
The Kryptonite of Evidence-Based I–O Psychology

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The focal article (Briner & Rousseau, 2011) addresses at length the merits of systematic reviews for advancing evidence-based practice. In general, we are in agreement with the authors, but we identify one major omission of the focal article that is critical for advancing evidence-based industrial–organizational (I–O) psychology and management: the topic of publication bias.

Publication bias exists when primary study results available to a reviewer systematically differ from all primary study results (McDaniel, Rothstein, & Whetzel, 2006; Rothstein, Sutton, & Borenstein, 2005). Typically, publication bias serves to cause systematic reviews to overestimate the magnitude of effects. Thus, an ineffective management practice may be declared effective. Although systematic reviews (including qualitative studies and quantitative studies, such as meta-analyses) may demonstrate “superman”-like qualities for their abilities to advance cumulative knowledge and evidence-based practice, publication bias can have a devastating effect on the accuracy of the reviews, much like “kryptonite” has a debilitating effect on Superman.

The focal article asks, “What is needed to make I–O psychology an evidence-based

discipline?” Evidence-based practice is well established in other fields, particularly in medicine. Medicine has long investigated how publication bias influences systematic reviews and limits evidence-based practice. We believe that Society for Industrial and Organizational Psychology (SIOP), scientists, and practitioners, through collaboration, hold the key to overcoming publication bias. The following commentary concisely explains recommendations for preventing and evaluating publication bias to promote improved systematic reviews and evidence-based practice.

Causes of Publication Bias

Contrary to popular belief, the editorial review process is not the only cause of publication bias (Dickersin, 2005; Halpern & Berlin, 2005), there are multiple causes. Table 1 displays the most common causes of publication bias. As indicated in Table 1, there are two primary causes of publication bias. The first cause derives from publication issues and the second stems from access issues.

It is not clear how prevalent publication bias is in I–O psychology. Studies have evaluated the presence of publication bias in test vendor data (McDaniel et al., 2006) as well as racial differences in job performance (McDaniel, McKay, & Rothstein, 2006) and personality results (Tate & McDaniel, 2008). Findings in these examples indicate the existence of publication bias. Another study explored

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Table 1. Sources of Publication Bias That Impede Evidence-Based Practice

A. Publication issues	The study is not accepted by a conference or journal	The study is submitted and accepted
<p>The study is not submitted for one or more of the following reasons</p> <p>Decision of the author:</p> <ol style="list-style-type: none"> 1. The study has a small sample size and a small magnitude effect 2. The results are statistically insignificant 3. The results are contrary to theory 4. The results are contrary to trend of past research 5. The results are contrary to the position of the author (e.g., an advocate of personality testing in personnel selection has results indicating near zero validity for a personality measure) 6. The author believes that the study has a limited chance of acceptance 7. The author never gets around to submitting the paper <p>Decision of the organization that owns the data:</p> <ol style="list-style-type: none"> 1. The results present a liability to the organization (e.g., an employment test shows adverse impact) 2. The results are harmful to an organization's profits (e.g., a consultant has evidence that its product or services do not work) 	<p>The study is not accepted by a conference or journal</p> <ol style="list-style-type: none"> 1. The results are not sufficiently interesting to warrant publication 2. The study has a small sample size and a small magnitude effect 3. The results are statistically insignificant 4. The results are contrary to the theory 5. The results are contrary to the trends of past research 6. The results are contrary to the position of the editor or reviewer (e.g., the editor/reviewer believes A to be true and the paper argues that A is not true) 	<p>The study is submitted and accepted</p> <ol style="list-style-type: none"> 1. The editor requests that some results be removed from the paper to save space 2. The editor requests that some results be removed from the paper because it is socially uncomfortable (e.g., editor requests that sex difference results be removed) 3. The editor requests that some results be removed because they are contrary to the editor's position (e.g., the editor believes A to be true and the paper argues that A is not true) 4. The author removes some results that are socially uncomfortable prior to submission or during a revision process 5. The author removes some results that are contrary to the author's position prior to submission or during a revision process 6. An author ignores requests for results not reported in the article
<p>B. Access issues (identifying grey literature; Hopewell, Clarke, & Mallett, 2005)</p> <ol style="list-style-type: none"> 1. A conference paper is presented but never distributed to researchers who request it 2. Studies are not identified, located, or retrieved in systematic searches 3. Researchers conducting a systematic review elect not to or are unable to translate studies published in foreign languages 4. An insufficient number of studies has been conducted and is available, resulting in a summary effect size that may be due to chance or genuine heterogeneity 5. Time-lag bias and Proteus effect: Results that are statistically significant or interesting are published more quickly (Trikalinos & Ioannidis, 2005) 		

the possibility of publication bias in regards to the validity of customer service tests (Whetzel, 2006). This study found little evidence for publication bias in the validity of customer service tests. The best conclusion that can be drawn at this point is that the degree to which publication bias affects our scientific results and our evidence-based practice is unknown. Most systematic reviews in I–O psychology do not address publication bias. What is clear is that evidence-based practice cannot develop as illustrated in the focal article without addressing the need for SIOP, scientists, and practitioners to collaborate in the completion of systematic reviews that account for and minimize publication bias.

