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INTRODUCTION



CRSP special issue on power poses: what was the point and what did we learn?

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The possibility that holding an expansive nonverbal display for two minutes could affect a person's behavioral, psychological, and physiological states was a provocative idea when first proposed (Carney, Cuddy, & Yap, 2010). Specifically, the notion that a static nonverbal expression could affect a person's endocrine profile – namely their cortisol and testosterone levels – was so provocative it was almost preposterous. However, the field of social psychology took notice. Additional claims were then made about how such poses might positively impact a person's life, particularly for people “with no resources and no technology and no status and no power” (Cuddy, 2012).

This exciting proposition ignited a wave of popular interest, evidenced in one way by the enormous popularity of a TED talk about the idea that has, at the end of 2016, already been viewed 38 million times. Beyond this specific finding, Carney et al. (2010) hoped to offer an important theoretical contribution to theories of mind–body interaction such as the James–Lange theory of emotion (James, 1884; Lange, 1912) and Jamesian notions of ideomotor action (for a review, see Laird & Lacasse, 2014). This work hoped to offer support for a bidirectional link between a nonverbal display of a powerful-looking posture and the mental and physiological states that were indicative of possessing power.

This idea was, to put it mildly, subject to the hard glare of scientific inquiry not long after its debut. Approximately 5 years after the original paper was published, a conspicuous failure to replicate (Ranehill et al., 2015) caught the attention of many who were already skeptical – including Carney herself. A response (Carney, Cuddy, & Yap, 2015) to Ranehill et al. dutifully listed the many differences between the original 2010 paper and the 2015 failure to replicate that might have served as possible moderators. Further variations on the original power pose work were published, many by the original research team members – albeit based on data collected before the Ranehill publication – including work demonstrating that power posing could positively impact job interview performance (Cuddy, Wilmuth, Yap, & Carney, 2015).

At the same time, among some circles the idea became a shorthand for flashy social psychological work that could not be replicated (see, e.g., Andrew Gelman's blog posts on the topic and additional failures to replicate such as Garrison, Tang, & Schmeichel,

2016). Further, it became increasingly clear to some authors of “power pose” work that effects were fragile at best, and likely not replicable as researchers across the world wanted to discuss minor differences between the original study and theirs – because their work did not replicate the original (Carney, 2016). Much of this work was never published. Perhaps the authors of the failed replications did not wish to throw fuel on the fire, but the fire was already burning when a p-curve analysis of the reply to Ranehill written by Carney et al. (2015) suggested strongly that even though some papers showed effects, overall the body of work had no evidentiary value (Simmons & Simonsohn, 2015).

In this context, one purpose of this Special Issue by CRSP was to gather additional data – but this time transparent and preregistered – about the effects of power poses, including direct replications and tests of possible moderators. Our aim in this regard was to demonstrate the possibility of a different path than the unproductive cycle that social psychology has come to know all too well in recent years: a provocative finding with a small sample size, a failure to replicate, a rebuttal outlining all the possible reasons (some would say excuses) for the failure, researchers entrenching in their views and refusing to update based on new data, and so on. Part of our aim, then, was to show how researchers could coordinate and cooperate in an effective and efficient manner.

We admit that we were expecting this special issue to be a “final word” on the topic, providing a consistent and definitive answer on both the replication and novel effects. As the results rolled in, we initially believed that we were on exactly this path, as the preregistered predictions failed to show strong evidence of effects. We further expected that the issue-wide analysis, overseen by E.J. Wagenmakers, would confirm these expectations. However, a surprise awaited us as the novel Bayesian meta-analysis conducted by Gronau (Gronau et al., this issue) in fact showed a reliable non-zero effect on felt power, despite the majority of individual studies failing to reject the null hypothesis. (Unfortunately, the measure of felt power was the only measure included in enough papers to provide such a test, meaning that on the behavioral indicators we are left with the analyses from each individual study only.)

While this special issue did not provide the kind of definitive final word which we hoped for, we believe something much more interesting has emerged. This coordinated research effort has now outlined a clear program of research for anyone who wishes to take power poses seriously. Given the failures to find effects on actual power-related behaviors, and only a small effect on felt power, then the following questions must be answered for power poses to continue to be recommended: (1) is the self-reported measure of felt power anything beyond an experimental demand characteristic? and (2) are there conditions under which feeling powerful from power poses could lead to beneficial behavioral changes? (It seems unlikely to us that the latter question will be answered in the affirmative because if increases in self-reported power did lead to changes in behavior, such behavioral effects would likely have been observed in at least some of the articles published in this special issue.) One positive report of this special issue, then, is that there may be some value of power poses on self-reported sense of power, but whether this effect is a methodological artifact or is meaningful is an open question and this issue of CRSP has charted out a clear path toward future research for those interested in the topic.

