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# The Impact of Blatant Stereotype Activation and Group Sex-Composition on Female Leaders

Crystal L. Hoyt
*University of Richmond*, choyt@richmond.edu

Stefanie K. Johnson
*University of Colorado at Denver and Health Sciences Center*

Susan Elaine Murphy
*Claremont McKenna College*

Kerry Hogue Skinnell
*Santa Rosa Junior College*

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Crystal L. Hoyt, Jepson School of Leadership Studies, University of Richmond; Stefanie K. Johnson, School of Business, University of Colorado at Denver; Susan Elaine Murphy, Department of Psychology, Claremont McKenna College; Kerri Hogue Skinnell, Behavioral Sciences Department, Santa Rosa Junior College.

Correspondence concerning this article should be addressed to Crystal L. Hoyt, who is at the Jepson School of Leadership Studies, University of Richmond, Richmond VA, 23173; Phone: (804) 287-6825. Electronic mail may be sent to *choyt@richmond.edu*.

Abstract

The individual and combined impact of blatant stereotype activation and solo status or mixed-sex groups on the self-appraisals, performance, and anxiety of female leaders was examined across three laboratory studies. The first study utilized a two-condition, two-stage design in which female leaders were exposed to a blatant stereotype threat or control condition after which they completed a leadership task. In the second stage, the threatened leaders received a solo status manipulation (leading a group of men) while the control condition did not. In the second study a 2 (blatant threat, no blatant threat) by 2 (solo status, all-female group) fully factorial design was used to test the hypotheses. Finally, in Study 3, a similar factorial design was used with a mixed-sex, rather than solo, condition.  Across the studies it was hypothesized and found that receiving a single stereotype threat would result in a positive, stereotype reactance, response. However, when both threats were combined a stereotype vulnerability response was elicited, as expected. Theoretical and practical implications are discussed.

*The Impact of Blatant Stereotype Activation and Group Sex-Composition on Female Leaders*

Although women have made considerable strides in gaining access to leadership roles, there remains a sizeable dearth of women in elite leadership positions. The term "glass ceiling" has been replaced with the metaphor of a leadership labyrinth, an obstacle-ridden maze through which women must traverse on their journey to influential leadership positions (Eagly & Carli, 2007).  Unlike the glass ceiling, the labyrinth signifies that there is not equal access to lower level positions, and that there are a number of obstacles rather than one impenetrable barrier. Women are indeed represented in the top echelons of business (e.g., Meg Whitman, Andrea Jung) and politics (e.g., Nancy Pelosi, Hillary Clinton, Condoleeza Rice); however, they are *under*represented.  Although 25.6% of American CEOs are women, that number diminishes to less than 2.5 percent within Fortune 500 companies (Catalyst, 2008; U.S. Bureau of Labor Statistics, 2007). Likewise, on the political front women hold only 91 of the 535 seats (17%) in the 111th US Congress.  Researchers have proffered a number of explanations for this shortage including inadequate human capital investment, familial responsibilities, and a lack of requisite ability and motivation (Biernat & Wortman, 1991; Eagly & Carli, 2003, 2004; Hoyt, 2006). One prominent explanation for the gender gap in leadership, and one key barrier in the labyrinth, is gender bias (Eagly & Carli, 2007; Eagly & Karau, 2002; Hoyt & Chemers, 2008).

According to the role congruity theory (Eagly & Karau, 2002), individuals perceive agentic qualities (confidence, assertiveness), which are typically ascribed to men, as important for success in a leadership role. Conversely, communal qualities (caring, kindness), which are typically ascribed to women, are perceived as incompatible with the leader role. This gender leader stereotypical association is supported by substantial research (Arkkelin & Simmons, 1985;

Martell, Parker, Emrich, & Crawford, 1998; Powell & Butterfield, 1979, 1984, 1989; Rosenwasser & Dean, 1989; Schein, 1973, 1975, 2001). In addition to leading to prejudice and biased behavior from others, the gender leader stereotype can impact female leaders' self-perceptions, well-being, and behaviors (Hoyt & Blascovich, 2007). While studies have shown that people often respond negatively when targeted by a stereotype, (Steele & Aronson, 1995), there is evidence that under certain circumstances they actually react against the stereotype and respond positively (Hoyt, 2005; Hoyt & Blascovich, 2007; Kray, Thompson, & Galinsky, 2001).

