POWER VS. PERSUASION: DO OPEN BODY POSTURES OF MESSAGE RECIPIENTS MAKE THEM MORE SUSCEPTIBLE TO ATTITUDE CHANGE?

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THESIS ABSTRACT

Power vs. Persuasion: Do open body postures of message recipients make them more susceptible to attitude change?

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A current controversy exists regarding the effects of open/expansive body postures on power-related outcomes. While some studies suggest that open postures make people feel and behave in a more empowered way (Carney et al., 2010), other studies challenge these findings (Ranehill et al., 2015). In the current study, I proposed that the meaning of the body posture depends on the context – whether people are being persuaded rather than persuading others. As such, I investigated the effects of open postures on both power and attitude change following persuasion. Two hundred participants were randomly assigned to hold either an open or closed body posture, while simultaneously being exposed to either a strong or a weak message in favor of introducing a junk food tax. . I measured their attitudes towards junk food tax before and after the persuasive message to obtain a measure of the degree to which their attitude changes following persuasion. I proposed two competing hypotheses- if open body postures embody only power, then participants will be more confident in their own thoughts and will be less persuaded by the message irrespective of its strength. On the contrary, if open body postures embody openness to persuasion under certain circumstances, we will see a greater attitude change in favor of the strong argument (vs. weak argument). When looking at the change in attitude pre-post

persuasion, findings revealed that participants exposed to a strong message were less likely to change their attitude if they held an open vs. closed posture, a finding that is more consistent with the power rather than persuasion explanation. However, neither subjective feelings of power nor openness mediated the relationship between posture and Attitude Change. Implications for both the power and persuasion literature are discussed.

Power vs. Persuasion: Do open body postures of message recipients make them more susceptible to attitude change?

Some nonverbal behaviors have an evolutionary and universal meaning according to a vast array of psychological literature (Darwin, 1872/2009; de Waal, 1998). For example, smiling is a universal expression of joy. Similarly, open expansive body postures tend to be associated with power and dominance. Indeed, powerful human and non-human primates tend to have more expansive body postures (Hall, Coats, & LeBeau, 2005). Recent research has also proposed a reversed causal pathway. Several studies described open body postures as "power postures" and showed that merely adopting a power pose produces feelings of dominance, confidence and power (Carney, Cuddy, & Yap, 2010). This *open posture-power* link is thus seen as direct, automatic and free from the context in which these feelings or behaviors are being manifested (Adam & Galinsky, 2012; Huang, Galinsky, Gruenfeld & Guillory, 2011).

However, I argue that, open body postures may sometimes mean something other than power, depending on the situation. Specifically, when placed in the role of the recipient of a persuasive message, adopting open body postures may activate a different meaning of openness– that of openness to others' views and agreeableness. If this were true, it would mean that open body postures may facilitate attitude change following a persuasive message. In the current study, I will investigate whether adopting an open body posture while receiving a persuasive message can elicit feelings of openness rather than feelings of power. More specifically, I propose two competing hypotheses that will be tested against each other. If open body postures exclusively embody power, they will lead to greater feelings of power and less attitude change. Conversely, if open body

postures can also lead to being open to new ideas, such postures may increase the elaboration of a persuasive message resulting in greater attitude change.

The Body-Mind Link

"A picture paints a thousand words". Just as a picture paints a thousand words, our bodies can communicate our thoughts and emotions. The cues given by our bodies through gestures, facial expressions and postures are a medium through which we communicate with the external world.

Further, theories and research on embodiment postulate that not only does our mind impact our bodily expressions but the reverse is also true. Specifically, our bodies may impact our minds. In other words, our bodily states impact higher level cognitions (Niedenthal, Barsalou, Winkielman, Krauth-Gruber, & Ric, 2005; Pezzulo et al., 2011; Schubert & Semin, 2009). Our facial muscles, gestures, body postures, movements, hand placements and gaze have been shown to impact our perceptions, feelings and subsequent behaviors (Riskind & Gotay, 1982; Mussweiler, 2006; Parzuchowski & Wojciszke, 2014; Chandler & Schwarz, 2009; Schubert, 2004). For example, keeping a hand on one's heart increases moral behavior as this gesture is emblematically linked to honesty (Parzuchowski & Wojciszke, 2014). Also, power related words (e.g. powerful, strong) become more accessible while making a fist (a behavior related to physical force) as opposed to a neutral gesture, e.g. a "scissor" hand gesture (Schubert, 2004).

Power Postures

Open/expansive body postures (arms in the air, feet apart and backs erect) as opposed to contractive postures (crossed legs and arms) are accompanied by power related psychological effects. Open postures elicit feelings of power (Carney, Cuddy, & Yap,

2010; Ranehill et. al, 2015), confidence (Cuddy, Wilmuth, Yap, & Carney, 2015) and pride (Stepper & Strack, 1993). These feelings further impact power related outcomes such as increased risk taking (Carney et al, 2010) and improved performance during a self-presentation task (Cuddy, Wilmuth, Yap & Carney, 2015).

Although this literature has gained a lot attention from both the scientific community and the general public, there are several methodological and theoretical issues. First, methodologically, the evidence on the effect of power postures is mixed. Ranehill and colleagues (2015) failed to replicate the findings on risk taking observed by Carney et al. Also, Simmons & Simonsohn (2016), conducted an analysis of 33 studies on power postures (including the ones cited by Cuddy and colleagues (2015) as evidence for the link between open body postures and power). It was found that most of these studies were underpowered. The researchers concluded that behavioral and physiological effects of open and closed postures should currently be treated as hypotheses lacking empirical support.

Second, theoretically, some researchers have proposed a robust causal link between open postures and feelings of power. For example, Adam and Galinsky (2012) proposed that a physical experience *automatically* activates its symbolic meaning and is independent of the context or situational cues. Also, high power postures were observed to be more proximate of implicit activation and physical manifestations of power than the assigned hierarchical role (high or low power roles) of study participants (Huang et al, 2011). These studies suggest that the link is so direct that it precedes perception, or at least more direct than a person's hierarchical role.

