Social Psychological and
Personality Science
1-9

DOI: 10.1177/1948550617725153
journals.sagepub.com/home/spp
SAGE

Power Poseur: Bodily Expansiveness Does Not Matter in Dyadic Interactions

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Abstract

Strong claims have been made that power poses can significantly improve one's life. Starting from an evolutionary perspective, we reason that expansive poses will have no impact in more realistic situations, as in the presence of an interaction partner or when participants are aware of what the pose should accomplish. Across four dyadic studies including both commonly used outcomes and a negotiation task (which could actually have direct benefits for one's life), we find nearly uniform null effects of holding expansive poses, despite checks confirming the success of the manipulation. For example, in two of the studies, participants watched a popular TED talk on power poses, held an expansive pose, and then completed a negotiation in the presence of a partner, as might happen in real life. We argue that researchers should stop recommending power poses as an empirically supported strategy for improving one's life.

Keywords

power poses, power, evolutionary psychology

Can making one's body physically expansive influence the psychology of power and have positive effects on life outcomes? The possibility that "power poses" can have cognitive, physiological, and behavioral effects has important theoretical and practical implications. On the theoretical side, this research has been used to support an embodied (rather than computational) understanding of the mind. On the practical side, power posing has been offered as an easy technique for powerless people to achieve the outcomes they want in life. As one indicator of how this research has captured public attention, over 40 million people have viewed an online TED talk recommending power poses (Cuddy, 2012). It is difficult to think of many topics in social psychology that have so quickly captured such wide public interest. In this article, we critique the theoretical foundation of this research and test its practical claims.

Past Research and Theory

Past research has shown that holding expansive bodily poses (compared to constrictive poses) can positively impact a range of power-related outcomes (see, e.g., Figure 1). Holding expansive poses can increase the subjective experience of power (Carney, Cuddy, & Yap, 2010; Huang, Galinsky, Gruenfeld, & Guillory, 2011), risk-taking behavior (Carney et al., 2010; Huang et al., 2011), abstract thinking (Huang et al., 2011), testosterone (Carney et al., 2010), the implicit activation of power (through a word completion task; Huang et al., 2011), pain tolerance (Bohns & Wiltermuth, 2012), and effectiveness at mock job interviews (Cuddy, Wilmuth, Yap, & Carney, 2015).

Researchers have combined ideas from evolutionary theories and the "embodiment" literature to argue that expansive poses have a *direct and unmediated* effect on the psychology of power. The argument is that because size and power have been closely tied throughout evolution, power is "embodied," and therefore increasing one's size should induce power. Carney, Cuddy, and Yap (2010) provide a prototypical description of this mechanism: "Humans and other animals display power and dominance through expansive nonverbal displays, and these power poses are deeply intertwined with the evolutionary selection of what is 'alpha'" (p. 1363). Along with this is the claim that the connection between physical pose and power is "deeply intimate" and automatic. For instance, Adam and Galinsky (2012) state, "In embodied cognition, the link between a physical experience and its symbolic meaning is direct, as it is the physical experience itself that carries the symbolic meaning. In other words, the symbolic meaning is always automatically embodied because it directly stems from the physical experience" (p. 919).

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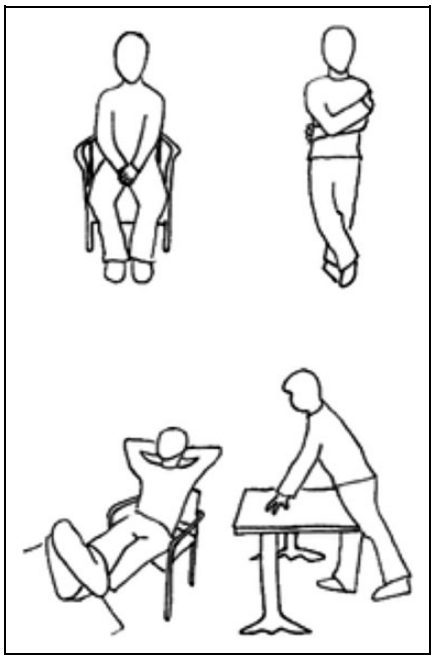

Figure 1. Constrictive (top panel) and expansive (bottom panel) poses used in past research and the present studies.

