



## Review Article

# Anomalous information reception by mediums: A meta-analysis of the scientific evidence

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## ABSTRACT

**Background and purpose** Mediumship is the ostensible phenomenon of human-mediated communication between deceased and living persons. In this paper, we perform a meta-analysis of all available modern experimental evidence, specifically from 2001 to December 2019, investigating the accuracy of apparently anomalously received information provided by mediums about deceased individuals.

**Methods** 14 papers passed our selection criteria, for a total of 18 experiments. Both Bayesian and frequentist random effects models were used to estimate the aggregate effect size across studies.

**Results** The overall standardized effect size (proportion index), estimated with a frequentist and a Bayesian random effects model, yielded a value of .18 (95% C.I. = .12 - .25) above the chance level. Furthermore, these estimates passed the control of two publication bias tests.

**Conclusions** The results of this meta-analysis support the hypothesis that some mediums can retrieve information about deceased persons through unknown means.

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## Introduction

Mediumship is the alleged phenomenon of mediated communication between living human agents and deceased persons. The “medium” is the person who mediates such communication, ostensibly by interacting with a deceased person(s) some aspect of whom is claimed to have survived bodily death by unknown means. This aspect is usually said to exist in a disembodied or discarnate state. Various purported types of mediumship have been discussed in the parapsychological and psychical research literature. Each of these types is usually classified under one of two broad categories: *physical mediumship*, which involves striking empirical phenomena such as materializations and tactile sensations supposedly associated with disembodied (or discarnate) humans who have survived bodily death, and *mental mediumship*, which involves the transmission of messages to mediums from discarnates, often for the purpose of communication with an individual (known as a sitter) seeking to contact a deceased person through a medium.

Mediumship was first studied in a broadly scientific, but also somewhat unsystematic, way in the UK in the nineteenth century through the Society for Psychical Research, with renowned mediums such as Leonora Piper subjected to especially thorough investigation (see Gauld’s<sup>16</sup> review of nineteenth- and early-twentieth-century

research into mediumship). With the decline of psychical research and the rise of experimental parapsychology by the early twentieth century, interest in detailed study of mediumship fell substantially, with attention moving to (seemingly) less metaphysically extravagant psychic phenomena, such as extrasensory perception (consider the research reviewed by Pratt et al.<sup>26</sup>).

Alan Gauld, in a contribution to the 1977 *Handbook of Parapsychology*, was among the most important researchers in (relatively) recent times to attempt to revive interest in mediumship research. After reviewing the efforts of nineteenth- and (mostly) early-twentieth-century psychical researchers, he discussed the possibility that mediumistic and other ostensibly postmortem-survival-indicating phenomena may be due to so-called super-psi—or, more neutrally, “living-agent psi”<sup>1</sup> (see Sudduth<sup>35</sup>)—effects. In other words, the phenomena that mediums and some investigators of them tended to attribute to the activities of discarnates may in fact have resulted from psi effects stemming only from living agents (to be sure, this

<sup>1</sup> The term “somatic psi” has been proposed as more appropriate than “living-agent psi” [5]—it designates “telepathy with living persons, clairvoyance (including of a psychic reservoir), and precognition on the part of the medium but not including survival psi” [6]. In describing “survival psi,” Sudduth [36] writes that “we might suppose that the medium acquires her knowledge of discarnate minds by telepathically scanning their minds or that the discarnate person is telepathically sending information to a medium’s mind” (p. 177). We thank an anonymous reviewer for suggesting that we include some discussion of “somatic psi” and for highlighting relevant sources and passages.

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idea did *not* originate with Gaud—early members of the Society for Psychical Research had discussed the uncertain source of anomalous mediumistic effects, such as Myers<sup>24</sup>). Gaud termed the opposed postmortem survival model the continuity hypothesis, and concluded, after careful examination of mediumship data and other data seemingly relevant to the question of survival after bodily death, that it was not possible to favor one of these two hypotheses over the other in the absence of higher-quality experimental evidence.

Skeptical approaches to explaining mediums' apparently anomalous information reception, on the other hand, usually invoke the effects of so-called “cold,” “warm,” and “hot” reading for which researchers allegedly have failed to adequately control. Cold reading is the inferring of information about the deceased individual that the medium is supposed to be contacting from the appearance, dress, behavior, etc. of the sitter. Hot reading is the acquisition of explicit information about the deceased from sitters. Warm reading is intermediate between these two strategies of learning about the deceased through mundane means, which involves obtaining explicit information about sitters' lives from which information about the deceased can be inferred.

Despite Gaud's indication of the need for better mediumship evidence, a true revival in scientific mediumship research did not occur until some 24 years after the publication of the 1977 *Handbook of Parapsychology* (although mediumship research and research in closely related areas did indeed occasionally get published in the intervening years<sup>13,14,17,27,32</sup>). Two groups were responsible for the first efforts to bring rigorous experimental design to bear on the matter of whether mediums provide accurate and anomalously received information about deceased persons. One group, based out of the University of Glasgow, produced a pair of papers in 2001 (Robertson & Roy, 2001 and Roy & Robertson, 2001<sup>2</sup>) presenting data on the accuracy of mediums, although the first of the two papers (Robertson & Roy, 2001) lacked adequate controls for, among other things, possible “cold reading.” Gary Schwartz, of the University of Arizona, whose name is perhaps most strongly connected with the revival and scientific advancement of mediumship research, developed a research program that aimed to assess the ability of mediums to obtain accurate information about deceased persons without the use of any known means of information acquisition (Schwartz & Russek, 2001). This research has nevertheless been highly controversial (see discussion by McLuhan<sup>22</sup>), although Schwartz has conducted experiments to which many criticisms of his earlier work do not apply (*e.g.* complaints were raised about insufficient blinding in earlier experimental work by Schwartz, but Beischel & Schwartz, 2007 would go on to conduct a triple-blind test of medium accuracy).

