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The Mitigation of Stereotype Threat Through Embodied Cogition

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Abstract

Stereotype threat has been well-supported by decades of research. It is a pervasive phenomenon which affects multiple social groups with both immediate and lasting consequences. Therefore, it has been of a particular importance to study strategies that may serve at mitigating the effects of stereotype threat. Women, in particular, often face stereotypes that state that women are inferior to men in certain domains, among which are mathematics, spatial reasoning, driving ability, leadership, and making financial decisions. In the current study, we evaluate whether embodied cognition can be used to mitigate the effects of stereotype threat experienced by women in the financial domain. Furthermore, we conclude to what extent embodied cognition is more effective at stereotype threat mitigation than threat reframing.

Keywords: stereotype threat, stereotypes, mitigation, financial decision-making, power posing, embodied cognition

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THE MITIGATION OF STEREOTYPE THREAT THROUGH EMBODIED COGITION

By

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Introduction

Research into stereotype threat has demonstrated that it is a real and pervasive phenomenon which affects multiple social groups. It affects African-Americans, Hispanics/Latinos, other ethnic minorities, women, men, the elderly, and even children Aronson, Lustina, Good, Keough, Steele, & Brown, 1999; Aronson, Quinn, & Spencer, 1998; Gonzales, Blanton, Williams, 2002; Barber & Lee, 2016; Beckmann, & Menkhoff, 2008; Bliss, & Potter, 2002; Carr & Steele, 2010; Charness & Gneezy, 2004; Chasteen, Bhattacharyya, Horhota, Tam, & Hasher, 2005; Davies, Spencer, Quinn, Gerhardstein, 2002; Desert, Preaux, and Jund, 2008; Hess, Auman, Colcombe, & Rahhal, 2003; Hess, Emery & Queen, 2009; Horton, Baker, Pearce, & Deakin, 2008; Horton, Pearce, & Deakin, 2010; Gonzales, Blanton, Williams, 2002; Joanisse, Gagnon, & Voloaca, 2012; Joanisse, Gagnon, & Voloaca, 2013; Koenig and Eagly, 2005; Lambert, et al., 2016; Schmader, 2002; Cadinu, Maass, Rosabianca, & Kiesner, 2005; Spencer, Steele, & Quinn, 1999).

Research into the possible mechanisms of stereotype threat has identified affective, cognitive, and neurological components that may lead to stereotype threat (Aronson & Inzilcht, 2004; Bosson, Haymovitz, Pinel, 2004; Cadinu, Maass, Rosabianca, Kiesner, 2005; Chung, Ehrhart, Holcombe-Ehrhart, Hattrup, Solamon, 2010; Croizet, Després, Gauzins, Huguet, Leyens, Méot, 2004; Engle, Tuholski, Laughlin, & Conway, 1999; Hess, Anuman, Colcombe, Rahhan, 2003; Kray, Thompson, & Galinsky, 2001; Krendl, Richeson, Kelley, and Heatherton, 2008; Mayer & Hanges, 2003; Mrazek, Chin, Schmader, Hartson, Smallwood, Schooler, 2011; Schmader, 2013; Steele & Aronson, 1995; Stone, 2002 Rydell, McConnell, Beilock, 2009; Turner & Engle, 1989). In recent

years, stereotype threat mitigation has become a topic of interest. Specifically, research has been conducted on methods and strategies to mitigate the effects of stereotype threat. Some stereotype threat mitigation research has evaluated cognitive strategies, for example, stress and emotion management as well as Dweck's growth mindset. Another focus on stereotype threat mitigation has centered on environmental control. However, less research has concentrated on embodied cognition. The purpose of this research is to determine whether stereotype threat can be mitigated using embodied cognition.

Social Identity Theory

Tajfel and Turner's (1970) Social Identity Theory (SIT) specifies and predicts the circumstances under which individuals think of themselves as individuals or as group members. Specifically, the theory helps us to understand the consequences of personal and social identities for individual perceptions and group behavior. An individual's social identity is derived from the perceived membership in a relevant social group, such as gender, ethnicity, political and religious affiliations, sexual orientation, and preference for sports teams (Turner & Oakes, 1986). It argues that a person's behavior toward people like themselves, and those different from themselves, can be predicted with some accuracy. Specifically, it posits that in-group and out-group members are thought about differently. That is, group members of an in-group will seek to criticize characteristics of an out-group, thus enhancing and reaffirming the characteristics of the in-group (Cuhadar & Dayton, 2011; McLeod, 2008; Tajfel & Turner, 1979).

SIT further proposes that individuals go through three stages of group identity formation (McLeod, 2008; Tajfel & Turner, 1979). In social categorization, individuals see themselves as part of a group, for example, a student may see himself or herself as a

nerd, geek, or jock. In social identification, individuals automatically perceive those who share the same social identity as part of the in-group. The individuals who do not share the same attributes of the social identity are categorized as the out-group. Individuals also adopt values, attitudes, behavior, and other characteristics of the in-group; for example, a high school football player will adopt the stereotypical behaviors of a high school jock. In social comparison, individuals view their social identity as superior to others, in regards to the characteristics of the group's identity. This leads to inter-group tensions and prejudice. It can also lead to discrimination and violence if one group has the power to influence another (McLeod, 2008; Tajfel & Turner, 1979). One such example is the political conflict between the Hutus and Tutsis (Stanton, 1998) or the genocide Jews endured in World War II-era Germany (Dwork & Pelt, 2002).

Group formation is demonstrated in the early research that has been conducted on SIT using the minimal group paradigm (Gagnon & Bourhis, 1996; Gaertner & Insko, 2000; Tajfel, Billig, Bundy, & Flament, 1971; Tajfel & Turner, 1979). The minimal group paradigm is used in social psychology to investigate the minimal conditions required for discrimination to occur between groups (Diehl, 1990; Tajfel, Billig, Bundy, & Flament, 1971; Tajfel & Turner, 1979). Studies illustrate that placing young children into arbitrary groups with meaningless distinctions can elicit favoritism toward in-group members and derogation toward out-group (Tajfel, Billig, Bundy, & Flament, 1971; Tajfel & Turner, 1979).

General research into SIT also found evidence for a reluctance to go against one's in-group. Because social identities are so integral to one's self-concept, individuals will choose group interests over self-interests to maintain the illusion of belonging to a social

group (Morewedge, Tang, & Larrick, 2016). This is even true in the case of favorable bets against identity-relevant desired outcomes, such a free, real chance to earn $5 if their sports team lost its upcoming game (Morewedge, Tang, & Larrick, 2016).

Research in this area set the foundation to understand and predict human behavior. One theoretical offshoot of SIT is tokenism. Early research describes a token as a marginalized individual who is permitted into a group but is not fully accepted (Laws, 1975). Law's definition of a token is similar to Hughes' concept of an outsider, which is defined as someone who meets the formal requirement for entry into a group, but is not fully accepted based on auxiliary characteristics, such as sex, race, or ethnicity (Hughes, 1945; Laws, 1975; Zimmer, 1988). In current research, a token is defined in terms of the sociological literature, which defines it as admitting an individual (usually a woman or ethnic minority) into a group because of the difference from the other members. The purpose of this is to serve as proof that the group does not discriminate against such groups (Zimmer, 1988). Tokenism theory explains that being the sole minority in an otherwise homogenous group should elicit cognitive deficits in all domains, as a byproduct of the self-consciousness it causes (Levin & Van Laar, 2006; Lord & Saenz, 1985; Saenz, 1994; Saenz & Lord, 1989).

Another offshoot of SIT research focuses on stereotypes. A stereotype is an over-generalized belief about a particular group or class of people (Cardwell, 1996; McGarty, Yzerbyt, & Spears, 2002). Stereotypes are not necessarily negative, biased statements. On one hand, stereotypes can help people to respond quickly to new situations because we can refer to previous similar situations. On the other hand, however, differences within a

group may be ignored if generalizations about an entire group are made. Stereotypes are the building blocks underlying social categorization (Cardwell, 1996).

Substantial research has been produced in SIT and stereotypes. Another theoretical offshoot of interest is stereotype threat. Stereotype threat occurs when one is in a situation where they have the fear of doing something that would inadvertently confirm a negative stereotype about themselves. In stereotype threat, the stereotype itself causes evaluation apprehension for the individual and leads to reduced performance (Steele & Aronson, 1995). In other words, it is the awareness of the stereotype that leads to reduced performance in the people who are members of the stereotyped group (Saenz, 1994; Steele & Aronson, 1995).

Stereotype Threat Research Methodology

Steele and Aronson in their 1995 study set the precedent in which other studies on stereotype threat are based. In the original stereotype threat paradigm, African-American and Caucasian undergraduate students were recruited to participate in a lab study. All participants reported their SAT scores prior to the study. Each participant was informed that he/she will be working on a set of verbal problems for the next 30 minutes. For the crucial stereotype manipulation, participants were randomly assigned to the stereotype-threat condition or to the no stereotype threat condition. To induce stereotype threat, the participants in the stereotype threat condition were informed that the problem set would be diagnostic of their intellectual ability. The goal in doing this was to bring to mind the negative stereotypes relevant to African-American students and academic performance in the minds of the Black participants. This would then instill the fear of fulfilling the stereotypes in that context and lead African-American participants in the stereotype threat

condition to perform worse than the Whites and other African-American participants in the no threat condition (Psychology in Action, 2013; Steele & Aronson, 1995).

The no-stereotype-threat condition participants were told that the verbal problems were a problem-solving task and non-diagnostic of ability. Steele and Aronson (1995) made the stereotypes about Black students and academic ability irrelevant in the no-stereotype condition. Therefore, African-Americans in this condition completed the task in a non-threatening environment (Psychology in Action, 2013; Steele & Aronson, 1995). After receiving the instructions, participants worked on a GRE-like test for 30 minutes. The primary dependent variable was the test performance.

After controlling for the SAT skill in data analysis, Steele and Aronson (1995) found that the African-American students underperformed compared to their Caucasian peers in the stereotype threat condition. Meanwhile, African-American and Caucasian students performed the same in the no stereotype threat condition (Psychology in Action, 2013; Steele & Aronson, 1995). This differencing performance indicates stereotype threat.

What this study illustrated is that creating a situation in which stereotype threat is salient led African-American students to perform worse than Caucasian students on a test supposedly measuring intellectual ability, due to the fear of confirming negative racial stereotypes about intelligence (Steele & Aronson, 1995).

Steele and Aronson followed up with another variation of their study (Psychology in Action, 2013; Steele & Aronson, 1997). In the second study, African-American students ticked a box indicating their race right before taking a GRE-like test. This led to

differences between groups by inducing stereotype threat among Black students (Psychology in Action, 2013; Steele & Aronson, 1995).

Inducing Threat. There are a few pieces that go into stereotype threat research. The first of which is knowing how to induce threat. There are three ways in which stereotype threat can be activated. The first way stereotype threat can be induced is through activating threat, which alerts the participant that a group they belong to is deficient in a given domain. Examples of the use of this cue have involved manipulations of the diagnosticity of a test (Steele & Aronson, 1995), explicit statements that one's in-group would do poorly in the domain (Spencer et al., 1999), or stereotypic group portrayals (Davies et al., 2002). The negative stereotypes activated in this manner are a manifestation of the primed negative link between the group and the domain. Furthermore, individual differences in stereotype endorsement (Schmader, Johns, & Barquissau, 2004) or stigma consciousness (Brown & Pinel, 2003) might increase susceptibility to stereotype threat (Schmader, 2008).

The second method of inducing threat is an off-shoot of the previous method. Research suggests that presenting the task as evaluative of one’s abilities results in the induction of stress and anxiety, thus decreasing performance (Frantz, Cuddy, Burnett, Ray, & Hart, 2004**;** Kray, Thompson, & Galinsky, 2001**;** Marx, Stapel, & Muller, 2005). Furthermore, individuals’ perception of evaluative scrutiny increases when the task is challenging. Several studies have shown that stereotype threat effects are stronger on difficult tests, particularly for people who are highly-identified with the domain (O'Brien & Crandall, 2003; Spencer, Steele, & Quinn, 1999; Wicherts, Dolan, & Hessen, 2005).

Another way to induce threat is through manipulations of group salience. Past studies demonstrate manipulations of group salience can produce stereotype threat effects; this includes solo status (Inzlicht & Ben-Zeev, 2000), group priming (Shih, Pittinsky, & Ambady, 1999), and group representativeness (Schmader, 2002).