As such, there might be some benefit in relooking at this posture-power effect from the situational approach. It was found that the same posture (expansive body posture) may have contradictory psychological effects under different conditions (Cesario & McDonald, 2013). Expansive postures were related to feeling powerful only when the context was social (i.e. when there were faces present) and not otherwise. Also, imagining being in a submissive role (being frisked by the police) while adopting an open body posture did not translate to one feeling powerful. The researchers concluded that the association between a certain body posture and the feelings it produces does not have to be direct, but the motor system influences psychological states by defining for people which actions they can or cannot perform. Therefore, the impact of expansive body postures on subjective feelings of power may be situation specific based on the actions that can be performed (Schubert & Semin, 2009). Expansive postures may therefore cause feelings of power only when it is possible to act on these feelings – in this case acting in a powerful way, such as making a business decision or showing one's power to others.

Several situational factors such as context, gender and culture can moderate the effects of posture on feelings and thoughts. Adopting an identical or almost similar posture may impact people in disparate or completely opposite ways depending on their gender (Roberts and Arefi-Afshar, 2007), culture (Park, Streamer, Huang & Galinsky, 2013) and context (Cesario & McDonald, 2013; Bialobrzeska & Parzuchowski, 2016). For example, men experienced more confidence and pride when they maintained an upright posture while receiving positive feedback. However, the reverse was true for women. The feedback had a positive effect on women only when they adopted a slumped

posture (Roberts and Arefi-Afshar, 2007). Further, some expansive postures translated to feelings of power only for people from individualistic cultures, e.g. Americans, but do not produce the same feelings in people from collectivistic cultures, e.g. East Asians (Park et al, 2013).

Overall, research suggests that the impact of the motor system on psychological processes is highly contextual and varied, such that an expansive posture may translate into feelings of power, feelings of submissiveness or have no effect at all. Despite this evidence, open body postures are so synonymous with power postures that no studies have investigated interpretations unrelated to power. In a situation where there are no power related action possibilities, it is likely that the open body posture may translate to non-power related feelings. In my study, I aim to clarify if expansive postures can be associated with psychological states other than power. One such state may be openness to persuasion, given contextual cues that do not prime power, but rather the state of being open to other's arguments.

Embodiment and Attitude Change/Persuasion

Of particular importance to the current research is the question whether persuasion can be embodied, in other words whether body postures can impact the likelihood of attitude change. Some studies suggest that under low thinking conditions, our attitudes can be easily impacted by our bodies. For example, participants rated neutral Chinese ideographs more positively during an arm flexion (approach behavior) action versus during arm extension (avoidance behavior) (Cacioppo, Priester, & Berntson, 1993). Given that the participants had no prior semantic associations with the ideographs, the contrasting attitudes of the two groups can be attributed to the differences in arm

movements. Similar findings for head nodding were also observed where participants had a more favorable attitude towards a persuasive message when they listened to it while nodding their heads (associated with agreement) as opposed to while listening to it while shaking their heads (associated with disagreement) (Wells & Petty, 1980). Overall, it seems that body movements can impact our attitudes. However, it is important to understand the underlying psychological mechanisms. Consistent with the Elaboration Likelihood Model (ELM), the motor system influences attitude change through the extent of thoughtful information processing one engages (Petty & Cacioppo, 1986). The amount of cognitive processing of an attitude object may range from little or no processing to elaborate and detailed processing. Petty and Brinol (2008), proposed that our bodily movements or responses may impact attitude change by moderating this elaboration process. For example, under low thinking conditions as described in case of the experiment done with Chinese ideographs, the body provided a simple cue for attitude change (evaluative conditioning). When a neutral stimulus is presented along with a conditioning stimulus which is associated with positive or negative reactions, the previously neutral stimulus also becomes associated with the respective positive or negative reactions. Since we use arm flexion movements to bring desirable objects closer to our bodies, Chinese ideographs presented during this task were evaluated more favorably as opposed to those presented during arm extension (which we normally use to move undesirable objects away from our bodies). Arm flexion and extension are associated with positive and negative affect respectively and impact attitude change through a low effort conditioning process. When the level of thinking is not restricted to be low or high, bodily expressions may facilitate/attenuate attitude change by influencing

the motivation or ability to think about external stimulus (persuasive message). For example, when people are happy or confident, they tend to think less as opposed to when they are sad or doubtful (Brinol, Petty & Barden, 2007; Tiedens & Linton, 2001). Therefore, body postures which make us feel confident or doubtful may differentially impact our motivation to think about a persuasive message.

Alternatively, certain body postures may impact our thinking by increasing or decreasing cognitive resources. For example, reclining participants were more persuaded by a message– which does not take away cognitive resources, as opposed to standing – which takes away cognitive resources (Petty, Wells, Heesacker, Brock & Cacioppo, 1983). This was particularly true when the persuasive message had strong vs weak arguments. While the reclining participants were differentially persuaded by strong and weak arguments, the standing participants were less persuaded irrespective of the quality of arguments in the message. In a comfortable position, participants engaged in elaborate and thoughtful processing of the message and were persuaded more in favor of strong arguments (but not in favor of weak arguments). On the contrary, standing participants were less likely to process information in a detailed manner and were neither persuaded by weak nor strong arguments.

Another approach that has been recently explored by researchers is the self-validation hypothesis (Petty, Brinol & Tormala, 2002). According to this theory, our bodies can impact attitudes by influencing the extent to which people trust in the validity of their own thoughts. In one study, participants were asked to think about their best or worst qualities while sitting in a confident posture (chest out and back erect) or in a doubtful posture (slouching). It was found that thoughts generated about the self-

impacted self-esteem only in the confident posture and not in the doubtful posture conducted by Brinol, Petty and Wagener (2009). This finding implies that confident postures make us more confident in our own thoughts.

Overall, body postures can influence attitude change following persuasion through various mechanisms. In this study, I will similarly focus on the mechanism through which body postures influence attitude change in favor of a persuasive message. Open body postures may influence persuasion and attitude change in one of the two ways. If the link between open body postures and power related feelings such as confidence and dominance is invariant, these postures will attenuate the likelihood of attitude change. On the contrary, if an open body posture can activate an affect unrelated to power-one that of openness to new ideas and others' views, it will result in greater attitude change in favor of the persuasive message.

Literature on Open Body Postures

The main focus of this research will be to determine if what is being embodied when a person adopts an open body posture is contingent upon the implicit role cues and the context defining action possibilities. Bialobrzeska and Parzuchowski (2016) state that "There is no pure meaning of one body state; rather, it is composed of evolutionary and sociocultural meanings, as well as of the situational context in which it occurs". It may therefore be reasonable to assume that an open body posture may evoke feelings other than power and confidence under certain circumstances.