Since 2001, other groups have worked on mediumship, employing a number of experimental designs so as to exclude the possibility that various mundane processes are responsible for mediums' acquisition of accurate information about deceased persons, such as the hot, warm, and cold reading described above.

In a typical experiment, a medium is provided with the first name of a deceased person or ostensible discarnate (a practice that is potentially problematic, as explained in the discussion), and then provides a “reading” about this person, *i.e.* gives information that is supposed to be about the discarnate. A sitter—an individual associated with the discarnate and in a position to determine what information does and does not pertain to the latter—is then given at least two readings to evaluate, but is not told the person for whom any reading is intended. This allows experimenters to control for a variety of cognitive biases and errors that might reduce the accuracy of sitters' evaluations of readings; for example, a sitter might overestimate the relevance of a reading to a deceased person when the sitter knows that the reading is intended for that person—*e.g.* the sitter

might be led to seek out correspondences with the life of the deceased person in the reading where there might be none, or the sitter might exaggerate the significance of these correspondences where they are present but trivial.

Crucially, experiments testing medium accuracy vary in their level of blinding—perhaps especially as a response to skeptical criticism, it seems that such experiments have tended to employ higher levels of blinding over time (a recent study, for instance, has five levels of blinding, and is apparently the first mediumship experiment to have so many such levels; see Beischel, Boccuzzi, Biuso & Rock, 2015). To give some examples of levels of blinding, a study might ensure that mediums have no knowledge (by mundane means) about either the deceased of whom they offer a reading or the associated sitter, or, as would be necessary for a reasonable test of mediumship, both. A further level of blinding might ensure that experimenters who interact with mediums have no knowledge about the deceased or the associated sitters.

These methodological developments have provided a relatively mature literature on the accuracy of mediums that is ripe for meta-analytic study; indeed, meta-analysis has been an especially popular way of addressing controversies surrounding the evidence in many areas of parapsychology<sup>2,10,36,41</sup>, since it represents a set of powerful tools for pooling data across studies and quantifying the effects of moderators on effect size variability, in addition to means for estimating the biases attributable to questionable research practices in extant research through the use of publication bias tests, etc. (but it is worth noting that some skeptics have taken issue with the use of *retrospective* meta-analysis in parapsychological research, *e.g.* Wagenmakers et al.<sup>40</sup>).

To date only one other meta-analysis of research on medium accuracy has been conducted<sup>28</sup>; however, it was not at all comprehensive due to its selective inclusion criteria. Here we aim to conduct the first comprehensive meta-analysis of studies testing the accuracy of apparently anomalous information reception by mediums, concerning deceased humans, from 2001—when the first studies of medium accuracy using truly modern experimental designs began to appear—to 2019 (see Beischel & Zingrone<sup>4</sup>).

## Methods

### Studies retrieval

A meta-analysis was conducted following the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines.<sup>23</sup> We provide the full set of details concerning all relevant aspects of the studies, study selection, and exclusion criteria, so as to facilitate meta-analytic replicability, jointly between this paper and the open online supplement (link below). A PRISMA flowchart is also provided to show how the original study pool was reduced to the final set of effect sizes employed.

The literature search began using the PsycArticles, PsycINFO, and Academic Search Complete databases, as well as Google Scholar and ResearchGate. Consideration of relevant articles with which we were already familiar led us to use the following terms for our literature search: “medium,” “mediums,” “mediumship,” “medium” + “accuracy,” “mediums” + “accuracy,” “mediumship” + “accuracy,” “parapsychology” + “medium,” “parapsychology” + “mediums,” “parapsychology” + “mediumship,” “discarnate,” and “discarnates.” References of the papers from the initial pool of studies were also examined for any studies that we may have missed. We also contacted experts in mediumship research to obtain any unpublished studies germane to the planned meta-analysis, which did not provide any such studies that were ultimately meta-analyzed. Further, we searched the website of Dr. Carlos Alvarado for studies that we may have missed (applying the same search terms provided above) as

<sup>2</sup> Later on, they published another paper on medium accuracy (see Robertson & Roy, 2004).

parapsychologists recognize it as one of the best sources of current information on all aspects of parapsychology.

#### Inclusion criteria

Our inclusion criteria were not particularly selective, since we aimed for comprehensiveness. Any experimental study that we found that was published from 2001 on, that involved quantitative analysis of the accuracy of information about deceased humans ostensibly anomalously received by mediums, and that involved mediums providing readings for sitters to assess was eligible for inclusion. The studies excluded (along with the reason for exclusion for each) are as follows: Beischel (2012; concerns non-human discarnates); Beischel, Boccuzzi, Biuso, and Rock (2011; included in Beischel et al., 2015); Robertson and Roy (2004; opaque presentation of crucial results<sup>3</sup>); Rocha et al. (2014; retrospective study without readings); Rock and Storm (2015; methodological paper); and Beischel, Tassone, and Boccuzzi (2019; data of the relevant kind not gathered).