A Critical Look at Existing Theory

Although power poses research might be *consistent* with an embodiment approach (but see Wilson & Golonka, 2013), we question whether this account is adequate given current evolutionary thought. Previous uses of evolutionary logic may reflect a misunderstanding of the role of physical size in animal contests (see also Gawronski & Cesario, 2013). A detailed description of game theory and the logic of animal contests is beyond this article (see Maynard-Smith, 1974, 1979; Maynard-Smith & Parker, 1976; Maynard-Smith, & Price, 1973). It is sufficient here to note that physical size is not the only variable used by the brain when deciding which actions to pursue. Research on animal contests has shown animals take into account: *relative* judgments of the other animal's physical size, coalitional support, environmental constraints, positions in social hierarchies, and past encounters with the target (see, e.g., Benson-Amram, Heinen, Dryer, & Holekamp, 2011; D. C. Blanchard, 1997; D. C. Blanchard & Blanchard, 1984; D. C. Blanchard, Hynd, Minke, Minemoto, & Blanchard, 2001; R. J. Blanchard, Flannelly, & Blanchard, 1986; McComb, Packer, & Pusey, 1994; Smith et al., 2010; Stankowich & Blumstein, 2005; Wilson, Britton, & Frank, 2002).

The idea that power can be increased by a temporary expansion of one's physical size—overriding other relevant role and context information—is akin to arguing that the brain can be "tricked" into regulating the body to such a degree as to result in behaviors that would negatively impact reproductive success. Any animal who escalated conflict against others with better fighting skills, weaponry, or status—just because of momentary expansiveness—would have experienced drastically reduced reproductive success, making this an unlikely candidate for an evolutionary adaptation. Rather, the role of physical size in animal contests is computational and comparative, not a direct mapping of physical size and power.

In fact, the relevant animal research does not instill much confidence that power poses could successfully "boost" one's power. Physical size, as it relates to one's position in a dominance hierarchy, is an *honest signal* in that it reveals actual qualities about an individual's ability to attain and maintain hierarchy positions. In this context, power poses must be understood as elevating a person's internal representation of his or her status beyond that which is justified by the person's *actual* status (as when the poor or powerless hold expansive poses). Hence, power poses fall within the class of behavior known as *dishonest signals*. When dishonest signals are easy to produce (as in raising one's arms), their use by cheaters is selected against through other kinds of costs, including challenges by those who possess the signals honestly.

For example, the comb of male red junglefowl (*Gallus gallus*) is affected by social status and serves as an honest signal of mate quality. High-status males aggressively challenge other males who display large combs and dominant behavior, thereby preventing dishonest development of combs by subordinates (Parker & Ligon, 2002). In one experiment, when subordinate male Harris Sparrows (*Zonotrichia querula*) had the feathers on their throats and crowns artificially dyed a darker black (a signal of mate quality), they were persecuted *more strongly* by high-status males (Rohwer, 1977; Rohwer & Rohwer, 1978).[1] In these species, trying to "fake it 'till you become it'" (as recommended by Cuddy, 2012) does not result in better outcomes. The implication for the low-status worker, entering the boss's office having spent 2 min with a puffed-out chest, should be clear.

Why Does It Matter?

If power-related decisions are governed not by direct feedback but by a computational system that takes into account broader features of an interaction, there may be serious implications for the practical utility of power pose interventions. There are two reasons for concern.