At the same time, there was a more important goal for this Special Issue beyond merely providing additional data on a narrow research question. The broader goal was to demonstrate the benefits of peer-reviewed preregistration for enhancing the quality of research. The benefit of preregistration is clear. (And in other outlets we have described the benefits of peer-reviewed preregistration; see Jonas & Cesario, 2015.) While previous, non-preregistered replication projects often faced discussions about the validity of the obtained results, the approach taken, or the analyses applied, a preregistered and *peer-reviewed* route is fully transparent and also benefits from the input of reviewers. To this end, it is instructive to ask, *how was any individual research proposal meaningfully changed by this process?*

Without exception, the method, design, or analysis of every proposed study was modified in some way following the initial Stage 1 review. True experts in the fields of embodied cognition, hormones, and other relevant areas of expertise provided advice to researchers *before* they spent precious resources conducting these studies. It is certainly the case that the quality of the research was improved by the preregistration process, a point confirmed by the many emails and positive comments we received by the authors during and after the review process. Indeed, the authors' comments reveal something we have long argued: That the peer-review preregistration process changes the dynamic and tone of the review process from destructive and negative to constructive and exciting. Reviewers were not on the lookout for the many ways the researchers failed to do what they should have (often a reflection of reviewers trying to show how smart they are) but instead approached these proposals with the mindset of, "What would I do to make this the best research possible?" Refreshing indeed.

Most important, every researcher received feedback from a true expert in power poses – Dana Carney, first author on the original power pose manuscript (Carney et al., 2010). Carney reviewed all proposals with replication plans (direct or conceptual) and provided detailed feedback, including experimenter scripts, programmed experiments, stimuli, instructions on how to get the participants to hold the poses exactly, and nuanced and highly specific information not obvious from or included in the original publication. Researchers often bemoan learning such "insider information" only after the fact or not at all. The peer-review preregistration process at CRSP solves this problem and, as indicated from the comments of the researchers, is a much-appreciated change.¹

A final benefit of the preregistration process at CRSP is the ability to coordinate among researchers prior to any researcher beginning data collection. This allowed us to make two contributions with this special issue that would not otherwise have been possible. First, we were able to ensure that multiple researchers had the basic conditions present in their studies – comparing expansive and contractive poses – which allowed us to provide an overall, cross-lab analysis testing replication of the basic power pose effect (Gronau et al., this issue). Moreover, we were able to have all researchers include a measure of whether participants had seen the TED talk on power poses, which allowed for cross-lab testing of a key potential moderator of power pose effects. This analysis, testing whether awareness influences the effect of expansive poses, appears as the final paper in this special issue and supports the possibility that the observed effect of powerful poses on felt power might be understood as a demand characteristic, as the effect was weaker with those participants unfamiliar with the TED talk (Gronau et al., in press).

As a final note, it is important to state that all three of us have, at one point or other, supported the possibility that power poses could have meaningful effects on behavior, psychology, physiology, or cognition (e.g. Carney et al., 2010; Cesario & McDonald, 2013). It is also important to note that the research presented here did not include any tests of whether power poses could impact others, as an expression of nonverbal behavior (for a review, see Hogue & Lord, 2007; and specifically for power poses, Rennung, Blum, & Göritz, 2016). This distinction is important because there is a long history of research in communication studies, anthropology, primatology, and social psychology on the way in which power and status are displayed to others in social context. This vast body of work on *nonverbal displays* is not to be confused with the power pose work and the focus of this special issue which was on *embodied effects of these postures*.

Moreover, it is obvious that the researchers contributing to this special issue framed their research as a productive and generative enterprise, not one designed to destroy or undermine past research. We are compelled to make this point given the tendency for researchers to react to failed replications by maligning the intentions or integrity of those researchers who fail to support past research, as though the desires of the researchers are fully responsible for the outcome of the research. (Curiously, the desires of researchers to *find* effects never play a role in these defensive arguments.) The very costly expense (in terms of time, money, and effort) required to chip away at published effects, needed to attain a “critical mass” of evidence given current publishing and statistical standards, is a highly inefficient use of resources in psychological science. Of course, science is to advance incrementally, but it should do so *efficiently* if possible. One cannot help but wonder whether the field would look different today had peer-reviewed preregistration been widely implemented a decade ago.

Note

1. From Bailey et al., “The peer reviewed preregistration process made the reviewer/author dynamic less adversarial and more collaborative.” From Jackson et al., “[Were able to make] amendments before data collection even began, strengthening the quality of our study procedures.” From Klaschinski et al., “We greatly appreciated the fact of getting constructive feedback on our design by well-informed experts before data collection started.” From Latu et al., “We very much enjoyed the peer-reviewed preregistration process ... the openness of the process helped improve our research by allowing us to communicate directly with reviewers, to get materials and advice for designing our study.”

Disclosure statement

No potential conflict of interest was reported by the authors.

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