Steps I–O Psychology Can Take to Limit Publication Bias

We present five recommendations for SIOP, scientists, and practitioners that can be used to limit the influence of publication bias on systematic reviews and, therefore, to improve evidence-based practice.

Recommendation #1: Create research registries. The creation of research registries as an attempt to prevent and limit the influence of publication bias is not a new concept (Berlin & Ghersi, 2005). A research registry is an electronic database where researchers register the studies that they plan to conduct, are in the process of conducting, or have already conducted. Research registries already exist in several fields that conduct evidence-based practice, such as in education (e.g., *What Works Clearinghouse* established in 2002 by the U.S. Department of Education), social work (e.g., *Campbell Collaboration*), and medical research (there are many, some have argued too many).

Research registries can aid in systematic reviews by assisting the reviewer in locating studies that would otherwise likely be missing from a review. Registries could also limit the frequency with which researchers replicate studies with near-zero population effects. Such replications may be attempted

when the previous studies that showed near-zero magnitude effects were not published or were otherwise not available. Furthermore, registries can help facilitate collaboration and communication between researchers and practitioners. For example, one technique referred to as prospective meta-analysis determines *a priori* to include studies that are not yet underway or completed. Scientists and practitioners can decide to collaborate and conduct a series of studies to be included in a prospective meta-analysis. This technique encourages standardization in research design as researchers collaborate on the variables included and the types of measures used. Registries can help to diminish the influence of publication bias even if they are incomplete. A complete registry, although desired, is not necessary to begin to prevent and mitigate the influence of publication bias (Berlin & Ghersi, 2005). We suggest that SIOP (and the Academy of Management) could lead the way in creating a registry for scientific research using all papers submitted to the annual conferences.

Recommendation #2: Improve reporting practices of systematic searches. From our perspective, a primary deficiency of I–O psychology meta-analyses is in the literature reviews and documentation of their literature reviews. Literature reviews need to be explicit, transparent, and replicable. Systematic reviews should fully report efforts to identify published and unpublished studies from multiple sources. Scientists should seek unpublished studies to be included in both qualitative and quantitative systematic reviews. This practice is common in traditional meta-analyses published in I–O psychology. However, scientists must consider all the causes of publication bias displayed in Table 1. The focal article noted that academics and practitioners are not mingling with each other in journals. Collaboration on systematic reviews to obtain published and unpublished studies (e.g., technical reports and internal data) can lead to less publication bias and superior systematic reviews.

Recommendation #3: Evaluate the presence and influence of publication bias.

Every systematic review should address the attempts of the researchers to evaluate the presence and influence of publication bias. There are well-established techniques to evaluate the presence and influence of publication bias in qualitative and quantitative systematic reviews. Due to the limited nature of this commentary, we do not address specific methodological techniques that can be employed in systematic reviews (For a complete review of those methods see Borenstein, Hedges, Higgins, & Rothstein, 2009; Rothstein et al., 2005). More method development is needed, particularly when evaluating potential publication bias in the presence of moderators or other sources of variance, such as differences across studies in measurement error and range restriction/enhancement. Nonetheless, all systematic reviews should fully report the results of their evaluation of publication bias; otherwise, we will never learn the extent to which publication bias is or is not a problem for our field.

Recommendation #4: Practice customer-centric science.

A recent paper by Aguinis et al. (2009) reviews the manner in which primary studies may be conducted and reported that would address a science–practice gap. One recommendation is that researchers could conduct a focus group after completing a study. The outcome of the focus group is to identify the practical significance of certain study results. We propose to extend the suggestion made in this paper to systematic reviews. It is possible that the presence of publication bias influences the results of a systematic review but does not change the ultimate conclusion of the practical significance. For example, publication bias may be found in test vendor data, such that it overestimates the validity of a test that predicts counterproductive work behaviors. In other words, a test with a population validity of .10 is offered as having a validity of .40. In the context of some organizations, the practical significance of such a finding may diminish to the point that the

organization would no longer use the test. However, in an organization where counterproductive work behavior can have huge financial (e.g., a bank) or social (e.g., a hospital) consequences, a validity of .10 may still have practical significance. Therefore, the customer-centric approach advocated by Aguinis et al. may be applied to the evaluation of the influence of publication bias on systematic reviews and, therefore, evidence-based practice.

Recommendation #5: Release unpublished studies.

Practitioners should cooperate with the attempts of scientists and other practitioners to conduct systematic reviews. Organizations can greatly aid both science and practice by releasing internal studies for systematic reviews. This would help to limit publication bias. If a technical report merits inclusion in a systematic review to be published, the researchers can agree to protect the identity of the organization that supplies the technical report. Journal editors need to be accepting of data cited so as to maintain confidentiality of the data source. Organizations should reward and recognize their employees who provide research for systematic reviews.

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