First, studying any computational process requires ensuring that the relevant pieces of information used by real decision-makers are present in laboratory investigations. If power pose studies show positive laboratory effects but are missing critical pieces of information used by real-world decision makers, then the real-world applicability of these findings may be limited. In the case of displaying powerful behavior, evolutionary theory argues that *this necessarily includes partner information*. Unfortunately, the prototypical power pose experiment involves a single participant holding an expansive or constrictive pose, even though the intention is to have people use power poses in dyadic situations (as when a pose is held prior to negotiating with the boss). If there is any real-world value in power poses, experimental tests must include these critical dimensions.[2]

Second, there is the issue of awareness. In order to enact power poses in the real world, a person has to know what the pose is supposed to do. In contrast, almost all existing research

keeps participants blind to the purpose of the pose (see Keller, Johnson, & Harder, in press; Ranehill et al., 2015), and researchers go to great lengths to mislead participants. But this is an impossible condition for the real world. If I am to change my outcomes by intentionally holding a power pose before a job interview, *I have to know that this is the intended effect*. Indeed, supporting the possibility that awareness matters, Carney, Cuddy, and Yap (2015) specifically cite awareness as a moderator that could *undermine* expansive pose effects.

If there is a direct link between expansive body postures and power, then it makes sense to recommend power poses to low-status individuals on the way to negotiate a raise with the boss. But if other, more important information such as knowledge one's role or position in a hierarchy also enters the computation (see Cesario & McDonald, 2013), we would be offering false hope to powerless people with the message that their lives will drastically change by using such techniques.

The Present Research

The first objective is to test the effects of power poses within the context of dyadic interactions. Additionally, we include dependent measures from past research as well as a negotiation task, an outcome that could have clear benefits for a person's life. The second objective is to test the effects of power poses with studies containing larger sample sizes and identical dependent variables across studies. The tendency of past studies to use small samples and report different dependent variables makes an overall assessment of power pose effects difficult. (We conducted no a priori power analyses but instead aimed to collect as many participants as possible each semester.) Across the studies, expansive poses were compared to constrictive or neutral poses.[3] Poses were those depicted in Figure 1, and instructions replicated exactly those from the original Carney et al. (2010), with participants holding the two poses for 1 min each. Table 1 presents descriptive statistics and Table 2 presents inferential statistics.

In Studies 1 and 2, participants watched the TED talk on power poses, held an expansive pose, and then completed the dependent variables; responses between expansive pose and no pose participants were compared. In Studies 3 and 4, participants held either an expansive or constrictive pose alone (Study 3) or in the presence of another participant (Study 4) and then completed the dependent measures; responses between expansive and constrictive participants were compared. In Studies 3 and 4, participants were blind to the purpose of holding the poses. All participants were undergraduates at Michigan State University and received course credit for participating.

Study 1: Holding the Pose After Watching a TED Talk

Procedure

For this study, we intended to make the experimental context as realistic as possible, in terms of how a person might learn about and use power poses. Participants arrived in pairs. Participants in the expansive pose condition watched the TED talk on power poses, after which the experimenter said, "we're interested in whether holding certain positions will increase your power and make you more effective in negotiations." The video was edited, so that only the introductory and concluding sections were presented (8 min duration). No results were described, as we did not want participants' behavior to be driven by demand effects. The experimenter then instructed this participant to hold each of the two expansive poses.

While the "expansive participant" was watching the video and holding the poses, the "no pose" participant was sitting alone in an adjacent room. This participant also watched the same TED talk but was given no information about the purpose of the study or the experience of the other participant. This participant was simply told "to watch a short video, and you'll be asked questions about it later on" and was asked to "sit comfortably with your hands on your legs during and after the video." (When probed, 22 participants revealed that they had spontaneously held the poses described in the video and were removed from analyses, an a priori decision.) Finally, participants were brought together and completed all measures.

Participants and Design

Analyses compare the responses of participants who held the expansive pose ($n = 92$) to participants who held no pose ($n = 72$).

Measures

Dependent measures. Three dependent measures of power were collected: risk-taking, abstract thinking, and a negotiation task.[4]

Risk-taking: Gambling task. This measure replicates risk-taking measures from past power pose studies (Carney et al., 2010; Cesario & McDonald, 2013; Huang et al., 2011; Ranehill et al., 2015). Participants were endowed with two tickets for a raffle to win a US$50 grocery store gift card. They could either enter the two tickets right now (the safe bet) or take a risk and role a die, potentially doubling their number of tickets (if a 4, 5, or 6 was rolled), but potentially losing them all (if a 1, 2, or 3 was rolled). Participants' choices were recorded. To ensure decisions were independent, both made their decisions confidentially in writing. Only at the end of the study were these papers revealed and the dice rolled. To test whether expansive poses increased gambling, Fisher's exact odds ratio tests compared the proportion of people who chose the risky gamble between conditions.