Most of the studies conducted with open body postures and their effects have either used power manipulations (for example, assigned people to high or low power roles) or provided power related action possibilities (such as giving a persuasive speech

to people, making a risky decision, assuming the role of a business owner making decisions). In all these studies, the subconscious tasks or role cues in the situation may have led participants to embody power because the situation afforded participants to influence outcomes or people. However, if the context is unrelated to power but is that of being exposed to persuasive messages, an open body posture may embody openness to persuasion instead of power. The participants in our study will be recipients of a persuasive message. They will be placed in a situation which is likely unrelated to power. Rather than persuading others (which is typical of a power role), the participants in the current study will be exposed to a persuasive message. Additionally, in order to investigate the cognitive mechanism through which body posture influences persuasion, I will vary the strength of the message. Being persuaded by a good, strong argument would suggest deeper cognitive processing compared to being persuaded by a poor, weak argument.

If openness of body automatically translates to power and confidence, this may impact the process of persuasion in one of the two ways (see Figure 1). According to Tiedens and Linton (2001), people tend to think less when they are confident and more when they are doubtful. Therefore, people in a confident posture will tend to think less about a persuasive message and bring about less attitude change. Alternatively, power may also impact what we think about our own thoughts (metacognition). When power is induced before giving a persuasive message, it makes people feel more confident about their own thoughts, thereby reducing the level of motivation to engage in thoughtful processing. If this is the case, we should see that open body postures lead to less attitude change in people irrespective of the quality of the argument (weak vs. strong). On the

other hand, people in closed body postures may feel less confident about their own thoughts and are more likely to be persuaded in favor of the persuasive argument when the argument is strong but not when the argument is weak. People will be differentially persuaded by weak and strong arguments in closed body postures but not in open body postures because they feel more confident in their own thoughts.

On the contrary, if embodiment is context specific, then an open body posture should embody openness to new ideas and thoughts when individuals are in a context in which they are being persuaded. As a consequence, participants will engage in more careful processing of the information presented leading to greater attitude change in favor of strong arguments (as opposed to weak arguments). A closed body posture on the other hand, may be associated with a closed-minded attitude. As a result, participants will be less likely to carefully evaluate the arguments in the persuasive message and will be less persuaded irrespective of the quality of the argument presented (weak vs strong). To sum up, participants adopting an open body posture will be differentially persuaded by strong and weak arguments but not those in a closed body posture. Attitude change may also be brought about through a simple low effort processing by adopting an open body posture. The openness cue from the body may become associated with the message, thereby leading to greater attitude change in favor of the message (irrespective of argument quality). We should observe the opposite in case of closed body postures, resulting in less attitude change irrespective of the argument quality (see Figure 2).

Current Study and Hypotheses

The primary goal of the study was to investigate whether an open body posture can embody openness to persuasion and produce a change in participants' attitudes. I measured participants' initial attitudes towards introducing junk food taxation and then randomly assigned participants to hold either an open or a closed posture condition. Participants were then exposed to a persuasive message while holding the assigned body posture. The postures, instructions and cover story were adopted from the study conducted by Carney and colleagues (2010). Human faces were presented along with the persuasive message in order to enhance the extent to which these findings seek a closer replication of Carney and colleagues. Participant attitudes post persuasion were measured to compute the difference score as a measure of attitude change. The argument quality was manipulated and the participants were presented with either a strong or a weak argument in favor of junk food taxation. This manipulation helped in investigating whether the attitude change was being brought about by a thoughtful processing of the message (in which case attitude change would be brought about by the strong message), or through a simple thoughtless process (in which case persuasion would be enhanced by the weak argument).

I proposed two research questions along with two competing hypotheses that sought to clarify the relationship between body postures and attitude change.

Research Question 1

Can open (compared to closed) body postures result in attitude change after being exposed to a persuasive message?

Competing Hypotheses 1

a) If open body postures embody power, then these postures will result in less attitude change (irrespective of message strength) and closed body postures will lead to more attitude change (especially for strong message)

b) If open body postures embody openness to persuasion, then open body postures will result in more attitude change (especially for strong message) and closed body postures will lead to less attitude change.

Research Question 2

What factors mediate the relationship between body posture and attitude change (power and/or openness to persuasion) and whether this relationship is moderated by the strength of the persuasive message (strong vs. weak).

Competing Hypotheses 2

a) If open body postures embody power, then subjective feelings of power will mediate the relationship between body posture and attitude change, such that open (compared to closed) postures would lead to increased feelings of power, which in turn would lead to less attitude change (irrespective of the strength of the message). However, a closed body posture will result in one feeling less powerful, which in turn would lead to greater attitude change. This mediation would be moderated by the message strength; such that power will mediate the relationship but only when the message is strong.

b) If open body postures embody openness to persuasion, then the subjective feelings of openness will mediate the relationship between body posture and attitude change, such that open (compared to closed) postures would lead to more openness to the persuasive message, which in turn would lead to greater attitude change. This mediation would be

moderated by the message strength; such that openness will mediate the relationship but only when the message is strong. However, a closed body posture will result in less attitude change irrespective of the message strength.

Method

Participants and design

Two hundred participants (111 female, mean age 22.43 years old) were recruited on the Rutgers University-Camden campus and were paid $10 for their participation. Participants were randomly assigned to one of four conditions in a 2 (Body posture: open or closed) x 2 (Persuasive message: strong vs. weak argument) between-participants design. At the time of data analysis, participants with severe difficulties in speaking, reading, or understanding English were removed from the data set.

The sample size was determined based on a power analysis conducted with G*Power software (Faul, Erdfelder, Lang, & Buchner, 2007), using the Wilcox-Mann-Whitney test with an alpha level of .05. The estimated effect size used in the analysis was .50 and was obtained by averaging four effect sizes: d = .91 (Carney et al., 2010), d = .48, and d = .28 (Huang et al., 2011), and d = .34 (Ranehill et al., 2015). The a priori power (1 - β) was set to .95.

Procedure

Participants were run by research assistants who were blind to the hypotheses of the study. After signing the informed consent, participants were informed that the study investigated how people evaluate certain messages related to current societal issues. Using a MediaLab program, we first displayed a brief explanation of junk food taxation ("Junk food is food that has low nutritional value, typically high in sugar and produced in the form of packaged snacks needing little or no preparation. Junk food taxation would involve adding an extra tax on the sale of junk foods"). To be able to compute a difference score, we then measured participants' pre-attitude towards junk food taxation.

