for schizotypal personality disorder. *Journal of Personality Disorders*, *9*, 346–355. <https://doi.org/10.1521/pedi.1995.9.4.346>
- Raudive, K. (1971). *Breakthrough: an amazing experiment in electronic communication with the dead*. Colin Smythe.
- Riekkki, T., Lindeman, M., Aleneff, M., Halme, A., & Nuortimo, A. (2013). Paranormal and religious believers are more prone to illusory face perception than skeptics and non-believers. *Applied Cognitive Psychology*, *27*, 150–155. <https://doi.org/10.1002/acp.2874>
- Smith, E. L. (1974). The Raudive voices: Objective or subjective? A discussion. *Journal of the American Society for Psychical Research*, *68*, 91–100.
- Smith, C. L., Johnson, J. L., & Hathaway, W. (2009). Personality contributions to belief in paranormal phenomena. *Individual Differences Research*, *7*, 85–96.
- Spanos, N. P., & Barber, T. X. (1968). "Hypnotic" experiences as inferred from subjective reports: Auditory and visual hallucinations. *Journal of Experimental Research in Personality*, *3*, 136–150.
- Spanos, N. P., & Stam, H. J. (1979). The elicitation of visual hallucinations via brief instructions in a normal sample. *Journal of Nervous and Mental Disease*, *167*, 488–494. <https://doi.org/10.1097/00005053-197908000-00006>
- Terhune, D. B., & Smith, M. D. (2006). The induction of anomalous experiences in a mirror-gazing facility: Suggestion, cognitive perceptual personality traits and phenomenological state effects. *Journal of Nervous and Mental Disease*, *194*, 415–421. <https://doi.org/10.1097/01.nmd.0000221318.30692.a5>

- Thalbourne, M. A., & Delin, P. S. (1993). A new instrument for measuring the sheep-goat variable: Its psychometric properties and factor structure. *Journal of the Society for Psychical Research*, 59(832), 172–186.
- van de Ven, V., & Merckelbach, H. (2003). The role of schizotypy, mental imagery, and fantasy proneness in hallucinatory reports of undergraduate students. *Personality and Individual Differences*, 35, 889–896. [https://doi.org/10.1016/S0191-8869\(02\)00304-5](https://doi.org/10.1016/S0191-8869(02)00304-5)
- Van Elk, M. (2013). Paranormal believers are more prone to illusory agency detection than skeptics. *Consciousness and Cognition*, 22, 1041–1046. <https://doi.org/10.1016/j.concog.2013.07.004>
- Waters, F., Badcock, J., Michie, P., & Maybery, M. (2006). Auditory hallucinations in schizophrenia: Intrusive thoughts and forgotten memories. *Cognitive Neuropsychiatry*, 11, 65–83. <https://doi.org/10.1080/13546800444000191>
- Williams, L. M., & Irwin, H. J. (1991). A study of paranormal belief, magical ideation as an index of schizotypy and cognitive style. *Personality and Individual Differences*, 12, 1339–1348. [https://doi.org/10.1016/0191-8869\(91\)90210-3](https://doi.org/10.1016/0191-8869(91)90210-3)
- Wilson, S. C., & Barber, T. X. (1983). Fantasy-prone personality: Implications for understanding imagery, hypnosis, and parapsychological phenomena A.A. Sheikh (Ed.), *Imagery: current theory, research, and application* (pp. 340–387). Wiley
- Wiseman, R., Watt, C., Stevens, P., Greening, E., & O’Keeffe, C. (2003). An investigation into alleged ‘hauntings.’ *British Journal of Psychology*, 94, 195–211. <https://doi.org/10.1348/000712603321661886>

Prédicteurs des Phénomènes d’Audition de Voix Électroniques dans du Bruit Aléatoire: La Schizotypie, l’Inclination à la Fantaisie, et les Croyances Paranormales

Résumé. Cette étude utilisait une version modifiée de la tâche « Noël blanc » pour examiner les récits de phénomènes d’audition de voix électronique (EVP) à partir d’un bruit aléatoire. Après une familiarisation avec le concept d’EVP, 107 participants ont écouté une piste audio combinant bruit blanc et bruit rose. Les instructions indiquaient aux participants pour presser un bouton sur un clavier afin d’indiquer qu’ils ont entendu un EVP. À la fin de la piste, les participants ont fourni un score de confiance pour leur perception d’EVP. Trente-neuf participants (36 %) ont relaté la présence d’EVP. La comparaison entre les expérimentateurs d’EVP et les non-expériences sur des mesures cognitives-perceptuelles (schizotypie, hallucinations et inclination à la fantaisie) et de croyances paranormales (générale et relatives à la hantise) n’a relevé aucune différence significative. Une analyse pas à pas a indiqué que la croyance dans la hantise médiatisait les relations entre les croyances paranormales et l’inclination aux hallucinations avec les résultats aux EVP (nombre et confiance). Toutefois, l’inclination à la fantaisie et la schizotypie n’avaient pas de relations significatives avec l’EVP. Ces résultats étaient conformes aux précédentes découvertes, avec des participants qui ont imaginé entendre la fameuse chanson « Noël blanc ». Au sein de cette étude, une minorité non-triviale de participants ont vécu des EVP sous la forme d’une hallucination congruente avec la croyance. Ces résultats supportent l’idée que les croyances anormales fournissent un cadre de structuration des cognitions et perceptions inhabituelles.

Zur Überprüfung von Prækognition und veränderten Bewusstseinszuständen mit ausgewählten Teilnehmern im Ganzfeld

Zusammenfassung. Diese Studie ist die erste, die zu einer prospektiven Metaanalyse von zuvor registrierten Ganzfeld-Studien zur Außersinnlichen Wahrnehmung (ASW) beiträgt. Wir versuchten, ein-

en erwarteten Psi-Effekt zu maximieren, indem wir Teilnehmer aufgrund ihrer selbstberichteten Kreativität, früherer Psi-Erfahrungen oder -Überzeugungen oder der Ausübung einer mentalen Disziplin auswählten. Aus Gründen der Einfachheit und Sicherheit verwendeten wir auch ein automatisiertes Präkognitionsdesign, um zusätzlich zur Erweiterung der geringen Datenbasis präkognitiver Ganzfeldstudien beizutragen. Ziel- und Kontrollbilder waren kurze Videoclips, die zufällig aus einem Pool von 200 Bildern mit Zurücklegen ausgewählt worden waren. Neben der Vorhersage eines signifikanten Gesamteffektes der Ganzfeld-Präkognitionsaufgabe sollte die Studie auch die Annahme testen, dass die Ganzfeld-Methode einen psi-förderlichen veränderten Bewusstseinszustand hervorruft, indem zwei Maße des veränderten Bewusstseinszustands (Altered State of Consciousness, ASC) mit dem Ergebnis der Präkognitionsaufgabe korreliert wurden. Wir sagten vorher, dass die Ähnlichkeit der Übereinstimmungen mit den Zielbildern mit dem Grad der Ausprägung des ASC während der Sitzung verknüpft war. Drei Experimentatoren führten jeweils 20 Einzelversuche durch. Es wurden zweiundzwanzig direkte Treffer erzielt (37% Trefferquote), was den geplanten Test der Ganzfeld-Präkognitionsaufgabe signifikant unterstützt (exakter Binomialtest $p = .03$, 1-t). Entgegen der Vorhersage wurde kein Zusammenhang zwischen dem ASC und der Psi-Aufgabe gefunden. Abschließend diskutieren wir die Gründe, die für eine Fortsetzung der Ganzfeld-ASW-Forschung sprechen.

Predictores de Audición de Fenómenos de Voz Electrónica en Ruido Aleatorio: Esquizotipia, Propensión a la Fantasía, y Creencias Paranormales

Resumen. Este estudio utilizó una prueba modificada de la canción White Christmas para examinar respuestas de fenómenos electrónicos de voz (EVP) en ruido aleatorio. Tras familiarizarse con el concepto de EVP, 107 participantes escucharon una pista de audio que combina ruido blanco y rosa. Las instrucciones dirigieron a los participantes a presionar un botón del teclado para indicar si habían oído EVP. Al final de la grabación, los participantes dieron una calificación de confianza general de la percepción de EVP. Treinta y nueve participantes (36%) confirmaron la presencia de EVP. Las comparaciones entre quienes experimentaron o no EVP en medidas de percepción cognitiva (esquizotipia, alucinaciones, y propensión a la fantasía) y creencias paranormales (general y de casas encantadas) no revelaron diferencias significativas. Un análisis de pautas (path analysis) indicó que la creencia en casas encantadas medió las relaciones entre la creencia paranormal y la propensión a las alucinaciones con las experiencias de EVP (número y confianza). Sin embargo, la propensión a la fantasía y la esquizotipia no tuvieron relaciones significativas con EVP. Los resultados son consistentes con resultados anteriores, donde los participantes imaginaron escuchar la famosa canción White Christmas. En este estudio, una minoría no trivial de participantes experimentó EVP como un tipo de alucinación congruente con las creencias. Estos hallazgos respaldan la noción de que las creencias anómalas dan un marco para estructurar cogniciones y percepciones inusuales.

Tolerance of the Unknown: Negative Capability, the Problem of Demarcation, and the Truzzi-Gardner Dialogue¹

Renaud Evrard

University of Lorraine

Bevis Beauvais

Independent Researcher

Abstract. The poet John Keats coined the term *negative capability* to describe the kind of open mindedness that is capable of tolerating the unknown or only half-known. He also described a similar idea regarding our ability to disregard our own knowledge and allow the mind to become a thoroughfare for all thoughts. This capability may be considered from the perspective of the psychology of science as an epistemic virtue, which plays an important role within the scientific study of anomalous phenomena or what might be more succinctly termed *anomalistics*. Have scientists developed sufficient negative capability to deal adequately with the claims of the paranormal? As an illustration, we analyze the role of negative capability within the recently published correspondence between sociologist Marcello Truzzi and mathematician and science journalist Martin Gardner. Gardner defended a kind of hardline skepticism favoring prejudice and pejorative labels whereas Truzzi promoted a softer skepticism with more symmetry and a courteous effort toward those who strive diligently to follow the rules of science. Both forms of skepticism have different epistemological grounds and this inner-demarcation is analyzed through the perspective of the psychology of science and its assessment of individual's epistemic vices and virtues. This inner-demarcation has an impact on the wider issue of demarcation between science and pseudoscience. We conclude that negative capability should be a salient factor in future research and may be encouraged and developed by the educational opportunities provided by anomalistics and its characteristic skeptic-proponent dialogues.

Keywords: Negative capability, skepticism, psychology of science, Marcello Truzzi, Martin Gardner

In an 1817 letter to his brothers (Keats, 1899, p. 277), the poet John Keats coined a term that has retained its currency to our very day: "I mean *Negative Capability*, that is, when a man is capable of being in uncertainties, mysteries, doubts, without any irritable reaching after fact and reason." In a later letter to his brother George (Keats, 1819), he harped upon a similar theme: "The only means of strengthening one's intellect is to make up one's mind about nothing - to let the mind be a thoroughfare for all thoughts. Not a select party."

After co-editing *Parapsychology: A Handbook for the 21st Century*, Etzel Cardeña (2015) published an epilogue entitled "On negative capability and parapsychology," pointing out that even though we

¹ Address correspondence to: Renaud Evrard, Ph. D., INTERPSY, Department of Psychology, University of Lorraine, 5400, Nancy, France, renaud.evrard@univ-lorraine.fr.

have learned some things since the publication of the similar 1977 *Handbook*, we have yet to recognize just how little we know about the phenomena in question (Cardeña, 2015, p. 400):

The various analyses... documented in this tome show in my mind a too remarkable regularity to be explained away by wholly or partly dishonest researchers ... thus I conclude that we do have evidence for something like what we call psi. Nonetheless, the small effect sizes and lack of ability to design an experiment that would almost certainly produce evidence also signifies that we are very far from understanding psi, whether of the conscious or unconscious variety.

Cardeña (2015, p. 402) provides a personal example of the epistemic effort that prohibited him from concluding the *Handbook* more enthusiastically, using a metaphor developed by Gleiser (2014): “One of those lessons for every reader should be, I believe, that our ‘island of knowledge’ about psi has increased size while simultaneously revealing just how much we do not know.” Negative capability is the mark of a relation to knowledge of greater importance than merely finding itself at the conclusion of an inventory of research, and it has nothing to do with pessimism. On the contrary, it could be an indispensable epistemological tool for scientific research in parapsychology and anomalistics.

In this article, we will first describe some key elements of the psychology of negative capability, and then integrate it within the psychology of science as a possible solution to this particular demarcation problem. We illustrate this with an analysis of two scientific attitudes regarding paranormal claims: those of sociologist of science Marcello Truzzi and mathematician and science journalist Martin Gardner, based on their recently published correspondence (Richards, 2017).

The Psychology of Negative Capability

Let us begin by examining the original intent of John Keats when he coined the term *negative capability* in his letter of 22nd December 1817 to his brothers George and Thomas. Keats was a romantic poet who tragically succumbed to tuberculosis at the age of 25. Longing to find beauty in what was often an ugly and terrible world, he was a great admirer of Shakespeare and emulated the genius of the Bard’s creativity through his concept of negative capability. It characterizes the capacity of the greatest writers to pursue a vision of artistic beauty even when it leads them into intellectual confusion and uncertainty, in contradistinction to the preference for philosophical certainty over artistic beauty.

