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RESEARCH ARTICLE

The Myth of Publication Bias in Psi Research: A Comparison Between Parapsychology and Mainstream Psychology

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ABSTRACT

This study investigates the persistent claim that publication bias contaminates (indeed, possibly inflates) the scientific evidence for parapsychological phenomena, specifically extrasensory perception (ESP). We analyzed 165 published studies (243 experiments) from recent ESP meta-analyses and 40 preregistered confirmatory experiments from the Koestler Parapsychology Unit Registry. We compared these two datasets to datasets from the field of mainstream psychology. Our primary measure was the percentage of peer-reviewed experiments reporting null statistically significant outcomes (i.e., $p > 0.05$). Results indicate that the rate of published experiments with null outcomes in ESP research is considerably higher than that observed in psychology, for both non-preregistered and preregistered experiments. While the publication bias is substantially smaller, suggesting more balanced reporting of parapsychological outcomes compared to mainstream psychological research, we cannot conclusively show that the statistical evidence for ESP is not an artifact of that relatively minimal bias, but a number of earlier tests on the file-drawer problem do undermine that assumption.

KEYWORDS

File-Drawer Problem, Psychology, Parapsychology, Publication Bias, Questionable Research Practice.

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INTRODUCTION

Publication bias describes the tendency for peer-reviewed journals to favour (i.e., publish) studies that report statistically significant results supporting researchers' hypotheses while non-supportive studies with non-significant, negative, or chance results, are rejected (i.e., not published). This selective reporting is a questionable research practice (QPR, Larsson et al., 2023) because it creates a distorted view of the scientific literature, often making the evidence for phenomena appear more substantial or prevalent than is warranted.

In the field of psychology, some will argue that publication bias is over-stated. For example, Dalton et al. (2012) argued that their five studies provided "consistent empirical evidence that the file-drawer problem does not produce an inflation bias and does not pose a serious threat to the validity of meta-analytically derived conclusions as is currently believed" (p. 222). However, their findings are confined to industrial/organizational psychology that

do not necessarily generalize to experimental psychology or fields with different research incentives. Furthermore, other meta-analyses have reported consistent publication bias in psychology—e.g., stereotype threat (Lamont et al., 2015) and social priming (Mac Giolla et al., 2024).

We may therefore accept that publication bias exists, but unfortunately, born of this bias is a claim that has persisted in the long term that the scientific evidence for so-called parapsychological phenomena (e.g., extra-sensory perception, or ESP) is severely contaminated by publication bias (Francis, 2012; Hyman, 2017; Kennedy, 2004; Wiseman & Watt, 2006).

We must add that the problem of publication bias may not be entirely attributable to decisions made at the editorial level, but can start with researchers/experimenters who, in the past, may have refrained from submitting to journals any of their studies they deemed 'unsuccessful', meaning their statistical test results did not reach significance.

The problem with publication bias (in the specific context of the present paper) invariably leads to accusations of selective reporting, giving rise to the file-drawer problem, often raised against psi meta-analyses, especially in the ganzfeld domain (see Hyman, 1985, 2017). This problem was recognised and acknowledged in 1975, resulting in the Parapsychological Association (PA) Council adopting a strict policy of opposing the exclusive publication of studies with only positive (psi-supportive) outcomes. Thereby, "*negative findings have been routinely reported at the association's meetings and in its affiliated publications*" since that date (Bem & Honorton, 1994, p. 6; see also Honorton, 1985, p. 66).[1] This policy encouraged researchers to submit their papers regardless of experimental outcomes. Bierman et al. (2016) actually mention this publication policy, and they stated that "a non-significant outcome is not a danger to the career of the parapsychologist" (p. 8).

Nevertheless, no policy is water-tight or fool-proof, and given the apparent weirdness of many parapsychological phenomena, it seems an obvious and logical step for some skeptical scientists and like-minded critics to conclude that, *due to the persistent problem of publication bias, the available evidence is not only unreliable but probably not valid* (Francis, 2012; Wagenmakers et al., 2011). In this report, we present some statistics that should undermine those claims and hopefully convince the skeptic that:

1. The scientific evidence for parapsychological phenomena is not an artifact of publication bias, and,
2. if any evidence for publication bias exists, it is of no consequence to the field of parapsychology but may be a problem for mainstream psychology.