Abstract thinking: Gestalt task. Participants completed the Gestalt Completion Task (Huang et al., 2011). Participants were shown images of incomplete pictures and asked to identify them. We followed the exact scoring procedures used by Huang et al. and had independent coders rate whether participants provided correct, incorrect subordinate (incorrectly

Table 1. Descriptive Statistics Across the Studies.

Variable	Study 1	Study 2	Study 3	Study 4
Initial sample size	264	282	257	330
Removals for				
Careless responding	*n/a*	*n/a*	24	34
Made up responses	12	9	17	6
Friends with partner	8	4	6	8
Held pose in booth	22	16	*n/a*	*n/a*
Final total *N*	226	254	213	284
n completed study with partner	164	161	140	247
n females, *n* males	122, 40	0, 161	123, 17	139, 108
n in key comparison conditions	164	161	71	174
n control, *n* expansive	72, 92	72, 89	34, 37	85, 89
% Risky gamble				
Control	59.2%	80.3%	47.1%	60.0%
Expansive	68.1%	78.4%	51.4%	77.5%
Abstract thought task				
Number correct				
Control	3.56 (1.88)	3.63 (2.04)	3.47 (1.91)	3.31 (1.93)
Expansive	3.71 (1.95)	3.76 (1.92)	3.27 (1.94)	3.43 (1.84)
Incorrect subordinate				
Control	0.68 (0.82)	1.67 (1.87)	0.94 (1.10)	0.86 (1.35)
Expansive	0.65 (0.94)	1.47 (1.67)	1.35 (2.04)	1.03 (1.47)
Incorrect superordinate				
Control	0.29 (0.54)	0.04 (0.20)	0.21 (0.41)	0.27 (0.54)
Expansive	0.29 (0.55)	0.11 (0.51)	0.41 (0.69)	0.31 (0.54)
Negotiation task % first offer				
Control	45.7%	58.0%	50.0%	*n/a*
Expansive	53.9%	44.2%	54.3%	
Sellers' first offer amount				
Control	27.91 (17.72)	26.18 (13.64)	22.73 (3.56)	*n/a*
Expansive	28.59 (22.37)	23.30 (4.45)	23.25 (10.88)	
Buyers' first offer amount				
Control	19.40 (3.75)	19.14 (3.59)	17.95 (3.59)	*n/a*
Expansive	18.39 (3.47)	18.36 (3.24)	17.63 (4.26)	
Final price deviation				
Control	3.54 (7.66)	2.76 (2.31)	4.46 (11.37)	*n/a*
Expansive	3.16 (7.80)	3.21 (9.37)	3.24 (4.49)	

Note. Values in parentheses are standard deviations. Descriptives are provided on the subset of data reported in analyses in the text. "Control" condition refers to holding the neutral pose (Studies 1 and 2) or the constrictive pose (Studies 3 and 4). Study 4 has no negotiation data because this task was not included. "*n* completed study with partner" refers to the number of participants who had a partner present during the study; "*n* in key comparison conditions" is the number of expansive versus control condition participants and is the total on which analyses are conducted.

identifying a picture at a low abstraction level), or incorrect superordinate (incorrectly identifying a picture at a high abstraction level) responses. These researchers obtained three pose effects, all of which indicate that powerful people think more abstractly: (1) expansive poses increased the number of pictures correctly identified, (2) expansive poses decreased the number of subordinate-level incorrect responses, and (3) expansive poses increased the number of superordinate-level incorrect responses. To test whether expansive poses increased abstract thought, *t* tests compared the means between conditions for each of the three calculations.