Current Research

African-Americans. Research has looked at several groups of individuals. Research has been conducted about the various stereotypes that African-Americans face. The most recognizable of these studies were the studies conducted by Steele and Aronson (1995) regarding academic test-taking. On a more positive note, Stone, Lynch, Sjomeling, and Darley (1999) as well as Stone (2002) looked at the stereotype that African-American men outperform threatened Caucasian men in terms of athletic ability. These studies indicated that African-Americans outperformed threatened Caucasian men in sports.

Hispanics and Latinos. Research has also been conducted using the stereotypes that Hispanics and Latinos have faced. For example, Hispanics who have been primed with the stereotype that they do not match Caucasians in academic ability have performed worse than their white peers (Gonzales, Blanton, Williams, 2002).

Men. Research has indicated that even men can be induced with stereotype threat. This is surprising because men are normally compared to women and found to outperform their female counterparts. However, when Caucasian and African-American men are compared on athletic ability, threatened Caucasian perform worse than the African-American peers (Stone, 2002; Stone, Lynch, Sjomeling, & Darley, 1999). This

suggests that men can be threatened by the stereotype that African-American men are superior athletes.

Another stereotype is that women outperform men in terms of interpersonal ability and social sensitivity. In a study conducted by Koenig and Eagly (2005), it was found that men who were told that the test assessed social sensitivity performed worse than women on the test than did men who were told that the test assessed information processing.

Elderly. The older population can also feel stereotype threat. Ageism can be found in many domains of life, including driving skills, cognitive abilities, and physical abilities. Research seem to suggest that the elderly who are under stereotype threat have poorer performance on driving abilities compared to those not under threat (Joanisse, Gagnon, & Voloaca, 2012; Joanisse, Gagnon, & Voloaca, 2013; Lambert, et al., 2016). When the elderly are induced under threat, their performance on cognitive abilities weakened compared to those not placed under threat (Chasteen, Bhattacharyya, Horhota, Tam, & Hasher, 2005; Hess, Auman, Colcombe, & Rahhal, 2003; Hess, Emery & Queen, 2009; Horton, Baker, Pearce, & Deakin, 2008; Horton, Pearce, & Deakin, 2010; Lamont, Swift, & Abrams, 2015; Levy, Zonderman, Slade, and Ferrucci, 2011; Horton, Baker, Pearce, & Deakin, 2008; Levy, 1996; Levy & Leifheit-Limson, 2009; Meisner, 2011; O'Brien, & Hummert, 2006).

Another stereotype regarding the older population is that hearing ability decreases. Research suggests that there is a great perception of hearing decline among those induced with stereotype threat compared to those not under threat (Barber & Lee, 2016; Levy, Slade, & Gill, 2006).

Children. Unfortunately, research has also determined that stereotype threat can be experienced by children as well. In a study conducted by Desert, Preaux, and Jund (2008), children in first and third grade performed an intellectual ability test. The authors concluded that indicated participants believed that children from a high social-economic status are better at school than children from a low social-economic status. Furthermore, low social-economic status participants' performance on the task was lower in the evaluative condition than in the non-evaluative condition. In a study by Chan and Rosenthal (2014), it was demonstrated that adolescents from Hong Kong can be placed under threat with the stereotype that males perform better at mathematics.

Women. In the stereotype threat paradigm, women have been manipulated to indicate that they are less capable at mathematics compared to men (Aronson, Lustina, Good, Keough, Steele, & Brown, 1999; Aronson, Quinn, & Spencer, 1998; Davies, Spencer, Quinn, Gerhardstein, 2002; Gonzales, Blanton, Williams, 2002; Schmader, 2002; Cadinu, Maass, Rosabianca, & Kiesner, 2005; Spencer, Steele, & Quinn, 1999).

Women have also been found to perform worse than men on driving tasks while under stereotype threat (Yeung & von Hippel, 2008; Joanisse, Gagnon & Voloaca, 2013; Stone & McWhinnie, 2008; Berger, 1986; Granie, & Papafava, 2011).

There is also significant research on the stereotype that women are more risk-averse than men on a variety of financial tasks including risk taking and financial decisions (Beckmann, & Menkhoff, 2008; Bliss, & Potter, 2002; Carr & Steele, 2010; Charness & Gneezy, 2004; Lindquist, & Säve-Söderbergh, 2011; Nelson, 2014; Niessen & Ruenzi, 2006; Perelman, 2000; Wealth, 2011).

Mechanisms

Given all of the research on stereotype threat across multiple populations and in different domains, it can be concluded that this is a very durable phenomenon. Researchers over the last couple decades are getting consistent results about the inducement of threat and the negative consequences of performance. However, it is still unclear on why it happens and what can be done about it.

In further understanding stereotype threat, research has developed various explanations of stereotype threat. These explanations span across multiple disciplines, including biology, neuroscience, cognitive science, and behavioral science. There is no single agreement of the intricate mechanisms of stereotype threat. Therefore, it is difficult to pinpoint the cause-and-effect of stereotype threat.

Affective. Much research has proposed that affective variables underpin the effects that stereotype threat has on performance (Schmader, 2013). Stereotype threat is often described as a fear, anxiety, or apprehension (Aronson & Inzilcht, 2004; Kray, Thompson, & Galinsky, 2001; Steele & Aronson, 1995). Accordingly, researchers have considered affective and other subjective variables as an influence in the stereotype threat-performance relationship. Both self-report measures of affect as well as physiological measures have been utilized by researchers (Bosson, Haymovitz, Pinel, 2004; Chung, Ehrhart, Holcombe-Ehrhart, Hattrup, Solamon, 2010; Hess, Anuman, Colcombe, Rahhan, 2003; Mayer & Hanges, 2003; Mrazek, Chin, Schmader, Hartson, Smallwood, Schooler, 2011; Steele & Aronson, 1995; Stone, 2002). Research has

showed support that elements of negative affect work together to undermine performance (Stroessner & Good, 2011).

Cognitive. Since stereotype threat interferes with performance on tests of cognitive ability, an evaluation of stereotype threat from the perspective of cognitive science is also warranted. In the original studies, it was demonstrated that stereotype threat can be created in testing situations (Steele, 1997; Steele & Aronson, 1995; Steele, Spencer, & Aronson, 2002). Inferences can be made that activating stereotype threat creates additional situational stress, reducing available working memory. In cognitive psychology, working memory capacity is defined as the ability to focus one's attention on a given task while keeping task-irrelevant thoughts at bay (Engle, Tuholski, Laughlin, & Conway, 1999). Studies aiming to identify cognitive mechanisms of stereotype threat have made several discoveries. Schmader and Johns (2003) argued that performance-evaluative situations might reduce working memory capacity as stereotype-related thoughts consume cognitive resources. Other studies show similar conclusions through various experiments (Rydell, McConnell, Beilock, 2009; Turner & Engle, 1989). Available working memory is also reduced when those under threat face cognitive interference, that is, negative or distracting thinking (; Mrazek, Chin, Schmader, Hartson, Smallwood, Schooler, 2011). A method people rely on when dealing with negative or districting thoughts is suppressing those thoughts. Thought suppression may increase cognitive load, and thus reduce performance (Croizet, Després, Gauzins, Huguet, Leyens, Méot, 2004; Logel, Iserman, Davies, Quinn, Spencer, 2009; Steele & Aronson, 1995). People who are aware that their performance will be evaluated in regards to negative stereotypes, such in tasks deemed diagnostic, will engage in active efforts to disprove the

stereotype. This unique combination of both awareness and avoidance may lead people to try to suppress negative thoughts, which in turn, may lead to increased cognitive loads.

Research has also been conducted on cognitive load as a possible avenue. There is ample research which explains that stereotype threat taxes the brain by placing a high level of demand of mental resources (Croizet, Després, Gauzins, Huguet, Leyens, Méot, 2004; Rydell, van Loo, Boucher, 2014; Schmader & Johns, 2003).

Many of these stressors come from affective mechanisms, such as anxiety, evaluation apprehension, physiological arousal (Blascovich, Spencer, Quinn, & Steele, 2001; Schmader & Johns, 2003; Steele & Aronoson, 1995). Studies illustrate that stereotype threat induces anxiety and performance decrements in complex tasks (Aronson, et al., 1999; Schmader & Johns, 2003; Spencer, Steele, & Quinn, 1999; Stone, Lynch, Sjiomeling, & Darley, 1999).

Neuroscience. Wraga, Helt, Jacobs, and Sullivan (2006) addresses stereotype threat against spatial reasoning using fMRIs in three groups: positive stereotype, negative stereotype, and control. Among the three groups, those in the negative stereotype threat experienced poorer performance and increased activation in brain regions associated with increased emotional load. Likewise, those in the positive stereotype threat experienced improved performance and increased activation in visual processing areas and, to a lesser degree, complex working memory processes. The authors conclude that stereotype messages affect the brain selectively, with positive messages producing relatively more efficient neural strategies than negative messages

In support, Krendl, Richeson, Kelley, and Heatherton (2008) presents additional neuroscientific insight into stereotype threat. They aimed to use fMRIs as a tool to

identify the neural structures that are associated with women's underperformance on mathematical performance. General conclusions show that although the women in the control group used regions of the brain associated with mathematical learning, those in the threat condition activated the region of the brain responsible for social and emotional processing.

Consequences of Stereotype Threat

It is still unclear how and why stereotype threat occurs. Nevertheless, there is no doubt that it occurs and that it has lasting consequences. The most recognizable consequence of experiencing stereotype threat is reduced performance in the threatened domain. Research has demonstrated that threatened groups underachieve on classroom exams, standardized tests, and tasks (Steele & Aronson, 1995; Cole, Matheson, & Anisman, 2007; Good, Aronson, & Harder, 2008; Keller, 2007; Neuville & Croizet, 2007; Good, Aronson, & Inzlicht, 2003; Brown & Day, 2006; Klein, Pohl, & Ndagijimana, 2007). Stereotype threat can also affect threatened groups in non-academic domains: white men in sports (Stone, Lynch, Sjomerling, & Darley, 1999); women in negotiation (Kray, Galinsky, & Thompson, 2002), homosexual men in providing childcare (Bosson, Haymovitz, & Pinel, 2004), women in driving (Yeung & von Hippel, 2008), and elderly in memory performance (Levy, 1996).

Stroessner and Good (2011) identified additional consequences of stereotype threat. Those threatened by stereotypes may resort to self-defeating strategies. Specifically, individuals under stereotype threat might reduce preparation, exhibit less effort, or invoke factors to create attributional ambiguity for potential failure (Brown & Josephs, 1999; Keller, 2002; Schimel, Arndt, Banko, & Cook, 2004; Steele & Aronson,

1995; Stone, 2002). Another strategy individuals may engage in is questioning the validity of the task or even the importance of the trait being tested. One severe consequence is individuals disengaging and distancing from the domain. Severe disengagement may develop into disidentification. Disidentification occurs when an individual avoids the domain to the point of detaching their identity from the domain (Fryer, 2006; Osborne, 1997; Osborne & Walker, 2006; Steele, et al. 2002; Zirkel, 2004).

This can lead to irrevocable lasting impact on individuals' lives. When individuals are unnecessarily detached from domains, it can lead to decisions leading away from that domain, such as decisions regarding career paths and professional aspirations (Good, Dweck, & Rattan, 2008; Gupta & Bhawe, 2007; Murphy, Steele & Gross, 2007; Steele, James & Barnett, 2002).

Mitigation

Research into stereotype threat has been extensive over the last few decades (Singletary, Ruggs, Hebl, & Davies, 2009). The research discussed above illustrates the pervasive role stereotype threat plays in society. It is a phenomenon experienced by multiple social groups across various domains. Additionally, it could lead to detrimental consequences. Hence, more research into understanding stereotype threat is warranted. This not only includes understanding it on a neurological, biological, and cognitive basis but also identifying methods in which the effects of stereotype threat can be controlled or eliminated. There have already been some explorations made into methods and techniques attempting to mitigate the effects of stereotype threat. Carr et al. (n.d) summarizes several strategies to combat stereotype threat that have been empiratically validated.

One such method is to remove cues that trigger stereotype threat. This is accomplished by reducing prejudices (Logal et al., 2006), removing physical cues that make it seem that a school setting is defined by the majority group (Cheryan et al, 2009); not asking people to report a negatively stereotyped group identity immediately before taking a test (Danaher & Crandall, 2008; Steele & Aronson, 1995; Stricker and Ward, 2004). Another method that has been researched is to identify and present role models from diverse groups who are exceptions to the negative stereotype (Blanton, Crocker, & Miller, 2000; Huguet & Régner, 2007; Marx & Goff, 2005; Marx & Roman, 2002; Marx, Stapel, & Muller, 2005 ; McIntyre et al., 2003; McIntyre, Paulson, & Lord, 2003).