The statistical method we use involves basic percentage comparisons of collections of studies, both psychological and parapsychological. The statistics from the discipline of psychology are drawn from earlier meta-analyses and reviews (for details, see the sub-section Data Evaluation in the Method section). Six key psychological studies were used: Fanelli (2012), Klein et al. (2018), Open Science Collaboration (2015), Scheel et al. (2021), Toth et al. (2021), and van den Akker et al. (2024). These studies examined trends such as the decline in published null results, variability in replicability and reproducibility rates, the rise in positive findings, and patterns in pre-registration practices.

Similarly, statistics were drawn from extant literature in the sub-discipline of parapsychology (Duggan & Tressoldi, 2018; Mossbridge et al., 2012; Storm & Tressoldi, 2023; Storm et al., 2010; Tressoldi & Katz, 2023; Tressoldi & Storm, 2024). These studies also provided (or linked to) the sources of databases of four experimental domains (Forced-Choice, Remote Viewing, Ganzfeld, and Presentiment. For definitions, see Literature Search in the Methods section). These studies enabled further analyses and more concise comparisons within the field.

We argue that cross-disciplinary comparisons we undertook in the present study are valid and informative. Specifically, and for our purposes, the two domains contribute empirical findings relevant to publication trends, but importantly, the percentage differences between disciplines and between domains refer to counts of studies and are therefore quantitative (not qualitative).

METHOD

Literature Search

We sampled the recent meta-analyses on ESP studies that used the four most prominent experimental protocols: namely, Forced-Choice (Storm & Tressoldi, 2023), Ganzfeld (Tressoldi & Storm, 2024), Remote Viewing (Tressoldi & Katz, 2023), and Presentiment (Duggan & Tressoldi, 2018). These so-called 'paradigms' or experimental domains, are defined thus:

- A 'forced-choice' test is a test of ESP where the target-guess is "one of a limited range of possibilities which are known in advance" (Thalbourne, 2003, p. 44);

- The ganzfeld is a "special type of environment (or the technique for producing it) consisting of homogenous, unpatterned sensory stimulation" to the eyes and ears of the participant, who is usually in "a state of bodily comfort" (Thalbourne, 2003, p. 45). The ESP test during ganzfeld is basically free-response, meaning "*the range of possible targets is relatively unlimited and is unknown to the percipient, thus permitting them to respond freely with whatever impressions come to mind*" (Thalbourne, 2003, p. 44);
- Remote viewing is a "neutral term for general extra-sensory perception introduced especially in the context of an experimental design in which a percipient attempts to describe the surroundings of a geographically distant agent" (Thalbourne, 2003, p. 107.);
- Presentiment refers to "*an unconscious form of precognition, that is, pre-feeling (sentiment) as compared to pre-knowing (cognition)*" (Radin, 2016).

We included only those studies published in peer-reviewed scientific journals so the comparison of those studies with studies published in psychological journals would be valid. This criterion gave us 249 experiments from a total of 171 studies. The list of selected studies is available at https://zenodo.org/records/16947132.

Furthermore, from the Koestler Parapsychology Unit (KPU) Registry (Watt & Kennedy, 2015), a dedicated open-access repository for preregistered studies in parapsychology, we extracted all outcomes of confirmatory experiments completed by June 30, 2025 since its inception in the fall of 2012, based both on the outcomes posted on the Registry by the authors of the studies, and on the relevant published papers if available. A list of these studies is available at the same link.

Positive Outcome Criterion

For each experiment included in the selected studies, we checked whether the statistical findings that were to support the hypotheses under investigation reached a statistical threshold of $p < 0.05$ (one-tailed), which would support the research hypotheses provided the effects were in the direction hypothesized (e.g., a theory-driven *positive* correlation was hypothesized and found). While we could not ascertain whether some experimenters set a more stringent alpha (e.g., $\alpha \leq 0.01$), we chose 0.05 because it is still the most used in parapsychology and psychology notwithstanding other criteria such as effect size or Bayes Factor estimation.

Data Evaluation

For parapsychological studies, we calculated the percentage of studies with statistically non-significant (null) results (i.e., studies that failed to reject the null hypothesis). The difficulty here is that some studies reported multiple experiments of which some were significant, some not. We defined a 'significant study' as being a study with *at least one* statistically significant experiment. Accordingly, we also report percentages of studies *and* experiments with significant results.