The final database consisted of 14 studies (see Fig. 1 for the PRISMA flowchart) for a total of 18 effect sizes.

#### Effect size and variance calculation

For a standardized effect size we used the proportion index (PI) as proposed by Rosenthal and Rubin.<sup>31</sup> The PI allowed us to homogenize

the data such that the null value is equal to .5 for all effect sizes. Values above .5 indicate that the percentage accurate of the intended readings was above chance expectation, whereas values below .5 indicate that the percentage accurate of the intended readings was below chance expectation. The variance for the proportion index was calculated with the following formula:  $1/\text{readings} * \text{PI}^2 * (1 - \text{PI})^2 / (\text{Raw Percentage} * (1 - \text{Raw Percentage}))$

To make interpretation of the effect size easier, we used the difference with respect to the chance level. For example,  $\text{PI} = .81$  corresponds to a positive difference of  $.81 - .5 = .31$  above chance.

The complete database and the included studies are available at <https://figshare.com/s/43c7135f4c2ba939f61f>

## Results

### Descriptive statistics

The means, standard deviations, and ranges of the main independent variables are presented in Table 1.

A simple inspection of the range and the standard deviations clearly shows the wide variability among the different experiments, which could affect their heterogeneity.

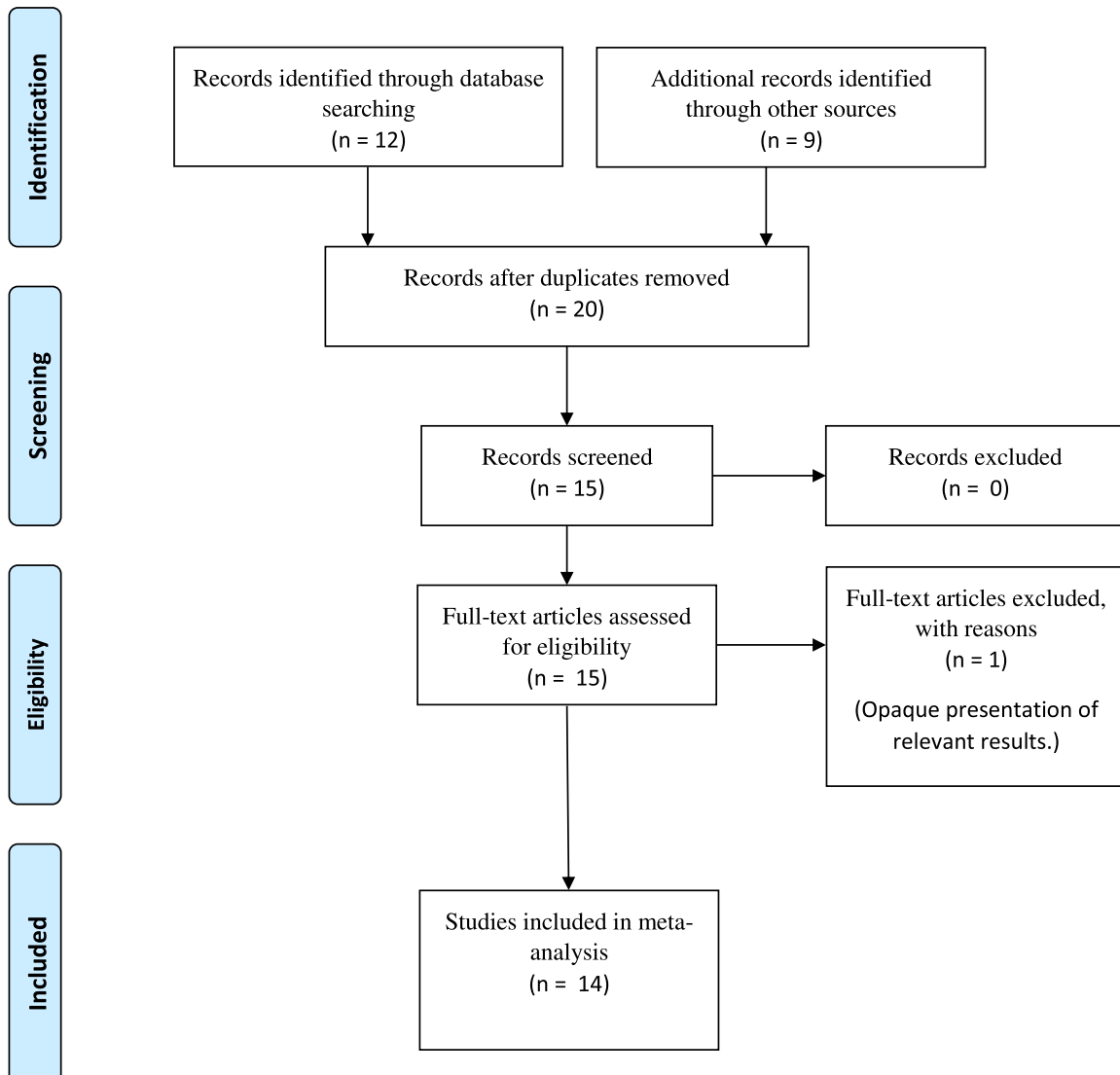


Fig. 1. PRISMA flowchart showing the process of assembling the database for the meta-analysis.