Being in a position to validate a negative stereotype regarding one's own social group is referred to as stereotype threat. Stereotype threat comes in multiple forms including a blatant threat, such as exposure to stereotypical information, and a more subtle threat, such as being the only woman leading a group of men, called solo status, or even simply being in mixed-sex groups. Although previous research has examined the effects of each of these types of stereotype threat, it has failed to examine the effects of receiving both types of threat (blatant and group sex-composition) on female leaders, despite the fact that female leaders are likely to face such situations in organizations. Blatant stereotype threat is often communicated via the media (Davies, Spencer, Quinn, & Gerhardstein, 2002), and solo status and mixed-sex environments are a reality for many women in high level management positions (Daily, Certo, & Dalton, 1999). The current research examines the effects of receiving each and both of these types of threats on responses of female leaders.

*Stereotype Threat*

Research on stereotype threat indicates that individuals are aware of negative stereotypes that disparage the ability of members of their social group, and when put in a stereotype-relevant performance situation they are threatened by the potential to confirm the stereotype (Steele &

Aronson, 1995). These stereotypes can be activated in very subtle ways, such as marking one's

race before an academic test or even simply having a woman take a test she knows is measuring

her math ability (Spencer, Steele, & Quinn, 1999; Steele & Aronson, 1995).

     *Stereotype threat and group composition*. Another subtle way that stereotypes are

activated is through the sex-composition of groups. Tokenism is the state in which a social group

is represented as less than 15% of a total group's population (Kanter, 1977). Kanter (1977)

suggests that being a "token" increases the salience of one's group membership to oneself and to

others. Solo status is the extreme end of tokenism, in which one is the only representative of his

or her group and, therefore, activates the potential for stereotyping (Taylor, Fiske, Etcoff, &

Ruderman, 1978). For example, in one study participants who were told that they would be

working with a group of individuals who were all of the opposite gender reported that they

expected to be stereotyped by their group members to a greater extent than participants who were

told that they would be working with a group of individuals who were all of the same gender

(Cohen & Swim, 1978).  Solo status has been shown to produce expected outcomes of stereotype

threat and lower performance (Saenz, 1994; Sekaquaptewa & Thompson, 2003; Stangor, Carr, &

Kiang, 1998).  Furthermore, the mere presence of males, when women are in the majority of a

mixed-sex group, has been shown to result in significant stereotype threat effects for women

(Inzlicht & Ben-Zeev, 2000)  In this case, men act as a situational cue that serves to create a

threatening environment for women.  This is a likely contributor to the greater social tension

evidenced in mixed-sex leadership situations (Johnson, 2003).

     *Stereotype vulnerability*.  Stereotype threat often leads, paradoxically, to confirmation of

the stereotype by way of both diminished performance and lessened motivation to succeed in the

domain (Aronson, Quinn, & Spencer, 1998; Davies, Spencer, Quinn, & Gerhardstein, 2002;

Steele, 1997). Substantial research shows that the threat results in deleterious vulnerability responses.  Although the negative effects of stereotype threat have been primarily demonstrated in the academic arena (Aronson et al., 1998; Spencer, Steele, & Quinn, 1999; Steele & Aronson, 1995), they also have been demonstrated in other performance domains such as lexical decision-making tasks (Leyens, Desert, Croizet, & Darcis, 2000), sports performance (Stone, Lynch, Sjomeling, & Darley, 1998), and social sensitivity in men (Koenig & Eagly, 2005).  Recent research has also examined how negative stereotypes can have adverse effects on female leaders (Davies, Spencer, & Steele, 2005; Hoyt & Blascovich, in press).

*Stereotype reactance.* However, individuals do not always conform to the negative stereotypic expectations. In fact, at times they engage in behaviors that are counter-stereotypical. This engagement in counter-stereotypical behavior can be seen as a type of reactance to the negative stereotype. According to Brehm's (1966) psychological reactance theory, people respond to perceived threats to their freedom (such as stereotyped expectations of inferiority) by attempting to reassert their freedom (engage in counter-stereotypical behavior). Engagement in counter-stereotypical behavior when confronted with a stereotype that disparages the performance ability of one's social group has been termed stereotype reactance (Kray et al., 2001). For example, Kray and colleagues (2001) showed that women blatantly presented with the gender and bargaining stereotype outperform men at the bargaining table. Additionally, Kray and colleagues found that participants could only successfully react against the stereotype when they possess sufficient power (Kray, Reb, Galinsky, & Thompson, 2004).  Furthermore, Hoyt and colleagues found that women with high levels of leadership efficacy responded to the explicit negative female leadership stereotype by exhibiting positive reactance responses (Hoyt, 2005; Hoyt & Blascovich, 2007).

