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Opening Up: A Primer on Open Science for Industrial-Organizational Psychologists

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Introduction

My purpose with this "Opening Up" article is to orient *TIP* readers – both practicing I-O psychologists and academics—to open science. Think of this particular article as your first class on open science. I will share an interesting story to give you some historical context on the open science movement, highlight facts that should make it abundantly clear why you are taking this course, and clarify key terms that you need to know. Subsequent articles will touch on the many ways we might make our collective work more replicable, reproducible, and credible by adopting open science practices. By the end of this course, my goal is that you leave more aware of the need for open science, but also possessing effective tactics for opening up our science. Crucially, I hope to leave you with more questions than answers.

A Brief History of the Replication Crisis

In 2011, a study was published in a top-tier journal—the *Journal of Personality and Social Psychology* (JPSP) —that fundamentally challenged the methodological foundations of psychological science writ large. This study, conducted by eminent Cornell University social psychologist Daryl Bem, presented nine studies involving over 1,000 participants on *precognition* (i.e., conscious awareness of future events) and *premonition* (i.e., affective apprehension regarding future events), eight of which provided statistically significant evidence that individuals held the ability to feel the future (Bem, 2011). The studies involved taking classical psychological phenomena—such as how erotic images cause arousal and training can affect recall—and time-reversing the effects (e.g., if someone received training in the future, that would facilitate performance in the present). Bem estimated that such *psi* effects were rather robust for psychological phenomena: a Cohen's *d* of .22. Just imagine pitching *psi* to an executive via a utility analysis to garner support for a future training investment: "If we train employees in the future, they will perform better in the present because of *psi*."

Bem's work caught the attention of the media and the broader scientific community. He appeared on MSNBC claiming to provide strong evidence of psychic phenomena (MSNBC, 2011) as well as Comedy Central's *Colbert Report* (see "Time-Traveling Porn", Colbert, 2011). Quickly thereafter, his work was roundly criticized by the academic community. *Psi* had long been a debunked idea (see Alcock, 2011). It also raised serious questions about the quality of statistical thinking going on in psychology and whether we should abandon null hypothesis significance testing (see Wagenmakers, Wetzels, Borsboom, & van der Maas, 2011). Scholars called into question the quality of the peer review process in general and the values of the academic community (i.e., quantity over quality, publish or perish; see Gad-el-Hak, 2011) and raised the possibility that science itself was broken (Engber, 2017).

Though there were many attempted replications that failed to support Bem's findings (see Galak, LeBoeuf, Nelson, & Simmons, 2012; Ritchie, Wiseman, & French, 2012), the debate over the substantive nature of Bem's contributions is still unresolved. In fact, there is a large-scale collaborative effort to replicate Bem's work going on in the present (Kekecs et al., 2019). Notably, one replication attempt (i.e., Ritchie et al.) was rejected by JPSP because the journal does not publish replications (see Aldhous, 2011). This reflects a deeper trend among publications in psychology. A review of psychological studies