**Table 1**  
Descriptive statistics of the main independent variables, each as a raw count.

	Mean	SD	Range
Mediums	6.5	5.9	1–20
Readings	16.5	13.7	1–44
Sitters	14.2	15.7	1–44

### Overall effect size

For the estimation of the overall effect size we applied both a frequentist and a Bayesian random effects model using respectively the *metafor* package<sup>38,39</sup> and the *MetaBMA* package.<sup>18</sup>

A copy of the syntax is available at <https://figshare.com/s/43c7135f4c2ba939f61f>

### Frequentist random model

Following the recommendations of Langan et al.,<sup>21</sup> we used the restricted maximum likelihood (REML) approach to estimate the heterogeneity variance and Hartung's profile likelihood method for deriving the average effect size estimate and its confidence interval.<sup>31</sup>

### Bayesian random model

As priors for the overall effect size we used a normal distribution with mean = 0, sd = .03, constrained positive, lower bound = 0,<sup>30</sup> given our expectation of a positive value (see details in the syntax file).

The results are presented in Table 2 and Fig. 2.

The frequentist and the Bayesian models converge on the same parameter estimates supporting a positive effect of approximately .18 (95% CI = .11 - .25) above chance, which corresponds approximately to 6 to 14% above chance. Furthermore, the  $\tau$  values<sup>4</sup> indicate a low level of between-study heterogeneity.

### Publication bias tests

Although we are quite confident that our search method reduced the publication bias to near zero, we also applied two publication bias tests.

Following the suggestions of Carter, Schönbrodt, Gervais, and Hilgard,<sup>11</sup> we applied the Three-parameter selection model as implemented by Coburn and Vevea<sup>12</sup> with the package *weightr* and the *P-Uniform\** test as described by van Aert and van Assen<sup>37</sup>. The results are presented in Table 3. The three parameters of the former model represent the average true underlying effect,  $\delta$ ; the heterogeneity of the random effect sizes,  $\tau^2$ ; and the probability  $p_1$  that there is a non-significant effect in the pool of effect sizes. The last parameter,  $p_1$ , is modeled by a step function with a single cut point at  $p = .025$  (one-tailed), which corresponds to a two-tailed  $p$  value of .05. This cut point divides the range of possible  $p$  values into two bins: significant and nonsignificant. The three parameters are estimated using maximum likelihood (Carter et al.<sup>11</sup>, p. 124).

Both publication bias tests confirm the reliability of the results obtained with the random effects model analyses.

**Table 2**  
Overall effect size estimation with both a frequentist and a Bayesian approach.

Random model	Overall ES	95% CI	$p$ /BF	$\tau$
Frequentist	.182	.12 - .25	$p = 1.93^{e-9}$	.06
Bayesian	.178	.10 - .25	BF <sub>(H1/H0)</sub> = 231	.08

## Moderator analyses

### Blinding effects

Even though in the overall analysis we found a minimal amount of between-study heterogeneity, we thought it interesting to see if there was a moderator effect associated with the level of blinding. We classified the experiments in two categories: high level if the experimental design involved at least three levels of blinding, and low level if the experimental design involved less than three levels of blinding.

The results are presented in Table 4.

Although the overall effect size estimates are the same to two decimal places, the estimations of their precision (confidence intervals) might suggest that the experiments with a lower level of blinding tend to obtain better results. Furthermore, these experiments show a lower level of heterogeneity.

### Mediums' certification

Establishing a moderating effect of medium certification was achieved through comparison of certified and non-certified mediums.<sup>5</sup> The results are presented in Table 5.

These results must be interpreted with caution given the large difference in the number of studies between the two categories. Nonetheless, there is evidence that the mediums selected on some basis for their mediumistic skills outperform, as expected, those recruited without such a selection process.

## Discussion

Our results are consistent with the hypothesis that some mediums are able to acquire information about deceased persons through some unknown or anomalous means. It seems to be unlikely that the results are attributable to publication bias. Importantly, our findings are robust to the use of both frequentist and Bayesian analyses. There is some evidence that certified mediums are better able to anomalously receive accurate information than those who are not certified.

It is important to note that our results do not allow any conclusion about the causal basis of this mediumship effect. Book-length studies have been devoted to assessing evidence for postmortem survival, including the evidence from mediumship research. Among the most sophisticated of these, one concludes that there is at best weak support for the postmortem survival hypothesis<sup>9</sup>, whereas another concludes that the empirically based arguments so far developed for the postmortem survival hypothesis, or at least the classic arguments for that hypothesis, are unsuccessful.<sup>35</sup>

A different and recent meta-analysis of medium accuracy failed to find evidence for an anomalous information reception effect—however, and as noted above, the study's inclusion criteria were far stricter than ours, and therefore the meta-analysis was not comprehensive of contemporary research on the accuracy of mediums; moreover, only eight effect sizes were meta-analyzed, and consequently the researchers had little statistical power to work with.<sup>28</sup>

As already indicated, contemporary mediumship research has proven to be highly controversial,<sup>22</sup> with a variety of alleged methodological errors identified by critics (e.g. Battista et al.<sup>3</sup>). At least some of their complaints are not well founded, however. For example, Battista et al.<sup>3</sup> critique Beischel and Schwartz's (2007) use of a paired

<sup>4</sup> Tau ( $\tau$ ) is a measure of heterogeneity between studies; it corresponds to the standard deviation of the distribution of the true effects across studies [8].