Negotiation task. Participants completed the "Synertech-Dosagen" negotiation task to test whether holding expansive poses resulted in better negotiation outcomes (see Appelt, Zou, Arora, & Higgins, 2009; Diekmann, Tenbrunsel, Shah, Schroth, & Bazerman, 1996; Galinsky, Leonardelli, Okhuysen, & Mussweiler, 2005; Galinsky & Mussweiler, 2001; Kurtzberg, Naquin, & Belkin, 2009). One participant is the seller, and the other the buyer of a pharmaceutical plant; participants receive identical general information plus information specific to their role. Participants had 20 min to negotiate the sale with the explicit goal to get the best outcome for themselves.

We recorded each participant's *initial first offer*, *which participant made the first offer*, and the *final sale price* (for those successful negotiations, which was nearly all dyads). These outcomes have been used in prior research and there is "remarkably robust" (Gunia, Swaab, Sivanathan, & Galinsky, 2013, p. 1548) evidence that setting an aggressive first offer yields better final outcomes. As such, this is one of the most direct measures yet to assess an outcome that could be life changing in the way suggested by power pose advocates.

Table 2. Analyses Testing Differences Between Expansive Pose Conditions and Neutral Pose (Studies 1 and 2) or Constrictive Pose (Studies 3 and 4) Conditions. *d* is Cohen's *d*.

Variable	Study 1	Study 2	Study 3	Study 4
Risky gamble	$OR = 0.68$ [0.34, 1.36], $d = 0.21$ [−0.14, 0.57]	$OR = 1.12$ [0.48, 2.64], $d = -0.06$ [−0.49, 0.37]	$OR = 0.84$ [.30, 2.36], $d = 0.09$ [−0.43, 0.62]	$OR = 0.44$ [0.21, 0.88], $d = 0.46$ [0.09, 0.83]
Abstract thought task				
Number correct	$d = 0.08$ [−0.23, 0.39]	$d = 0.06$ [−0.25, 0.37]	$d = -0.10$ [−0.57, 0.36]	$d = 0.07$ [−0.23, 0.36]
Incorrect subordinate	$d = 0.03$ [−0.28, 0.34]	$d = 0.11$ [−0.20, 0.42]	$d = -0.25$ [−0.71, 0.22]	$d = -0.12$ [−0.42, 0.17]
Incorrect superordinate	$d = 0.003$ [−0.31, 0.31]	$d = 0.18$ [−0.14, 0.49]	$d = 0.35$ [−0.12, 0.82]	$d = 0.08$ [−0.22, 0.38]
Negotiation task				
% First offer	$b = 0.17$, $SE = 0.16$, $z(159) = 1.04$, $OR = 1.39$, $d = 0.09$ [−0.08, 0.27]	$b = -0.33$, $SE = 0.17$, $z(155) = -1.89$, $OR = 0.58$, $d = -0.18$ [−0.37, 0.002]	$b = 0.14$, $SE = 0.25$, $z(69) = 0.58$, $OR = 1.18$, $d = 0.08$ [−0.19, 0.35]	*n/a*
First offer amount	$b = 0.42$, $SE = 1.26$, $t(143) = 0.33$	$b = -054$, $SE = 0.64$, $t(145) = -0.84$	$b = 0.21$, $SE = 0.84$, $t(58) = 0.25$	*n/a*
Seller's first offer amount	$d = 0.03$ [−0.45, 0.51]	$d = -0.29$ [−0.77, 0.19]	$d = 0.06$ [−0.75, 0.87]	*n/a*
Buyer's first offer amount	$d = 0.28$ [−0.20, 0.76]	$d = 0.23$ [−0.24, 0.70]	$d = 0.08$ [−0.62, 0.79]	*n/a*
Final price deviation	$b = -0.27$, $SE = 0.65$, $t(134) = -0.42$, $d = 0.05$ [−0.29, 0.39]	$b = 0.18$, $SE = 0.61$, $t(137) = 0.30$, $d = -0.06$ [−0.40, 0.27]	$b = -0.78$, $SE = 1.16$, $t(55) = -0.67$, $d = 0.14$ [−0.39, 0.67]	*n/a*

Numbers in bracket are 95% CIs.