Subsequently, participants were asked to adopt either an open or a closed body posture depending on the condition. While maintaining the assigned body posture, participants were exposed to either a strong or a weak message supporting junk food taxation, depending on the randomly assigned condition. We then measured participants' subjective feelings of power, attitude towards junk food taxation and subjective feelings of openness. Finally, participants were debriefed. We also asked them whether they were familiar with the power posture literature (from classes or the Amy Cuddy Ted Talk).

Cover story

Participants were told "you will participate in a study which investigates how people evaluate certain messages related to global issues. Before you begin, we would like to pretest some ideas for a future study we will be conducting." After measuring their pre-attitude towards junk food taxation, we told participants "You are now ready to participate in the main study in which we will ask you to evaluate one message related to the issue of junk food taxation. Your task is to read this message and later evaluate it. As a side project, we are currently conducting in our lab, we are also testing the accuracy of physiological responses as a function of sensor placement. Because of this, we are asking you to hold a certain physical position"

Body posture manipulation

We used the two standing positions from Carney and colleagues (2010). Open body posture included arms away from body, palms open, feet apart, whereas the closed body posture included arms crossed across the chest, palms against the body, feet crossed at the ankles. We did not use the forward lean in the Carney and colleagues standing open position, because it may introduce a confound. More specifically, we aimed for the body

posture openness to be the only factor being manipulated across the open and closed postures (e.g., participants in the open body posture condition should not be physically closer to the screen displaying the persuasive message, compared to those in the closed body posture condition). Pictures similar to Carney and colleagues were used as models. The research assistants corrected the participants' posture if the adopted posture did not correctly match the picture. A screen displaying the persuasive message was placed at eye level in front of the participants. We also presented faces along with the persuasive message. Pictures of open and closed body postures are included in Appendix 1 and both the strong and weak messages are included in Appendix 2.

Measures

Pre-attitude about junk food taxation. Before being exposed to the persuasive message, participants were asked to rate junk food taxation on three 9-point (1-9) semantic differential scales (against – in favor, unfavorable – favorable, bad - good). The items were averaged to create a composite pre-attitude index (M = 5.23, SD = 2.07, Cronbach's α = .92), with higher numbers denoting more positive attitudes towards junk food taxation. The items were taken from Brinol, Petty, Valle, Rucker and Becerra (2007).

Post-attitude about junk food taxation. Following the persuasive message, participants were asked to rate junk food taxation on three 9-point (1-9) semantic differential scales (against – in favor, unfavorable – favorable, bad - good). The items were averaged to create a composite post-attitude index (M = 6.08, SD = 2.14, Cronbach's α = .93), with higher numbers denoting more positive attitudes towards junk food taxation.

Sense of power. Consistent with Carney et al. (2010) and Ranehill et al. (2015), participants indicated how "powerful" and "in charge" they felt on a scale from 1 (not at

all) to 4 (a lot). The items were averaged to create a composite subjective power index (M = 2.51, SD = 0.89, Cronbach's α = .83), with higher numbers denoting higher sense of power.

Openness. Participants were asked to rate four statements on a scale from 1 (Strongly Disagree) to 9 (Strongly Agree), as they relate to their state while reading the persuasive message. The items are "I feel open to new ideas", "I welcome thinking about new ideas", "I like to entertain different points of view" and "I am curious about many different things." The items were averaged to create a composite openness index (M = 6.42, SD = 1.56, Cronbach's α = .85), with higher numbers denoting more openness.

Results

Analysis Plan

To test the two proposed hypotheses I will conduct a between-subject ANOVA and moderated mediations using Hayes' PROCESS macro Model 14 (Hayes, 2013). Till recently, Sobel Test was a commonly used tool to test for mediation effects. However, compared to the Sobel Test, bootstrapping is a superior way of testing for indirect effects. Sobel Test, like all other Z-tests assumes that the underlying sampling distribution of the statistic is normal. Unfortunately, many simulations have shown that the indirect effects may not be normally distributed. Bootstrapping on the other hand is a non-parametric resampling procedure which does not impose normality on the sampling distribution. An empirical estimate of the sampling distribution is created and used to form confidence intervals for the indirect effect by repeating this process several times. Extensive simulations (MacKinnon, Lockwood & Williams, 2004) examined the Type I error rates and power of various ways of testing indirect effects. They found that the bootstrapping approach outperformed the Sobel test, because it had higher power while maintaining reasonable control over Type I error.

Attitude Change

A variable called *Attitude Change* was computed in order to evaluate the change in participants' attitudes after receiving the persuasive message. *Attitude Change* is a difference score. The difference score was calculated as the difference between participants' attitudes towards junk food taxation in the posttest and those in the pretest. Attitudes in the pretest were subtracted from those in the posttest. *Attitude Change* may be positive or negative. Higher positive numbers indicate a more positive attitude change

in favor of junk food taxation; whereas higher negative numbers indicate a more negative attitude change in favor of junk food taxation. The mean and standard deviation of the *Attitude Change* variable were as follows: M =0.85 and SD =1.35.

Attitude Change as a Function of Body Posture and Persuasive Message Strength

To test our first research question regarding the effects of body posture on attitude change I conducted a 2 (Body posture: open or closed) x 2 (Persuasive message: strong vs. weak) between participants ANOVA on Attitude Change towards junk food taxation. Results showed a main effect of message strength, F (1, 196) = 5.36, p = .022 such that strong messages (M = 1.06, SD = 1.41) led to more attitude change compared to weak messages (M = 0.63, SD = 1.25). This result shows that our manipulation of message strength was successful and replicated previous research. The main effect of body posture on attitude change in favor of junk food was not significant, F (1, 196) = 2.22, p = .138. However, the interaction between posture and message strength was significant, F (1, 196) = 5.53, p = .02. Contrast analyses showed that when exposed to a weak message, there is no difference between the closed and open posture, t (196) = .61, p = .54. However, when exposed to a strong message, those participants holding an open posture were significantly less persuaded than those holding a closed posture, t (196) = 2.71, p = .007. Figure 3. represents a visual interpretation of this interaction.