*Stereotype threat: Vulnerability vs. reactance.* Researchers have only recently begun trying to understand when people respond to stereotypes with reactance, as opposed to the more common vulnerability responses demonstrated in earlier research.  Researchers have shown that women respond by engaging in counter-stereotypical behaviors when gender stereotypes are primed explicitly and when the target has sufficient power and self-efficacy to react against the stereotype (Hoyt & Blascovich, 2007, Kray et al, 2001; Kray et al., 2004). Self-efficacy refers to one's "beliefs in one's capabilities to organize and execute the courses of action required to produce given attainments" (Bandura, 1997, p. 3).  Thus, these findings indicate that the leader must have the ability (e.g., power, self-efficacy) to effectively cope with the stereotype. However, the studies to date that have examined stereotype reactance have examined a single stereotype threat, whereas oftentimes women are actually faced with more than one form of stereotype threat.

Based on previous research demonstrating stereotype reactance in female leaders (Hoyt & Blascovich, 2007), we predict that experiencing one type of stereotype threat in a moderately demanding situation will lead to reactance responses, but experiencing two types of stereotype threat in that situation will lead to a threat response.  Women who have the ability to cope with the stereotype threat by eliciting an *'I'll show you'* reactance response are likely not made anxious by the stereotype but rather are motivated to prove it wrong.  However, the combined threats are predicted to increase the leader's levels of anxiety which will facilitate the vulnerability responses; indeed, previous stereotype threat research has shown that arousal may play a part in determining when vulnerability responses are elicited (Ben-Zeev, Fein, & Inzlicht, 2005; Blascovich, Spencer, Quinn, & Steele, 2001; O'Brien & Crandall, 2003; see Schmader, Johns, & Forbes 2008 for an overview). Furthermore, although not in the context of stereotype

threat, one study found that low levels of stress enhanced leaders' performance, while high levels of stress hurt leaders' performance (Halverson, Murphy, & Riggio, 2004). In further support of our prediction, Sekaquaptewa and Thompson (2003) found that the negative effects of solo status and blatant threat were indeed additive for women on a math task.

*Self-Appraisals and Leadership*

Stereotype threat research has generally examined its effects on individuals' performance, but has largely neglected to examine important emotional, motivational, or attitudinal variables. Recent research suggests that one way in which stereotype threat impacts performance is by increasing individuals' negative self-appraisals during their task. Cadinu, Maas, Rosabianca, and Kiesner (2005) examined the effects of stereotype threat against women on a math task. They found that stereotype threat resulted in an increase in negative task-related thoughts (e.g., "this exercise is difficult for me", "I am not good at math"), which led to a decrease in performance. Self-appraisals play an important role in the leadership process and leadership researchers have started to examine the vital role of these appraisals, including leaders' identities and self-schema, on leadership behavior and performance (e.g., Gardner & Avolio, 1998; Lord & Emrich, 2001; Lord & Hall, 2005; Murphy, 2001; Wofford & Goodwin, 1994; Wofford, Goodwin, & Whittington, 1998).

In this study, we examine the effects of blatant stereotype threat and group sex-composition on individuals' self-appraisals including self-efficacy, leadership performance appraisals, and self-esteem. Self-efficacy has been shown to consistently impact performance in a variety of domains (Bandura, 1982; Gist, 1989).  In this research we are examining both leadership efficacy, people's perception of their ability to lead in general, and task efficacy, their perception of their ability to lead on a specific task. Both leadership efficacy and task efficacy

have been shown to impact the leadership process (Hoyt, Murphy, Halverson, & Watson, 2003). In addition to efficacy, we are examining two important self-appraisal variables that have been strong indicators of stereotype reactance in previous research: leadership performance self-appraisals and self-esteem (Hoyt & Blascovich, 2007). Perceptions of how well one has performed and one's abilities on a task is a very important source of immediate feedback, particularly in situations that lack clear measures of effectiveness such as leadership tasks (Bandura, 1997). Furthermore, stereotypes have also been shown to impact the psychological well-being, including self-esteem, of those targeted by the stereotype (Swim, Hyers, Cohen, & Ferguson, 2001). Self-esteem, or in this case one's self-worth in regards to leadership, also likely contributes to building a sense of efficacy; one of the strongest sources of self-efficacy is mastery experiences and self-esteem is a direct indicator of success or failure (Bandura, 1997). In sum, leader self-appraisals, including self-efficacy, leadership performance appraisals, and self-esteem, are important constructs that have been shown to be impacted by negative stereotypes and play an important role in the leadership process.