For psychological studies, we drew statistics from the six previously mentioned psychological studies: Fanelli (2012), Klein et al. (2018), Open Science Collaboration (2015), Scheel et al. (2021), Toth et al. (2021), and van den Akker et al. (2024). These studies assessed (i) declines in the number of published studies with negative results (Fanelli, 2012); (ii) variations in replicability rates (Klein et al., 2018); (iii) reproducibility rates in psychology (Open Science Collaboration, 2015); (iv) increases in the number of published psychological studies with positive results (Scheel et al., 2021); and (v) pre-registration rates (Toth et al., 2021; van den Akker et al., 2024).

RESULTS

Figure 1 shows the percentage of *null statistical outcomes*[2] of the parapsychological experiments published in peer-reviewed journals (i.e., 168/249 = 67.5%) compared with those observed in three different studies examining the same issue related to mainstream psychological studies (Fanelli, 2012, Scheel et al., 2021; Toth et al., 2021). For actual parapsychological studies without *at least one* significant experiment (i.e., those studies that did not meet the minimum to justify publication under the skeptical hypothesis explaining publication bias), the percentage is 63.7% (109/171).

So, the risk of publication bias of parapsychological experiments is still much lower than that of mainstream psychology, ranging between 63.7% and 67.5%.

Percentages for the four experimental domains are shown in Table 1. We see that success rates for Remote Viewing (RV) and Presentiment (PS) are considerably higher than Forced-Choice (FC) and Ganzfeld (GZ), but still generally less than for psychology. We argue that these outcomes do not suggest publication bias, see more in the Discussion.

Figure 2 shows the percentage of experiments with null statistical outcomes (55/71 = 77.5%) observed in the

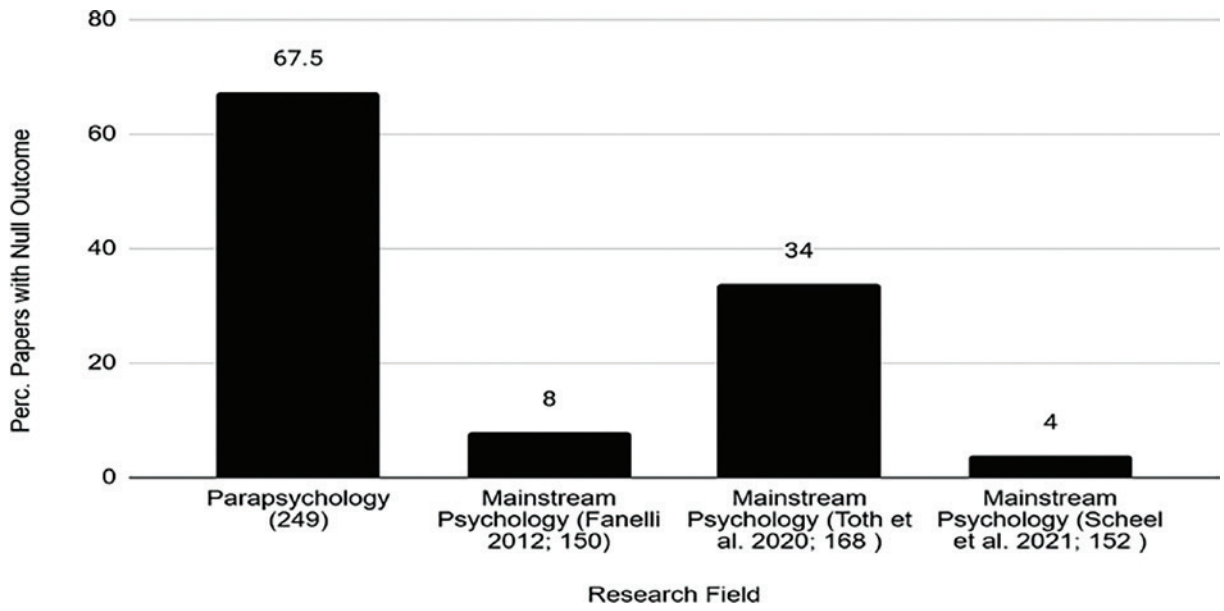

Figure 1. Percentage of papers published with null outcomes observed in non-preregistered experiments. In parentheses are the number of studies examined.

Table 1. Counts of Studies and Experiments in Four Psi experimental protocols (FC, GZ, RV & PS) reaching a significant statistical outcomes.