Beyond aesthetic analysis, the state described by Keats can be prosaically compared to a definition of psychological conflict: “An emotional state characterized by indecision, restlessness, uncertainty and tension, resulting from incompatible inner needs or drives of comparable intensity” (Oram & Heilizer, 1965). Keats’ description of the poetical character portrays a soul that prefers clinging to a higher vision despite conflict rather than giving way to the crushing spiritual death demanded by the dull materialism of an industrial age with its illusion of authoritarian certainty. The ensuing conflict between seeming dream and so-called reality is characteristic of a *liminal* state (Hansen, 2001). By not imposing oneself upon the doubts and uncertainties that make up a conflict, Keats would rather have us transcend the narrow confines of intellect and open ourselves to the intuitive realm of imagination and creativity. This involves a kind of preternatural empathy, a chameleon-like state of being capable of eliminating one’s

own personality in order to imaginatively enter into another person's perspective, especially that of the beloved or Muse. It is no surprise that negative capability has attracted the interest of psychotherapists.

The twentieth-century British psychoanalyst Wilfred Bion (1974, p. 209-210) referred to Keats's term to elaborate an attitude of openness of mind, which he considered of central importance not only to the psychoanalytic session but also to life itself. For Bion, negative capability was the ability to tolerate the pain and confusion of unknowing, rather than imposing ready-made or omnipotent certainties upon an ambiguous situation or emotional challenge. It is not a way of changing the knowledge of the patient or the analyst, but of changing their *relation to knowledge*. He extracted from Freud's correspondence the idea of making himself *artificially blind* so as to focus all the light upon a single dark point, in the context of the analytic cure. This method involves a suspension of memory, desire, understanding, and sensorial perception (Bion, 1974, p. 86-87), something stronger than the classical phenomenological "epoché" or "bracketing" (Husserl, 1977). It is only at the cost of a certain degree of effort that the analyst's listening skills gain access to the full wealth of knowledge emerging from the therapeutic situation. This process is in part a continuity of Freud's "free-floating attention" or "evenly-suspended attention" (*gleichschwebende Aufmerksamkeit*).

Negative capability is not limited to the register of analytical technique, it is in full accord with the epistemological ambitions of psychoanalysis. It organizes a certain relation with knowledge that, during a therapy session as in any field of research, turns towards *the unknown*, this "obscure point" which must be illuminated by "blindness" (Bion, 1974, p. 124). Other psychoanalysts including André Green (1993) and Jean Guillaumin (2003) have tried to generalize this psychoanalytic epistemology to all sciences. This model is articulated around a *negative operator* or *strange organizer* that assures psychoanalytic thought an availability for the discovery of the *unthought*. The *negative work* would be like the relentlessness of the psychoanalysts who struggles to maintain, within practice and theory, an epistemic position animated by incessant questioning of their own neutrality and in relation to their own certainties (Guillaumin, 2003, pp. 92-93). The part of the unknown on which psychoanalysts expects to stumble becomes the operator of their knowledge, always revisable. The "non-knowledge" is qualified, in turn, as "strange attractor," "indispensable negative support," and "central operator" of human knowledge (Guillaumin, 2003, p. 116).

It is unfortunate that Guillaumin does not explore the limits of this capacity, which to him appears to be a permanent feature of the psychoanalyst, so much so that, in his model, it is in an ideal position to reach this infallible attitude only by practicing psychoanalysis. Therefore his generalization about negative capability appears excessive. Further, his specificity is questionable since scientists also defend themselves of their (ideal) opening to the unknown through their self-correcting dynamics. For instance, the neurobiologist Stuart Firestein recently recalled that "ignorance drives science" (Firestein, 2014): scientists are animated by the desire to confront their own ignorance, to the point where, at the extreme limit of what we know, we no longer actually know. Gregory Bateson (1972) already wrote about the importance of *nescience*, the negative side of knowledge. And Richard Feynman, a Nobel laureate for Physics, gave in 1969 a subversive definition of science as "the belief in the ignorance of experts." We can even go back to Socrates' disregard of his own knowledge as the first step in Western philosophy: "All I know is that I know nothing."²

² This quote is not a literal translation of Plato's *Apology of Socrates* but sums up his words. A closer translation may be: "I'm wiser [than this person] because I don't believe to know what I don't know", and "My wisdom is nothing compared to gods' one" (Vergely, 2014).

All in all, negative capability has been recognized as an essential element of the “scientific mind” (Bachelard, 1934, 1938). However, the extensive empirical work on laboratory work in the sociology of scientific knowledge shows that the reality of the field, with all the negotiations of scientific reality, is very far from confirming these ideal identifications (Galison, 1987; Gieryn, 1983, 1999; Latour & Woolgar, 1988). This is even more obvious in the field of unconventional sciences such as parapsychology where the science-pseudoscience demarcations are particularly prejudicial and applied to the detriment of the ideals mentioned earlier (Collins & Pinch, 1982; Hansen, 2001; Hess, 1993; Mauskopf, 1979; McClenon, 1993; Wallis, 1979).

We could bring negative capability closer to other psychological constructs such as *tolerance to ambiguity* (Barron, 1969; Renkel-Brunswik, 1949), *epistemic curiosity* (Mussell, 2010), *openness to experience* (McCrae & John, 1992), and *psychic lability* (Braud, 1981). According to some researchers (Lauriola et al., 2016), the attitude toward ambiguity can be best represented as a multidimensional construct involving affective, cognitive, and epistemic components. However, we do not currently have a reliable tool for assessing negative capability. This is a challenge for the most recent meta-science: the psychology of science.

The Psychology of Science and the Demarcation Problem

The psychology of science is described as the new “meta-science” after philosophy, history, and the sociology of science. Feist and Gorman (2013, p. 3) defined it as “the study of scientific thought and behavior both narrowly and broadly defined.” The psychology of science examines both explicit and implicit forms of scientific thought and behavior, at all times in life. By symmetry, it is also the study of forms of thought and behavior that could be described as “non-scientific.” Its role is not to replace other meta-sciences by denying the sociological, political, historical, or philosophical influences already at work (for instance, the impact of politic and sociological context on the physics of gravity wave detection, Collins, 1998, 1999). It is rather a question of complementing them through the analysis of how both conscious and unconscious psychological factors (like cognitive, perceptive, or emotional biases) are also involved in scientific processes.

One possible area of interest is the identification of “epistemic vices and virtues” (Baehr, 2011; Fricker, 2009; Roberts & Wood, 2007), especially in the field of psychical research as carried out by Ian Kidd (2014) using the example of William Crookes³ (see also Richet, 1923). Without falling into an idealistic or moralistic representation of scientific activities, we can look for the psychological skills and attitudes that are science-conducive or science-inhibitory. A non-exhaustive list of typical virtues would include: curiosity, impartiality, open-mindedness, epistemic justice, epistemic humility, and epistemic courage. Epistemic vices will be the inverses: conservatism, partiality, dogmatism, vainness, epistemic cowardice. These lists are, of course, subject to vigorous debate, and a central task of contemporary virtue epistemology is to identify and individuate the virtues and vices, and to provide a developed taxonomy of them (Baehr, 2011).

³ The physicist and chemist William Crookes (1832-1919) is an eminent figure in the history of psychical research, with investigations into spiritualistic and psychical phenomena during the early 1870s, before the creation of the societies for psychical research.

This psychological approach may provide an enriched solution to the old demarcation problem, understanding how to distinguish a scientific activity from a non-scientific one (Popper, 1959, 1963). This issue remained unsettled in the 1980s when philosophers of science failed to reach a consensus on the demarcation criteria. Laudan (1983) even showed that the demarcation problem was the pillar of ideological driven activity, since the great difficulty in the definition of generalizable demarcation criteria matched with the production of cleaving and militant speeches. But this issue rose again recently with renewed attempts to gather nonspecific demarcation criteria, like self-correcting empiricism and coherence within neighboring fields, as a pragmatic tool against pseudo-scientific practices (Pigliucci & Boudry, 2013; Rasplus, 2014). In these books, the treatment of parapsychology is totally biased and based upon deep ignorance of the field (Evrard, 2016), with claims like “parapsychologists do not publish in recognized scientific journals” (Goode, in Pigliucci & Boudry, 2013, p. 149) or suggesting fraud to explain Bem’s successful experiments on anomalous cognition (Gauvrit, in Rasplus, 2014, p. 160-162). The authors fail to produce concrete definitions of demarcation criteria beyond a “tacit knowledge” of what would be a pseudo-science. Using the contemporary virtue epistemology may help assess whether or not an individual has a genuine scientific attitude. This individual-level approach solves concrete problems rather than applying pejorative labels to poorly defined fields. And this approach can be applied symmetrically when a person makes an unorthodox claim (“telepathy exists”) or an orthodox one (“telepathy doesn’t exist”).

French psychologist Louis Favre (see Evrard, 2017) has pointed out how the heterodox field of parapsychology could serve as a testing ground of the scientific mind, by strongly eliciting the faculty of negative capability. Among the many good reasons to study psychical phenomena, he included the “excellent training” of the scientific mind (Favre, 1909, p. 7) through the confrontation with parapsychology. An exercise where, unfortunately, many fail:

He who acts as a scientific mind when he studies other objects, appears unscientific when addressing these difficult issues or this land where you have to walk alone, where the good guides and good examples that you can follow or imitate easily, are quite lacking (Favre, 1909, p. 11; our translation here and in other quotations of Favre).

Walter Franklin Prince (1930) made the same observations in his book *The Enchanted Boundary*. But rather than denouncing the excesses of rationalism, Favre made it an additional asset of parapsychology: “This study is the reagent of choice to detect and meter the scientific mind – our own and that of the individual with whom we speak or discuss” (Favre, 1909, p. 19). In this way the field excites the passions and makes many people partial and unscientific, thereby supporting his idea of a parapsychology as a “sensitive reagent.” Such a discipline has this “touchstone” function by which we may re-evaluate the claims of the supposed custodians of the scientific mind (Evrard, 2016). Who truly combines curiosity and critical spirit, benevolence and rigor? According to Favre, very few of his contemporaries can claim to do so:

When we do the test or the assay, we find that people with enough scientific mind or a sufficient “title” are rare. Many who have a head “full of knowledge” are far from having a rightly shaped mind”(Favre, 1909, p. 8, with a reference to a famous quote by Montaigne).

Favre deconstructed the figure of the scientist because he noted repeatedly that people give their opinion on parapsychology without having studied it, something that is usually doomed from the outset in any other field. He gave several examples of conversations with scholars who opposed him with prejudices, “common sense,” authority arguments, peremptory affirmations, or a refusal to examine the evidence based on the conviction that the whole issue has already been adjudicated and resolved (Favre, 1909, p. 13-18). He observed that many established scientists failed to rigorously apply science in these areas because of personal, economic, or social prejudices. What is happening in this zone of conflict may also reflect the psychological and social investment of *orthodoxy*, even when it is minimized through the rhetoric of openness, truthfulness, and disinterested and dispassionate scientific practice. His conclusion was unequivocal: “At the present time, the best area for scientific intolerance is that of psychic phenomena. The prouds who know everything can not tolerate that those who claim to know only what they have studied expressed a different opinion.” (Favre, 1909, p. 27). We will now discuss a more contemporary case involving two opposing attitudes in regard to negative capability and parapsychology.

Negative Capability in the Truzzi-Gardner Dialogue

Marcello Truzzi (1935-2003) was a sociologist of science at Eastern Michigan University. One of the founding members of CSICOP (the Committee for the Scientific Investigation of Claims of the Paranormal), he soon parted ways with it since it moved away from the scholar and democratic attitude expected by Truzzi, and started the journal *The Zetetic Scholar*. As an alternative to CSICOP, he created the Center for Scientific Anomalies Research. Martin Gardner (1914-2010) was a science journalist, and a famous voice in the American skeptic movement. Their correspondence (Richards, 2017) is an excellent resource for identifying various degrees of tolerance to the unknown, because they differ in the way they receive unconventional claims. Dana Richards (2017, p. xi) summarizes the correspondence as follows: “They agree about fundamentals, but disagree about practical aspects. Martin felt that practical aspects of *doing* science favor ignoring and/or debunking pseudoscientists. Marcello felt that practical aspects of *adjudicating* science trump the exigencies of doing science.”

Rhetorical strategies used by advocates and critics of parapsychology have been studied by several researchers through discourse and text analyses (Coelho, 2005; Collins & Pinch, 1979; Zingrone, 2004). This approach taught us a lot about the constitutive role of discourse and communication in the ways that scientists debate contested or competing claims (Gilbert & Mulkay, 1984). Here we only comment on the endorsed epistemological positions, according to the vices and virtues that underlie them, and to the way in which they were embodied individually. We looked in detail at their differences in four steps: the scientific value of prejudging; the symmetrical approach of skepticism; the effort at courtesy initiated by Truzzi; and the oppositional strategies to provoke negative capability in others.

Prejudging as a Scientific Practice

Gardner repeatedly identifies people he thinks are cranks, explains why they are cranks, and pleads with Truzzi to ignore them, if not disown them. He authoritatively designates some “irrespon-

sible visionaries” (Letter of January 18, 1978, in Richards, 2017, p. 80) who are dangerous for science, and distinguishes them from responsible scientists who hold extremely far from orthodox views. The so-called cranks and crackpots make highly implausible claims that Gardner has no objection in prejudging, before making further tests, because of their implausibility (Letter of March 5, 1978, in Richards, 2017, p. 114). In regard to this attitude, Truzzi quoted the study of psychologist Michael Mahoney (1976) who affirmed that “Scientists are not the paragons of rationality, objectivity, open-mindedness, and humility that many of them might like others to believe” (in Richards, 2017, p. 105-106) These transgressions of scientific norms or virtues are made possible by the frequent absence of sanctions and the negotiable aspects of many of these alleged norms.