Moderated Mediation for Subjective Feelings of Power and Message Strength

To test the first competing hypothesis for the second research question I conducted a moderated mediation analysis. The proposed model (see Figure 4.) sought to establish if *subjective feelings of power* mediated the link between *body posture* and *attitude change.* Further it tested whether this mediation pattern was moderated by the strength of the

message (weak vs strong). The models were tested using Hayes' PROCESS macro Model 14 (Hayes, 2013). To test the moderated mediation, we reported the conditional indirect effects at the two levels of the moderator (strong message and weak message) using 5000 bootstrap samples. As can be seen in Table 1, subjective feelings of power did not mediate the relationship between posture and attitude change. The conditional indirect effects were not significant for the weak message 95% CI [-0.10, 0.03] with 5000 bootstrap samples, or for strong message 95% CI [-0.02, 0.16] with 5000 bootstrap samples. Moreover, it should be noted that the effects of body posture on subjective feelings of power were not significant. The mechanism proposed in Figure 1 for the impact of posture through embodied power on attitude change was not supported. However, an interaction between posture and message strength significantly predicted attitude change. In other words, we did not find a main effect of posture on attitude change (as proposed in figure 1), we did find a significant interaction between posture and message strength.

Moderated Mediation for Subjective Feelings of Openness and Message Strength

To test the second competing hypothesis for the second research question I conducted a moderated mediation analysis. The proposed model (see Figure 5.) sought to establish how *subjective feelings of openness* mediated the link between *body posture* and *attitude change.* Further it tested whether this mediation pattern was moderated by the strength of the message (weak vs. strong). The models were tested using Hayes' PROCESS macro Model 14 (Hayes, 2013). To test the moderated mediation, we reported the conditional indirect effects at the two levels of the moderator (strong message and weak message) using 5000 bootstrap samples. As can be seen in Table 2, subjective feelings of openness

did not mediate the relationship between posture and attitude change. The conditional indirect effects were neither significant for weak message 95% CI [-0.17, 0.04] with 5000 bootstrap samples, nor for strong message 95% CI [-0.21, 0.06] with 5000 bootstrap samples. The mechanism proposed in Figure 2 for the impact of body posture through embodied openness on attitude change was not supported.

Discussion

The goal of the current study was to test two hypotheses against each other. According to the first hypothesis, open body postures would increase feelings of subjective power, thus supporting the idea of an exclusive, causal relationship between open body postures and power (Adam & Galinsky, 2012; Carney et al., 2010), resulting in less attitude change in favor of a persuasive message. As a competing hypothesis, we proposed that open body postures might embody openness to persuasive arguments, resulting in greater attitude change especially in favor of a strong persuasive message, thus supporting the idea that the implicit role cues present in the situation may change the interpretation of the body posture.

The hypothesis regarding the effect of posture on persuasion was not supported. However, the interaction between posture and message strength revealed that participants exposed to a strong message were less likely to change their attitude if they held an open vs. closed posture, a finding that is more consistent with the power rather than persuasion explanation. In other words, those holding an open posture resisted persuasion after being exposed to a strong message. This could be because of one feeling more powerful and in turn feeling more confident in their own thoughts. Consistent with our hypothesis, power can influence attitude change by validating people's own thoughts prior to message exposure. In other words, participants in a high-power posture (open posture) validated their initial beliefs, thereby resisting persuasion. This is in line with the previous research on self-validation hypothesis. However, on probing further, we did not find an effect of posture of subjective feelings of power, $b = 0.13$, $SE = 0.13$, $p = 0.30$. Since we asked participants to report how powerful they felt after the posture manipulation, it is possible

that participants' self-reports on felt power did not correspond with their implicit feelings of power. In other words, the increase in feelings of power occurred at an implicit level below participants' awareness. Further, the power measure as adapted from Carney and colleagues (2010) comprised of two items; "how powerful you felt" and "how in-charge you felt". We ran separate analyses for these two items to find a main effect of posture on feelings of power, but not on feelings of being in-charge. Dana Carney, one of the authors of the original study on power postures, in her response to the ongoing debate on the effectiveness of power poses professed that the study suffered from *p-hacking*, a practice of selective reporting of results within studies (Carney, 2016). This could have led to the choice of these two items under the measure for felt power.

We did not find support for either of the two-competing hypotheses for our second research question. In other words, neither subjective feelings of power nor subjective feelings of openness mediated the relationship between body posture and attitude change. Further this relationship was not moderated by message strength.

Theoretical implications of Current Research

Power is an important aspect of human behavior and it is important to study the psychological mechanisms associated with it. The current study provides an important addition to existing body of literature on non-verbal behaviors, specifically those associated with power postures. We found that open body postures evoked feelings of power irrespective of the situational context. To confirm this, we tested two hypotheses against each other to understand whether open body postures always elicited feelings of power or could they also provoke feelings of openness to others' arguments in a context free from power related action possibilities. In other words, we sought to clarify whether

a direct, context-free link existed between open postures and feelings of power or does context dictate what is being embodied. We put forth a "self-validation" hypothesis as a potential mechanism of recipient's power affecting persuasion. We found that open postures resulted in less attitude change in favor of a persuasive message. Open postures possibly evoked feelings of power in participants which led them to validate their initial views and impressions, reducing their motivation to engage in thoughtful processing of information. Open postures did not lead to participants' feeling open to others' ideas and views, despite being placed in a situation where they were being exposed to a persuasive message.

This study substantiates the open posture-power link and has implications for the literature on *power postures* and persuasion. Since the initial study conducted by Carney et. al (2010) on power postures, several researchers failed to replicate those findings, which not only outpaced the evidence in favor of it but also raised several questions about the way the original research was conducted. On the contrary, our study lends support to the *posture-power* hypothesis put forth by the authors of the original study. We argue that the psychological mechanisms associated with power posing may be complex and the relationship between posture and power may not be as simple as initially assumed. Though open expansive postures could have an effect, it may not necessarily mean that assuming a power pose will always arouse a surge of confidence. Future research must consider how individual differences such as personality, gender, culture etc. might moderate this relationship in order to establish the exact conditions under which these effects can be detected.

Applied Implications of Current Research

The present work also supports the existing research on self-validation hypothesis (Brinol et. al, 2007), demonstrating that feelings of power and confidence can impact message recipients' motivation to process information, leading them to resist persuasion. Thus, we can say that powerful individuals may show greater resistance to change and may not be easily dissuaded by opposing arguments.

This has implication for the real world, particularly advertising, as well as the field of consumer psychology. The level of confidence consumers might have in their own thoughts prior to being exposed to a sales pitch or an advertainment may impact their favorability towards the product and subsequently their purchasing behavior. More specifically, this research points out how bodily expressions might play a role in resisting persuasion. People may be able to resist persuasion by adopting a more open/expansive posture when exposed to an advertisement or a sales pitch. Embodied resistance to persuasion opens up a new avenue of research, demonstrating that bodily expression mediated through postural expansiveness induces thought confidence in message recipients, resulting in persuasion resistance. On the one hand this could provide consumers with a tool to effectively resist persuasion tactics, while simultaneously providing marketers with an opportunity to understand the mechanism behind this consumer resistance strategy.