<sup>5</sup> We are using the term "certification" and cognates in a very general sense. Any study that selected mediums on the basis of some apparent evidence of their having mediumistic ability was included as having "certified" mediums.

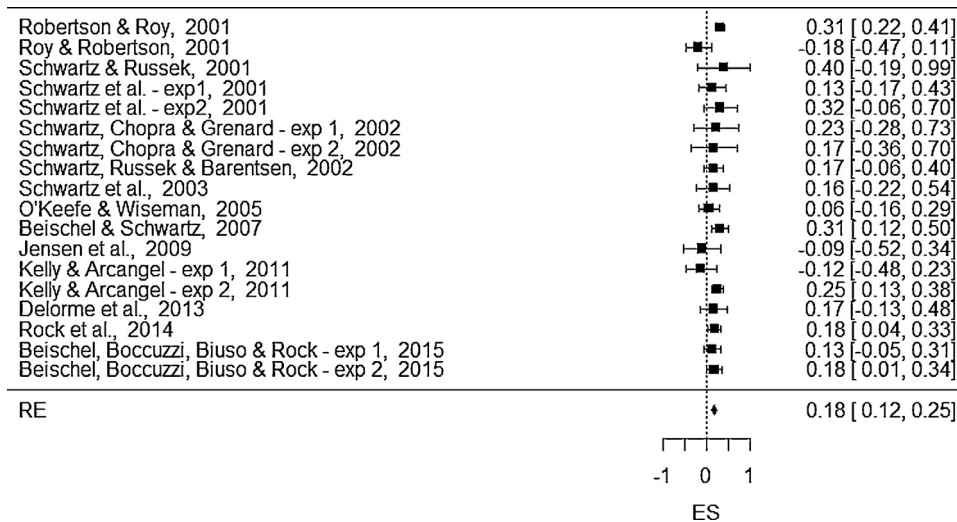


Fig. 2. Forest plot of effect sizes including overall effect size, with studies and corresponding effect sizes ordered by year of publication.

t-test and a binomial test, on the basis that such a test cannot produce valid results when data have a dyadic structure. But in fact the paired t-test and similar non-parametric tests are commonly and legitimately used in such cases.

Further, Battista et al.<sup>3</sup> state the following: “In a nutshell, the same data set can virtually always be analyzed in a multitude of different ways that could yield positive evidence for the hypothesis at hand. This multiplicity of data-analytic possibilities can easily and drastically inflate the rate of false positives” (p. 624). This point is what might be called “trivially true,” since there is seemingly no field of quantitative research to which it could not be applied.

A more serious concern for mediumship research is that blinding is not clearly ideal, given that, for example, the first names of the deceased are often provided to mediums (e.g. Beischel et al., 2015). While there are reasons for thinking that this is not a serious source of veridical leakage (Beischel et al., 2015, p. 138), it would be better if this practice simply were not used in experimental tests of the accuracy of mediums as it could give mediums a mundane basis from which to infer information about deceased persons. Concerns could also be raised about mediumship experiments that use designs that pair sitters, if the statistical non-independence of trials that might be a consequence of these designs is not accounted for in the analyses (C. Phillips, personal communication, July 25th, 2019). But given that mediums are not made aware of the pairing procedure and typically conduct readings separately (see, e.g., Beischel et al., 2015), there is no clear reason to anticipate that this procedure would violate the assumption of the statistical independence of trials. It is also worth emphasizing that average medium accuracy does not seem to vary with level of blinding. This opens the possibility that veridical leakage is effectively prevented even at low levels of blinding, in studies that likely tend to have relatively less sophisticated experimental designs. This does not align with expectations to the effect that less stringent studies have in fact involved substantial leakage of veridical information to mediums (note that it is likely true that variation in level of blinding captures variation in methods quality generally).

A variety of hypotheses could be and have been offered to account for statistically significant results of tests of medium accuracy. One

that we have already discussed is that mediums, by unknown means, communicate with deceased individuals who have, also by unknown means, in some way survived bodily death. The typical idea here is that at least some aspect of the human mind is non-physical, e.g. the soul, and that it does not depend on organismal survival for its existence, and so can persist after the death of the organism with which it was associated prior to that death. Another hypothesis, which we have also mentioned, is that of living-agent psi, according to which mediums receive accurate information about deceased persons not from people who have survived death in some form, but from the minds of living persons that possess information about those deceased persons.