Gardner pragmatically argues that: “It is absolutely necessary for the health of science that the more outrageous claims be ‘prejudged.’ Scientists simply do not have the time, inclination, or funds for investigating such claims.” (Richards, 2017, p. 114). He gives several examples of wasted time with tests of such claims. This pragmatic argument about how science *must* operate with respect to far-out claims was also defended by the philosopher Michael Polanyi (1969, p. 79):

Journals are bombarded with contributions offering fundamental discoveries in physics, chemistry, biology or medicine, most of which are nonsensical. Science cannot survive unless it can keep out such contributions and safeguard the basic soundness of its publications. This may lead to the neglect or even suppression of valuable contributions, but I think this risk is unavoidable. If it turned out that scientific discipline was keeping out a large number of important ideas, a relaxation of its severity might become necessary. But if this would lead to the intrusion of a great many bogus contributions, the situation could indeed become desperate. The pursuit of science can go on only so long as scientific judgments of plausibility are not too often badly mistaken.

Such an extreme defensive stance requires a very low negative capability. But this position of a strong orthodoxy for science, probably shared by many critics of unconventional theories, looks problematic to Truzzi, who developed a less asymmetrical position.

Skepticism as a Symmetrical Nonbelief

In a letter to Douglas Hofstadter (31 January, 1983), Truzzi complained that “the term ‘skeptic’ has become unfortunately equated with disbelief rather than its proper meaning of *nonbelief*. That is, skepticism means the raising of doubts and the urging of inquiry” (Richards, 2017, p. xxvi). He was not a relativist, as he believed in science’s cumulative progress, but he sought to extend skepticism “to all claims including orthodox ones” (Richards, 2017, p. xxvii). Truzzi looked for a truly impartial skepticism, with no room for prejudging: “Bad science is (analytically) bad science whether or not it is practiced by socially respected ‘scientists’ or outsider mavericks.” (Letter of the January 12, 1978, in Richards, 2017, p. 76). He even claimed that his impartial skepticism is much stronger than those of the members of the CSICOP:

For I am skeptical about much of what passes for science in the orthodox science areas. It is

because I see psychiatrists as little different from witchdoctors, for example, that I am more sympathetic about the practices of the witchdoctor. I see neither the witchdoctor nor the psychiatrist as true scientists, but I see little reason to be more tolerant of the latter than the former. And since I recognize that we know little about the area that both are working in (in a strictly scientific sense), I am inclined to tolerate both rather than denounce both (since there is no ready replacement in society for their functions). Compared to some of the Committee members, I am very willing to emphasize how much we simply do not know yet (scientifically). And if a Gauquelin or a Hynek (or anyone intellectually honest and willing to play by the scientific rules of evidence for judgment by the historical court of science) wants to play in the search-game for the truth (which is simply trying to discover what the hell is going on 'out there' in the empirical world), I welcome them into the search party." (Letter of the 12 January 12, 1978, in Richards, 2017, p. 76)

This symmetrical skepticism goes with a more tolerant methodology, which prefers negative capability to debunking. This is not a demonstration of strength, to reassure oneself about the established knowledge, but a strategy that has learnt lessons from the history of science. According to Truzzi, the finding and re-conceptualizing of anomalies is "the life blood of science" (same letter, p. 77). He summoned the two types of errors that can arise when dealing with an ostensible new fact, not just the one implicit in Gardner's prejudging attitude: "You seem overly concerned with Type I (thinking there is an anomaly present when none actually exists) to the neglect of the Type II error (not noticing an important departure from the norm when one exists)" (*Idem*).

In a meeting in Washington, February 16, 1978, Truzzi presented a well-articulated view of his ideas on the reception of unconventional science. He built on what Thomas Kuhn (1977) has termed "the essential tension in science": "It is this problem of equilibrium that faces the scientific community in its collective reception of unconventional theories. The balance is a difficult one to put into operation, and the history of science is replete with examples of failure. In general however, institutionalized science has tended to be conservative and protective of its existing bodies of currently accepted facts and theories." (Truzzi, 1978, in Richards, 2017, p. 102)

Truzzi sees a complementarity between the traditionalist and iconoclast attitudes about Type I and Type II errors, and does not want to advocate one more than the other. He defined his role as the one of "*amicus curiae*, a friend of the court who recognizes the rules of evidence and the adjudication procedure and tries to help the process work more efficiently and fairly" (Letter of January 12, 1978, in Richards, 2017, p. 78). He therefore takes care to distinguish his personal prejudices from his scientifically established opinions, a task that requires an important negative capability.

In defense of a more conservative view, Gardner argues that treating unorthodox claims with a symmetrical fairness has a "legitimatizing" effect. According to him, "an AAAS symposium on astrology would have the effect of strengthening the public's astrological obsession... The general public can't follow careful arguments, and they are too ignorant of elementary statistics" (Letter of January 27, 1977, in Richards, 2017, p. 67). This is a recurrent rhetorical argument with some skeptics: the public opinion is "ill-founded" and only some elites know what is good for the masses (Bensaude-Vincent, 2000).

In the same vein, Gardner criticized Truzzi's use of the word "anomaly" for some unconventional claims when he found it better to view the "occult wave" as a "social aberration" (Letter to Ray Hyman, January 24, 1978, in Richards, 2017, p. 86). Gardner's distinction between plausible and implausible anomalies is rejected by Truzzi, as another example of a prejudgmental attitude against new ideas (Letter of 24 January 24, 1978, in Richards, 2017, p. 80-81). On the occasion of this letter, Truzzi even questions the maxim he helped to make famous ("extraordinary claims require extraordinary proof") because "extraordinary" is far too relativistic to establish a clear adjudication. He would soon develop another maxim.

A Courtesy Effort

Truzzi was very inspired by Charles Sanders Pierce, who made some observations on research into the paranormal. He adopted his "first rule of science": *do nothing that will block inquiry*. To follow this rule involves taking a step back to fight against what comes along to prevent the material from emerging. This recalls the use of negative capability in psychotherapy to open the therapeutic situation to all possible material. Truzzi saw the difference between CSICOP and his Center for Scientific Anomalies Research (CSAR) in how they follow this golden rule: "I view much of CSICOP activity as obstructing inquiry because it has prejudged many areas of inquiry by labeling them pseudoscientific prior to serious inquiry" (Letter to Douglas Hofstadter, January 31, 1983, in Richards, 2017, p. xxvi).

There are two ways to "do nothing": one is a passive tolerance. Truzzi wrote: "I am willing to tolerate ignoring those we think are 'too far out' in their claims; but I am not willing to attack their ideas in any way that will block inquiry into those ideas by any that might otherwise want to pursue such inquiry" (Letter of January 24, 1978, in Richards, 2017, p. 82-83). Truzzi sometimes clearly reproached Gardner that the vocabulary and tone he uses against paranormal claims are not justified, because they disqualify the empirical study that they should instead encourage.

The other way is more active: with a *courtesy effort*. The goal of his journal, *The Zetetic Scholar*, was "to bring together protoscientific proponents (those willing to abide by the rules and evidence of science) and responsible critics (those willing to similarly accept normal scientific rules of discourse and not reverting to ad hominem and similar tactics) into rational dialogue" (Letter to Douglas Hofstadter, January 31, 1983, in Richards, 2017, p. xxvi). Truzzi insisted on his choice of words: he preferred "dialogue" to "debate" "for the purpose is not to 'win' or 'defeat' an opponent. The purpose is to advance science" (*Idem*).

In the same vein, he introduced a new taxonomy instead of the pejorative terms used by Gardner. He labeled protoscientists "those willing to play by the rules of science in having their claims accepted or rejected but who have not yet been accepted as scientists by the general science community" (Letter of February 5, 1978, in Richards, 2017, p. 93). He gave four characteristics for this label, distinguishing someone who:

- a. "Seems to have honest intentions.
- b. Wants to see his theories seriously discussed by the scientific community, in terms of its ground rules.

- c. Is willing to respond to criticisms made.
- d. Is unlikely to cause anyone physical harm while such consideration is going on.” (Letter of January 24, 1978, in Richards, 2017, p. 80-81).

Therefore he promoted the epistemic virtues of the psychologist Michel Gauquelin, who made *astrobiological* claims about strange correlations between date of birth and later life activities (Letter of February 19, 1978, in Richards, 2017, p. 98-99). Truzzi especially praises Gauquelin’s negative capability: his attitude about his work is not excessively defensive, he welcomes debate and replication studies, he attempts to control for various factors, etc. But Truzzi failed to convince Gardner to stop labeling him a crackpot.

Truzzi repeatedly says that anyone who acts like a scientist (uses data, obey the rules, etc.) must not be dismissed. He affirms that he is capable of such efforts at courtesy because he has a strong confidence in science as a self-correcting system, whereas some of his colleagues lack such a level of confidence (Richards, 2017, p. xxvii). This involves both a personal negative capability and a global one, with the perception of science not as the support of established knowledge but as a method of learning.

To Provoke Negative Capability

Truzzi felt everyone should be given a fair hearing, whereas Gardner felt that this, taken to its logical extremes, is impractical and foolish. One of Gardner’s recurrent arguments for rejecting courteous efforts is the lack of negative capability from those who claim paranormal events: “The chance that a dialog with parapsychologists such as Puthoff and Panati, and characters like Hynek, will alter their beliefs I regard as too minimal to be considered.” (Letter of September 25, 1976, in Richards, 2017, p. 56) He feared that such dialogue would only be used for their legitimization strategies: “attempts to establish ‘dialog’ with the genuine crank are foredoomed to failure, and a waste of time unless one does it for laughs.” (Letter to Ray Hyman, January 24, 1978, in: Richards, 2017, p. 86). Thus, while he had no direct contact with Gauquelin, he predicted that the latter would not change his mind if presented with negative evidence (Letter of May 12, 1978, in Richards, 2017, p. 138). This general appreciation leads him to think it is not worth the effort.

Truzzi replied that he was not primarily concerned about the claimers of paranormal phenomena, but about those who think themselves neutral about such claims. “I hope to convince some of the people who already hold contrary views, but I am especially concerned about those who have not made up their minds” (Letter of January 20, 1977, in Richards, 2017, p. 65). He believed that his pedagogical and courteous strategy would have better effects (in terms of provoking negative capability) than debunking.

CSICOP’s favorite strategy, based on ridicule and debunking, was regarded by Truzzi as “ultimately damaging” (*Idem*). This mockery not only inhibits serious work on anomalies but also fails to convince the public who is always so fond of the occult (Hansen, 1992; Pinch & Collins, 1984). With some nuances, Truzzi explained that he is not against debunking, *ad hominen* arguments, or humor. But he found it imperative that such arguments should not be presented as scientific actions “even if they are meant to, in some sense, defend science” (Letter of January 24, 1978, in Richards, 2017, p. 81). The confrontation

with claims of anomalistics should be part of the normal scientific process. Therefore, once confronted, the arguments against them should be rigorous and without character attacks. This is still the same symmetrical strategy that involves resisting the emotions provoked by the confrontation with the unknown.

Conclusion

Parapsychologist Charles Honorton (1976) asked if “science has developed the competence to confront claims of the paranormal.” We should perhaps rephrase this question by asking how we might make scientists develop sufficient negative capability to confront the unknown. Both sociology and psychology of science shows us that there is a big gap between the ideal norms of science and the conservative psychological tendencies of human beings (Favre, 1909; Mahoney, 1976). An individual approach to the scientific mind may help us understand the factors conducive or inhibitory for research in anomalistics. Empirical research is required to provide an assessment tool for negative capability, and we should also look at how we might implement it within the practice of anomalistic psychology, parapsychology, or even science in general.

Despite some exceptions (Méheust, 1999; Pinch & Collins, 1982), human sciences have failed to explore the demarcation between various forms of skepticism, while there would be as much to learn about the scientific mind as in the analysis of the differences between genuine, proto- and pseudoscientists. The correspondence between Truzzi and Gardner shows that there is no consensus between skeptics on the scientific reception of unconventional claims. Gardner favored overt prejudging as an efficient tool, coupled with pejorative labels, ridicule, and debunking strategies, because he considered such claimants were bad for science and not able to change their minds. Truzzi placed methodological skepticism towards anomalies at the very core of the scientific process, and followed Peirce’s obligation to do nothing that might block inquiry. Thus he developed a symmetrical approach of orthodox and unorthodox claims, considering the essential tension between traditional and iconoclastic attitudes. He actively made courteous efforts to develop a responsible dialogue with unconventional researchers who attempt to follow the rules of science, whom he labeled “proto-scientists.” And he believed that this strategy, while avoiding the reinforcement of division, would contribute to the progress of science.