Limitations and Future Research

We did not find an effect of posture on felt power. This does not necessarily imply that power poses and body manipulations more generally lack psychological consequences. As stated earlier, open postures may lead to implicit activation of power, and self-report

measures may not be an accurate way of detecting these phenomena. In the future, more powerful manipulations and more sensitive outcome measures will be needed to detect them.

Further, other variables like gender and personality differences may have affected our findings. There is some research to support that the same posture may affect men and women differently (Roberts and Arefi-Afshar, 2007). Also, stable individual differences might predict thought-confidence and subsequently the likelihood of being persuaded (Brinol, Petty & Tormala, 2004). It is possible that some individuals may be naturally more agreeable than others and may be more easily persuaded. Individual differences in prior knowledge or expertise could also play a role. Future research must look at controlling for such variables that may dampen any possible effects of posture on persuasion due to bimodality.

Another line of future research could explore how the interaction between message framing (i.e. gain or loss framed message), individuals' approach/avoidance orientation (behavioral activation/inhibition system) and posture (open vs. closed) might impact persuasion. There are many ways in which a persuasive message can be conveyed. The message can either be conveyed in terms of the benefits of engaging in a particular behavior (known as gain frame) or in terms of the cost of failing to engage in the behavior (known as loss frame). Although the information presented is objectively the same, research demonstrates that framing it differently may impact individuals' judgements, decisions and behaviors differentially (Rothman & Salovey, 1997). Further, research also suggests that individual differences in avoidance and approach motivations may also interact with message frame to impact the persuasion. Therefore, power may

interact with message frame and individual orientation to have varied effects on persuasion.

Conclusions

We did not find an effect of body posture on felt power. However, when looking at the change in attitude pre-post persuasion, findings revealed that participants exposed to a strong message were less likely to change their attitude if they held an open vs closed posture, a finding that is more consistent with the power rather than persuasion explanation. The effect of posture on openness were not significant. These findings suggest that the power pose effect may be real, however, more research must be conducted to reveal the exact conditions under which these effects can be seen. Additionally, implicit measures for detecting feelings of power should be included in future research.

Appendix 1

Body Posture Manipulation (Open Body Posture)

Body Posture Manipulation (Closed Body Posture)

Appendix 2

Pro-Junk Food Tax (Strong Persuasive Message)

In Favor of Junk Food Taxation

Some states in the United States are considering legislation on the taxing of junk food. When taking many factors into consideration, this program seems likely to bring about a number of good things.

According to some proponents of this legislation, taxing junk food will provide money for many government-based initiatives. For example, they estimate that a one-cent tax per 12-ounce soft drink could generate about $1.5 billion annually which could be spent on promoting physical activity and nutrition education. In addition, a penny tax per pound of candy would raise about $70 million. Large amounts of money like this could be used to fund a number of healthy lifestyle programs and to subsidize health insurance for people suffering from obesity.

In addition to the economic benefits, placing a tax on junk food will encourage healthy eating. According to Stanford Professor Keith Brown, a major reason people eat junk food is because it is cheap and convenient. Dr. Brown says that so much cheap junk food creates a "toxic environment" of sweetened food. This junk food is more calorically dense than healthy food, so people are much more likely to gain weight. Taxing junk food could make people choose healthier alternatives because the junk food would no longer be cheaper in the long run. Moreover, Dr. Brown proposes to tax junk food to make unhealthy food more expensive and to use the funds from the tax to decrease the costs of healthy food by 70%. By taking the pressure off of individuals to choose between food

quality and food value, people will feel more positive towards buying and eating healthier food.

By promoting healthy eating habits, this taxation would also have an indirect impact on the nation's obesity problem (and medical conditions related to obesity). The Journal of the American Medical Association reports that in 2001, 44.3 million Americans were obese and the number of Americans with diabetes increased 61% since 1990. A report from the Journal of Food Analysis found that Americans receive nearly one-third of their calories from junk food. These facts are even more alarming when one realizes that diseases like diabetes cost millions of dollars annually in health care and lost productivity. In a 1992 study that assessed the direct costs of treating diabetes in the U.S., the American Diabetes Association found that the estimated total expenditure for 1 year was $45.2 billion. Because eating large amounts of junk food is associated with being obese and is related to a higher risk for costly diseases like diabetes, junk food is a major contributor to the current obesity problem.

Pro-Junk Food Tax (Weak Persuasive Message)

In Favor of Junk Food Taxation

Some states in the United States are considering legislation on the taxing of junk food. When taking many factors into consideration, this program seems likely to bring about a number of good things.

According to some proponents of this legislation, taxing junk food will provide money for some government-based initiatives. For example, they estimate that a one-cent tax per 12-ounce soft drink could generate a small amount of money annually which could be spent on a number of different things. In addition, a penny tax per pound of

candy could create a small increase in funds as well. Amounts of money like this could be used to partially fund programs for a small number of citizens.

In addition to the economic benefits, placing a tax on junk food might encourage healthy eating. According to college student Keith Brown, a major reason people eat junk food is because it is cheap and convenient. Brown says that so much cheap junk food creates a "toxic environment" of sweetened food. This junk food is somewhat more calorically dense than healthy food, so people are more likely to gain weight. Taxing junk food could make people choose healthier alternatives because the junk food would no longer be much cheaper in the long run. Brown proposes to tax junk food in order to negatively affect junk food producers and in turn, decrease the large amount of junk food that has become too readily available for consumers. By taking the pressure off of individuals to choose between food quality and food value, people will feel more positive towards buying and eating healthier food.

By promoting healthy eating habits, this taxation may also have an indirect impact on the nation's obesity problem (and medical conditions related to obesity). Another college student reports that in 2001, 15.3 million Americans were obese and the number of Americans with joint pain increased 2% since 1990. A report from a local newspaper found that Americans receive nearly one-twelfth of their calories from junk food. These facts are even more alarming when one realizes that conditions such as joint pain cost thousands of dollars annually in health care and lost productivity. In a 1992 survey that assessed the indirect costs of treating sufferers of joint pain, one health clinic found that the estimated total expenditure for 1 year was $100,000. Because eating large amounts of

junk food is associated with being obese and is related to a higher risk for costly medical conditions like joint pain, junk food is a major contributor to the current obesity problem.