As negotiation outcomes are necessarily partner dependent, we used a series of multilevel models (with dyad as Level 2 and individual as Level 1) to test the effects of poses across the different negotiation outcomes. To test whether expansive poses made participants more likely to make the first offer, a multilevel model was conducted with negotiation role ($-1 = buyer$, $1 = seller$) and pose condition ($-1 = neutral$, $1 = expansive$) as predictors and whether that participant made the opening bid ($0 = no$, $1 = yes$) as the predicted variable. Evidence of the benefits of expansive poses would be demonstrated with greater likelihood of making the opening bid for expansive pose participants.

To test whether expansive poses made participants set a more aggressive opening offer, a multilevel model tested for the interaction between negotiation role and pose, testing whether sellers holding expansive (vs. neutral) poses set higher opening offers and buyers holding expansive (vs. neutral) poses set lower opening offers.

The final test was whether holding expansive poses resulted in better final sale prices (with higher prices for sellers and lower prices for buyers). Because outcome price is a single outcome for each dyad, we created a value for each participant that represented the deviation of the final sale price from the starting offer. This value represents success at the negotiation, insofar as having a final price that was closer to one's opening bid (i.e., a lower deviation value) is better than having a final price far from one's opening bid. The deviation score was calculated such that smaller values were better for both sellers and buyers; hence, a main effect of pose condition would provide evidence for the benefits of expansive poses.[5]

To show that participants completed the task correctly, across studies the expected main effect of negotiation role on opening bid was obtained, $b = 2.43$, $SE = 0.16$, $t(281) = 15.37$, $p < .001$, with sellers setting higher opening bids ($M = 23.50$, $SD = 4.00$) than buyers ($M = 18.78$, $SD = 3.49$). In addition, setting an aggressive first offer strongly resulted in better final outcomes for both buyers, $r(136) = .37$, $p < .001$, $d = 0.80$, 95% confidence interval (CI) = [0.43, 1.16] and sellers, $r(127) = .76$, $p < .001$, $d = 2.34$, 95% CI = [1.80, 2.88].

Manipulation check. As a manipulation check, participants reported their felt power by rating, on 1–7 scales, how *powerful*, *in control*, *in charge*, *superior*, *dominant*, *afraid* (*r*), *at risk* (*r*), *vulnerable* (*r*), *lowly* (*r*), and *subordinate* (*r*) they currently felt, $\alpha = .79$, 95% CI = [.75, .83].[6]

Results

The manipulation check confirmed that the pose manipulation was successfully implemented. Participants reported feeling more powerful after holding the expansive pose, $M = 5.22$, $SD = 0.68$, compared to the neutral pose, $M = 4.92$, $SD = 0.72$, $d = 0.43$, 95% CI = [0.12, 0.74]. As shown in Table 2, however, there were no significant effects of holding expansive poses on any of the dependent measures.

Study 2: Holding the Pose After Watching an Instructional TED Talk, Males Only

Study 2 was a direct replication of Study 1, except that we recruited only males given the small percentage of males in Study 1. Analyses compare the responses of participants who held the expansive pose ($n = 89$) to participants who held no pose ($n = 72$).

Results

The manipulation check showed the predicted directional effect, such that participants felt slightly more powerful after holding the expansive pose, $M = 5.19$, $SD = 0.67$, compared to the neutral pose, $M = 5.02$, $SD = 0.81$, $d = 0.24$, 95% CI = [−0.08, 0.55]. As with the prior study, and shown in Table 2, participants in the expansive condition showed no evidence of greater power on any dependent measure.

Study 3: Holding the Pose Without Awareness

Procedures

In this study, several changes were made to make the method more similar to past power pose research. One participant in the dyad held either an expansive or constrictive pose, while the other dyadic partner waited alone, in another room, until the participant finished holding the poses. As in past research, the participant who held the expansive or constrictive pose had no awareness of why he or she was holding the pose, as a cover story kept the participant blind to the purpose of the study. The partner returned to the room and the pose participants completed all dependent measures in the presence of the other participant.