Another technique that has been explored is to educate individuals to manage feelings of stress and threat so that they 1) attribute anxiety to stereotype threat or another external factor rather than to the risk of failure (Good, Aronson, & Inzlicht, 2003; Johns, Schmader, and Martens, 2005), and 2) reappraise arousal as a potential facilitator of strong performance rather than barrier to it (Johns et al., 2008).

Another option is reframing the task description. Describing tasks so that the stereotype is not induced can mitigate the effects of stereotype threat (Spencer, Steele, & Quinn, 1999; Quinn & Spencer, 2001). In other words, addressing the fairness of the test or task while retaining its purpose can alleviate the effects of stereotype-threat. For example, Spencer, Steele, and Quinn (1999) reframed threat by manipulating the relevance of the stereotype through the presentation of the task. In the threat condition, participants were told that the test had shown gender differences in the past—this explicitly evoked the stereotype about women's math ability. On the other hand, in the no threat condition, participants were told that the test had never shown gender differences

in the past. In a different study, Blanton, Crocker and Miller (2000) demonstrated that providing role models can reduce stereotype threat effects.

Theories of Intelligence. Alternatively, examining how individuals define and view intelligence can provide insight into identifying those likely to be affected by stereotype threat. Carol Dweck is credited with one of the popular implicit theories of intelligence – incremental vs entity mindsets of intelligence (Dweck & Leggett, 1988). The theory suggests there are two major attitudes that individuals can adopt regarding intelligence, which are the entity (or fixed) mindset and the incremental (or growth) mindset.

According to the entity theory, innate intelligence is a personal quality that is unchangeable. Those who believe this perspective of intelligence believe that even if people can learn new things, their intelligence stays the same. They will likely blame their intelligence and abilities for achievement failures. On the other hand, the incremental theory explains that innate intelligence is not fixed and can be improved through enough effort. Those who adopt the incremental theory will blame task failures on a lack of effort and/or strategy use. They are also likely to work to improve their task performance.

Dweck and her colleagues found that students' perception of their abilities played a key role in their motivation and achievement. By changing students' mindsets, achievement and task performance can be boosted. Specifically, students who believed in the growth mindset outperformed those who believed their intelligence was fixed (Dweck & Leggett, 1988; Dweck, 2006; Dweck, 2015).

Adopting incremental view of intelligence may help reduce the effects of stereotype threat. Research has shown that those who adopt the entity theory as opposed to the incremental theory are more susceptible to stereotype threat and suffer task performance (Aronson, Fried, & Good , 2002; Goff, Steele, & Davies, 2008).

Most of these interventions, so to speak, are cognitive. They require changing our thinking patterns and beliefs. However, no one has attempted to address the issue of mitigating stereotype threat effects from a different perspective. Given the vast quantity of research on power, embodied cognition, and stereotype threat, there is an opportunity to evaluate the use of power poses as a self-applied method of mitigating the effects of stereotype threat. Inducing power through posing may perhaps be useful in making individuals more resilient against the effects of stereotype threat.

Embodied cognition. In another line of research focused in cognitive science, research in embodied cognition tries to link neural processes of perception, action, and emotion to cognition. In other words, manipulate cognition through the physiological nature of the body. Embodied cognition theory essentially suggests that one's physiology contributes significantly to one's cognitive processes, i.e., there is a causal relationship between one's body and one's mind.

There are multiple studies that show that manipulating the body can elicit specific cognitive processes. The most well-known manipulation is the authentic smile vs. Duchenne smile (Kraft & Pressman, 2012). Kraft and Pressman's results indicate that all smiling participants, whether they were aware of it or not, had lowered heart rates during recovery times. Those who explicitly told to smile had stronger effects than those who were not told to smile explicitly. Another body manipulation used is the nodding vs.

shaking head. Research suggests that nodding the head makes one less resistant to attitudinal influences. It also acts as an attracting force for the subject (Gail, Petteren, Lau, Burton, & Cook, 1991; Wells & Petty, 1980).

Power posing. Yet another body manipulation is body postures. The most recognized researcher of this manipulation is Amy Cuddy, who became known for her work on power poses after a 2012 TEDTalk presentation. Her TEDTalk is the second most viewed talk to this day. In her study with colleagues, Cuddy placed participants in poses that demonstrate confidence, dominance, and power (high power poses) or in poses that demonstrate defeat, subordination, and lack of confidence (low power poses). Results show that those in the high power pose group showed an increase in testosterone and a decrease in cortisol whereas those in the low power pose group showed a decrease in testosterone an increase in cortisol (Carney, Cuddy, & Yap, 2010). Both of these hormonal changes reflect the cognitive processes associated with the poses. Cuddy also demonstrated that high power poses are correlated with risk taking behavior.

The poses stimulated the sense of a presence or absence of power. Cuddy furthered this manipulation by having the participants partake in a mock job interview by preparing a 5-minute speech which would be evaluated. Results showed that those in the high power group performed better in the interview and scored higher on "hireability" (Cuddy, Wilmuth, & Carney, 2012; Cuddy A. J., Wilmuth, Yap, & Carney, 2015).

Power poses criticism. Cuddy's TedTalk brought light to her and her colleagues' power posing research to the attention of many (Cuddy, 2012). And with growing popularity came replications and criticisms. However, these failed attempts at replications were published quietly in journals. In 2016, however, Cuddy's coauthor on the original

research came forth to criticize the existence of power poses, which caused an uproar (Carney D. , 2016). This led to Cuddy making her own statement in response to the public criticism.

Another study concluded that the absence of power impairs one's executive functions (Smith, Jostmann, Galinsky, & Van Dijk, 2008). Across four experiments, Smith, Jostmann, Galinsky and van Dijk found that low power was consistently related to lowered executive functioning through multiple tasks and different manipulations of power.

Furthermore, another study (Van Loo & Rydell, 2013) that looked at the effects of power on women's math performance demonstrated that women's perception of power influenced their susceptibility to stereotype threat-based performance. That is, feeling powerful protected women from the effects of stereotype threat on math performance by preserving working memory capacity.

Most of the research on power relied on cognitive tasks, such as academic performance, spatial reasoning, or executive functioning. Research by Burgmer and Englich (2012) examined the effects of power on motor functioning. They demonstrated that activating power enhanced performance on tasks which were goal-directed.

Present Study

Social psychology illustrates that we as humans are born with the need to categorize and identify patterns in our environment and in our interactions (Cuhadar & Dayton, 2011). This is a basic cognitive process. This process aids in mapping out one's personal and social identities. Our social identity defines our relationships with others,

both members of our social groups and those in the out-groups (McLeod, 2008; Tajfel, Billig, Bundy, & Flament, 1971; Tajfel & Turner, 1979).

Individuals feel threatened when they believe they are demonstrating a negative stereotype associated with one's social group, resulting in poorer performance in that task (Schmader, Johns, & Forbes, 2008). There have been attempts at evaluating interventions that mitigate the effects of stereotype threat experienced by groups.

Given the literature discussed above, the purpose of this study is to evaluate the strength of interventions as a mitigating influence to combat the performance inference of stereotype threat. In particular, the focus on the current study is the stereotype threat experienced by women in financial decision-making. In this study, three interventions will be compared to a control group on their effectiveness to mitigate the effects of stereotype threat experienced by women on making insurance decisions. More specifically, two variants of power posing, high power posing, low power posing, will be compared to threat reframing as well as a control group

In evaluating the effectiveness of the interventions, the groups will be completing a series of hypothetical scenarios where they will be asked to choose a level of insurance to protect their assets given a probability of damage or disaster to the assets. They will also be assessed on their current emotions through a measure of their affect. Affect is often measured in stereotype threat studies as an indicator of the experience of threat (Bedyńska & Żołnierczyk-Zreda, 2015; Grimm, Markman, Maddox, & Baldwin, 2009; Hess, Emery, & Queen, 2009; Vermeulen, Castellar, Janssen, Calvi, & Van Loo, 2016). Additionally, they will be assessed on their propensity for risk-taking behaviors through a scale. Because the study is measuring how risk-seeking women are in regards to making

financial decisions, it is recommended to include an additional measure of risk-taking behaviors. Given how individuals can vary in how risk-seeking they are, a measure of risk will be used as a covariate.

In this study, we will also be measuring women's confidence levels regarding financial decision making at the start of the study. Research on financial decision making have demonstrated a lower degree of confidence amongst women in their ability to make decisions and the outcomes of those decisions (Estes & Hosseini, 1988; Stinerock et al., 1991; Zinkhan & Karande, 1991; Masters, 1989).

Overall, in this study, we are evaluating women's preference for risk in making financial decisions. We will be using an insurance-related task as the measure of risk. Furthermore, two proposed interventions will be compared against two controls. More specifically, the two interventions are threat reframing and high power posing. The two controls will be a standard control group in which no intervention is introduced and a low power posing group. The reason low power posing is being treated as a control is because it is hypothesized that it will induce more threat as opposed to try to mitigate it. The design is a basic pre-post manipulation where covariates are 1) confidence at the start of the study, 2) pre-manipulation of the insurance task, and 3) positive and negative affect at the start of the study.

Hypotheses. Given the literature, the researcher will make several hypotheses regarding stereotype threat experienced by women and their risk-aversion in regards to purchasing insurance.

Hypothesis 1. The first hypothesis concerns the main effect for stereotype threat. Given the vast impact of stereotype threat on performance across domains and

populations, it is hypothesized that inducing stereotype threat in women will result in women being less risk-seeking; that is, those in the stereotype threat group will make less-risky decisions regarding insurance compared to those in the no stereotype threat group (H1). It is hypothesized that there is a significant effect of stereotype threat on choosing insurance options, controlling for confidence, propensity for risk-taking behaviors, and the baseline insurance task scores. In other words, stereotype threat will increase women's risk-avoidance in making financial decisions.

Hypothesis 2. The second hypothesis concerns the main effect for the intervention. It is hypothesized that there is a significant effect of intervention on choosing riskier insurance options, controlling for confidence, propensity for risk-taking behaviors, and the baseline insurance task scores.

Given that there is already promising research detailing the mitigating effects of interventions, it is further hypothesized that those in high power posing and threat reframing will show higher riskiness compared to control (H2A). Moreover, those in the low power posing groups are less risk-seeking than those in the control groups (H2B).

Hypothesis 3. Lastly, in regards to the interaction effect, the researcher hypothesized that there is an interaction effect between the presence of threat and intervention. More specifically, the researcher hypothesized that the presence of threat will dampen the effects of the intervention in comparison to those not threatened. The hypotheses are listed in the table below.

Hypotheses	
Main Effect for Stereotype Threat	H0: No differences exist in women's propensity to choose riskier insurance options based on stereotype threat
	H1: Differences exist in women's propensity to choose riskier

	insurance options based on stereotype threat Those in the stereotype threat group will make less-risky decisions regarding insurance compared to those in the no stereotype threat group (H1)
Main Effect for Intervention	H0: No differences exist in women's propensity to choose riskier insurance options based on intervention H2: Differences exist in women's propensity to choose riskier insurance options based on intervention Those in high power posing and threat reframing are more risk-seeking compared to control (H2A). Those in the low power posing are less risk-seeking than those in the control groups (H2B).
Interaction Effect for Stereotype Threat and Interaction	H0: No interaction occurs between stereotype threat and intervention in affecting women's propensity to choose a riskier insurance option. H3: Interaction occurs between stereotype threat and intervention in affecting women's propensity to choose a riskier insurance option. There are differences in the effectiveness of intervention across the stereotype threat conditions. The effect of low power posing on the insurance task across threat conditions differs from the effects of high power posing and threats reframing on insurance task scores across threat conditions (H3).

Methods

Participants

For the current study, students were recruited from the psychology department at Montclair State University. All students were female students enrolled in introductory

psychology courses. Students were given 2 SONA credits as compensation for their participation in the study.

There were 230 women recruited for this study; six subjects were dropped from data analyses due to response incompleteness, resulting in a total of 224 subjects. Participants ranged from 18 years to 45 years old (M = 20.17; SD = 3.09). 206 participants (92%) were between the ages of 18 and 22. Sixty-seven participants (29.9%) were White. Fifty-two participants were Hispanic/Latina (23.2%). Forty-nine (21.9%) were Asian; forty-five (20.1%) were Black. Two (<1%) participants were Native American/Alaskan Native. Nine participants (4%) indicated Other Ethnicity. Regarding grade level, eighty subjects (35.7%) were freshmen. Fifty-nine (26.3%) were sophomores. Sixty (26.8%) were juniors. Twenty-two (9.8%) were seniors and three subjects (1.3%) indicated Other in regards to grade level. Tables 1A-C in the Appendices illustrate the descriptive statistics for the demographic data.