Little empirical work has been done to isolate the source of anomalous information that mediums seem to receive (but see<sup>19</sup> and Rock & Storm, 2015 on ways that future research might address the problem). Of course, another hypothesis, also indicated above, is that mediumship does not involve any anomalous processes and that the significant results of studies of the accuracy of mediums are to be explained with reference to methodological problems and questionable research practices (QRPs; see discussion of mediumship critics in<sup>22</sup>). But it must be stressed that claims that QRPs can fully account for statistically significant results in parapsychology generally (see, e.g., Stokes<sup>35</sup>) have so far fared poorly in the light of relevant analyses.<sup>1,7,25</sup> And, to reiterate, the failure of level of blinding to emerge as a moderator of medium accuracy in our own meta-analysis does not bode well for theories that invoke poor methodology. Contrary to skeptical claims, the methodological quality in parapsychological research tends to be very high (see Fallon<sup>15</sup>).

Nonetheless, it should be noted that Wiseman, Watt, and Kornbrot<sup>42</sup> found a much lower rate of significant test results in preregistered compared to non-preregistered parapsychology studies in a pool of studies extracted from a 17-year period in the history of the *European Journal of Parapsychology* (~8% and ~28%, respectively), and they seem to suggest that this evidences a very high rate of QRPs in non-preregistered parapsychology research. They do not have adequate support for this idea, however, as they appear to concede: “the

Table 3  
Publication bias test results.

Tests	Overall ES	95% C.I.
Three-parameter selection model	.23	.15 - .30
P-Uniform*	.21	NA - .29

Table 4  
Comparison between studies with high and low level of blinding.

Blinding Level	Overall ES	95% CI	p	τ
High n. 9	.18	.05 - .31	.01	.11
Low n. 9	.18	.10 - .26	.0007	.001

**Table 5**  
Comparison between studies with and without medium certification.

Medium Certification	Overall ES	95% CI	p	T
Yes n. 14	.17	.12 - .22	4.5 <sup>e-15</sup>	0
No n. 4	.10	-.29 - .50	.46	.22

[*European Journal of Parapsychology*] studies were not randomly allocated to condition, so the [preregistered studies] and [non-preregistered studies] may have varied on several other factors (including, for example, study design, power, and methodological quality), therefore it is possible that these factors may be responsible for the observed effect” (Wiseman et al.<sup>42</sup>, p. 8). An observation with different implications from that of Wiseman et al.<sup>42</sup> would be that the confirmatory studies preregistered in the Koestler Parapsychology Unit Registry since 2012 and so far completed seemingly have been quite successful on the whole (consider the findings of confirmatory studies from KPU<sup>20</sup>).

It is worth mentioning that parapsychologists only seem to have seriously considered three hypotheses to explain the results of mediumship experiments (postmortem survival, living-agent psi, and methodological problems). It does not seem to us that this exhausts the space of possible explanations, and so perhaps more theoretical development in mediumship research would be worthwhile. We also recommend that if future mediumship research is conducted, especially on the accuracy of mediums, it should be preregistered with the Koestler Parapsychology Unit, as this will increase confidence that results are not attributable to QRPs.

#### List of retrieved studies. Studies included in the meta-analysis are marked with an asterisk

Beischel, J. (2012, June). *Anomalous information reception by credentialed mediums regarding non-human animal discarnates*. Presented at the 31st Annual Meeting of the Society for Scientific Exploration, Boulder, Colorado.

Beischel, J., Biuso, M., Boccuzzi, M., & Rock, A. (2011, June). *Anomalous information reception by research mediums under quintuple-blind conditions: Can the mind exist without the body?* 30th Annual Meeting of the Society for Scientific Exploration, Boulder, Colorado.

\*Beischel, J., Boccuzzi, M., Biuso, M., & Rock, A. J. (2015). Anomalous information reception by research mediums under blinded conditions II: Replication and extension. *EXPLORE: The Journal of Science & Healing*, 11, 136–142.

\*Beischel, J., & Schwartz, G. E. (2007). Anomalous information reception by research mediums demonstrated using a novel triple-blind protocol. *EXPLORE: The Journal of Science and Healing*, 3, 23–27.

Beischel, J., Tassone, S., & Boccuzzi, M. (2019). Hematological and psychophysiological correlates of anomalous information reception in mediums: A preliminary exploration. *EXPLORE*, 15, 126–133.

\*Delorme, A., Beischel, J., Michel, L., Boccuzzi, M., Radin, D., & Mills, P. (2013). Electrocortical activity associated with subjective communication with the deceased. *Frontiers in Psychology*, 4, 834.

\*Jensen, C. G., & Cardena, E. (2009). A controlled long-distance test of a professional medium. *European Journal of Parapsychology*, 24, 53–67.

\*Kelly, E. W., & Arcangel, D. (2011). An investigation of mediums who claim to give information about deceased persons. *The Journal of Nervous and Mental Disease*, 199, 11–17.

\*O’Keeffe, C., & Wiseman, R. (2005). Testing alleged mediumship: Methods and results. *British Journal of Psychology*, 96, 165–179.

\*Robertson, T. J. & Roy, A. E. (2001). A preliminary study of the acceptance by non-recipients of mediums’ statements to recipients. *Journal of the Society for Psychological Research*, 65, 91–106.

Robertson, T. J. & Roy, A. E. (2004). Results of the application of the Robertson-Roy protocol to a series of experiments with mediums

and participants. *Journal of the Society for Psychological Research*, 68, 18–34.

Rocha A. C., Paraná D., Freire E. S., Lotufo Neto F., Moreira-Almeida A. (2014). Investigating the fit and accuracy of alleged mediumistic writing: A case study of Chico Xavier’s letters. *EXPLORE: The Journal of Science & Healing*, 10, 300–308.