We also tried to make the experimental situation match real-world circumstances by instructing the participant holding the pose:

> While you're holding this position, I'd like you to imagine that in a few minutes the other participant is going to be sitting in that chair and that you're going to compete against him/her in a negotiation, and you're going to try to get as much for yourself out of the negotiation as you can.

This mimics the advice given to the public by power pose researchers: immediately before a negotiation, job interview, and so on, hold the pose and think about the upcoming event.

Participants and Design

Analyses compare the responses of participants who held the expansive pose ($n = 37$) to those who held the constrictive pose ($n = 34$), given that this is the most common comparison in past research.

Results

Again, the manipulation check indicated that participants felt more powerful after holding the expansive pose, $M = 4.84$, $SD = 0.64$, than the constrictive pose, $M = 4.22$, $SD = 0.85$, $d = 0.83$, 95% CI = [0.34, 1.31]. As seen in Table 2, holding the expansive pose had no statistically significant effects on any measured outcome.[7]

Study 4: Holding the Pose in the Presence of a Partner

Procedure

In this study, participants held either an expansive or constrictive pose across the table from their partner, who held a neutral pose. The participant holding the expansive or constrictive pose was first instructed on how to hold the pose. The neutral pose participant was then instructed to sit in a neutral position, with arms on the arm rests and a straight back. While power pose researchers explicitly recommend against holding poses in front of others (e.g., Cuddy, 2012), we suspected from past work on complementarity that this might actually have stronger effects as expansive and constrictive poses signal dominance and submissiveness within dyadic interactions (e.g., Tiedens & Fragale, 2003).

Participants and Design

Analyses compare the responses of participants who held the expansive pose ($n = 89$) to those who held the constrictive pose ($n = 85$). Participants were always in same-sex dyads, with male participants paired with male confederates but female participants paired with other female participants.[8]

Results

The manipulation check showed that participants reported feeling more powerful after holding the expansive pose, $M = 4.77$, $SD = 0.78$, than the constrictive pose, $M = 4.37$, $SD = 0.82$, $d = 0.49$, 95% CI = [0.19, 0.80]. The only effect to reach significance in this study was the effect on the risky gamble, $d = .46$, 95% CI = [.09, .83]. As seen in Table 2, no other effects reached statistical significance.

General Discussion

Across four studies using dyadic designs, we found no evidence that power poses had beneficial effects on power-related outcomes. These studies used more realistic methodologies and, in total, had a larger sample size than any previous study on this topic. Furthermore, our three largest studies were larger than 91% of past studies finding effects of expansive poses (see Carney et al., 2015, table 1). Most important, Studies 1 and 2 recreated the conditions under which a person might encounter power pose recommendations.

It is common to acknowledge that any study is simply a datapoint for a future meta-analysis, and of course our studies are no exception. However, one must balance this fact with past failures to replicate, small samples in publications that have obtained significant results, little evidence of moderators, and *p*-curve analyses that cast doubt on the published findings (Simmons & Simonsohn, 2015). That is, in addition to the published data, the broader research and publication details surrounding those data are relevant information. Given the scope and size of the four studies presented here, these data should give pause to those who recommend power poses as a means for the poor and low status to better their lives.

Across all studies, the most consistent pose effect was on felt power. While power pose researchers consider this a manipulation check and have in the past *explicitly downplayed* the importance of this measure (Cuddy et al., 2015), defenders could argue this effect is important for actual life outcomes. If you can "fake it 'till you become it,'" then feeling more powerful might give you the motivation to carry through initial failures until you succeed. At the same time, one could easily predict the opposite: Failing repeatedly when you expect to succeed (because you held expansive poses and felt powerful) may decrease motivation and increase uncertainty regarding the connection between one's actions and outcomes. Indeed, one might expect this negative outcome to be *most likely for low-status individuals*, who are more likely to lack the skills needed for success. Those who believe power poses are an effective method of empowerment must provide concrete evidence that the poses have effects beyond just increased feelings of power.