In regards to the groups, subjects were randomly assigned and split evenly between the stereotype threat condition and the no stereotype threat condition. The control had 56 subjects; the reframing condition had 59 subjects. There were 54 subjects in the high power pose condition and 55 subjects in the low power pose conditions. The distribution of participants across the groups are illustrated by Table 2, found in the Appendices.

As the research design relies on a pre-post manipulation, descriptive statistics were also calculated for the pre-manipulation scores of the dependent variables; these served as the baseline scores. These values are included in Table 3.

Design

This study is a mixed within, between subject design with Stereotype Threat Presence (2) x Intervention (4) x Pre/Post Task Administration (2). High Power Posing will be compared to Low Power Posing, Threat Reframing, and a Control condition across a No-Stereotype Threat condition as well as a Stereotype Threat condition.

		STEREOTYPE THREAT PRESENCE			
		Stereotype Threat		**No Stereotype Threat**	
INTERVENTIONS	**High Power Posing**	Pretest	Posttest	Pretest	Posttest
	Low Power Posing	Pretest	Posttest	Pretest	Posttest
	Reframing Threat	Pretest	Posttest	Pretest	Posttest
	No Intervention/Control	Pretest	Posttest	Pretest	Posttest

This study incorporates a partial blindness to assigned conditions. In the control groups as well as the reframing stereotype threat conditions, the researcher was completely blind to which stereotype condition participants were assigned and as well as whether they were assigned to the control or the reframing stereotype threat conditions. This is because the computer randomized the variables. However, for those in the power poses conditions, the research was only blind to whether participants were assigned to the stereotype threat condition or the no stereotype threat condition. Because the researcher

was required to interact with participants to demonstrate the poses to the participates were to be in, this could not be blind to the sole researcher.

Stereotype Threat. Participants were randomly assigned to either the Stereotype Threat condition or the No Stereotype Threat condition. Stereotype threat was induced in the directions of the task prior to the second administration of the insurance task. Those in the No Stereotype Threat condition received a neutral, non-discriminating set of instructions. Those in the Stereotype Threat were told that there were studies which indicated that were men overall were more risky than women on the task that they were completing. Prior to the second administration of the insurance task, subjects participated in a short task, asking them to evaluate a set of alternate instructions for future administration of the insurance task.

Interventions. Participants were also randomly assigned to one of four intervention conditions, which are as follows: 1) Control, 2), Threat Reframing, 3) High Power Pose, and 4) Low Power Pose.

Control. Those in the control groups do not receive further instructions regarding any intervention. Students will then read a brief research background on the insurance task and are asked to evaluate it. The directions on this task will introduce the stereotype threat. Students will think that they are evaluating the clarity of alternative directions of the insurance task for future studies. The students will complete a quick manipulation check for stereotype threat.

Reframing Threat. Those in the in the Threat Reframing condition are given the information that the task they are about to take has shown no gender differences in prior trials. Telling students that a test or task has never shown any gender differences in the

past has been shown to reduce stereotype threat for women on general mathematics tasks (Good, Aronson, & Harder, 2008). This information is incorporated into the task along with the stereotype threat prior to the second administration of the insurance task. Students will think that they are evaluating the clarity of alternative directions for future studies. The students will complete a quick manipulation check for stereotype threat.

Power Poses. After the first administration of the insurance task, subjects complete a supposedly irrelevant task – 2 stretching poses to relax. The type of pose depends on power pose condition. Those in the high power poses will hold poses which are outstretched and open. Those in the low power poses will hold poses which are hunched and closed (see Appendices for images of the poses). Students will hold two poses, each for three minutes. Students are told the "yoga poses" will calm them down in preparation for the actual test. Students will then read a brief research background on the insurance task in the introduction. The directions will introduce the stereotype threat. Students will think that they are evaluating the clarity of alternative directions for future studies. The students will complete a quick manipulation check for stereotype threat.

Materials

Demographics. Standard student demographic information was collected such as age, race/ethnicity, year in school. This was collected at the start of the session before the task.

Confidence level. On a scale of 1-10, how confident on average do you feel at making financial decisions in your life? There will be Pre- and Post-test administration of the confidence item.

DOmain-SPEcific Risk-Taking (DOSPERT) scale. This is a 2002 psychometric scale developed to assess likelihood respondents might engage in risky activities or behaviors in five domains. The five domains include the financial decisions (which is further broken down to investing and gambling), health and safety, recreational, ethical, and social subscales. Respondents rate the likelihood that they would engage in domain-specific risky activities on a Likert scale of 1 (Extremely Unlikely) to 7 (Extremely Likely).

In 2006, the authors released a shorter, 30-item version. Sample items include "Having an affair with a married man/woman" (Ethical), "Investing 10% of your annual income in a new business venture" (Financial), "Engaging in unprotected sex" (Health/Safety), "Disagreeing with an authority figure on a major issue" (Social), and "Taking a weekend sky-diving class" (Recreational).

Item ratings are added across all items of a given subscale to obtain subscale scores. Scores of all five subscales were added to generate an overall score. Scores ranged from 7 to 42 for each individual subscale. Overall scores ranged from 35 to 210. Higher scores indicate greater risk taking. This will be administered once at the beginning of the survey along with the demographic survey. For this study, the shorter, 30-item version was used.

Positive and Negative Affect Schedule (PANAS). The PANAS is a measure that is used to evaluate a participant's affect. In the current study, participants were asked to evaluate their current mood at the time of administration. The PANAS measure was administered twice, once at the start of the study and again at the conclusion of the study.

Internal consistency for the PANAS scale ranged between .86-.90 for positive affect and .84-.87 for negative affect. Test-retest reliability for the PANAS (using the one week measure) were reported as .79 for positive affect and .81 for negative affect. Correlation of the PANAS to Hopkins Symptom Checklist is = .74 for negative affect and -.19 for positive affect. Correlation of PANAS to Beck's Depression Inventory = .65 for negative affect and -.29 for positive affect.

The total score is calculated by finding the sum of the 10 positive items, and then the 10 negative items. Scores range from 10–50 for both sets of items. For the total positive score, a higher score indicates more of a positive affect. For the total negative score, a lower score indicates less of a negative affect.

Insurance task. This is adapted from Powell, M., & Ansic, D. (1997): This is a choice of insurance cover designed to represent a financial decision. Participants were told that they would make 12 completely independent insurance decisions. They were informed that for each decisions, they would be given a cash amount, some insurable assets, information about insurance cost, and the risk of damage or loss of the assets. They are then asked to make a choice about insuring their assets. The participants were also informed that the aim was to maximize total wealth holdings (cash and asset value) in each decision separately, noting that buying insurance would guarantee the asset value but reduces cash holdings. They were also told that the insurance premium, their wealth, and the nature of the risk would vary across each decision. Lastly, they were informed that for each scenario, one of three events will happen: 1) experience damage to assets, 2) experience a disaster to assets, or 3) nothing will happen. Damage to assets will reduce its

value in half. A disaster occurring would reduce the value of the assets to $0**.** One of the questions used in this study is below:

Sample Question
Q: You have a cash amount of $1280 and an asset amount of $2200. The risk level of either damage or damage is low.
1. Insure against damage: $500 2. Insure against disaster: $600 3. Insure against damage and disaster: $750 4. No insurance at all

In scoring performance on the insurance task, a numeric score was assigned to each insurance option based on riskiness. "No insurance at all" received 3 points for being the most risky option. "Insure against damage" received 2 points. "Insure against disaster" received 1 point. "Insure against damage and disaster" received 0 points for being the least risky. For each the pre- and the post-manipulation administrations of the insurance task, the scores of the 12 trials were summed to create the insurance score for each participant. The risk taking scale score will be compared with the pre-manipulation insurance-risk score. Scores ranged from 0 and 36; high scores indicating higher risk.

Procedure

Students arrived at the test location at their scheduled timeslot. They completed the consent form. They began the study by completing the initial questionnaire, which included the DOSPERT scale, the confidence item and the PANAS scale, and demographic items. Then they completed the first administration (baseline) of the insurance task.

At this point, the participants are introduced to the stereotype threat and intervention. Those in the power posing conditions are directed to hold two poses for

three minutes each before engaging in the manipulation task which introduced the stereotype threat condition. On the other hand, those in the control and the threat reframing conditions completed the manipulation task in which the stereotype threat - and the reframing intervention for those in the reframing threat condition - are introduced to the participants.

After the appropriate manipulation and intervention the participants have been assigned to, the participants completed a brief manipulation check before the second administration of the insurance task. This is followed up with the second administration of the PANAS scale and the confidence level item. The participant's interaction with the study ended with debriefing and an opportunity for the participant to ask questions. The table below provides a step by step of the procedure.

- Consent Form
- Pre-Study Questionnaire
  - Demographics, PANAS, DOSPERT, Confidence
- Pre-manipulation Insurance Task
- Manipulation
  - Power Poses, if applicable
- Manipulation Task
  - Stereotype Threat inducement, if applicable
  - Threat Reframing, if applicable
- Post-Manipulation Insurance Task
- Exit Questionnaires
  - PANAS, Confidence
- Debriefing Form

Data Analyses

SPSS was used to evaluate and analyze the collected data. General descriptive statistics was used to study the distribution of age, ethnicity, and year in school. Descriptive statistics were determined for affect, confidence, and propensity for risk-

seeking behaviors. Correlations were analyzed between insurance task scores, confidence levels, positive and negative affect, and participants' risk-taking behaviors.

Prior to testing for the effects of the interventions, we tested for differences between groups using T-Tests and ANOVAs. More specifically, T-Tests were utilized to compare groups on confidence levels, positive and negative affect, and propensity for risk-seeking behaviors across the two stereotype threat conditions at the start of the study. On the other hand, ANOVAs were utilized to compare groups on confidence levels, positive and negative affect, and propensity for risk-seeking behaviors across the 4 intervention groups at the start of the study.

Finally, an ANCOVA was conducted on the insurance task scores to measure preference for risk, controlling for confidence in making financial decisions, propensity for risk (DOSPERT total score), baseline PANAS scores, and the baseline insurance task scores.

Results

Descriptive Statistics

Descriptive statistics were analyzed for confidence levels, the PANAS scale, the DOSPERT scale, and the insurance task. The baseline confidence level mean across all groups was 5.11 (SD = 1.32). The confidence level mean at the end of the study for all group was 4.62 (SD = 1.56). Across all groups, the baseline positive affect mean was M = 31.87 (SD = 9.13). On the other hand, baseline negative affect mean across all groups was at 15.29 (SD = 3.25). End of study positive affect mean was 29.67 (SD = 10.05). End of study negative affect mean was 16.69 (SD = 6.77). Overall, across all groups tested,

confidence levels and positive affect was higher at the start of the study than at the end of the study. Negative affect was higher at the end of the study than at the start of the study.

DOSPERT. The overall mean for DOSPERT Total Score was 92.75 (SD = 27.22). The overall mean for DOSPERT- Ethical was at 14.73 (SD = 16.93). The overall mean for DOSPERT – Health/Safety was 20.11 (SD = 6.21). The overall mean for DOSPERT – Social was 23.47 (SD = 5.71). The overall mean for DOSPERT - Recreational was 16.98 (SD = 6.86). The overall mean for DOSPERT - Financial was 17.75 (SD = 7.35). The overall mean for DOSPERT - Gambling was 6.72 (SD = 4.23). The overall mean for DOSPERT - Investment was 11.03 (SD = 4.26).

Keeping the fact that the score range for a scale is from 0 to 36, the sample was the least risky in the ethical domain, followed by the recreational domain. The sample was the most riskiest in the social and health/safety domains.

Insurance task. Overall mean for the baseline insurance task scores was at 11.80 (SD = 7.39). The overall mean for the post-manipulation insurance task scores was at 11.99 (SD = 6.70).

Correlation

A Pearson's correlation was calculated for age, pre-manipulation confidence level, post-manipulation, pre- and post-manipulation positive and negative affect, pre-manipulation and post-manipulation, insurance riskiness, and pre- and post-manipulation risk taking behaviors. Correlations are represented in the matrix below.

One of the major findings is that there are strong relationships between confidence at the start of the study with positive affect ($r = .402$; $p < .000$); propensity for risky behavior ($r = .167$; $p = 012$); and propensity for risky financial behavior ($r = .177$;

p = .008). However, some of the relationships weakened at the end of the study. For example, at the start of the study, the relationship between confidence and DOSPERT was at significant (r =.167; p = .012), However, comparing the confidence levels at the end of the study and the same DOSPERT score was not significant (r = .112; p = .094).