Another skeptic, the Dutch journalist Piet Hein Hoebens, mostly agreed with Truzzi’s approach. He brought a useful but mostly unexplored taxonomy of four sub-families of skeptics depending on their relation to knowledge and their privileged practices (Hoebens, 1980, in Hövelmann & Michels, 2017): the *extremists* who use demagoguery instead of discussion, and insinuations instead of arguments; the *hard-liners* (including Randi); the *almost hardliners* (including Gardner); and the *soft-liners*. This last group, in which we could locate Truzzi, shows how skepticism could be compatible with a fair tolerance for the unknown. This is how Hoebens describe this group:

In this group we find those skeptics who do not believe that psi really exists, but who have a weakness for parapsychology nonetheless. Typical soft-liners like to meet with parapsychologists. They happily publish in parapsychological journals and, despite their unbelief, they permanently refuse to commit themselves. They are the critical allies of the parapsychologist. The soft-liners catch the eye because of their philosophical approach to the problem.

Frequently, they consider the debate on parapsychology as an illustration of the much more general debate on the nature of science. Sometimes they distance themselves openly from their nominal confederates who are going much too fast. If they ever ruthlessly attack a specific parapsychologist, they always explain, politely, that their critique is not meant to apply to parapsychology as a whole. (Hoebens, 1980, in Hövelmann & Michels, 2017, p. 86)

Even if he identified himself with the soft-liners, Hoebens claimed he endorsed some special tolerance for parapsychology only on the basis of his “intuition”! He considered Gardner’s arguments about the waste of time dealing with unconventional claims, but nevertheless endorsed a positive personal attitude toward the field:

In practice, it is a waste of time to shower “tolerance” on the unorthodox sciences. The chances that we are ridiculing a future Galileo or Pasteur are infinitesimally small. The chances that we are doing society a service by impugning noxious nonsense are accordingly large. Obviously, we cannot carefully examine and give the benefit of the doubt to each and every outlandish idea. It would cost too much time, and too much money that would be more profitably expended on more plausible pursuits. One does not need to have read the Flat Earth literature in order to reject the Flat Earth theory. Some ideas are so ludicrous that they may confidently be dismissed prior to investigation. Why make an exception for parapsychology, where some of the leading practitioners have publicly espoused ideas compared to which the beliefs of the Flat Earth Society seem a model of scientific rigor? . . . I find it difficult to deny the logic of such arguments. All I can do is to point to ‘circumstantial evidence’ supporting a different view and to admit, once again, that there is an element of ‘intuition’ in my own preference for soft-line skepticism. (Hoebens, 1982, in: Hövelmann & Michels, 2017, p. 36)

Should we conclude that there are no sufficient epistemological arguments to justify the courteous reception of parapsychological claims? That one has to rely on a subjective competence, such as negative capability? To solve the demarcation problem in science, we should perhaps explore the diversity of skepticisms and how their different coordinates alter the emerging epistemic attitudes. New research is needed to explore the psychology of paranormal non- or dis-believers with as much interest as for the psychology of paranormal believers (Irwin, 2009; Schriever, 1998).

References

- Bachelard, G. (1934). *Le nouvel esprit scientifique* [The new scientific mind]. PUF.
- Bachelard, G. (1938). *La formation de l'esprit scientifique. Contribution à une psychanalyse de la connaissance objective* [The formation of the scientific mind. Contribution to a psychoanalysis of objective knowledge]. Vrin.
- Baehr, J. (2011). *The inquiring mind: On intellectual virtues and virtue epistemology*. Oxford University Press.
- Barron, F.X. (1969). *Creative person and creative process*. Holt, Reinhardt Winston.
- Bateson, G. (1972). *Steps to an ecology of mind*. Ballantine Books.
- Bensaude-Vincent, B. (2000). *L'opinion publique et la science: À chacun son ignorance* [The public opinion and science: Everyone has some ignorance]. Institut d'édition Sanofi-Synthélabo.
- Bion, W.R. (1974). *L'attention et l'interprétation. Une approche scientifique de la compréhension intuitive en*

- psychanalyse et dans les groupes* [Attention and interpretation: A scientific approach to insight in psycho-analysis and groups]. Payot.
- Braud, W. (1981). Lability and inertia in psychic functioning. In B. Shapin & L. Coly (Eds.), *Concepts and theories of parapsychology* (pp. 1-36). Parapsychology Foundation.
- Cardeña, E. (2015). On negative capability and parapsychology: A personal epilogue. In E. Cardeña, J. Palmer, & D. Marcusson-Clavertz (Eds.), *Parapsychology: A handbook for the 21st century* (pp. 399-403). McFarland.
- Coelho, C. (2005). *Constructing parapsychology: A discourse analysis of the accounts of experimental parapsychologists*. Unpublished PhD thesis, University of Edinburgh, UK.
- Collins, H. M. (1998). The meaning of data: Open and closed evidential cultures in the search for gravitational waves. *American Journal of Sociology*, 104, 293-337.
- Collins, H.M. (1999). Tantalus and the aliens: Publications, audiences and the search for gravitational waves. *Social Studies of Science*, 29, 163-197.
- Collins, H. M., & Pinch, T.J. (1979). The construction of the paranormal: Nothing unscientific is happening. In R. Wallis (Ed.), *On the margins of science: The social construction of rejected knowledge* (pp. 237-270), University of Keele, Sociological Review Monograph no. 27.
- Collins, H. M., & Pinch, T.J. (1982). *Frames of meaning. The social construction of extraordinary science*. Routledge and Kegan Paul.
- Evrard, R. (2016). *La légende de l'esprit: Enquête sur 150 ans de parapsychologie* [The legend of the mind: An investigation on 150 years of parapsychology]. Trajectoire.
- Evrard, R. (2017). Anomalous phenomena and the scientific mind: Some insights from "psychologist" Louis Favre (1868-1938?). *Journal of Scientific Exploration*, 31, 71-83.
- Favre, L. (1909). Pourquoi il faut étudier les phénomènes psychiques [Why we should study psychic phenomena]. *Bulletin de l'Institut général psychologique*, 9(4), 5-28.
- Feist, G. J., & Gorman, M.E. (Eds.) (2013). *Handbook of the psychology of science*. Springer.
- Feynman, R.P. (1969). What is Science. *The Physics Teacher*, 7, 313-320.
- Firestein, S. (2012). *Ignorance: How it drives science*. Oxford University Press.
- Fricke, M. (2009). *Epistemic injustice: Power and the ethics of knowing*. Oxford University Press.
- Galison, P. (1987). *How experiments end*. University of Chicago Press.
- Gieryn, T. (1983). Boundary-work and the demarcation of science from non-science: Strains and interests in professional ideologies of scientists. *American Sociological Review*, 48, 781-795.
- Gieryn, T. (1999). *Cultural boundaries of science: Credibility on the line*. University of Chicago Press.
- Gilbert, G.N., & Mulkay, M.J. (1984). *Opening Pandora's box: A sociological analysis of scientists' discourse*. Cambridge University Press.
- Gleiser, M. (2014). *The island of knowledge. The limits of science and the search for meaning*. Basic Books.
- Green, A. (1993). *Le travail du négatif* [The work of the negative]. Editions de Minuit.
- Guillaumin, J. (2003). *La psychanalyse: un nouveau modèle pour la science ?* [Psychoanalysis: A new model for science?] L'Esprit du Temps.
- Hansen, G.P. (1992). CSICOP and the skeptics: An overview. *Journal of the American Society for Psychical Research*, 86, 19-63.
- Hansen, G.P. (2001). *The trickster and the paranormal*. Xlibris.
- Hess, D. J. (1993). *Science in the New Age: The paranormal, its defenders and debunkers, and American culture*. University of Wisconsin Press.
- Honorton, C. (1976). Has science developed the competence to confront claims of the paranormal? In J. D. Morris, W. G. Roll, & R. L. Morris (Eds.), *Research in Parapsychology 1975* (pp. 199-223). Scarecrow.
- Hövelmann, G. H., & Michels, H. (Eds.) (2017). *Legitimacy of unbelief: The collected papers of Piet Hein Hövelmann*. LIT Verlag Münster.

- Husserl, E. (1977). *Cartesian meditations: An introduction to phenomenology*. Springer Netherlands.
- Irwin, H.J. (2009). *The psychology of paranormal belief: A researcher's handbook*. University of Hertfordshire Press.
- Keats, J. (1819). *Letter to George Keats*. <http://englishhistory.net/keats/letters/georgekeatsseptember1819.html>
- Keats, J. (1899). *The complete poetical works and letters of John Keats, Cambridge Edition*. Houghton, Mifflin and Company.
- Kidd, I. J. (2014). War Sir William Crookes epistemically virtuous? *Studies in History and Philosophy of Biological and Biomedical Sciences*, 48, 67-74.
- Kuhn, T.S. (1977). *The essential tension: The selected studies in scientific tradition and change*. University of Chicago Press.
- Latour, B., & Woolgar, S. (1988). *La vie de laboratoire: la production des faits scientifiques* [Laboratory life: The social construction of scientific facts]. La Découverte.
- Laudan, L. (1983). The demise of the demarcation problem. In R.S. Cohen & L. Laudan (Eds.), *Physics, philosophy, and psychoanalysis* (pp. 111-127). D. Reidel.
- Lauriola, M., Foschi, R., Mosca, O., & Weller, J. (2016). Attitude toward ambiguity: Empirically robust factors in self-report personality scales. *Assessment*, 23, 353-373.
- Mahoney, M. (1976). *Scientist as subject: The psychological imperative*. Ballinger Publishing.
- Mauskopf, S.H. (Eds.) (1979). *The reception of unconventional science*. Westview Press.
- McClenon, J. (1984). *Deviant science: The case of parapsychology*. University of Pennsylvania Press.
- McCrae, R.R., & John, O.P. (1992). An introduction to the Five-Factor Model and its applications. *Journal of Personality*, 60, 175-215.
- Méheust, B. (1999). *Somnambulisme et médiumnité* [Somnambulism and mediumship]. Les empêcheurs de penser en rond.
- Mussell, P. (2010). Epistemic curiosity and related constructs: Lacking evidence of discriminant validity. *Personality and Individual Differences*, 49, 506-510. <https://doi.org/10.1016/j.paid.2010.05.014>
- Oam, P. G., & Heilizer, F. (1965). A note on the concept of conflict. *The Journal of Psychology: Interdisciplinary and Applied*, 59, 35-43.
- Pascal, B. (1669). *Pensées* [Thoughts]. <http://www.bartleby.com/48/1/2.html>
- Pigliucci, M., & Boudry, M. (Eds.) (2013). *Philosophy of pseudoscience: Reconsidering the demarcation problem*. Chicago University Press.
- Pinch, T. J., & Collins, H. M. (1984). Private science and public knowledge: The Committee for the Scientific Investigation of the Claims of the Paranormal and its use of the literature. *Social Studies of Science*, 14, 521-546.
- Polanyi, M. (1969). *Knowing and being*. University of Chicago Press.
- Popper, K.R. (1959). *The logic of scientific discovery*. Routledge.
- Popper, K.R. (1963). *Conjectures and refutations: The growth of scientific knowledge*. Routledge.
- Prince, W.F. (1930). *The enchanted boundary: Being a survey of negative reactions to claims of psychic phenomena 1820-1930*. Boston Society for Psychic Research.
- Rasplus, V. (Ed.) (2014). *Sciences et pseudo-sciences: Regards des sciences humaines* [Sciences and pseudo-sciences. Perspectives of human sciences]. Éditions Matériologiques.
- Renkel-Brunswik, E. (1949). Intolerance of ambiguity as an emotional and perceptual personality variable. *Journal of Personality*, 18, 108-143.
- Richards, D. (Ed.) (2017). *Dear Martin/Dear Marcello: Gardner and Truzzi on skepticism*. World Scientific.
- Richet, C. (1923). *Le savant* [The scientist]. Hachette.
- Roberts, R.C., & Wood, W.J. (2007). *Intellectual virtues: An essay in regulative epistemology*. Oxford University Press.

- Schriever, F. (1998). *Grenzbereiche der Realitätserfassung. Ein Erklärungsmodell auf der Basis individueller Lebenserfahrungen* [Boundaries of reality acquisition. An explanatory model based on individual life experiences]. Retriever.
- Vergely, B. (2014). *Deviens qui tu es: quand les sages grecs nous aident à vivre* [Become who you are: When the Greek sages help us to live]. Albin Michel.
- Wallis, R. (Ed.) (1979). *On the margins of science: The social construction of rejected knowledge (Sociological Review Monograph, vol. 27)*. University of Keele.
- Zingrone, N.L. (2002). Controversy and the problems of parapsychology. *Journal of Parapsychology*, 66, 3-30.
- Zingrone, N.L. (2004). *From text to self: The interplay of criticism and response in the history of parapsychology*. Unpublished PhD thesis, University of Edinburgh, UK.

La Tolérance à l'Inconnu : Capacité au Négatif, Problème de Démarcation, et Dialogue Truzzi-Gardner

Résumé. Le poète John Keats a inventé la notion de *capacité négative* pour décrire le type d'ouverture d'esprit qui permet de tolérer l'inconnu ou le demi-connu. Il a également décrit une idée similaire relative à notre faculté à prendre en défiance notre propre connaissance et permettre à notre esprit de penser toutes les pensées. Cette capacité peut être considérée selon la perspective de la psychologie des sciences en tant que vertu épistémique, laquelle joue un rôle important au sein de l'étude scientifique des phénomènes anomaux ou ce qui peut être appelé plus succinctement *anomalistique*. Les scientifiques ont-ils suffisamment développé leur capacité négative pour faire face adéquatement aux revendications de phénomènes paranormaux ? Pour illustrer cette question, nous analysons le rôle de la capacité négative au sein de la correspondance récemment parue entre le sociologue Marcello Truzzi et le mathématicien et journaliste scientifique Martin Gardner. Gardner défendait une sorte de scepticisme dur favorisant les préjugés et les labels péjoratifs, tandis que Truzzi promouvait un scepticisme plus souple avec plus de symétrie et un effort de courtoisie envers ceux qui suivaient autant que possible les règles de la science. Ces deux formes de scepticisme ont des bases épistémologiques différentes et cette démarcation interne est analysée à travers la perspective de la psychologie des sciences et son évaluation des vices et vertus épistémiques d'un individu. Cette démarcation interne a un impact sur le problème plus général de la démarcation entre science et pseudo-science. Nous concluons que la capacité négative pourrait être un facteur marquant des recherches futures qui devrait être encouragé et développé par des opportunités éducatives fournies par l'anomalistique et ses dialogues caractéristiques entre sceptiques et tenants.