Paradigm	Studies	Sig. Studies (%)*	Experiments	Sig. Experiments (%)
Forced-Choice (FC)	84	21 (25.0%)	123	29 (23.6%)
Ganzfeld (GZ)	46	13 (28.3%)	66	16 (24.2%)
Remote Viewing (RV)	22	14 (63.6%)	26	17 (65.4%)
Presentiment (PS)	19	14 (73.7%)	34	19 (55.9%)
Totals	171	62 (36.2%)	249	81 (32.5%)

*Number of studies with *at least one* statistically significant experiment.

preregistered confirmatory hypotheses included in the 40 studies reported in the KPU Registry, compared with those observed in five different studies related to preregistered experiments related to mainstream psychological phenomena (Klein et al., 2018; Open Science Collaboration [OSC], 2015; Scheel et al., 2021; Toth et al., 2021; van den Akker et al., 2024).

In both Figures 1 and 2, it is evident that both non-preregistered and preregistered experiments related to ESP show percentages of published experiments with null outcomes considerably higher compared to experiments related to mainstream psychological phenomena.

The File-Drawer Problem

A suggestively low publication bias may mean the field of parapsychology is more open to reporting all outcomes. The file-drawer problem (explained in the Introduction) must therefore still be considered a key concern to the field. Critics may argue that sufficient numbers of non-significant studies may still remain unpublished, and if they had been published and included in the meta-analyses, the significant overall results would shrink to non-significance. In the following four cases, we argue that past research on this problem provides little evidence for the critic's argument:

Forced-Choice

Similar to the finding above, Storm and Tressoldi (2023) noted that 29 (21%) of 141 studies in their homogeneous database of forced-choice experiments is not large, and they argued that their "database is not likely to have been contaminated by publication bias" on the basis that a much larger percentage of significant studies could be expected "as a result of authors withholding (not publishing) unsuccessful studies" (p. 526), meaning the statistical test(s) did not yield results that reached significance at the pre-determined

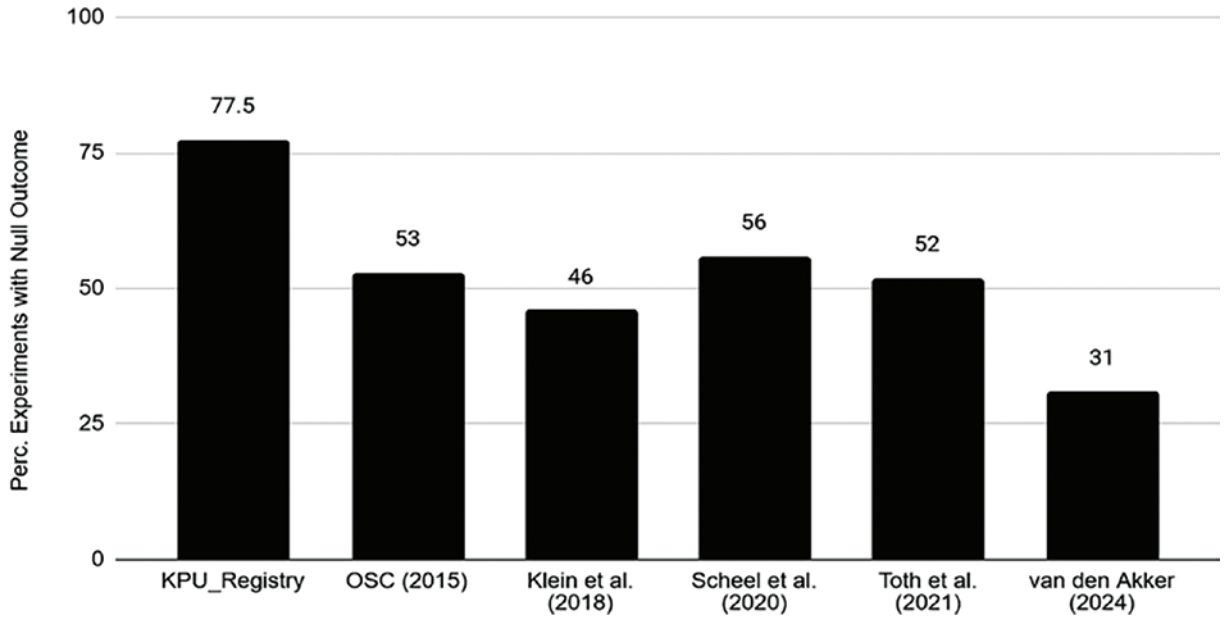

Figure 2. Percentage of experiments with null statistical outcomes observed in preregistered studies.

critical alpha level (typically $\alpha < 0.05$). However, they also noted that the majority of studies in their meta-analysis (91%) were "either published in journals specializing in parapsychology or journals known to be favorable to parapsychological research [regardless of the findings]" (p. 526).