Rock, A. J., & Beischel, J. (2008). Quantitative analysis of mediums’ conscious experiences during a discarnate reading versus a control task: A pilot study. *Australian Journal of Parapsychology*, 8, 157–179.

\*Rock, A. J., Beischel, J., Boccuzzi, M., & Biuso, M. (2014). Discarnate readings by claimant mediums: Assessing phenomenology and accuracy under beyond double-blind conditions. *The Journal of Parapsychology*, 78, 183–194.

Rock, A. J. & Storm, L. C. (2015). Testing telepathy in the medium/proxy-sitter dyad: A protocol focusing on the source-of-psi problem. *Journal of Scientific Exploration*, 29, 565–584.

\*Roy, A. E., & Robertson, T. J. (2001). A double-blind procedure for assessing the relevance of a medium’s statements to a recipient. *Journal of the Society for Psychological Research*, 65, 161–174.

\*Schwartz, G. E., Chopra, D., & Grenard, S. (2002). Evidence of accuracy and specificity for long-distance mediumship: The “double-deceased” multi-medium paradigm. Retrieved from [http://www.amebrasil.org.br/2018/docs/Schwartz\\_Chopra\\_Grenard.pdf](http://www.amebrasil.org.br/2018/docs/Schwartz_Chopra_Grenard.pdf)

\*Schwartz, G. E., Geoffrion, S., Jain, S., Lewis, S., Russek, L. G. (2003). Evidence of anomalous information retrieval between two mediums: Replication in a double-blind design. *Journal of the Society for Psychological Research*, 67, 115–130.

\*Schwartz, G. E., & Russek, L. G. (2001). Evidence of anomalous information retrieval between two mediums: telepathy, network memory resonance, and continuance of consciousness. *Journal of Society for Psychological Research*, 65, 257–275.

\*Schwartz G. E., Russek L. G. S., Barentsen, C. (2002). Accuracy and replicability of anomalous information retrieval: replication and extension. *Journal of the Society for Psychological Research*. 66,144–56.

\*Schwartz, G. E., Russek, L. G. S., Nelson, L. A., & Barentsen, C. (2001). Accuracy and replicability of anomalous after-death communication across highly skilled mediums. *Journal of the Society for Psychological Research*, 65, 1–25.

#### References

- Bancel, P.A. (2018). Simulating questionable research practices [Preprint]. doi:10.1314/RG.2.2.12941.64487.
- Baptista J, Derakhshani M, Tressoldi PE. Explicit anomalous cognition: a review of the best evidence in ganzfeld, forced choice, remote viewing and dream studies. In: Cardena E, Palmer J, Marcusson-Clavertz D, eds. *Parapsychology: a handbook for the 21st century*. Jefferson, NC, US: McFarland; 2015:192–214.
- Battista C, Gauvrit N, LeBel E. Madness in the method: fatal flaws in recent mediumship experiments. In: Augustine K, Martin M, eds. *The myth of an afterlife: the case against life after death*. Lanham, MD: Rowman & Littlefield Publishers; 2015:615–630.
- Beischel J, Zingrone N. Mental mediumship research. In: Cardena E, Palmer J, Marcusson-Clavertz D, eds. *Parapsychology: A handbook for the 21st century*. Jefferson, NC: McFarland; 2015:301–313.
- Beischel J, Mosher C, Boccuzzi M. Quantitative and qualitative analyses of mediumistic and psychic experiences. *Threshold*. 2017;1:51–91.
- Beischel J, Rock AJ. Addressing the survival vs. psi debate through process-focused mediumship research. *J Parapsychol*. 2009;73:71–90.
- Bierman DJ, Spottiswoode JP, Bijl A. Testing for questionable research practices in a meta-analysis: an example from experimental parapsychology. *PLoS ONE*. 2016;11:e0153049.
- Borenstein M, Hedges LV, Higgins JP, Rothstein HR. *Introduction to meta-analysis*. West Sussex, UK: John Wiley & Sons; 2009.
- Braude SE. *Immortal remains: the evidence for life after death*. Lanham, MD: Rowman & Littlefield Publishers; 2003.
- Cardena E. The experimental evidence for parapsychological phenomena: a review. *Am Psychol*. 2018;73:663–677.
- Carter EC, Schönbrodt FD, Gervais WM, Hilgard J. Correcting for bias in psychology: a comparison of meta-analytic methods. *Adv Methods Pract Psychol Sci*. 2019;2(2):115–144.