Another key finding is that there are strong correlations between pre- and post-administrations of a scale. For example, the first administration of the PANAS Positive Affect scale correlates with the second administration of the PANAS Positive Affect scale (r = .788; p < .001). The first administration of the Negative Affect correlates with the second administration of the Negative Affect (r = .155; p = .036).

Although the insurance task is measuring how much a subject is willing to risk on purchasing insurance in advance given a natural disaster probability, the pre-and-post administration of the insurance task show no strong correlations to other measures of risk and risk-taking behaviors. For example, the pre-manipulation of the insurance task show no correlation to the DOSPERT scale (r = -.042; p = .525) or to the financial subscale (r = -.049; p = .469). See Table 4 for the entire correlation matrix.

Testing for Differences

Prior to data analyses, differences between groups at the start of the study were determined. T-Tests were utilized to compare the stereotype threat and no stereotype threat groups on demographical information, confidence on financial decision-making, positive and negative affect, and propensity for risk-taking behaviors. Similarly, ANOVAs were utilized to compare the groups across interventions on demographical information, confidence on financial decision-making, positive and negative affect, and propensity for risk-taking behaviors.

T-Tests

Demographics. An independent t-test was conducted to compare demographic information across the threat conditions. There was not a significant difference in age for the stereotype threat (M= 20.56, SD= 3.61) and no stereotype threat (M= 19.79, SD= 2.42) conditions; t(222)= -1.89, p = .06. There was not a significant difference in ethnicity for the stereotype threat (M= 4.19, SD= 1.66) and no stereotype threat (M= 3.92, SD= 1.63) conditions; t(222)= -1.22, p = .225. There was a significant difference in grade level for the stereotype threat (M= 2.31, SD= 1.09) and no stereotype threat (M= 1.98, SD= 1.00) conditions; t(222)= -2.36, p = .019. This indicates there were differences between the two groups in regards to the distribution of grade levels.

Insurance task. An independent t-test was conducted to compare insurance decision making riskiness across the two stereotype threat conditions. There was not a significant difference in insurance decision making riskiness for the stereotype threat (M= 11.98, SD= 7.43) and no stereotype threat (M= 11.61, SD= 7.37) conditions; t(222) = .205, p =.379. Those in the no stereotype threat and the stereotype threat conditions did not differ in insurance decision making riskiness at the start of the study.

DOPSPERT scale. An independent t-test was conducted to compare pre-manipulation DOPSPERT Scale scores for the stereotype threat and no stereotype threat conditions. This was calculated to test for group differences in propensity for risk-taking behaviors at the start of the study. The analysis was conducted for the total score, the five subscales, and the two subscales of the financial subscale. There was not a significant difference in the DOSPERT total scores for the stereotype threat (M= 95.22, SD= 30.72) and no stereotype threat (M= 90.28, SD= 32.07) conditions; t(222)= -.1.362, p = .174.

There was not a significant difference in the Financial subscale scores for the stereotype threat (M= 18.61, SD= 7.26) and no stereotype threat (M= 16.90, SD= 7.37) conditions; t(222)= -1.744, p = .083. There was not a significant difference in the Ethical subscale scores for the stereotype threat (M= 15.30, SD= 7.59) and no stereotype threat (M= 14.14, SD= 6.06) conditions; t(222)= -1.26, p = .211. There was not a significant difference in the Health and Safety subscale scores for the stereotype threat (M= 20.05, SD= 6.05) and no stereotype threat (M= 20.17, SD= 6.39) conditions; t(222)= .140, p = .889. There was not a significant difference in the Social subscale scores for the stereotype threat (M= 23.62, SD= 6.21) and no stereotype threat (M= 23.33, SD= 5.18) conditions; t(222)= -.374, p = .709. There was not a significant difference in the Financial - Gambling subscale scores for the stereotype threat (M= 6.96, SD= 4.31) and no stereotype threat (M= 6.48, SD= 4.14) conditions; t(222)= -.855, p = .395. There was a significant difference in the Financial - Investment subscale scores for the stereotype threat (M= 11.64, SD= 4.00) and no stereotype threat (M= 10.42, SD= 4.43) conditions; t(222)= -2.17, p = .031. Overall, the stereotype threat and the no stereotype threat groups did not differ on the DOSPERT scale, except on the investment items of the Financial subscale.

PANAS positive affect. An independent t-test was conducted to compare positive affect across the two stereotype threat conditions. There was a significant difference in positive affect for the stereotype threat (M= 30.56, SD= 9.19) and no stereotype threat (M= 33.17, SD= 8.93) conditions; t(222) = 2.154, p = .032. Those in the no stereotype threat condition had a significantly higher positive affect at the start of the study compared to those in the stereotype threat.

PANAS negative affect. An independent t-test was conducted to compare negative affect across the two stereotype threat conditions. There was not a significant difference in negative affect for the stereotype threat (M= 15.24, SD= 3.57) and no stereotype threat (M= 15.33, SD= 2.91) conditions; t(222) = .205, p = .838. Those in the no stereotype threat and the stereotype threat conditions did not differ in negative affect at the start of the study.

Confidence. An independent t-test was conducted to compare confidence regarding ability to make financial decision across the two stereotype threat conditions. There was a significant difference in confidence regarding ability to make financial decision for the stereotype threat (M= 5.36, SD= 1.29) and no stereotype threat (M= 4.86, SD= 1.31) conditions; t(222) = 8.32, p = .004. Those in the stereotype threat condition were more confident in their financial decision making ability than those in the no stereotype condition at the start of the study.

ANOVAs. Initial analyses were conducted to check for differences between groups across the four intervention conditions.

Insurance. A One-Way ANOVA was conducted to determine significant differences between groups across the four intervention conditions on the pre-manipulation administration of the insurance task. There was not a significant effect of the intervention on the pre-manipulation administration of the insurance task at the $p<.05$ level [$F(3, 220) = 3.07$, $p = .110$]. This indicates that there were no significant differences between the control, reframing, low power, and high power groups at the start of study on the dependent variable.

However, there were major differences between groups on confidence [$F(1, 222) = 8.55$, $p < .000$], positive [$F(1, 222) = 10.62$, $p < .000$] and negative [$F(1, 222) = 5.58$, $p = .001$] affect, and propensity to gamble [$F(1, 222) = 8.43$, $p < .000$] across the four intervention conditions.

Overall, differences were determined between threat groups on baseline positive affect, baseline confidence, and the DOSPERT- Financial – Investment subscale. Similarly, differences were also found between intervention groups on the DOSPERT scale, baseline positive and negative subscale, and baseline confidence. Therefore, baseline confidence, positive and negative affect, and the DOSPERT – total score have been controlled for the hypothesis testing.

Hypothesis Testing

Hypothesis 1. To reiterate, Hypothesis 1 tests for the main effects of stereotype threat on women's risk-seeking behaviors through the insurance task. Specifically, Hypothesis 1 says that women under stereotype threat will be less risk-seeking than those not under threat. T-Tests were first conducted to compare groups on dependent variables across stereotype threat groups. An ANCOVA was then conducted to compare the groups on the insurance task across the stereotype threat condition, controlled for the baseline insurance task scores, confidence levels and positive and negative affect at the start of study and DOSPERT scores.

ANCOVA. Results show a significant main effect for stereotype threat condition. An analysis of stereotype threat condition shows that those in the stereotype threat condition were less risk-seeking ($M = 10.37$; $SD = 5.89$) when buying insurance than

those in the no stereotype threat condition (M = 13.63; SD = 5.98); f(1, 217) = 13.22, p < .000. Hypothesis 1 is supported.

Hypothesis 2. To reiterate, Hypothesis 2 tests for the main effects of intervention on women's risk-seeking behaviors through the insurance task. Specifically, Hypothesis 2 says that differences exist in women's propensity to choose riskier insurance options based on intervention. More specifically, it was hypothesized that those in high power posing and threat reframing were significantly more risk-seeking compared to control (H2A). Furthermore, it was also hypothesized that those in the low power posing group were significantly less risk-seeking than those in the control, high power posing, and threat reframing groups (H2B). ANOVAs were first conducted to compare groups on dependent variables across intervention groups. An ANCOVA was conducted to compare the groups on the insurance task, controlled for the baseline insurance task scores, confidence levels, positive and negative affect and the DOSPERT scores.

ANCOVA. Results show a significant main effect for intervention condition. There were differences found between the interventions on the insurance task, controlled for baseline confidence levels, positive and negative affect and the DOSPERT scale. A comparison of means of intervention conditions shows that those in the control group were the least risk-seeking (M = 9.90; SD = .909) when buying insurance. Those in the low power pose group was the second least risk-seeking (M = 11.57; SD = .912). Those in the high power pose condition were the second most risk-seeking (M = 12.16; SD = .929. Those in the reframing threat was the most risk-seeking (M = 14.23; SD =.891).

A post-hoc analysis revealed significant differences between intervention groups. Specifically, statistically significant differences were found between threat reframing and

control; f(3, 215) = 4.10, p = .001. Threat reframing was also significantly different from low power posing; f(3, 215) = 4.10, p = .045.

High power posing was not significantly different from control, f(3, 215) = 4.10, p = .094; low power posing, f(3, 215) = 4.10, p = .646; or reframing, f(3, 215) = 4.10, p = .120. Additionally, low power posing was not significantly different from control, f(3, 215) = 4.10, p = .205.

Overall, hypothesis 2 says that differences exist in women's propensity to choose riskier insurance options based on intervention. This is supported. More specifically, those in high power posing and threat reframing are more risk-seeking compared to control (H2A) while the threat reframing groups were statistically more risk-seeking than the control groups; f(3, 215) = 4.10, p = .008, high power posing was not statistically different from the control groups, f(3, 215) = 4.10, p =.094). Hypothesis 2A is partially supported.

Furthermore, it was hypothesized that those in the low power posing group were less risk-seeking than those in the control groups (H2B). Results indicate that those in the low power posing groups were not statistically less risk-seeking than the control groups; f(3, 215 = 4.10, p < .205. Hypothesis 2B is not supported.

Hypothesis 3. Hypothesis 3 is that an interaction occurs between stereotype threat and intervention in affecting women's propensity to choose a riskier insurance option. Specifically, it was hypothesized that there are differences in the effectiveness of intervention across the stereotype threat conditions. We hypothesized that the effect of low power posing on the insurance task scores across stereotype threat conditions would differ from the effects high power posing and reframing on insurance task across

stereotype threat conditions. We conducted an ANCOVA, controlling for baseline scores on confidence, affect, the insurance task, and DOSPERT. No significant differences were found for interaction between the presence of threat and interaction, $f(3, 215) = 4.10$, $p = .176$. Therefore, hypothesis 3 is not supported.

Discussion

In this research, we discussed that stereotype threat is a real and pervasive phenomenon which can affect multiple populations in multiple domains. Additionally, there are both short-term and long-term consequences of stereotype threat, which include reduced performance at the immediate level as well as permanent disengagement from the domain at the long-term level. Due to the nature of the observed consequences, there is a need to study methods, strategies, and techniques that reduce the effect stereotype threat has on task performance.

In the current study, the purpose of the study was to evaluate the effectiveness of embodied cognition as a potential intervention to mitigate the effects of stereotype threat. Furthermore, this study compared the effectiveness of embodied cognition to another well-studied intervention as well as to a strategy identified in research as inducing more stereotype threat.

Summary of Findings `

To review, there were three primary hypotheses. Hypothesis 1 tested for a main effect for stereotype threat. Specifically, it was hypothesized that those in the stereotype threat condition were less risk-seeking than those in the no stereotype threat condition. The results show support for this hypothesis. Controlling for the subjects' confidence in

financial decision making, the pre-manipulation set of scores for the insurance task, and propensity for risk taking behaviors, those in the stereotype threat condition were overall more risk-averse than those in the no

stereotype threat condition.

Hypothesis 2 tested for a main effect for Intervention. It was hypothesized that there would be significant differences between the interventions. More specifically, it was hypothesized that those in high power posing and threat reframing interventions would be more risk-seeking compared to the control group (H2A). Additionally, those in the low power posing intervention would be less risk-seeking than those in the control groups (H2B). Results show a partial support for Hypothesis 2. Results show partial support for Hypothesis 2A; those in the threat reframing intervention were more risk-seeking than those in the control groups. However, those in the high power posing were not significantly more risk-seeking than those in the control groups. There was no support for Hypothesis 2B. Those in the low power posing intervention were not significantly less risk-seeking than those in the control group.

Lastly, we also tested for an interaction between the presence of stereotype threat and intervention. However, no interaction was found between stereotype threat and intervention. The effectiveness of intervention was not influenced by the threat condition.