Ganzfeld

An early assessment of the ganzfeld domain by Storm et al. (2010) gave a conservative estimate of 384 unpublished studies necessary to reduce the significance level to chance, based on their findings of 27 ganzfeld studies with significant positive outcomes in a database of 102 studies (pp. 477-478). It was regarded as unlikely that 384 additional studies with non-significant outcomes remained unreported and were tucked away in file-drawers at that time (about four unpublished studies for every one published study). Given the few researchers in parapsychology, and the great effort required to run a typical ganzfeld study, it is unlikely that such a number of unpublished studies exists.

Furthermore, the most recent meta-analysis by Tressoldi and Storm (2024) passed four different tests testing the publication bias. In particular, in a sensitivity analysis by Mathur and VanderWeele (2020), it was observed that for publication bias to attenuate (to "explain away") the observed overall effect size, affirmative results would need to be at least four-fold more likely to be published than nonaffirmative results.

Remote-Viewing

Tressoldi and Katz (2023) found no evidence of publication bias in their meta-analysis. The percentage of studies with *non-statistical positive results* (i.e., studies with non-significant test results yet were in the direction hypothesized) was 34.2%, and by using two modern statistical tests, the three-parameter selection model (Coburn & Vevea, 2019), and the Robust Bayesian Meta-Analysis (Bartoš et al., 2022), both showed that the overall results were not contaminated by publication bias.

Presentiment

In the meta-analyses by Mossbridge et al. (2012), and of Duggan and Tressoldi (2018), the percentages of studies with non-statistical positive results were respectively 54% and 58%. Furthermore, publication bias was found to be unlikely using, respectively, the Orwin (1983) and the Copas tests (Jin et al., 2015).

DISCUSSION

Publication bias refers to the practice of publishing in scientific journals (thus making public) only those studies with positive outcomes that support researchers' hypotheses. With this publication filter, whereby negative outcomes do not see the light of day, many phenomena may be spuriously supported by a restricted (biased) presentation

of scientific evidence. The present study aimed to test this claim that scientific evidence for ESP may largely be an artifact of publication bias. From the perspective of parapsychological domains, *combined* as single heterogeneous database (forced-choice, ganzfeld, remote viewing, and presentiment), we found that the biases were lower for preregistered and non-preregistered studies when these two datasets were compared to the same two respective categories in the psychological literature.

The results illustrated in Figures 1 and 2 clearly show that the claim of publication bias often leveled against parapsychology is most likely a myth. In fact, authors conducting ESP research endorse the methodological practice of publishing both positive and negative statistical outcomes of their experiments at a higher level than their peers who investigate mainstream psychological phenomena.

From the perspective of the four major parapsychological domains *considered separately* (forced-choice, ganzfeld, remote viewing, and presentiment), we found that the success rates for experiments in Remote Viewing (65.4%) and Presentiment (55.9%) were considerably higher than those in Forced-Choice and Ganzfeld, though still not higher than for psychology (see Figure 1). We next offer to explain these higher rates, but we point out that the reasons given here rule out publication bias.

First, Remote Viewing:

- Protocol flexibility: Remote Viewing often allows participants to describe targets in free-form ways, which can be more forgiving and open to interpretation than Forced-Choice tasks.
- Judging methods: Evaluations often involve blind judging or rank-order matching, which can increase the likelihood of detecting subtle effects.
- Participant selection: Studies frequently use individuals with prior experience or interest in psi phenomena, which may enhance performance.

Second, Presentiment

- Physiological measures: These studies often rely on unconscious bodily responses (e.g., skin conductance, heart rate) before a stimulus is presented. These are less prone to subjective interpretation and may reveal subtle anticipatory effects.
- Automated data collection: Reduces experimenter bias and increases replicability.

Added to this defence, we argue that Forced-Choice and Ganzfeld lag behind the other two domains for the following reasons.