Toleranz gegenüber dem Unbekannten: Negative Fähigkeit, das Demarkationsproblem, und der Truzzi-Gardner-Dialog

Zusammenfassung. Der Dichter John Keats prägte den Begriff der *negativen Fähigkeit*, um jene Art der Aufgeschlossenheit zu beschreiben, die befähigt, Unbekanntes oder nur Halbbekanntes zu tolerieren. Er beschrieb auch eine ähnliche Vorstellung hinsichtlich unserer Fähigkeit, unser eigenes Wissen zu missachten und den Geist zur Durchgangsstation für alle möglichen Gedanken werden zu lassen. Diese Fähigkeit kann aus der Perspektive der Wissenschaftspsychologie als eine epistemische

Tugend betrachtet werden, die eine wichtige Rolle bei der wissenschaftlichen Untersuchung anomaler Phänomene oder, was man prägnanter als *Anomalistik* bezeichnen könnte, spielt. Haben die Wissenschaftler genügend negative Fähigkeiten entwickelt, um mit den Behauptungen des Paranormalen angemessen umzugehen? Zur Veranschaulichung analysieren wir die Rolle der negativen Fähigkeit innerhalb der kürzlich veröffentlichten Korrespondenz zwischen dem Soziologen Marcello Truzzi und dem Mathematiker und Wissenschaftsjournalisten Martin Gardner. Gardner verteidigte eine Art hartnäckigen Skeptizismus, der Vorurteile und abwertende Bezeichnungen begünstigte, während Truzzi einen milderen Skeptizismus mit mehr Symmetrie und einer höflichen Einstellung gegenüber denjenigen vertrat, die offensichtlich bemüht sind, die Regeln der Wissenschaft einzuhalten. Beide Formen des Skeptizismus haben unterschiedliche erkenntnistheoretische Grundlagen, und diese innere Demarkation wird aus der Perspektive der Wissenschaftspsychologie und ihrer Bewertung der individuellen epistemischen Laster und Tugenden analysiert. Diese innere Demarkation wirkt sich auf die umfassendere Frage der Abgrenzung zwischen Wissenschaft und Pseudowissenschaft aus. Wir kommen zu dem Schluss, dass negative Fähigkeit ein hervorstechender Faktor in der zukünftigen Forschung sein sollte und durch die Möglichkeiten, die die Anomalistik und ihre charakteristischen Dialoge zur Bildung zwischen Skeptikern und Befürwortern bieten, gefördert und entwickelt werden könnte.

Tolerancia a lo Desconocido: Capacidad Negativa, el Problema de la Demarcación, y el Diálogo Truzzi-Gardner

Resumen. El poeta John Keats acuñó el término capacidad negativa para describir al tipo de mentalidad abierta que es capaz de tolerar lo desconocido o sólo medio conocido. También describió una idea similar con respecto a nuestra capacidad para ignorar nuestro propio conocimiento y permitir que la mente se convierta en una vía para todos los pensamientos. Esta capacidad puede considerarse desde la perspectiva de la psicología de la ciencia como una virtud epistémica, que desempeña un papel importante dentro del estudio científico de los fenómenos anómalos o lo que podría denominarse de manera más sucinta como anomalística. ¿Han desarrollado los científicos suficiente capacidad negativa para lidiar adecuadamente con las afirmaciones de lo paranormal? Como ilustración, analizamos el papel de la capacidad negativa dentro de la correspondencia recientemente publicada entre el sociólogo Marcello Truzzi y el matemático y periodista científico Martin Gardner. Gardner defendió una especie de escepticismo de línea dura que favorecía los prejuicios y las etiquetas peyorativas, mientras que Truzzi promovió un escepticismo más suave con más simetría y un esfuerzo cortés hacia aquellos que se esfuerzan diligentemente por seguir las reglas de la ciencia. Ambas formas de escepticismo tienen diferentes bases epistemológicas y esta demarcación interna se analiza a través de la perspectiva de la psicología de la ciencia y su evaluación de los vicios y virtudes epistémicos del individuo. Esta demarcación interna tiene un impacto en el tema más amplio de la demarcación entre la ciencia y la pseudociencia. Concluimos que la capacidad negativa debe ser un factor sobresaliente en futuras investigaciones y puede ser alentada y desarrollada por las oportunidades educativas proporcionadas por las anomalías y sus característicos diálogos escéptico-proponentes.

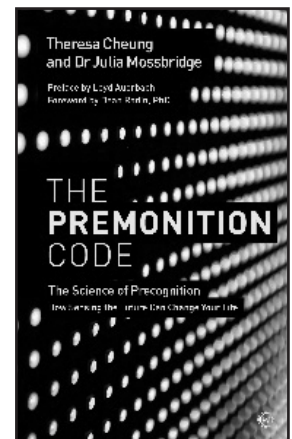
Perceiving the Future

Roger Nelson¹

Global Consciousness Project

A review of *The Premonition Code: The Science of Precognition: How Sensing the Future Can Change Your Life*, by Theresa Cheung and Julia Mossbridge, Watkins, 2018. Pp. 213. \$13.77, paperback. ISBN: 978-1-78678-161-1

The Premonition Code has two subtitles: “The Science of Precognition” and “How Sensing the Future Can Change Your Life.” The differences of meaning in these three monikers foretell the nature of the book. It is a collection of various things, all related in some way to the idea of accessing and potentially using qualities, information, or flavors of the future. The integration is piecemeal, but that will not trouble readers who are drawn to the prospect of learning how to do and use precognition. It might be a barrier to appreciation by those more interested in the first subtitle, who are looking for science. There is some information about relevant research over the past few decades, beginning in the 1970s (Targ & Puthoff, 1974), but it is scattered about, and somewhat obscured by the three other major foci in the book: tantalizing anecdotes about premonitions, instructions for learning to sense your future, and encouragement toward making that future rewarding.



Much of the early text is about experiences that people, including the authors, have had indicating that it is possible, indeed common, to have inklings and visions of the future that are veridical. Often these are trivial, but it also happens that they can be very useful, even critical, for example in avoiding or preventing an accident (Rhine, 1956). Some reports suggest that precognition may enable positive returns on investments (Targ & Katra, 1998), or even lottery wins (Broderick, 1992). But most of this material recounts simple, personal premonitions that turn out to be accurate. All of it is provided to support the book’s effort to persuade people to learn how to be “positive precogs.” This is the authors’ name for readers who take up and practice the lessons in Part 2 of the book. It takes a while to get there, but this do-it-yourself how-to is the motivating core of *The Premonition Code*.

There are some aspects of the lessons that are not only important for positive precogs to keep in mind but apply broadly in life. The first fundamental is what the authors call the REACH principles: Respect, Ethics, Accuracy, Compassion, Honesty. These are spelled out in terms intended to lay a foun-

¹ Address correspondence to Roger Nelson, Ph. D., rdnelson@princeton.edu

dation for learning precognition, but they work equally well in any self-improvement context. This is also the case for other preparatory suggestions, especially coaching to recognize and calm the busy “monkey-mind,” and steps toward contacting one’s “higher self.” These and other hints are the background against which training to be a positive precog takes place.

Finally, about half way through the book, the promised lessons begin. The preparatory exercises are repeated, and then a detailed list of steps or elements in the process is described. I would not gainsay the authors, since they both have their background of personal experience, but the list seems weighty, in the sense that it is so much process and activity that one wonders if it might distract from the intended opening up to precognition. It may be a good way to do things, though, if it becomes a ritual and conducive framework. Readers will differ in their response to such complex instructions, but the proof is in the pudding. As a reviewer, I would advocate that anyone desiring to learn remote viewing and precognition should be open to the process, giving these induction procedures a respectful try. If it works well, terrific, and if changes that make it better come up, go with them. I think the authors of *The Premonition Code* might agree.

Possibly the most interesting part of the book for people who already have some experience with these special topics might be Chapter 7, titled “Timeless Questions Answered.” It is a kind of FAQ for people interested in scientific and experiential knowledge relating to precognition, intuition, remote sensing, and the whole range of extended capacities of mind we never learn about in school. It is mostly Julia Mossbridge dealing with an extensive collection of questions she has been asked as a researcher. She is informative, reasonably concise, occasionally funny, and very generous in her approach. I would answer differently in a few cases, but in this arcane territory that we are only beginning to explore with serious science there are far more good questions than correct answers.

I think this book will work for some readers better than others. There are a lot of “what we’re going to tell you” observations long before they happen, too many apologies for not being physicists, and a lot of warnings about psychological issues that might arise, with accompanying recommendations to see a professional therapist. It is not a style that appeals to me, but it is one that apparently works for many readers. In any case, the central intention of the book is to provide better understanding of special capacities to touch the future that we may all have, and a way to access them for people willing to work at it. Being a “positive precog” as the authors describe it is valuable, especially since they create a context of good sense for the training – as I mentioned earlier, the REACH principles are important in life, past, present, and future.

There is a website that accompanies and extends the efforts of the book, providing direct experiences and opportunities to participate in research: www.thepremonitioncode.com. It hosts a forum and an online community to which readers are invited to join. Participants are encouraged to connect with each other and share experiences and work toward common goals. The website has practice sessions and experiments, with tools for assessing performance. In the book, and most likely on the website as well, there are encouragements to work for a more positive future. Some of the ideas seem idealized, but that is not a bad thing. What we envision for our future has a better chance of actualizing than if we just wait for what comes.

References

- Broderick, D. (1992). *The lotto effect: Towards a technology of the paranormal*. Hudson.
- Rhine, L. E. (1955). Precognition and intervention. *Journal of Parapsychology*, 19, 1-34.
- Targ, R., & Katra, J. (1998). *Miracles of mind: Exploring nonlocal consciousness and spiritual healing*. New World Library.
- Targ, R., & Puthoff, H. (1974). Information transmission under conditions of sensory shielding. *Nature*, 251, 602–607. <https://doi.org/10.1038/251602a0>

A Comprehensive History of Parapsychology in France

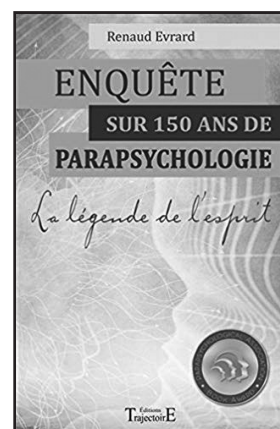
Massimo Biondi¹

A review of *Enquête sur 150 Ans de Parapsychologie: La Légende de l'Esprit* [An Inquiry of 150 Years of Parapsychology: The Legend of the Mind], by Renaud Evrard, Editions Trajectoire, 2016. Pp. 479. €25.00 (paperback). ISBN 978-28-41-97702-4

As the author states in the first pages, the purpose of this volume is to carry out a historical inquiry of parapsychology in France by focusing both on the results of studies and experiments, and on philosophical, sociological, and psychological issues related to this activity, which has always been in an ambiguous and unresolved relation with the main culture. The book however does not present a chronological description of events, but consists of ten extensive biographies of leading French personalities in the discipline.

A few of these ones are already well known, even outside France, but the author presents much supplementary and new information so we can better understand their involvement with the “psychic occult.” For example, the multifaceted commitments of the politician, man of culture, and theologian Agénor de Gasparin (1810-1871) are presented, as well as his early involvement with “animal magnetism” (i.e. hypnosis) and some physical phenomena of early mediumship, including table movements (also recently studied by Alvarado, 2018). Moreover, the book examines in detail numerous studies of the scientist Charles Richet (1850-1935), with particular attention to the experiences of the 1880s on “sleep induced at a distance” (telepathically), and to the famous mediumistic séances held during the early XX century at Algiers, where the “materialization” of the so-called Bien Boa occurred. In this chapter, about the length of a small book, a deep analysis is presented of Richet’s sometimes contradictory opinions on these subjects, his relationships and collaborations with other scientists, and the prevalence of the studies of mediumship in his career as a psychical researcher.

Among the lesser-known characters in the work of Evrard, the personalities of Timothée Puel (1812-1890) and François Favre (1942-2016) stand out. The first one, who lived in an age full of discourses and “discoveries” on mesmerism, contributed mainly to French psychical research by editing for a few years a journal devoted to “psychic matters,” the *Revue de Psychologie Expérimentale*, which disseminated a lot of information about the first studies carried out on the subject. The journal included translations of English works (e.g., the work of the London Dialectical Society), and articles from the *Psychische Studien*, the magazine founded in Germany by the Russian spiritualist Alexander Aksakov.