- 12 Coburn, K.M., & Vevea, J.L. (2017). Weightr: estimating weight-function models for publication bias (R package Version 2.0.2) [Computer software].
- 13 Edge H. The medium as healer and clown: an interpretation of Balinese mediumship. *J Am Soc Psychic Res.* 1993;87:171–183.
- 14 Edge H. Possession in two Balinese trance ceremonies. *Anthropol Conscious.* 1996;7:1–8.
- 15 Fallon JH. Foreword. In: May EC, Marwaha SB, eds. *Extrasensory perception: support, skepticism, and science (pp. ix–Xvi)*. Santa Barbara, CA: Praeger; 2015.
- 16 Gauld A. Discarnate survival. In: Wolman BB, ed. *Handbook of parapsychology*. New York: Van Nostrand Reinhold; 1977:577–630.
- 17 Haraldsson E, Pratt JG, Kristjánsson M. Further experiments with the Icelandic medium Hafsteinn Björnsson. *J Am Soc Psychic Res.* 1978;72:339–347.
- 18 Heck, D.W., Gronau, Q.F., & Wagenmakers, E. (2017). metaBMA: bayesian model averaging for random and fixed effects meta-analysis. <https://doi.org/10.5281/zenodo.835494>.
- 19 Jamieson GA, Rock AJ. A systems level neuroscience approach to mediumship and the source-of-psi problem. In: Rock AJ, ed. *The survival hypothesis: essays on mediumship*. Jefferson, NC: McFarland; 2014:235–253.
- 20 KPU Registry for Parapsychological Experiments (n.d.). koestlerunit.wordpress.com.
- 21 Langan D, Higgins JPT, Bowden D, Veroniki J, Kontopantelis AA, Simmonds E. . . . Jackson M. A comparison of heterogeneity variance estimators in simulated random-effects meta-analyses. *Res Synth Methods.* 2019;10:83–98. <https://doi.org/10.1002/jrsm.1316>.
- 22 McLuhan R. *Randi's prize: What sceptics Say About the paranormal, why they are wrong, and why it matters*. Leicester, UK: Troubador Publishing; 2010.
- 23 Moher D, Liberati A, Tetzlaff J, Altman DG. Preferred reporting items for systematic reviews and meta-analyses: the PRISMA statement. *BMJ.* 2009;339:b2535.
- 24 Myers FWH. *Human personality and its survival of bodily death*. London: Longmans: Green & Co; 1903. 2 volumes.
- 25 Palmer J. Hansel's ghost: resurrection of the experimenter fraud hypothesis in parapsychology [Editorial]. *J Parapsychol.* 2016;80:5–16.
- 26 Pratt JG, Rhine JB, Stuart CE, Smith BM, Greenwood JA. *Extrasensory perception after sixty years*. Boston, MA: Bruce Humphries; 1940.
- 27 Ravaladini S, Biondi M, Stevenson I. The case of Giuseppe Riccardi: an unusual drop-in communicator in Italy. *J Soc Psychic Res.* 1990;56:257–265.
- 28 Rock AJ, Thorsteinnsson EB, Tressoldi PE, Loi NM, et al. A meta-analysis of anomalous information reception by mediums: assessing the forced-choice design in mediumship research. In: Stanley Krippner, ed. *Advances in parapsychological research*. 10, Jefferson, NC, forthcoming: McFarland; 2020:2000–2019.
- 29 Rosenthal R, Rubin DB. Effect size estimation for one-sample multiple-choice-type data: design, analysis, and meta-analysis. *Psychol Bull.* 1989;106:332–337.
- 30 Rouder JN, Haal JM, Davis-Stober C, Hilgard J. Beyond overall effects: a Bayesian approach to finding constraints across a collection of studies in meta-analysis. *Psychol Methods.* 2019;24:606–621.
- 31 Rubio-Aparicio M, López-López JA, Sánchez-Meca J, Marín-Martínez F, Viechtbauer W, Van den Noortgate W. Estimation of an overall standardized mean difference in random-effects meta-analysis if the distribution of random effects departs from normal. *Res Synth Methods.* 2018;9:489–503.
- 32 Stevenson I, Oram A, Markwick B. Two tests of survival after death: report on negative results. *J Soc Psychic Res.* 1989;55:329–336.
- 33 Stokes DM. The case against psi. In: Cardena E, Palmer J, Marcusson-Clavertz D, eds. *Parapsychology: a handbook for the 21st century*. Jefferson, NC: McFarland; 2015:42–48.
- 34 Sudduth M. Super-psi and the survivalist interpretation of mediumship. *J Sci Explor.* 2009;23:167–193.
- 35 Sudduth M. *A philosophical critique of empirical arguments for postmortem survival*. Basingstoke, MD: Palgrave Macmillan; 2016.
- 36 Utts J. Replication and meta-analysis in parapsychology. *Stat Sci.* 1991;6:363–378.
- 37 van Aert, R.C.M., & van Assen, M.A.L.M. (2018, October 2). P-uniform\*. <https://doi.org/10.31222/osf.io/zqjr9>.
- 38 Viechtbauer W. Conducting meta-analyses in R with the metafor package. *J Stat Softw.* 2010;36:1–48.
- 39 Viechtbauer, W. (2017). The metafor package. Retrieved August 3, 2017, from <http://www.metafor-project.org/doku.php>.
- 40 Wagenmakers E-J, Wetzels R, Borsboom D, Kievit RA, van der Maas HLJ. A skeptical eye on psi. In: May EC, Marwaha SB, eds. *Extrasensory perception: support, skepticism, and science*. Santa Barbara, CA: Praeger; 2015:153–176.
- 41 Williams BJ. Revisiting the Ganzfeld ESP debate: a basic review and assessment. *J Sci Explor.* 2011;25:639–661.
- 42 Wiseman R, Watt C, Kornbrot D. Registered reports: an early example and analysis. *PeerJ.* 2019;7:e6232.