Limitations

Before discussing limitations of the current research, it is important to note that our failure to find effects of power poses should not be attributed experimenter or participant incompetence. Manipulation checks were successful, and participants showed predictable patterns of bargaining in the negotiations.

Nonetheless, there are limitations of the current work. All data come from a single population, undergraduates at Michigan State University. This might be a problem if, for example, these students were not skilled negotiators. Perhaps participants were so unskilled that even power poses could not impact their performance. Much existing work on power poses involves business school students (e.g., Cuddy et al., 2015), who may be meaningfully different than the general undergraduate population. However, this interpretation undermines the entire premise of power poses, as they are something that everyday people and low-status individuals can use to better their outcomes.

Another limitation of Studies 1 and 2 should be acknowledged. In these studies, the participant who did not hold a pose did watch the TED talk video. It is possible that merely watching this video had some benefit for the participant (e.g., increased confidence) even if that participant did not hold the pose himself or herself. Perhaps this benefit of seeing the video worked against obtaining positive behavioral effects of holding an expansive pose. We do not believe this design choice compromised our findings for three reasons. First, participants who held the expansive pose did report more felt power than those who merely watched the video, meaning that the manipulation check did show that holding the pose had its intended effect. Thus, merely watching the video was not identical to watching the video and holding the expansive pose. Second, we suspect that power pose advocates would not actually want to raise this argument, as it would undermine the premise that holding expansive poses is important. Finally, Studies 3 and 4, which were more closely aligned with the traditional methodology used in power pose research, also failed to find any positive effect of expansive poses.

Conclusion

There has been unprecedented public interest in the possibility that holding expansive poses can yield better life outcomes, particularly for powerless and low-status individuals. The current work provides two major arguments for questioning this narrative. First, the theoretical underpinning is unlikely in light of a more precise understanding of evolution. Second, more realistic conditions yielded no impact on power-related outcomes. In light of these points, as well as past criticisms and failures to replicate pose effects, we suggest ceasing to recommend this technique to the low-status and powerless until more supportive data can be gathered.

Author's Note

All data and materials, including experimenter scripts, are available on the first author's website (www.cesariolab.com). We report all studies conducted in our lab testing these hypotheses. Portions of this manuscript were presented at the Duck Conference on Social Cognition (2013).

Declaration of Conflicting Interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

The author(s) disclosed receipt of the following financial support for the research, authorship, and/or publication of this article: The material is based upon work supported by National Science Foundation under award No. BCS-1230281 to the first author.

Notes

1. We must quote Rohwer (1977): "Shortly after the dyeings it was evident that the manipulation had precipitated a veritable wrath of aggression from the legitimate studies" (p. 114, emphasis added).
2. One underpowered study (Cuddy et al., 2015) had participants deliver a speech to two evaluators. However, a higher powered peer-reviewed preregistered replication failed to replicate these results (Keller et al., in press).

3. Criteria for removal of participants were decided a priori: indicating made-up responses, indicating friendship with their partner, or failing careless responding checks (e.g., "Select 'strongly agree' now").
4. Participants also completed physical strength and attractiveness measures. Overall, stronger and more attractive participants showed more powerful outcomes. Details are available from the first author. Unrelated dependent variables were also collected for a different line of research on recalibration theory, as described in Johnson & Cesario (2017). The decision was made a priori that these measures would not be analyzed for the present research.
5. Throughout the studies, a small number of dyads ($n = 9$) had offers suggesting they did not understand the instructions or experimenter error. These dyads are removed from analyses, as this provides the most liberal test of the effectiveness of expansive poses. Eight participants who made extreme first offers and were clear outliers were also removed.
6. In the original Carney et al. (2010), this was described as a dependent variable. In more recent publications, this is described as a manipulation check (see Carney et al., in press; Cuddy et al., 2015). We are agnostic about this and we simply follow these authors in their latest terminology.
7. Because only one participant in each dyad held a pose and this study compares expansive versus constrictive conditions, multilevel models were not needed for the negotiation analyses.
8. Dyadic composition was different in this study to test predictions for other research regarding the effects of physical strength and attractiveness.

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Handling Editor: Michael Inzlicht