Theoretical Implications

The present study supports the current literature in two areas. First, the researcher replicated the inducement of stereotype threat. This corroborates the current literature that stereotype threat is an established phenomenon. Furthermore, it supports the claim that

stereotype threat can reduce the performance of a stereotype threatened individual on a given task, as illustrated in multiple studies and reviews.

Looking at the literature on interventions aimed to combat stereotype threat, research has identified multiple strategies and interventions that have been shown to mitigate stereotype threat, such as reframing the threat and introducing role models. The purpose of the current study was to evaluate the effectiveness of various interventions. Specifically, we introduced Cuddy's power posing as a potential strategy against stereotype threat. In the current study, threat reframing and high power posing was compared against a control and a low power posing intervention. Results show that all interventions mitigated against stereotype threat. Specifically, post-manipulation insurance task means for threat reframing, low power posing, and high power posing were all higher than the task mean for control. Although, only threat reframing was statistically different from the control.

In terms of Cuddy's power poses, there have been mixed views. Power poses became a widely recognized phenomenon when Cuddy delivered her TEDTalk. However, research conducted by other researchers failed to replicate the same findings as Cuddy and her colleagues. The current study also seems to challenge Cuddy's claims, considering that both power poses conditions – low and high power – did not significantly differ from the control condition in risk-seeking behaviors.

Practical implications

Firstly, this study provides further evidence that stereotype threat is a real and established phenomenon. More specifically, this provides support for stereotype threat experienced by women regarding their ability to make financial decisions. What is even

more promising is that it is possible for women to mitigate the effects of stereotype threat in this domain. More broadly, this challenges the validity of the stereotype that women are incapable of making financial and risk-related decisions.

This has major implications for women employed in the financial sector. According to the U.S. Bureau of Labor Statistics, 47% of management and professional roles in American financial roles held by women (Jaekel & St-Onge, 2016). However, the number grows smaller as we move up the organizational hierarchy; for example, it is reported that women occupy 20% of executive committees (Jaekel & St-Onge, 2016). Furthermore, 22% of board positions are women and only 12% of all CEOs of financial firms are women (Jaekel & St-Onge, 2016).

The current study on stereotype threat and potential interventions demonstrate that the risk-avoidance behaviors of women in financial decision-making may not be characteristic of women but a by-product of stereotype threat faced in the environment. Since it is possible to manipulate women in financial decision-making, it could be argued that women's risk avoidance is an adopted behavior as opposed an innate one.

Limitations and Future Directions

In the research design of the present design, participants interacted only with themselves and the researcher. Therefore, the researcher artificially induced the stereotype threat. This may not be representative of the actual stereotype threat that one may encounter in day-to-day life. Moreover, the stereotype threat that was induced was explicit and obvious. However, stereotype threat may also occur with subtle and non-explicit cues. This study only focused on overly expressed stereotype threat.

The results suggest that there is not a difference between the low power poses and the high power poses. The researcher was not blind to poses condition, which could have influenced.

The results suggest that reframing stereotype threat mitigates stereotype threat better than power posing. There is evidence of statistical significance. However, given that the score ranges from 0 and 36 for the insurance task, it could be argued that the difference of the means between reframing threat and the other conditions is not practically significant. Additionally, given the possible score range, it could be argued that the sample population was not prone to risk taking, given the low means of scores. However, it is difficult to make this assumption without another social group, such as men, as comparison.

One possible explanation for the low scores on the insurance task is history effect. During the data collection period of the study, multiple natural disasters occurred in North America, particularly hurricanes at the Category 4 and 5 severities. In the month of September, the United States experienced Hurricanes Harvey, Irma, Jose, Katia, Maria, and Tropical Storm Lee. Earthquakes have also occurred in Mexico and wildfires in western US. It is possible that these well-publicized events have primed participants to be hyper-vigilant about insuring their assets, leading to lowered risk-taking behaviors in regards to protecting their assets.

Another limitation of the study is that the participants in the high and low power poses conditions were placed under stereotype threat after receiving the intervention. Meanwhile, those in the threat reframing were induced under threat prior to receiving the reframing. This may have influenced in how effective the stereotype threat manipulation

was. In future studies, it is recommended that the stereotype threat manipulation precedes the intervention and that the order of which the manipulation and the intervention is administered is consistent throughout the study.

Research into interventions have been primarily explored in the academic domains, such as empowering students or reevaluating how tasks are instructed. Other interventions focused on motivating individuals or inviting them to change their thinking processes. There is an opportunity here to expand research into other areas of life. There is a need to understand environments which individuals are not able to control, such as work environments. In the current research, threat has been manipulated in labs. More research into stereotype threat and potential intervention is needed in the field. More specifically, there are questions regarding stereotype threat experienced within the organizational culture. There is an opportunity to study how organizational factors interact with how groups are affected by threat as well as with potential interventions.

Cuddy's initial goal was well-intentioned. In most cases, individuals can not change their environments, however, it is possible to change how we respond to it and how we can better guard ourselves against the effects of stereotype threat.

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Appendices

Tables

Statistics

age

N	Valid	224
	Missing	0
Mean		20.17
Median		19.00
Std. Deviation		3.092
Range		27
Minimum		18
Maximum		45

grade

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	freshman	80	35.7	35.7	35.7
	sophomore	59	26.3	26.3	62.1
	junior	60	26.8	26.8	88.8
	senior	22	9.8	9.8	98.7
	other	3	1.3	1.3	100.0
	Total	224	100.0	100.0	

ethnicityname

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	americannative	2	.9	.9	.9
	asian	49	21.9	21.9	22.8
	black	45	20.1	20.1	42.9
	hispanic	52	23.2	23.2	66.1
	other	9	4.0	4.0	70.1
	white	67	29.9	29.9	100.0
	Total	224	100.0	100.0	

stereotypethreat

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	no	112	50.0	50.0	50.0
	yes	112	50.0	50.0	100.0
	Total	224	100.0	100.0	

intervention

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	control	56	25.0	25.0	25.0
	highp	54	24.1	24.1	49.1
	lowp	55	24.6	24.6	73.7
	reframing	59	26.3	26.3	100.0
	Total	224	100.0	100.0	

Statistics

		baseline_confidence	baseline_PANAS_positive	baseline_PANAS_negative	baseline_insurancetask_totalscore	post_insurancetask_totalscore	post_PANAS_positive	post_PANAS_negative	post_c nc
N	Valid	224	224	224	224	224	224	224	
	Missing	0	0	0	0	0	0	0	
Mean		5.11	31.87	15.29	11.795	11.996	29.67	16.69	4
Std. Deviation		1.318	9.133	3.252	7.3864	6.7029	10.048	6.775	1.

Statistics

		DOSPERT_social	DOSPERT_financial	DOSPERT_recreational	DOSPERT_totalscore	DOSPERT_ethical	DOSPERT_healthandsafety	DOSPERT_gambling	DOSPI nvestr
N	Valid	224	224	224	224	224	224	224	
	Missing	0	0	0	0	0	0	0	
Mean		23.473	17.754	16.982	92.75	14.723	20.112	6.723	11
Std. Deviation		5.7081	7.3514	6.8658	27.220	6.9311	6.2073	4.2272	4.

Correlation

Correlations

		age	ethnicitynumber	grade	baseline_PANAS_positive	baseline_PANAS_negative	DOSPERT_totalscore	DOSPERT_ethical	DOSPERT_healthandsafety	DOSPERT_recreational	DOSPERT_social	DOSPERT_financial	DOSPERT_gambling	DOSPERT_investment
age	Pearson Correlation	1	.025	.567**	.043	-.087	.003	.022	-.067	-.017	-.020	.008	-.005	.018
	Sig. (2-tailed)		.715	.000	.523	.192	.964	.749	.319	.801	.764	.910	.942	.789
	N	224	224	224	224	224	224	224	224	224	224	224	224	224
ethnicitynumber	Pearson Correlation	.025	1	-.094	-.182**	.012	-.210**	-.236**	-.041	-.245**	-.078	-.169*	-.236**	-.058
	Sig. (2-tailed)	.715		.159	.006	.856	.002	.000	.539	.000	.243	.011	.000	.390
	N	224	224	224	224	224	224	224	224	224	224	224	224	224
grade	Pearson Correlation	.567**	-.094	1	-.119	-.020	.021	.042	-.012	.021	.010	-.001	-.001	.000
	Sig. (2-tailed)	.000	.159		.076	.765	.751	.535	.858	.751	.883	.994	.990	1.000

	N	224	224	224	224	224	224	224	224	224	224	224	224	224
baseline_PANAS_positive	Pearson Correlation	.043	-.182**	-.119	1	-.001	.329**	.254**	.173**	.358**	.221**	.236**	.238**	.172**
	Sig. (2-tailed)	.523	.006	.076		.987	.000	.000	.010	.000	.001	.000	.000	.010
	N	224	224	224	224	224	224	224	224	224	224	224	224	224
baseline_PANAS_negative	Pearson Correlation	-.087	.012	-.020	-.001	1	.074	.085	.061	.035	.022	.088	.049	.104
	Sig. (2-tailed)	.192	.856	.765	.987		.273	.206	.366	.603	.747	.188	.470	.120
	N	224	224	224	224	224	224	224	224	224	224	224	224	224
DOSPERT_totalscore	Pearson Correlation	.003	-.210**	.021	.329**	.074	1	.875**	.431**	.882**	.681**	.810**	.774**	.630**
	Sig. (2-tailed)	.964	.002	.751	.000	.273		.000	.000	.000	.000	.000	.000	.000
	N	224	224	224	224	224	224	224	224	224	224	224	224	224
DOSPERT_ethical	Pearson Correlation	.022	-.236**	.042	.254**	.085	.875**	1	.365**	.722**	.508**	.635**	.694**	.407**
	Sig. (2-tailed)	.749	.000	.535	.000	.206	.000		.000	.000	.000	.000	.000	.000
	N	224	224	224	224	224	224	224	224	224	224	224	224	224

DOSPERT_healthandsafety	Pearson Correlation	-.067	-.041	-.012	.173**	.061	.431**	.365**	1	.364**	.168**	.475**	.404**	.418**
	Sig. (2-tailed)	.319	.539	.858	.010	.366	.000	.000		.000	.012	.000	.000	.000
	N	224	224	224	224	224	224	224	224	224	224	224	224	224
DOSPERT_recreational	Pearson Correlation	-.017	-.245**	.021	.358**	.035	.882**	.722**	.364**	1	.469**	.708**	.686**	.542**
	Sig. (2-tailed)	.801	.000	.751	.000	.603	.000	.000	.000		.000	.000	.000	.000
	N	224	224	224	224	224	224	224	224	224	224	224	224	224
DOSPERT_social	Pearson Correlation	-.020	-.078	.010	.221**	.022	.681**	.508**	.168**	.469**	1	.326**	.301**	.263**
	Sig. (2-tailed)	.764	.243	.883	.001	.747	.000	.000	.012	.000		.000	.000	.000
	N	224	224	224	224	224	224	224	224	224	224	224	224	224
DOSPERT_financial	Pearson Correlation	.008	-.169*	-.001	.236**	.088	.810**	.635**	.475**	.708**	.326**	1	.865**	.867**
	Sig. (2-tailed)	.910	.011	.994	.000	.188	.000	.000	.000	.000	.000		.000	.000
	N	224	224	224	224	224	224	224	224	224	224	224	224	224

DOSPERT_gambling	Pearson Correlation	-.005	-.236**	-.001	.238**	.049	.774**	.694**	.404**	.686**	.301**	.865**	1	.502**
	Sig. (2-tailed)	.942	.000	.990	.000	.470	.000	.000	.000	.000	.000	.000		.000
	N	224	224	224	224	224	224	224	224	224	224	224	224	224
DOSPERT_investment	Pearson Correlation	.018	-.058	.000	.172**	.104	.630**	.407**	.418**	.542**	.263**	.867**	.502**	1
	Sig. (2-tailed)	.789	.390	1.000	.010	.120	.000	.000	.000	.000	.000	.000	.000	
	N	224	224	224	224	224	224	224	224	224	224	224	224	224
baseline_insurancetask_totalscore	Pearson Correlation	-.104	.066	-.162*	-.018	.071	-.042	-.058	.029	.020	-.039	-.049	.006	-.090
	Sig. (2-tailed)	.120	.328	.015	.794	.288	.529	.386	.665	.771	.561	.469	.925	.178
	N	224	224	224	224	224	224	224	224	224	224	224	224	224
post_insurancetask_totalscore	Pearson Correlation	.074	.095	.051	-.052	-.012	-.092	-.109	-.013	-.034	-.107	-.093	-.052	-.109
	Sig. (2-tailed)	.270	.155	.445	.442	.857	.169	.105	.847	.612	.110	.166	.439	.105
	N	224	224	224	224	224	224	224	224	224	224	224	224	224

post_confidence	Pearson Correlation	.117	-.135*	.094	.422**	-.068	.112	.023	.044	.184**	.022	.123	.093	.120
	Sig. (2-tailed)	.081	.044	.163	.000	.313	.094	.732	.511	.006	.741	.065	.164	.072
	N	224	224	224	224	224	224	224	224	224	224	224	224	224
post_PANAS_positive	Pearson Correlation	.097	-.156*	-.003	.778**	.031	.301**	.220**	.101	.313**	.160*	.288**	.244**	.255**
	Sig. (2-tailed)	.148	.020	.965	.000	.648	.000	.001	.132	.000	.016	.000	.000	.000
	N	224	224	224	224	224	224	224	224	224	224	224	224	224
post_PANAS_negative	Pearson Correlation	-.029	-.083	-.009	.253**	.155*	.524**	.437**	.347**	.490**	.303**	.453**	.503**	.284**
	Sig. (2-tailed)	.662	.217	.898	.000	.020	.000	.000	.000	.000	.000	.000	.000	.000
	N	224	224	224	224	224	224	224	224	224	224	224	224	224