¹ Address correspondence to: Massimo Biondi, M. D., Via Corridoni 14, 00046, Grottaferrata, Rome, Italy, mbiondi10@libero.it

François Favre is a modern author who, following the “ideology of 1968,” was one of the founders and main promoter of a famous group of studies deep-rooted in the university environment. That group wanted to promote integration of parapsychological themes, so it chose to set aside experimental research in favor of theoretical discussion, debates, and confrontation with orthodox circles. Evrard takes an important step, by showing that, to focus on the cultural perspective of a discipline, not only those who perform practical activities (studies) are important, but also those who favor the dissemination and introduction of relevant issues in the public opinion and the media, a perspective not always conceded by historians of culture (see also Evrard, 2017; Evrard & Pratte, 2017).

Pierre Janet (1859-1947), with his strong change of attitude towards parapsychology; Pierre Curie (1859-1906), and the Institut Général Psychologique; René Sudre (1880-1968), Eugène Osty (1874-1938) and the *Institut Métapsychique International*; René Warcollier (1881-1962), and finally Nicolas Maillard (1969-2000), are the other main personalities of this volume, which contains more information than any other publication on French parapsychology (e.g. Brower, 2010; Lachapelle, 2005; Marmin, 2001; Méheust, 1999).

The picture that emerges from the book is that of an effort, lasting for a century and a half, and performed by many culturally relevant personalities, to bring within the “dominant culture” themes related to magnetism and parapsychology (and to a few other “heretical” ideas), receiving often a dry, sometimes tolerant but superficial attention, but rarely a positive reception.

Evrard’s *Enquête* is certainly a reference book for anyone who wants, from now on, to really know important milestones of parapsychology in France. The book has an impressive length: 470 pages of text, composed in small letters and on two columns; 2,110 references, many of them citing multiple books or articles; 35 boxed sections within chapters, some of which occupy two or three pages, and whose content is about other characters and events of French parapsychology.

It has to be added that the same elements that make this book unique and precious also present weak points of no small importance. The author’s choice to focus on the biographies of a few people makes the narration of the historical evolution of the discipline fragmentary and difficult to follow. The numerous breaks for the boxes fragment the reading and risk confusing the general picture. Moreover, the mixing between the referral of facts and sociological and epistemological considerations, written from the author’s perspective, compels a multi-level reading, which risks leaving pure knowledge of the individual works in the background. However, if one wishes to better know the leading personalities who have made the history of French parapsychology, without following in detail the history of the discipline in that country, nothing is better than the present book, which answers many questions but at the same time - and this is another one of its merits - raises others.

References

- Alvarado, C. S. (2018). Table turning in the early 1850s: The séance reports of Agénor de Gasparin. *Journal of Scientific Exploration*, 32, 723-762.
- Brower, M. B. (2010). *Unruly spirits: The science of psychic phenomena in modern France*. University of Illinois Press.

- Evrard, R. (2017). Anomalous phenomena and the scientific mind: Some insights from “psychologist” Louis Favre (1868-1938?). *Journal of Scientific Exploration*, 31, 71-83.
- Evrard, R., & Pratte, E.A. (2017). From catalepsy to psychical research: The itinerary of Timothée Puel (1812-1890). *History of Psychology*, 20, 50-71.
- Lachapelle, S. (2005). Attempting science: The creation and early development of the Institut Métapsychique International in Paris, 1919-1931. *Journal of the History of the Behavioral Sciences*, 41, 1-24.
- Marmin, N. (2001). Métapsychique et psychologie en France (1880-1940) [Psychical Research and psychology in France (1880-1940)] *Revue d'Histoire des Sciences Humaines*, 4, 145-171.
- Méheust, B. (1999). *Somnambulisme et médiumnité (1784-1930): Vol. 2: Le choc des sciences psychiques* [Somnambulism and mediumship (1784-1930); Vol. 2: The impact of the psychic sciences]. Institut Synthélabo pour de Progrès de la Connaissance.

A Far Ranging Tour of All Things Psi

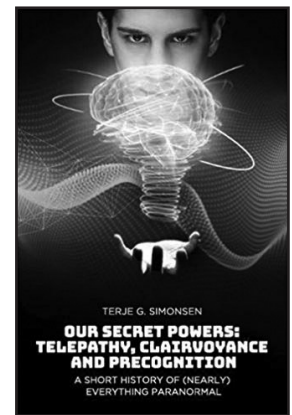
George R. Williams¹

A review of *Our Secret Powers: Telepathy, Clairvoyance, and Precognition. A Short History of (Nearly) Everything Paranormal*, by Terje G. Simonsen. Pari Publishing, 2018. Pp. 498. \$19.29. ISBN 978-1-5247-5882-0

Terje Simonsen, a Norwegian writer and historian of ideas, presents a highly readable and wide-ranging exploration of psi in his book, *Our Secret Powers: Telepathy, Clairvoyance, and Precognition: A Short History of (Nearly) Everything Paranormal*. While it is an excellent introduction to those new or generally curious around the topic, I believe scholars and many others more familiar with the material will also find it of value.

Simonsen begins his book presenting various cases of psychics and remote viewers probing for ancient artifacts in the service of archeology. Some of the historical findings are real prizes; they include King Richard III's bones, key structures at Glastonbury Abbey, and the remains of temples and palaces that appear to be associated with Cleopatra and the Lighthouse of Alexandria. But in the following chapter Simonsen, shifts toward the opposite end of the spectrum: formal investigations of psi within the military, both within the US and the former Soviet Union. And from there Simonsen explores psi within the field of anthropology, where several cases feature healing within non-Western cultures as well as some anthropologists stepping into radically different culture frames and encountering non-material entities. But perhaps the most valuable contribution from an anthropological perspective is the contribution psi makes to a greater sense of meaning or being connected to a greater whole.

However, as a historian of ideas, Simonsen is not content to merely present the various reports as such, as tantalizing as they may be. He also explores the evolution of the intellectual foundations of psi, as well as some of the currents of thought that rose in opposition. The centuries during and after the scientific renaissance were a pivotal time period when the powerful concept of mechanism or machine emerged as a way to understand the workings of our world, as well as a framework to dismiss rather ineffable or mysterious phenomena. Simonsen notes that Franz Anton Mesmer in 18th century Paris achieved impressive results and celebrity status through his unconventional theories of animal magnetism, laying on of hands technique, and considerable charisma. But despite many reported healings, a French royal commission (that included Benjamin Franklin) cast doubt on whether there was anything beyond what could be ascribed to "imagination." Simonsen also explores a number of important phi-



¹ Address correspondence to: George R. Williams, Ph. D., 8004 Maple Ave. Takoma Park, MD, 20912, USA, grwilliams@gmail.com

losophers who engaged with the possibility of psi, including Kant, Hegel, Fichte, Schelling, and Schopenhauer. Perhaps especially interesting was Kant, who apparently was considerably more open toward psi in his private letters and lectures than he was in his more public writings.

Later, another fascinating historical period includes William James, Sigmund Freud, Carl Jung, and transpersonal pioneer Stan Groff. The relationship between Freud and Jung, with its fracture based largely on their different capacities to embrace the paranormal, is of course familiar territory. Nevertheless, many will find this chapter of psi history fascinating in Simonsen's telling. Simonsen spends some time bringing to the reader key ideas from Jung, including his notions of archetypes, synchronicity, and the collective unconscious. But like much of the book, although the material serves as a good introduction, those wishing a deeper understanding of Jung (as well as Freud and James) are advised to look elsewhere.

As Simonsen turns toward the persistent mystery of consciousness, there is reason to suspect that the emphasis on mechanism for explaining all things and dismissing the ineffable may be on the wane. Simonsen notes that the philosopher David Chalmers has become influential for framing the "hard problem of consciousness." For Chalmers, the easy problems are those involving some sort of mechanism, such as learning, memory, or perception (Chalmers, 1996). But the hard problem does not involve a mechanism or function; the hard problem is the problem of subjective experience. Many philosophers such as Chalmers who take the hard problem seriously advocate taking consciousness as fundamental, in some sense. Exploring that avenue, Simonsen introduces us to *Irreducible Mind: Toward a Psychology for the 21st Century* (Kelly et al., 2007). Many of the authors covered here borrow and build on the ideas of Frederic Myers. Simonsen is apt at summarizing the core notions:

Consciousness is basically an immense field of information, and the brain can be understood as an ultra-sophisticated filter that condenses, sorts, modulates, and organizes this field. And the reason that for most of us experiences of the paranormal are not everyday occurrences is simply that our brains filter out most of these episodes! (pp. 250-251)

In his chapter on consciousness, Simonsen puts most attention on this "brain as filter" model, but he also casts relatively brief looks at alternatives, such as the quantum brain framework developed by Stuart Hameroff and Roger Penrose, as well as David Bohm's implicate order.

Maintaining the pattern of exploring psi from different angles, Simonsen includes a chapter on the psi skeptics and the primary arguments used against psi advocates. Here, the Committee for Skeptical Inquiry plays a key historical role. Although there is little new here to those familiar with the field, the various controversies and political disagreements within the organization continue to merit interest and attention. Further, I do find Simonsen's discussion of the outsized role that scientism plays among the skeptically inclined to be rather admirable, as well as his suggestion that not everything that is true can be determined solely within the laboratory.

But speaking of the laboratory, the author covers a good bit of ground there as well. Most of his attention is given to J. B. Rhine's research at Duke University, which began in the 1930s. The emphasis is understandable, given Simonsen's historical bent, as well as the crucial role Rhine's work played in the field. Simonsen discusses the battles with arguments and prejudices that Rhine won with great perseverance, as well as others that persist today. Other laboratory research covered includes the dream

telepathy experiments pioneered by Montague Ullman and Stanley Krippner; Charles Honorton's investigation of telepathy with the ganzfeld method; Bem's innovative tests for precognition; and Roger Nelson's Global Consciousness Project. A few strands of psychokinesis research appear to be left out, including the micro psychokinesis of the PEAR lab and Dean Radin's recent investigations of mental intention on the pattern produced by the well-known double-slit experiment. That said, Simonsen manages to cover a great deal of ground in the relatively small amount of space. For a good, recent overview of the meta-analysis of these and other psi research see Cardeña (2018).

Another place where Simonsen's expertise in the history of ideas pays dividends is his framing for the reader the influence of behaviorism in psychology that loomed large during the time of Rhine's work and probably helped promote a climate of skepticism as laboratory research of psi began. And later, after exploring Bem's research on precognition, he explores various philosophical views on the nature of time, which remains very mysterious. Again, Simonsen's efforts to examine the research and arguments from different angles are admirable.

Throughout his book, Simonsen suggests using what he calls the "Mental Internet" as a helpful explanatory model toward psi. That is, Simonsen invites us to imagine that "somewhat in the way that our computers are linked together via the Internet, the 'consciousness' of all humans and perhaps all living beings is linked together via some sort of Mental Internet" (p. 28) Most will find this an inviting metaphor, given that today's internet employs wireless and cloud based technology, as well as its web-like architecture, in helping us conceptualize the deeper nature of the world that the psi data may be suggesting.

For me, the most appealing models that try to account for psi do explore something like a field of information, perhaps serving as a foundation of our world (see David Bohm's implicate order, for example Bohm, 2005). And I believe Simonsen's "Mental Internet" does help get us into thinking in that direction. However, where I think this metaphor breaks down a little involves the nature of this information at the base of reality. Often, when we speak about information technology, or perhaps information more generally, we are speaking about something that fits into a digital paradigm. This is the type of information that drives our computers, the Internet, and today even audio and video distribution. Further, many intriguing ideas about the origins of our world and consciousness, such as whether our world is a simulation, or if artificial intelligence may one day become conscious, draw heavily on assuming that all kinds of information—even our consciousness—can be completely described in digital terms. My opinion is that the information residing in some sort of consciousness field, perhaps at the root of our world, cannot be completely characterized in this way. But Simonsen likely has a ready answer, a quote he borrows from George E. P. Box: "Essentially, all models are wrong, but some are useful!" (p. 29)

Near the end of the book, Simonsen quotes Massonobü Sakaguchi, a spokesperson for the electronics giant Sony, who revealed the conclusion of his company's multi-year research into psi: "We found experimentally that, yes, ESP exists but that any practical application of this knowledge is not likely in the foreseeable future." And indeed, the empirical evidence recently reviewed in Cardeña (2018) appears consistent with this; the effect sizes tend to be small, yet significantly different from zero to a substantial degree. If practical applications are questionable, we might ask what is the value in pursuing this research (perhaps leaving aside finding valuable artifacts through remote viewing, covered earlier). Although Simonsen does not give us the deep dive I might have liked here, I believe he does offer some

insight in noting that many instances around the paranormal “tend to occur around people in contact with ‘the deep dimension’ in life—someone seized by the quest for meaning, by an ‘ultimate concern,’ to use an expression from the philosopher and theologian Paul Tillich” (p. 443).

Also, if we are somehow connected with a much wider range of information than what we conventionally take for granted—or wired into a Mental Internet—what might this entail for our everyday lives? One way Simonsen explores this question is by examining the possibility that what we call “intuition” may be grounded in a deeper reality. According to Daniel Kahneman (2011), Nobel laureate psychologist and author of the book, *Thinking, Fast and Slow*, “fast” thinking is instant thinking - often associated with intuition or “gut feeling”—that is based on recognizing accumulated patterns that may not rely much on new information.