First, Forced-Choice:

- Task fatigue: Repetitive guessing tasks can lead to boredom or disengagement, which may suppress psi effects.
- Smaller effect sizes: Even when effects are present, they tend to be weaker and more variable (hence, a higher rate of non-significant experiments/studies reported).
- Replication uncertainty: Large-scale replications often fail to reproduce earlier findings, possibly due to subtle psychological factors or lack of psi-conducive conditions.

Second, Ganzfeld:

- High variability: Results depend heavily on participant traits, experimental setup, and even the emotional content of target stimuli.
- Resource intensity: Ganzfeld experiments are labour-intensive and costly, limiting the number of high-powered replications.

Thus we find discrepancies because Remote Viewing and Presentiment benefit from more psi-conducive conditions, greater methodological flexibility, use of non-conscious or intuitive processes, and participant selection based on traits linked to psi performance. Forced-Choice and Ganzfeld, however, are more rigid, resource-heavy, and sensitive to subtle design flaws, making them more vulnerable to replication issues and lower success rates.

Having considered the biases, albeit minimal compared to mainstream psychological phenomena, from the perspective of the file-drawer problem, we conclude that the argument for publication biases in the four psi domains is unwarranted.

Study Limitations

The results of this study cannot be generalized to experiments related to mind-matter interaction phenomena (i.e., psychokinesis), given the lack of recent meta-analyses related to such phenomena. However, it is plausible to expect the same methodological practice from authors who investigate such phenomena, given that most of them investigate ESP.

Due to the data being from extant databases not especially prepared for the present study (along with our arguably *post hoc* approach), this paper remains retrospective and indeed exploratory. Also, we could not test to see if

the reported differences were significant, so the element of chance has not been eliminated, though we suggest the chance factor is unlikely to have arisen so frequently. We note too that it was not possible to conduct more acute investigations of the extenuating circumstances that might underly *disproportionality* in publication bias (e.g., publication bias occurring for reasons unique to psychology to do with research designs, statistical thresholds, or publication practices that make publication bias fundamentally different from other fields; in particular, parapsychology). This point leads to the following *caveat*:

We cannot conclusively show one way or another that psychological research may naturally be more successful in terms of significance levels than parapsychological research, or that this is even the case. And while we might ask why the parapsychological studies are not as successful or more successful, we must still ask, Do psychological studies only *seem* as successful as they are? In fact, as we argued in the Introduction, publication bias does exist in psychology, but the comparatively high success rate may be because it has the theoretical underpinnings that parapsychological research lacks. Psi theories simply do not have a proven track record (i.e., they often fail to find support). While many studies conducted by psychologists may have a strong component of theoretical novelty, in all probability they can legitimately rely on taken-for-granted assumptions with a proven track record. Of course, as we have said, that does not negate the presence of publication bias, nor undermine the reality of the replication crisis in psychology which often lacks strong overarching theoretical frameworks (see Muthukrishna & Henrich, 2019).

Finally, conceptually (as one reviewer remarked), some may say a more critical approach would not have focused on *p* values, but on replicability, which is better demonstrated through repeated studies or validation via training and test samples, an approach often underemphasized not only in psychology but also in parapsychology. However, these issues are beyond the scope of this study, as is an investigation of QRPs other than publication bias. One final *caveat* worth repeating, our study is not a categorical proof of the psi hypothesis.

CONCLUSION

Having noted the limitations of this study, it may be more the case that ESP studies are as legitimately successful as we have shown them to be, and less the case (if at all) that they represent a completely different field of inquiry ontologically speaking. Also, for its methodological rigour, transparency under intense scrutiny, and openness about null (and even negative) results (and publication thereof), as well as methodological limitations, parapsychological research is frequently cited for its meticulous controls and replicability standards (Boccuzzi, 2024; Ferada, 2018). These facts also justify our claim that publication bias is lower in parapsychology than in psychology as shown in the present study.

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END NOTES

1 The term 'negative findings' means the studies failed to find evidence for psi phenomena either because statistical test results were not significant even if they indicated effects in the direction hypothesized, or *are* significant but effects were not in the direction hypothesized.

2 A *null statistical outcome* means the test result, derived from analysing data following the principle of Null Hypothesis Statistical Testing, did not reach a significant *p* value (i.e., $p < 0.05$) in any tested hypothesis.

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