Correlations

		baseline_insurancetask_totalscore	post_insurancetask_totalscore	post_confidence	post_PANAS_positive	post_PANAS_negative
Age	Pearson Correlation	-.104	.074	.117	.097	-.029
	Sig. (2-tailed)	.120	.270	.081	.148	.662
	N	224	224	224	224	224
Ethnicitynumber	Pearson Correlation	.066	.095	-.135*	-.156*	-.083

	Sig. (2-tailed)	.328	.155	.044	.020	.217
	N	224	224	224	224	224
Grade	Pearson Correlation	-.162*	.051	.094	-.003	-.009
	Sig. (2-tailed)	.015	.445	.163	.965	.898
	N	224	224	224	224	224
baseline_PANAS_positive	Pearson Correlation	-.018	-.052	.422**	.778**	.253**
	Sig. (2-tailed)	.794	.442	.000	.000	.000
	N	224	224	224	224	224
baseline_PANAS_negative	Pearson Correlation	.071	-.012	-.068	.031	.155*
	Sig. (2-tailed)	.288	.857	.313	.648	.020
	N	224	224	224	224	224
DOSPERT_totalscore	Pearson Correlation	-.042	-.092	.112	.301**	.524**
	Sig. (2-tailed)	.529	.169	.094	.000	.000
	N	224	224	224	224	224
DOSPERT_ethical	Pearson Correlation	-.058	-.109	.023	.220**	.437**
	Sig. (2-tailed)	.386	.105	.732	.001	.000
	N	224	224	224	224	224
DOSPERT_healthandsafety	Pearson Correlation	.029	-.013	.044	.101	.347**
	Sig. (2-tailed)	.665	.847	.511	.132	.000
	N	224	224	224	224	224
DOSPERT_recreational	Pearson Correlation	.020	-.034	.184**	.313**	.490**
	Sig. (2-tailed)	.771	.612	.006	.000	.000
	N	224	224	224	224	224
DOSPERT_social	Pearson Correlation	-.039	-.107	.022	.160*	.303**
	Sig. (2-tailed)	.561	.110	.741	.016	.000
	N	224	224	224	224	224
DOSPERT_financial	Pearson Correlation	-.049	-.093	.123	.288**	.453**
	Sig. (2-tailed)	.469	.166	.065	.000	.000

	N	224	224	224	224	224
DOSPERT_gambling	Pearson Correlation	.006	-.052	.093	.244**	.503**
	Sig. (2-tailed)	.925	.439	.164	.000	.000
	N	224	224	224	224	224
DOSPERT_investment	Pearson Correlation	-.090	-.109	.120	.255**	.284**
	Sig. (2-tailed)	.178	.105	.072	.000	.000
	N	224	224	224	224	224
baseline_insurancetask_totalscore	Pearson Correlation	1	.014	.015	-.098	.017
	Sig. (2-tailed)		.834	.824	.143	.802
	N	224	224	224	224	224
post_insurancetask_totalscore	Pearson Correlation	.014	1	-.090	-.040	.015
	Sig. (2-tailed)	.834		.179	.555	.819
	N	224	224	224	224	224
post_confidence	Pearson Correlation	.015	-.090	1	.594**	.117
	Sig. (2-tailed)	.824	.179		.000	.081
	N	224	224	224	224	224
post_PANAS_positive	Pearson Correlation	-.098	-.040	.594**	1	.295**
	Sig. (2-tailed)	.143	.555	.000		.000
	N	224	224	224	224	224
post_PANAS_negative	Pearson Correlation	.017	.015	.117	.295**	1
	Sig. (2-tailed)	.802	.819	.081	.000	
	N	224	224	224	224	224

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Hypothesis 1

T-Tests

Descriptive Statistics

Dependent Variable: pre_confidence

stereotypethreat	Mean	Std. Deviation	N
no	4.86	1.307	112
yes	5.36	1.287	112
Total	5.11	1.318	224

Descriptive Statistics

Dependent Variable: pre_confidence

stereotypethreat	Mean	Std. Deviation	N
no	4.86	1.307	112
yes	5.36	1.287	112
Total	5.11	1.318	224

Tests of Between-Subjects Effects

Dependent Variable: pre_confidence

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	14.000[a]	1	14.000	8.323	.004
Intercept	5842.571	1	5842.571	3473.357	.000
stereotypethreat	14.000	1	14.000	8.323	.004
Error	373.429	222	1.682		
Total	6230.000	224			
Corrected Total	387.429	223			

a. R Squared = .036 (Adjusted R Squared = .032)

ANCOVA

Descriptive Statistics

Dependent Variable: post_insuranceTS

stereotypethreat	Mean	Std. Deviation	N
no	13.830	6.9837	112
yes	10.161	5.8902	112
Total	11.996	6.7029	224

Group Statistics

	threatcon_number	N	Mean	Std. Deviation	Std. Error Mean
ethnicitynumber	0	112	3.92	1.634	.154
	1	112	4.19	1.663	.157
age	0	112	19.79	2.421	.229
	1	112	20.56	3.611	.341
grade	0	112	1.98	1.004	.095
	1	112	2.31	1.091	.103
baseline_confidence	0	112	4.86	1.307	.124
	1	112	5.36	1.287	.122
baseline_PANAS_positive	0	112	33.17	8.928	.844
	1	112	30.56	9.188	.868
baseline_PANAS_negative	0	112	15.33	2.911	.275
	1	112	15.24	3.572	.338
baseline_insurancetask_totalscore	0	112	11.607	7.3697	.6964
	1	112	11.982	7.4313	.7022
DOSPERT_totalscore	0	112	90.28	23.072	2.180
	1	112	95.22	30.723	2.903
DOSPERT_ethical	0	112	14.143	6.0610	.5727
	1	112	15.304	7.6874	.7264
DOSPERT_healthandsafety	0	112	20.170	6.3854	.6034
	1	112	20.054	6.0521	.5719
DOSPERT_recreational	0	112	16.589	6.2968	.5950
	1	112	17.375	7.3987	.6991
DOSPERT_social	0	112	23.330	5.1786	.4893
	1	112	23.616	6.2128	.5871
DOSPERT_financial	0	112	16.902	7.3729	.6967
	1	112	18.607	7.2626	.6862
DOSPERT_gambling	0	112	6.482	4.1459	.3918
	1	112	6.964	4.3120	.4074
DOSPERT_investment	0	112	10.420	4.4309	.4187
	1	112	11.643	4.0019	.3781

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
ethnicitynumber	Equal variances assumed	.017	.897	-1.216	222	.225	-.268	.220	-.702	.166
	Equal variances not assumed			-1.216	221.929	.225	-.268	.220	-.702	.166
age	Equal variances assumed	2.414	.122	-1.891	222	.060	-.777	.411	-1.586	.033
	Equal variances not assumed			-1.891	194.031	.060	-.777	.411	-1.587	.034
grade	Equal variances assumed	2.455	.119	-2.358	222	.019	-.330	.140	-.606	-.054
	Equal variances not assumed			-2.358	220.504	.019	-.330	.140	-.606	-.054
baseline_confidence	Equal variances assumed	.148	.700	-2.885	222	.004	-.500	.173	-.842	-.158
	Equal variances not assumed			-2.885	221.943	.004	-.500	.173	-.842	-.158
baseline_PANAS_positive	Equal variances assumed	.091	.763	2.154	222	.032	2.607	1.211	.221	4.993
	Equal variances not assumed			2.154	221.817	.032	2.607	1.211	.221	4.993
baseline_PANAS_negative	Equal variances assumed	.332	.565	.205	222	.838	.089	.435	-.769	.947
	Equal variances not assumed			.205	213.313	.838	.089	.435	-.769	.948
baseline_insurancetask_totalscore	Equal variances assumed	.117	.733	-.379	222	.705	-.3750	.9889	-2.3239	1.5739
	Equal variances not assumed			-.379	221.985	.705	-.3750	.9889	-2.3239	1.5739
DOSPERT_totalscore	Equal variances assumed	6.640	.011	-1.362	222	.174	-4.946	3.630	-12.101	2.208
	Equal variances not assumed			-1.362	205.987	.175	-4.946	3.630	-12.104	2.211
DOSPERT_ethical	Equal variances assumed	4.199	.042	-1.255	222	.211	-1.1607	.9250	-2.9836	.6622
	Equal variances not assumed			-1.255	210.538	.211	-1.1607	.9250	-2.9842	.6628
DOSPERT_healthandsafety	Equal variances assumed	1.057	.305	.140	222	.889	.1161	.8313	-1.5222	1.7543
	Equal variances not assumed			.140	221.365	.889	.1161	.8313	-1.5222	1.7544
DOSPERT_recreational	Equal variances assumed	2.741	.099	-.856	222	.393	-.7857	.9180	-2.5949	1.0234
	Equal variances not assumed			-.856	216.467	.393	-.7857	.9180	-2.5951	1.0237
DOSPERT_social	Equal variances assumed	3.660	.057	-.374	222	.709	-.2857	.7643	-1.7918	1.2204
	Equal variances not assumed			-.374	215.026	.709	-.2857	.7643	-1.7921	1.2207
DOSPERT_financial	Equal variances assumed	.155	.694	-1.744	222	.083	-1.7054	.9779	-3.6325	.2218
	Equal variances not assumed			-1.744	221.950	.083	-1.7054	.9779	-3.6325	.2218
DOSPERT_gambling	Equal variances assumed	.033	.855	-.853	222	.395	-.4821	.5652	-1.5960	.6318
	Equal variances not assumed			-.853	221.659	.395	-.4821	.5652	-1.5961	.6318
DOSPERT_investment	Equal variances assumed	1.897	.170	-2.168	222	.031	-1.2232	.5642	-2.3350	-.1114
	Equal variances not assumed			-2.168	219.737	.031	-1.2232	.5642	-2.3351	-.1113

ANCOVAS

Estimates

Dependent Variable: post_insurancetask_totalscore

stereotypethreat	Mean	Std. Error	95% Confidence Interval Lower Bound	95% Confidence Interval Upper Bound
no	13.657[a]	.628	12.419	14.894
yes	10.334[a]	.628	9.097	11.572

a. Covariates appearing in the model are evaluated at the following values: baseline_confidence = 5.11, baseline_insurancetask_totalscore = 11.795, baseline_PANAS_positive = 31.87, baseline_PANAS_negative = 15.29, DOSPERT_totalscore = 92.75.

Tests of Between-Subjects Effects

Dependent Variable: post_insuranceTS

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	1006.058[a]	6	167.676	4.037	.001
Intercept	1342.049	1	1342.049	32.312	.000
pre_confidence	147.481	1	147.481	3.551	.061
Pre_PANAS_POS	2.467	1	2.467	.059	.808
Pre_PANAS_NEG	6.950	1	6.950	.167	.683
gambling_totalscore	11.795	1	11.795	.284	.595
preinsrance_TOTAL	10.645	1	10.645	.256	.613
stereotypethreat	549.106	1	549.106	13.221	.000
Error	9012.938	217	41.534		
Total	42251.000	224			
Corrected Total	10018.996	223			

a. R Squared = .100 (Adjusted R Squared = .076)

Univariate Tests

Dependent Variable: post_insurancetask_totalscore

	Sum of Squares	df	Mean Square	F	Sig.
Contrast	549.106	1	549.106	13.221	.000
Error	9012.938	217	41.534		

The F tests the effect of stereotypethreat. This test is based on the linearly independent pairwise comparisons among the estimated marginal means.