Table 1.
Moderated mediation results for outcome Attitude Change

	Subjective Feelings of Power *(M)*		Attitude Change *(Y)*	
	Coeff.	*p*-value	Coeff.	*p*-value
Posture *(X)*	0.13	.30	- 0.28	.14
Message Strength (V*)*	--	--	- 0.44	.46
Subjective Feelings of Power (M)	--	--	- 0.05	.71
M x V	--	--	0.32	.15
Constant	2.44	.000	0.89	.02
	R^2 = .01		R^2 = .05	
	F (1,198) = 1.07, p = .30		*F (4, 195) = 2.53, p = .04*	

Table 2.
Moderated mediation results for outcome Attitude Change

	Subjective Feelings of Openness *(M)*		Attitude Change *(Y)*	
	Coeff.	*p*-value	Coeff.	*p*-value
Posture *(X)*	- 0.16	.46	- 0.25	.70
Message Strength (V*)*	--	--	- 0.31	.70
Subjective Feelings of Openness (M)	--	--	0.18	.04
M x V	--	--	0.08	.50
Constant	6.50	.000	- 0.31	.57
	R^2 = .003		R^2 = .10	
	F (1,198) = 0.54, p = .46		*F (4, 195) = 5.29, p = .001*	

Figure 1.
A summary of the hypotheses for the effects of body postures if open postures exclusively embody power.

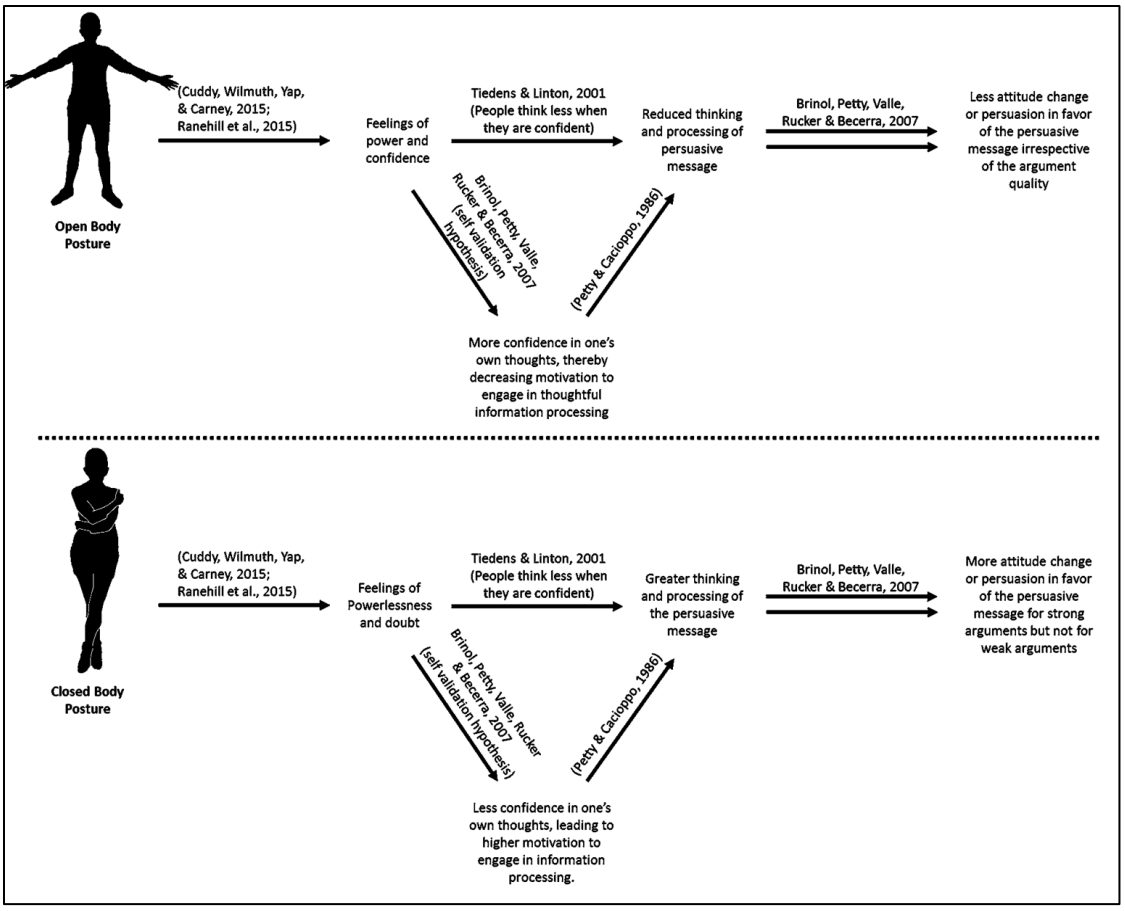


Figure 2.

A summary of the hypotheses for the effects of body postures if open postures embody openness to persuasion under certain circumstances.