Kahneman thus argues that what we call intuition might be subject to biases that do not afflict “slow” (analytical) thinking. But Simonsen contrasts this framework with an alternate view from Dutch psychologist Dijksterhuis and his colleagues (Dijksterhuis et al., 2006). They argue that intuition can also be considered a slow kind of thinking, where the unconscious processes in our brain takes time to process a great deal of information. Thus they recommend using the conscious mind to obtain all the information needed for making a decision, but in addition, taking time away from the problem (getting a night’s rest or taking a short holiday). Simonsen suggests that this sort of “deliberation without attention,” relies on prolonged unconscious processes highly valued by creative persons such as artists, inventors, and entrepreneurs. However, Simonsen would include psi among the background processes that support such a creative intuition, producing instances of knowing things we cannot fully account for. Unfortunately, Simonsen does not mention Jim Carpenter’s (2015) *First Sight*, which provides an excellent case for psi working in the background of our unconscious minds.

There is indeed quite a bit more in the book than I have covered, but I hope I have conveyed the impressive range that Simonsen explores. Given this wide range of areas touching on psi, it is understandable that some pieces here and there are missing, and I do not count that as a mark against the book. Overall, Simonsen’s book provides a highly readable, engaging, and thorough introduction to all things psi, and likely provides a good supplement to those more familiar with the field.

References

- Bohm, D. (2005). *Wholeness and the implicate order*. Routledge.
- Cardeña, E. (2018). The experimental evidence for parapsychological phenomena: A review. *American Psychologist*, 73, 663-677. <http://dx.doi.org/10.1037/amp0000236>
- Carpenter, J. C. (2015). *First sight: ESP and parapsychology in everyday life*. Rowman & Littlefield.
- Chalmers, D. J. (1996). *The conscious mind: In search for a fundamental theory*. Oxford University Press, 1996.
- Dijksterhuis, A., Bos, M.W., Nordgren, L.F., & Van Baaren, R. B. (2006). On making the right choice: The deliberation-without-attention effect. *Science*, 311, 1005-1007.
- Kahneman, D. (2011). *Thinking, fast and slow*. Farrar, Straus and Giroux.
- Kelly, E. F., Kelly, E. W., Crabtree, A., Gauld, A., Grosso, M., & Greyson, B. (Eds.) (2007). *Irreducible mind: Toward a psychology for the 21st century*. Rowman & Littlefield.

Parapsychology and the Nervous System

Carlos S. Alvarado¹

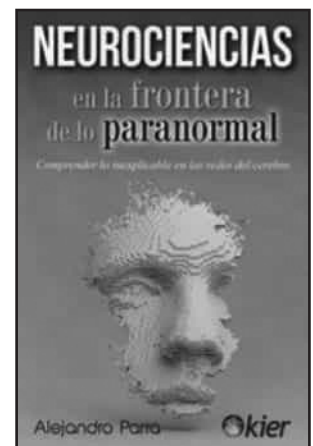
Parapsychology Foundation

A review of Neurociencias en la Frontera con lo Paranormal: Comprender lo Inexplicable en las Redes del Cerebro [Neurosciences at the frontier of the paranormal: Understanding the unexplained in the brain networks] by Alejandro Parra. Kier, 2019. Pp. 173 pp. (paperback). \$680 (Argentinian pesos). ISBN 978-950-17-2995-5

In the past some publications have explored the various interfaces between neuroscience and parapsychology (e.g., Krippner & Friedman, 2010; Williams, 2015). The book reviewed here, by Argentinian psychologist Alejandro Parra, is the latest overview of neuroscientific ideas and research as they apply to the field of parapsychology. In Parra's words, his purpose in the book is to "present readers the pioneer and contemporary efforts to explore the mind through emerging neurobiological theoretical models and technologies" (p. 13; all translations are by the reviewer).

The first three chapters are devoted to basic concepts related to neuroscience, including aspects of its history, and parapsychology. I was glad to see mention of Hans Berger and Ferdinando Cazzamalli, representatives of ideas that telepathy was caused by emissions of electromagnetic radiations from the brain. This, it is important to remember, has a longer history (Alvarado, 2015). In the third chapter Parra presents selective summaries of psi tests in relation to electroencephalography (EEG) and other measures, including pre-sentiment studies. He does not think there is much consistency in the results of the early EEG studies with unselected participants using forced-choice ESP tests, and concludes, commenting about research with psychics, that they "seem to point to differential structures and functioning in the brains of the psychics as compared to those of other persons" (p. 72). But, in addition to the lack of specific information in the statement, it is not clear if there are consistent results, at least not from this summary.

The chapter about psychokinesis (PK) has no discussion about relevant experiments relating the phenomenon to the functioning of the nervous system, but interesting research by Dean Radin is mentioned. In addition, poltergeists are discussed in relation to epilepsy, an idea promoted by William G. Roll (1977), but Parra argues that the studies supporting such relation have not produced clear results.



¹ Address correspondence to: Carlos S. Alvarado, Ph. D., Parapsychology Foundation, P.O. Box 1562, New York, NY, 10021, USA, carlos@theazire.org

Other topics discussed are near-death and out-of-body experiences (NDEs, OBEs). The author writes: "Studies about NDEs challenge our current concepts about consciousness and its relation to cerebral function, and their conclusions are important for medical sciences because this idea of consciousness as a non-local phenomenon could generate a great change in the current paradigm" (p. 116). OBEs are discussed paying attention to the recent work of researchers postulating that the experience has a neurological origin and does not represent the exteriorization of consciousness many experiencers believe in. Parra concludes: "The tools of cognitive neuroscience for the study of the OBE are insufficient to elaborate new theories. Although currently these theories are still in diapers, the anomalous experiences present paradoxes whose definitive solution could only be reached through a multidisciplinary approach" (pp. 124-125).

The rest of the book is about apparitions, mediums, and possession. Parra writes about mediums:

When, where, and how is information communicated to the medium's brain? To communicate their experiences, or interpretations of the experience, mediums must talk or write, which requires the coordinated control of the motor, premotor, and supplementary cortexes of the extensive nets of language of the brain to express, in turn, complex representations of meaning and belief. Consequently, there must be an extensive chain (or net) of underlying neuronal activity for each affirmation that is communicated by this means. In the last instance, this pattern of activity is generated through the information source and by the causal mechanism that links this *agent* with the medium (p. 148).

This is an interesting speculation, and one consistent with the idea that ESP manifests via the resources of the organism, among them imagery, memory, and motor and verbal processes. But it may be argued that there will be little progress as long as we do not learn more about this information source and the means of access to it.

In the last chapter, presented as an epilogue, Parra argues that the neuroscientific approach may help us "normalize" parapsychological phenomena. This makes sense assuming we find consistent relations between psychic phenomena and the workings of the nervous system. To some extent it may be argued that such a normalization process has been happening for a while with the psychological exploration of ESP and other phenomena, as seen in Myers's (1903) discussions of sensory and motor automatisms, and, more recently, in the theoretical work of James Carpenter (2012). Parra also hopes for the more practical goal that the neuroscience approach will allow us to control the phenomena we study, and that it will help us to better understand consciousness. But he is well aware of how much we do not know and places his hopes in future interdisciplinary developments. Parra's interest in neuroscience is not a reductionistic one. Earlier in the book he states that consciousness is in non-local space, and is not limited to the brain (p. 125). The brain, he writes, seems to allow for the expression of consciousness, but does not produce it, a topic he returns to in the final chapter.

Overall, positive aspects of the book include summaries of modern research in parapsychology that is not generally known to the general public. Similarly, there is useful information about the value of neuroscientific approaches. Unfortunately, there are several problems with the content of the book as well. Perhaps the main one lies in the omission of relevant work. This includes the literature of ESP and

the brain hemispheres (conveniently reviewed by Williams, 2015), laboratory PK studies (e.g., Giroladini, 1991), attempts to relate temporal lobe symptomatology to spontaneous psychic experiences (e.g., Neppe, 1983), EEG and mediumship (Bastos et al., 2016), and ESP and the frontal lobes (Freedman et al., 2018). Also lacking is the use of important modern publications to defend the independence of the mind from the nervous system, such as the monumental work *Irreducible Mind* (Kelly et al., 2007). Closely related to this is the author's neglect of important published criticisms of particular studies. This is the case on the evidence for the relation between epilepsy and poltergeists (Martínez-Taboas & Alvarado, 1981), and claims about neurological explanations of OBEs (e.g., Neppe, 2002).

One hopes that a second edition of the book will include this missing information. In the meantime, readers of *Neurociencias en la Frontera con lo Paranormal* may want to supplement their study of this topic with more comprehensive reviews of the relevant literature that have been published before (Krippner & Friedman, 2010; Williams, 2015).

References

- Alvarado, C.S. (2015). Telepathic emissions: Edwin J. Houston on "Cerebral Radiation." *Journal of Scientific Exploration*, 29, 467-490.
- Bastos, M. A. V., Jr., Bastos, P. R. H. de O., Osório, I. H. S., Muass, K. A. R. C., Iandoly, D., Jr., & Lucchiatti, G. (2016). Frontal electroencephalographic (EEG) activity and mediumship: A comparative study between spiritist mediums and controls. *Archives of Clinical Psychiatry*, 43, 20-26. <https://doi.org/10.1590/0101-60830000000076>
- Carpenter, J.C. (2012). *First sight: ESP and parapsychology in everyday life*. Rowman & Littlefield.
- Freedman, M., Binns, M., Gao, F., Holmes, M., Roseborough, A., Strother, S., Vallesi, A., Jeffers, S., Alain, C., Whitehouse, P., Ryan, J.D., Chen, R., Cusimano, M.D., & Black, S.E. (2018). Mind-matter interactions and the frontal lobes of the brain: A novel neurobiological model of psi inhibition. *EXPLORE: The Journal of Science and Healing*, 4, 76-85. <https://doi.org/10.1016/j.explore.2017.08.003>
- Giroladini, W. (1991). Eccles's model of mind-brain interaction and psychokinesis: A preliminary study. *Journal of Scientific Exploration*, 5, 145-161.
- Kelly, E. F., Kelly, E.W., Crabtree, A., Gauld, A., Grosso, M., & Greyson, B. (Eds.) (2007). *Irreducible mind: Toward a psychology for the 21st century*. Rowman & Littlefield.
- Krippner, S., & Friedman, H.L. (Eds.). (2010). *Mysterious minds: The neurobiology of psychics, mediums, and other extraordinary people*. Praeger.
- Martínez-Taboas, A., & Alvarado, C. S. (1981). Poltergeist agents: A review of recent research trends and conceptualizations. *European Journal of Parapsychology*, 4, 99-110.
- Myers, F.W.H. (1903). *Human personality and its survival of bodily death* (2 vols). Longmans, Green.
- Neppe, V.M. (1983). Temporal lobe symptomatology in subjective paranormal experiences. *Journal of the American Society for Psychical Research*, 77, 1-29.
- Neppe, V.M. (2002). Editorial commentary: Out-of-body experiences (OBEs) and brain localisation. A perspective. *Australian Journal of Parapsychology*, 2(2), 85-96.
- Roll, W.G. (1977). Poltergeists. In B.B. Wolman (Ed.), *Handbook of parapsychology* (pp. 382-413). Van Nostrand Reinhold.
- Williams, B.J. (2015). *Psychic phenomena and the brain: Exploring the neuropsychology of psi* (AIPR Monograph No. 3). Australian Institute of Parapsychological Research.

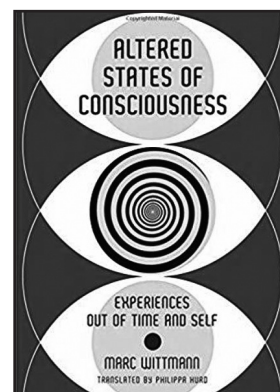
A Kulturträger Keeps Time

Etzel Cardeña¹

Lund University

A review of *Altered States of Consciousness: Experiences out of Time and Self*, by Marc Wittmann. Pp. xiv + 176. \$24.95 (hardcover). MIT Press. ISBN780262038317

Negar la sucesión temporal, negar el yo, negar el universo astronómico, son desesperaciones aparentes y consuelos secretos. Nuestro destino... es espantoso porque es irreversible y de hierro. El tiempo es la sustancia de que estoy hecho. (To deny the succession of time, deny the self, deny the universe, reveals our apparent despair and secret consolations. Our fate... is terrifying because it is irreversible and ironclad. Time is the stuff I am made of. (Borges, 1952/2011, p. 380; translated by the reviewer)



In his disquisition on time, the Argentinian writer Jorge Luis Borges made it the ineluctable companion to the self. Similarly, in this book Marc Wittmann centers the self, and its various modalities of experiencing, within time. In this deceptively short book, the author covers, many topics, including the conditions that affect our experience of the passage of time and our recollection of what we lived before, and he integrates research from psychology and the neurosciences with philosophical and artistic musings. It is a joy to read a book that is neither monolingual (the author references sources in various languages) nor monodisciplinary (he studied psychology, philosophy, and neurosciences, and is very knowledgeable of literature, music, and other arts). At about the same time I was reading this book I came across an article on another German “Kulturträger” (someone who communicates high culture across generations; Shapin, 2019), Hermann von Helmholtz, who gave us the first exact estimate of human time by measuring in the lab nerve speed transmission (about 30 meters per second in his preparation), while also maintaining a keen interest in the arts and humanities.