Hypothesis 2

ANOVAS

ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
baseline_confidence	Between Groups	40.441	3	13.480	8.547	.000
	Within Groups	346.988	220	1.577		
	Total	387.429	223			
baseline_PANAS_positive	Between Groups	2352.307	3	784.102	10.617	.000
	Within Groups	16247.675	220	73.853		
	Total	18599.982	223			
baseline_PANAS_negative	Between Groups	166.564	3	55.521	5.575	.001
	Within Groups	2191.150	220	9.960		
	Total	2357.714	223			
DOSPERT_totalscore	Between Groups	17032.902	3	5677.634	8.429	.000
	Within Groups	148197.098	220	673.623		
	Total	165230.000	223			
baseline_insurancetask_totalscore	Between Groups	328.636	3	109.545	2.036	.110
	Within Groups	11837.918	220	53.809		
	Total	12166.554	223			

ANCOVAs

Tests of Between-Subjects Effects

Dependent Variable: post_insuranceTS

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	963.627[a]	8	120.453	2.860	.005
Intercept	978.887	1	978.887	23.242	.000
pre_confidence	287.094	1	287.094	6.816	.010
Pre_PANAS_POS	47.389	1	47.389	1.125	.290
Pre_PANAS_NEG	7.656	1	7.656	.182	.670
gambling_totalscore	71.050	1	71.050	1.687	.195
preinsrance_TOTAL	21.040	1	21.040	.500	.480
intervention	506.675	3	168.892	4.010	.008
Error	9055.368	215	42.118		
Total	42251.000	224			
Corrected Total	10018.996	223			

a. R Squared = .096 (Adjusted R Squared = .063)

Estimates

Dependent Variable: post_insuranceTS

intervention	Mean	Std. Error	95% Confidence Interval Lower Bound	95% Confidence Interval Upper Bound
control	9.900[a]	.909	8.109	11.692
highp	12.161[a]	.929	10.330	13.991
lowp	11.572[a]	.912	9.775	13.370
reframing	14.228[a]	.891	12.471	15.984

a. Covariates appearing in the model are evaluated at the following values: pre_confidence = 5.11, Pre_PANAS_POS = 31.87, Pre_PANAS_NEG = 15.29, gambling_totalscore = 92.75, preinsrance_TOTAL = 11.795.

ANCOVAs

Tests of Between-Subjects Effects

Dependent Variable: post_insuranceTS

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	1721.517[a]	12	143.460	3.648	.000
Intercept	853.440	1	853.440	21.702	.000
pre_confidence	96.619	1	96.619	2.457	.119
Pre_PANAS_POS	.958	1	.958	.024	.876
Pre_PANAS_NEG	5.534	1	5.534	.141	.708
gambling_totalscore	14.030	1	14.030	.357	.551
preinsrance_TOTAL	24.404	1	24.404	.621	.432
stereotypethreat	591.727	1	591.727	15.047	.000
intervention	510.803	3	170.268	4.330	.005
stereotypethreat * intervention	196.091	3	65.364	1.662	.176
Error	8297.479	211	39.325		
Total	42251.000	224			
Corrected Total	10018.996	223			

a. R Squared = .172 (Adjusted R Squared = .125)

Estimates

Dependent Variable: post_insuranceTS

stereotypethreat	Mean	Std. Error	95% Confidence Interval Lower Bound	95% Confidence Interval Upper Bound
no	13.681[a]	.612	12.474	14.888
yes	10.217[a]	.613	9.009	11.426

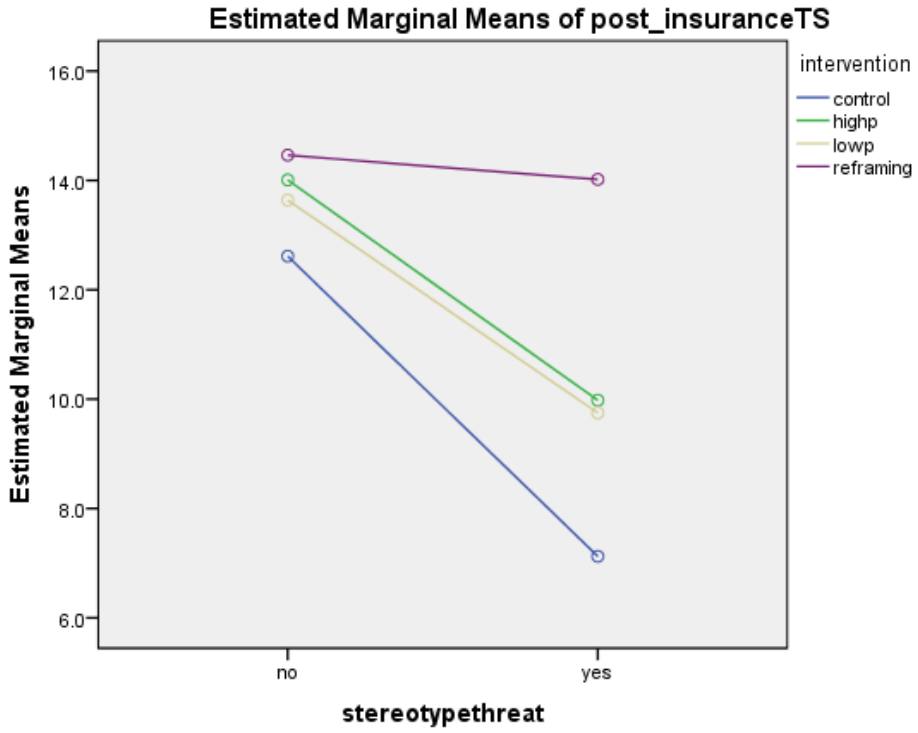
a. Covariates appearing in the model are evaluated at the following values: pre_confidence = 5.11, Pre_PANAS_POS = 31.87, Pre_PANAS_NEG = 15.29, gambling_totalscore = 92.75, preinsrance_TOTAL = 11.795.

*4. stereotypethreat * intervention*

Dependent Variable: post_insuranceTS

stereotypethreat	intervention	Mean	Std. Error	95% Confidence Interval Lower Bound	95% Confidence Interval Upper Bound
no	control	12.615[a]	1.203	10.244	14.985
	highp	14.008[a]	1.219	11.606	16.411
	lowp	13.640[a]	1.266	11.145	16.135
	reframing	14.462[a]	1.208	12.081	16.843
yes	control	7.125[a]	1.243	4.675	9.575
	highp	9.979[a]	1.303	7.411	12.548
	lowp	9.747[a]	1.218	7.346	12.149
	reframing	14.018[a]	1.175	11.702	16.334

a. Covariates appearing in the model are evaluated at the following values: pre_confidence = 5.11, Pre_PANAS_POS = 31.87, Pre_PANAS_NEG = 15.29, gambling_totalscore = 92.75, preinsrance_TOTAL = 11.795.



Covariates appearing in the model are evaluated at the following values: pre_confidence = 5.11, Pre_PANAS_POS = 31.87, Pre_PANAS_NEG = 15.29, gambling_totalscore = 92.75, preinsrance_TOTAL = 11.795

Materials

Demographic Questionnaire

1. What is your age?
2. What year in school are you on?
3. What is your ethnicity?

Confidence Item

On a scale of 1-10, how confident on average do you feel at making financial decisions in your life?

PANAS Questionnaire

This scale consists of a number of words that describe different feelings and emotions. Read each item and then list the number from the scale below next to each word.

Indicate to what extent you feel this way right now, that is, at the present moment.

1	2	3	4	5
Very Slightly or Not At All	A Little	Moderately	Quite a Bit	Extremely

_____ 1. Interested

_____ 2. Distressed

_____ 3. Excited

_____ 4. Upset

_____ 5. Strong

_____ 6. Guilty

_____ 7. Scared

_____ 8. Hostile

_____ 9. Enthusiastic

_____ 10. Proud

_____11. Irritable

_____ 12. Alert

_____ 13. Ashamed

_____ 14. Inspired

_____ 15. Nervous

_____ 16. Determined

_____ 17. Attentive

_____ 18. Jittery

_____ 19. Active

_____20. Afraid

Domain-Specific Risk-Taking (Adult) Scale – Risk Taking

For each of the following statements, please indicate the **likelihood** that you would engage in the described activity or behavior if you were to find yourself in that situation. Provide a rating from *Extremely Unlikely* to *Extremely Likely*, using the following scale:

1	2	3	4	5	6	7
Extremely Unlikely	Moderately Unlikely	Somewhat Unlikely	Not Sure	Somewhat Likely	Moderately Likely	Extremely Likely

- ☐ Admitting that your tastes are different from those of a friend. (S)
- ☐ Going camping in the wilderness. (R)
- ☐ Betting a day's income at the horse races. (F/G)
- ☐ Investing 10% of your annual income in a moderate growth diversified fund. (F/I)
- ☐ Drinking heavily at a social function. (H/S)
- ☐ Taking some questionable deductions on your income tax return. (E)
- ☐ Disagreeing with an authority figure on a major issue. (S)
- ☐ Betting a day's income at a high-stake poker game. (F/G)
- ☐ Having an affair with a married man/woman. (E)
- ☐ Passing off somebody else's work as your own. (E)
- ☐ Going down a ski run that is beyond your ability. (R)
- ☐ Investing 5% of your annual income in a very speculative stock. (F/I)

- ☐ Going whitewater rafting at high water in the spring. (R)
- ☐ Betting a day's income on the outcome of a sporting event (F/G)
- ☐ Engaging in unprotected sex. (H/S)
- ☐ Revealing a friend's secret to someone else. (E)
- ☐ Driving a car without wearing a seat belt. (H/S)
- ☐ Investing 10% of your annual income in a new business venture. (F/I)
- ☐ Taking a skydiving class. (R)
- ☐ Riding a motorcycle without a helmet. (H/S)
- ☐ Choosing a career that you truly enjoy over a more secure one. (S)
- ☐ Speaking your mind about an unpopular issue in a meeting at work. (S)
- ☐ Sunbathing without sunscreen. (H/S)
- ☐ Bungee jumping off a tall bridge. (R)
- ☐ Piloting a small plane. (R)
- ☐ Walking home alone at night in an unsafe area of town. (H/S)
- ☐ Moving to a city far away from your extended family. (S)
- ☐ Starting a new career in your mid-thirties. (S)
- ☐ Leaving your young children alone at home while running an errand. (E)
- ☐ Not returning a wallet you found that contains $200. (E)

Note. E = Ethical, F = Financial, H/S = Health/Safety, R = Recreational, and S = Social.

Insurance Task

The participants will choose 1 of 4 insurance options:

1. Insure against damage
2. Insure against disaster
3. Insure against damage and disaster
4. No insurance at all

Pre-Manipulation

		Price of Insurance			
Decision	Wealth (cash + assets)	Cost Condition	Against Damage	Against Disaster	Against Damage and Disaster
1	Low ($1000 + $2000)	Low	$200	$300	$350
2	Low ($1300 + $1850)	Low	$250	$290	$320
3	Low ($1280 + $2200)	High	$500	$600	$750
4	Low ($1000 + $1800)	High	$480	$560	$700
5	High ($5000 + $6500	Low	$1000	$1400	$2000
6	High ($6100 + $5900	Low	$1200	$1500	$2100
7	High ($7000 +	High	$3000	$3500	$4000

	$5500				
8	High ($6400 + $5300)	High	$2750	$3100	$3700
9	Low ($1100 + $1800)	Low	$300	$350	$400
10	Low (900 + $1600)	High	$450	$530	$610
11	High ($6200 + $6700)	Low	$1300	$1600	$2300
12	High ($5900 + $6200	High	$2400	$3000	$3900

Post-Manipulation4

		Price of Insurance			
Decision	Wealth (cash + assets)	Cost Condition	Against Damage	Against Disaster	Against Damage and Disaster
1	Low ($1240 + $1990)	Low	$215	$295	$340
2	Low ($1400 + $2050)	Low	$260	$280	$325
3	Low ($1000 + $2200)	High	$500	$610	$720
4	Low ($1190+ $1900)	High	$500	$580	$690
5	High ($5130 + $6200	Low	$1020	$1280	$1900
6	High ($5100 + $5900	Low	$1000	$1200	$1900

7	High ($7400 + $5500	High	$3300	$3700	$4400
8	High ($6130 + $4900)	High	$2480	$2800	$3300
9	Low ($1100 + $1800)	Low	$300	$350	$400
10	Low (900 + $1200)	High	$410	$480	$590
11	High ($5700 + $6400)	Low	$1000	$1400	$2000
12	High ($6450 + $6180	High	$2770	$3100	$4100

Poses

High Power

Low Power