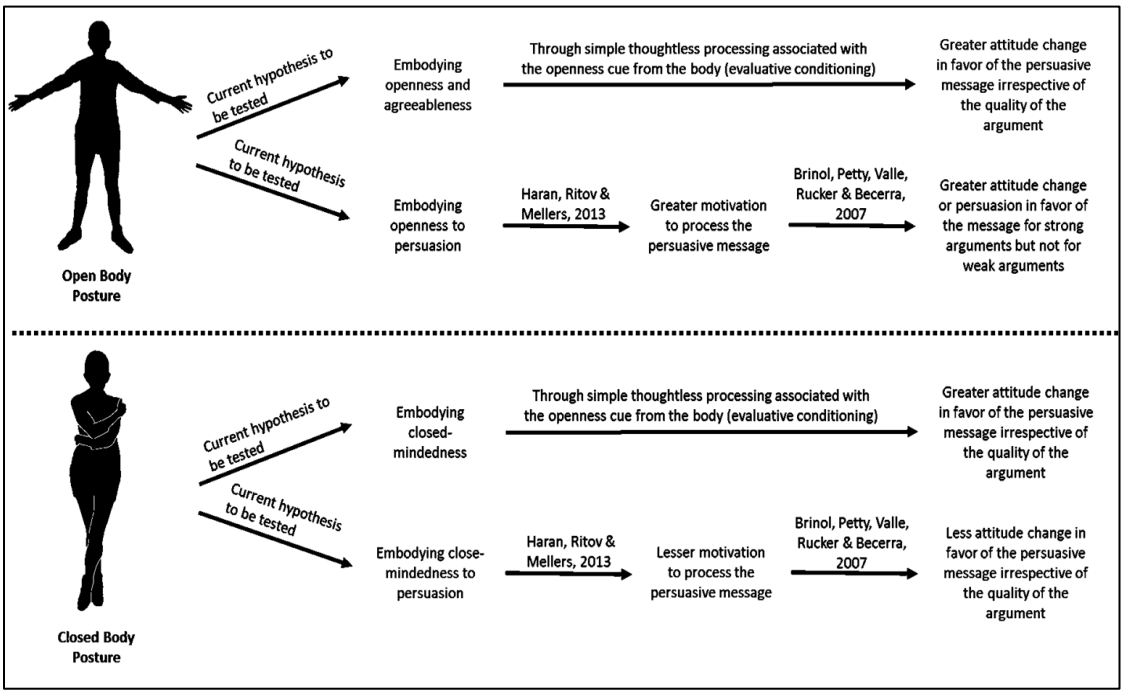


Figure 3.
Interaction between body posture and message strength

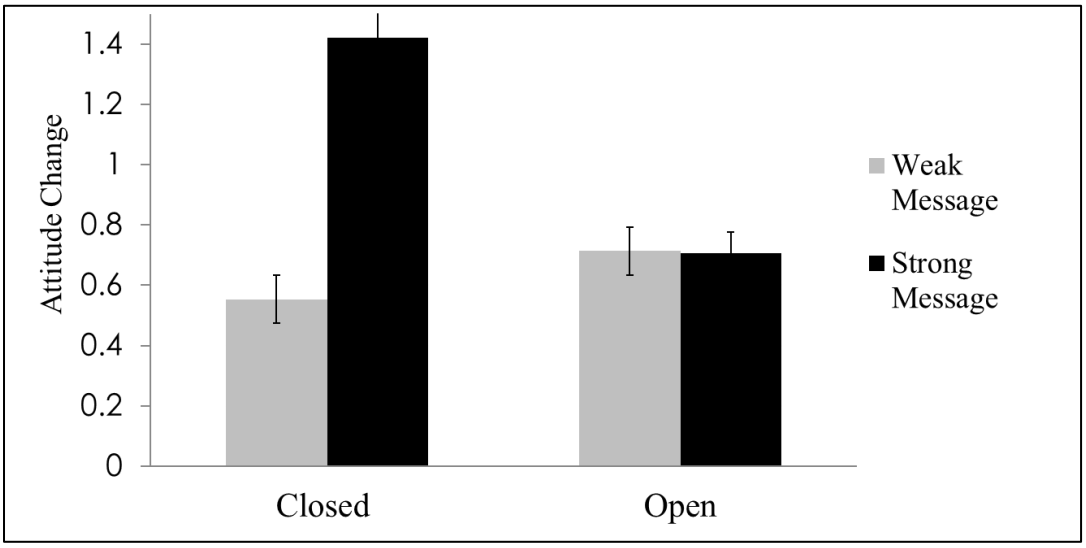


Figure 4.
Moderated Mediation Model for Subjective Feelings of Power and Message Strength.

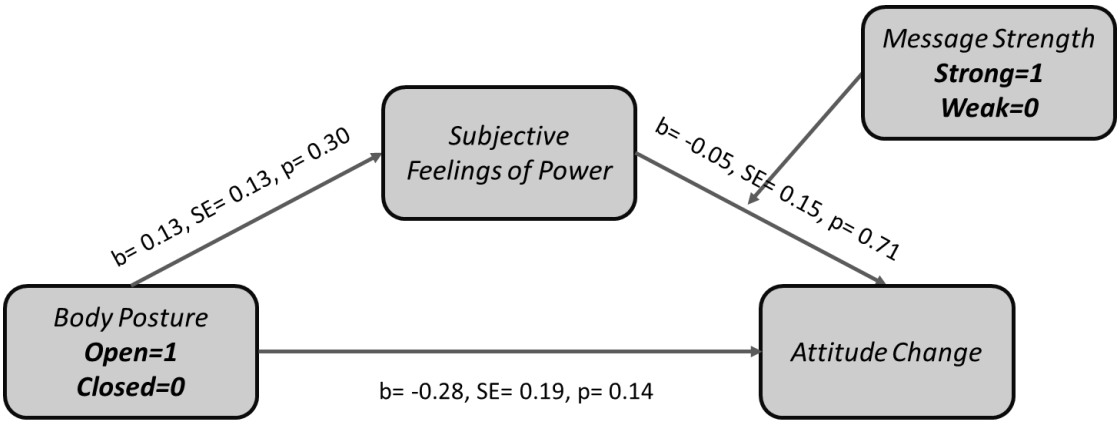
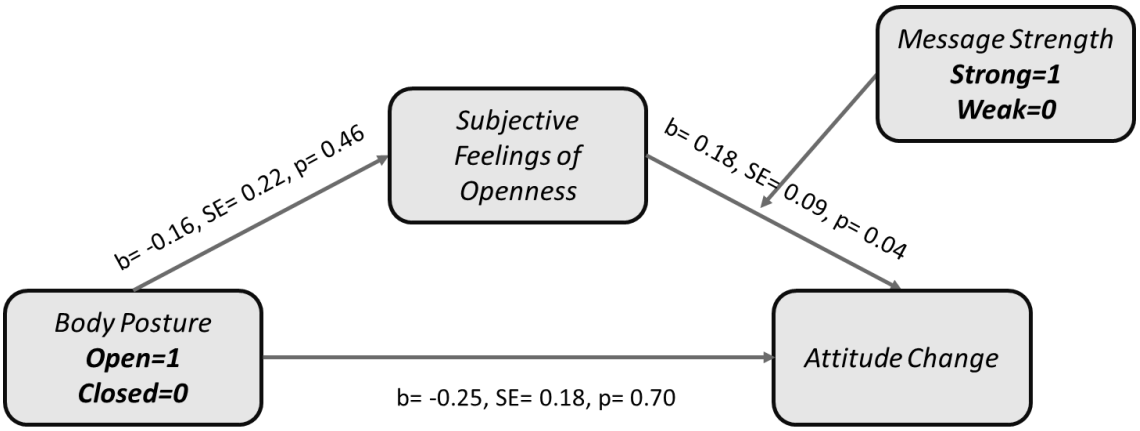


Figure 5.
Moderated Mediation Model for Subjective Feelings of Openness and Message Strength.



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