Wittmann begins his book with our experience of waking up or coming out of a coma to an “empty,” core self, that can only recover itself as the influx of personal knowledge and memories fill out that emptiness. Deprived of autobiographical memory, individuals are in a dark well, desperately trying to gain some existential purchase on the smooth wall, as in the case of the neurologically damaged musician Clive Wearing (Sacks, 2007). The book’s next section, quotes a poem of the Nobelist Tranströmer,

¹ Address correspondence to: Etzel Cardeña, Ph. D., Department of Psychology, Lund University, Allhegonakyrkogata 16A, Lund, 22350, Sweden, etzel.cardena@psy.lu.se

a personal account of another Nobelist (Sir John Eccles, a supporter of psi), and various survey and experimental studies demonstrating that during moments of danger, including brushes with death, time is experienced as expanding while mental events seem to be particularly intense, agile, and sharp; the literature on near-death-experiences is germane to this issue and Wittmann refers to it.

In the section on the effects of psychoactive drugs on felt time, Wittmann differentiates types of drugs, with stimulants giving a sense of speeded-up time and psychedelics elongating it. Or the sense of time may collapse altogether in mystical experiences. He quotes the mystic Meister Eckhart: "In eternity there is no before and after, and what happened a thousand years ago and what will happen in another thousand years is one in eternity" (p. 24). Which is no poetic embellishment. A highly hypnotizable participant expressed similarly while she was having an unsuggested transcendent experience in my lab: "Things do not happen here... here there is no time and no space" (Cardeña and Lindström, in press). In this context, Wittmann also describes how experienced time is imbricated in space, and vice versa.

In the second chapter, Wittmann concentrates on "The Moment," although it is more accurate to speak of different types of "moment." He refers to Husserl's phenomenological analysis of the experienced moment as including an *Urimpression* (what was just experienced), with its *retention* in the present moment, and the *protention* of the anticipated moment, what William James called the "specious present" (James, 1890, pp. 609-610). Research carried out by, among others, one of Wittmann's mentors has determined that typically our sense of the present moment is segmented in units of about 3 seconds (Pöppel, 1988). The duration of shorter intervals (about 30 - 300 milliseconds) determines whether two events are experienced as simultaneous ("functional moment"), and short-term and working-memory, along with reflective consciousness, establish the length of "mental presence." This can last between seconds and a few minutes (or more in alterations of consciousness or with practice of meditation), as studies reviewed by Wittmann show. This chapter also includes Heidegger's discussion of boredom as time that cannot be filled meaningfully (p. 86), but he also described how time and the self can become altered during creative activities: "I am wholly and absolutely present... what does "moment" mean here... it is an inappropriate designation" (Heidegger, 2008, in Hunt, 2019, p. 11).

The last chapter before an epilogue focuses on alterations of time and self in psycho- and neuro-pathology, and includes summaries of studies by Wittmann and others showing the insula to be an important area in the processing of time. It starts with the case of Alexandrine, a patient unable to experience her emotions or somatic signals, including thirst and hunger, and, meaningfully, lacking intrinsic awareness of the passage of time. Fascinating accounts of individuals with schizophrenia who seem to live in a perpetual "now" are cited, reminiscent of the unending loop in which the main character in Renais's film *Last Year in Marienbad* resides, as well as descriptions of transcendent experiences of time and self in epilepsy, including a description by Dostoevsky, who had the condition (for examples of models of time in literature see Cardeña & Reid, 2016). *Altered States of Consciousness* does not cover parapsychological phenomena, but Wittmann is aware of them and has contributed to the literature in precognition (Müller, Müller, & Wittmann, 2019).

As with all good conversations, I just wish that this fascinating but succinct book had lasted longer...

References

- Borges, J. L. (2011). Nueva refutación del tiempo [New refutation of time]. In *Inquisiciones/Otras inquisiciones* [Inquisitions/ Other inquisitions]. (pp. 359-380). Debolsillo (Originally published 1952)
- Cardeña, E., & Lindström, L. (in press). The light and the bulb: The psychology and neurophysiology of mystical experience. In A. Moreira-Almeida, B. Paz Mosqueiro, & D. Bhugra (Eds.), *Spirituality and mental health across cultures*. Oxford University Press.
- Cardeña, E., & Reid, L. (2016). Time and the writers: Models of time in literature, science, and Busby Berkeley films. *NODE Center for Curatorial Studies*. <http://www.nodecenter.org/time-and-the-writers-models-of-time-in-literature-science-and-busby-berkeley-films/>
- Hunt, H. T. (2019). Intimations of a spiritual New Age: III. Martin Heidegger's phenomenology of Numinous/ Being experience and the "other beginning" of a futural planetary spirituality. *International Journal of Transpersonal Studies*, 38 (1). <http://dx.doi.org/https://doi.org/10.24972/ijts.2019.38.1.1>
- James, W. (1890). *The principles of psychology* Vol. 1. Henry Holt. <https://doi.org/10.1037/10538-000>
- Müller, M., Müller, L., & Wittmann, M. (2019). Predicting the stock market: An associative remote viewing study. *Zeitschrift für Anomalistik*, 19, 326-346.
- Pöppel, E. (1988). *Mindworks: Time and conscious experience*. Harcourt Brace Jovanovich.
- Sacks, O. (2007, September 24). The abyss. *The New Yorker* [Internet]. <https://www.newyorker.com/magazine/2007/09/24/the-abyss>
- Shapin, S. (2019, October 10). A theorist of (not quite) everything. (A review of *Helmholtz: A Life in Science*, by David Cahan). *New York Review of Books*, 64(15), 29-31.

Manuscript Preparation Guidelines

TYPES OF MANUSCRIPTS

The *Journal of Parapsychology (JP)* publishes:

1. Empirical papers, presenting new data and/or analyses, and using quantitative, qualitative, or mixed methods. "Empirical" should be interpreted broadly to refer to systematic inquiry including experimental manipulation of variables as well as single case designs, analysis of collection of cases, phenomenological studies, historical analyses, systematic case studies, field research, and so on.
2. Theoretical papers, discussing new theories or novel implications of extant theories.
3. Methodological and analytical papers offering new or alternative ways of conducting research and/or analyzing data.
4. Book reviews from the international literature, which will be assigned by the Book Reviews Editor, Carlos Alvarado, Ph. D., carlos@theazire.org. *JP* will not consider unrequested reviews. If you are the author or publisher of a new book in the field contact Dr. Alvarado for information about potentially submitting it for a review as well as review guidelines.
5. Debates and letters about current issues in the field and papers recently published in the *JP*.

SUBMISSION OF MANUSCRIPTS

Articles in the *Journal* must be original, which means that they cannot have been published previously, either in whole or in part (except for isolated paragraphs or earlier versions in conference proceedings), in a journal or the Web. Manuscripts must be submitted to the *JP* electronically (as an e-mail attachment) in Word or compatible word processing program to: etzel.cardena@psy.lu.se. All submissions must be single column, double-spaced, in Times New Roman size 12. Preparation of the manuscript in all respects must follow the guidelines described in the 7th edition of the *Publication Manual of the American Psychological Association* (i. e., APA style; of which there are various summaries in the Web) and must be written at a very high level, commensurate with an academic publication in English. If the authors' writing is not at this level, they should consider hiring a professional academic editor service before submission. There are various editing services, including John Palmer's, the former *JP* Editor, at john@rhine.org. American English spelling must be used in the manuscript, other than in quotations. Some other style issues for the journal: a) use "volunteer", or "participant" instead of "subject", b) avoid sexist language, c) use "masked" instead of "blind" conditions, d) unless part of a quotation, do not use verb contractions (e.g., "is not" instead of "isn't"), e) include the appropriate diacritical marks in the case of foreign names and words.

Articles must not exceed 10,000 words, including references, unless previously authorized by the editor. They must include an abstract no longer than 200 words in a single paragraph, and up to 6 terms. Do not include references in the abstract. Research studies must contain the following sections: Objective, Method, Results, and Conclusion. To facilitate the evaluation of research study conditions, the methods section must include, besides the usual information (e.g., participants, measures, procedure, analyses, ethical approval and related considerations such as consent form and what was conveyed to participants about the goals of the study), specific information about those who interacted with the participants (basic demographics such as age range and self-identified gender; style of interaction with participants such as friendly, neutral, or peremptory; professional status, such as professor or head researcher, or research assistant), and researchers' a-priori belief that the psi hypotheses in their study would be supported in their project, using the following scale (5 -strong belief -, 4 -moderate belief-, 3 -neutral, 2 -moderate non-belief, 1 -strong non-belief). If authors have a reason to exclude any personal information, their submission should include a brief explanation for the exclusion. An institutional review board, when applicable, must have previously approved all research with human and other sentient beings, and research must be conducted according to generally accepted ethical guidelines. The manuscript must include information on funding and any potential conflict of interest.

Endotes should be avoided; use instead, if at all necessary, footnotes. Close attention should be paid to the formatting of references and quotations, which must follow *precisely* APA style formatting. Before submission the authors must check that all items in the reference list have matching text entries and vice versa, and include doi information for all references. Quotations should be double-checked for accuracy and their page numbers cited in the text. Statistical values must be checked multiple times for accuracy. Descriptive statistics (e.g., means, standard deviations) must be reported in addition to inferential statistics (e.g., *t* tests, ANOVAs, non-parametric tests), which must also include the specific *p* value and measures of effect size. The relevance of a finding should not be based exclusively on a particular *p* value (authors might consider consulting the "Statistical Guidelines for Empirical Studies" by Tressoldi and Utts published in the *Parapsychology: A Handbook for the 21st Century*, or the two editorials in *JP*, 83(2)).

The paper must clearly state which hypotheses (and analyses) were confirmatory and which exploratory. Although not mandatory, it is strongly recommended that all research, exploratory and even more so confirmatory, be preregistered, for instance through <https://koestlerunit.wordpress.com/study-registry> and that data be made available to other potential researchers through a depository such as <https://data.world> or open-data.spr.ac.uk. Meta-analyses are encouraged when multiple studies have basically used the same variables and a similar design. Tables and figures must have a title or caption, be numbered, and follow APA style. Figures and photos must be submitted electronically and they cannot be in color. Resolution should be a minimum of 300 dpi. Vector art (e.g., Adobe Illustrator, encapsulated postscript) is preferable to bitmaps.

Manuscripts will be refereed anonymously and the authors should mask their identities in the manuscript. They should include a page with all identifying information, and then the ms without that information. Manuscripts accepted for publication are copyedited for grammar and style. Copyedited text will be submitted to the author(s) for any required changes and approval, and a prompt response is required. Substantive revisions are generally not allowed after the manuscript has been accepted.

COPYRIGHT

As a condition for publication in the *Journal*, authors of articles must assign copyright of the article to the Parapsychology Press. Permission must be obtained from the Editor before the article can be published or reproduced elsewhere, including on a personal website. Article authors also have the option of retaining the copyright of their papers and make them “open access” by paying a fee (\$1,400 USCy institutional for grants and universities, \$700 personal).

Volume 84 / Number 1 / Spring 2020

Editorial

Pieces of the Psi Puzzle and a Recipe for Ganzfeld Success 5
Etzel Cardeña

In Memoriam

Mary Rose Barrington 8
Peter Mulacz

Donald J. West 12
Zofia Weaver

Invited Editorial

Ganzfeld-ESP: Three Reports and Looking Ahead 14
Rex G. Stanford

Articles

Testing Precognition and an Altered State of Consciousness with Selected Participants in the Ganzfeld 21
Caroline Watt, Emily Dawson, Alisdair Tullo, Abby Pooley, and Holly Rice

Performance at a Precognitive Remote Viewing Task, with and without Ganzfeld Stimulation: Three Experiments 38
Chris A. Roe, Callum E. Cooper, Laura Hickinbotham, Andrew Hodrien, Laurie Kirkwood, and Hanna Martin

Changes in State of Consciousness and Psi in Ganzfeld and Hypnosis Conditions 66
Etzel Cardeña and David Marcusson-Clavertz

Parapsychological Association 2019 Presidential Address 85
Making Sense of Psi: Seven Pieces of the Puzzle
Dean Radin

Predictors of Hearing Electronic Voice Phenomena in Random Noise: Schizotypy, Fantasy Proneness, and Paranor- 96
mal Beliefs
Kenneth Drinkwater, Andrew Denovan, Neil Dagnall, and Andrew Parker

Tolerance of the Unknown: Negative Capability, the Problem of Demarcation, and the Truzzi-Gardner Dialogue 114
Renaud Evrard and Bevis Beauvais

Book Reviews

Perceiving the Future. A Review of *The Premonition Code: The science of Precognition: How Sensing the Future 130*
Can Change your Life By Theresa Cheung and Julia Mossbridge
Roger Nelson

A Comprehensive History of Parapsychology in France. A Review of *Enquête sur 150 Ans de Parapsychologie: La Légende 133*
de de l'Esprit By Renaud Evrard
Massimo Biondi

A Far Ranging Tour of All Things Psi. A Review of *Our Secret Powers: Telepathy, Clairvoyance, and Precognition. 136*
A Short History of (Nearly) Everything Paranormal. By Terje G. Simonsen
George R. Williams

Parapsychology and the Nervous System. A Review of *Neurociencias en la Frontera con lo Paranormal: Comprender 140*
lo Inexplicable en las Redes del Cerebro By Alejandro Parra
Carlos S. Alvarado

A Kulturträger Keeps Time. A review of *Altered States of Consciousness: Experiences out of Time and Self 143*
By Marc Wittmann
Etzel Cardeña

Manuscript Preparation Guidelines 146

ISBN 2370000438683



2 370000 438683

The Rhine Center
2741 Campus Walk Avenue
Building 500
Durham, NC 27705
919-309-4600
WWW.RHINE.ORG