*The Current Research*

Previous research has demonstrated that stereotypes can result in both vulnerability and reactance responses. The current research suggests that a reactance response is more likely to occur when female leaders are presented with a single stereotype threat, but a vulnerability response is more likely to occur when individuals experience both types of stereotype threat at the same time. This research makes a unique contribution to the literature by examining the singular as well as simultaneous impact of two stereotype threats on female leaders. This unique perspective allows us to test the impact of stereotype threat in a more realistic manner while maintaining experimental control. Furthermore, we are testing the impact of stereotypes in the

under-studied domain of leadership, and are examining our vulnerability and reactance predictions on self-appraisal and performance outcomes as well as anxiety levels.

Across three studies, we examine the effects of stereotype threat on female leaders' self-appraisals (including self-efficacy, leadership performance appraisals, and self-esteem), performance, and anxiety.  For women leading in small group situations, we predict:

*Hypothesis 1*: Blatant stereotype activation, in an all-female group, will result in reactance responses.

*Hypothesis 2*: Solo status or a mixed-sex group, without blatant stereotype activation, will result in reactance responses.

*Hypothesis 3*: Blatant stereotype activation combined with solo status or a mixed-sex group will result in vulnerability responses.

## Study 1

In the first study we examine the effects of adding a solo status threat to already threatened female leaders on their self-appraisals and performance. In this study the self-appraisals measured were participants' expectations of how well they would perform on each of the tasks.

### *Method*

#### *Participants and Procedure*

Fifty-five female undergraduates at a small west coast liberal arts college participated in this study. The sample consisted of 18.2% Freshmen, 27.3% Sophomores, 52.7% Juniors, and 1.8% Seniors. Participants arrived at the laboratory in groups of no more than six people and completed an informed consent statement. Participants were randomly assigned to either a stereotype threat or non-stereotype threat condition after which all participants completed a

leadership task. After the first task, participants in the threat condition received the second

stereotype threat (solo status) while those in the control condition received another control

situation (non solo status). Using this two-stage threat design allowed us to test the effects of

blatant stereotype threat alone and when coupled with solo status, compared to non-threatened

female leaders. All participants were fully debriefed.

*Blatant stereotype activation manipulation.*   Participants in the experimental group were

presented with a blatant stereotype activation manipulation in which the researcher told them that

the purpose of the study was to determine why women have a difficult time achieving high level

positions in corporations and were asked to read an article which detailed the lack of women in

elite business positions (Oakley, 2000*).* Participants in the control condition read an excerpt

about leadership which was unrelated to gender (Conger, 1989).

*Leadership task scenario.* The leadership task was the Project Planning Situation (Human

Synergistics, 1985). Participants were given 10 minutes to rank order 15 project planning tasks in

terms of importance. After the 10 minutes participants' responses were collected and ostensibly

scored by the experimenter, while the participants completed the self-appraisal questionnaire. In

order to cultivate a moderately demanding leadership situation, the experimenter gave

participants in both conditions mock feedback forms indicating that they had scored in the 45th

percentile and that 55% of people scored higher than them. For Time 2 Performance, the

participants were given 5 additional project planning tasks to incorporate with the previous 15

tasks.

*Solo status manipulation.* When the project planning task was completed, participants

were told that they would complete the second phase of the study in which they would lead an

actual group. They were taken to a monitoring room to watch their group interact for a short

period of time. Those in the experimental (threat) condition saw a video of three men at a table, while those in the control condition (no threat) saw a video of three women at the table.

*Measures*

*Self-appraisals: Perceived and predicted performance*. Self-appraisals were measured in terms of participants' impressions of how well they did (or expected to do) on their leadership tasks. Using a scale ranging from 1 (Very Poor) to 5 (Very Well) participants responded to the following items: 'How did you perform on the leadership task?' (Time 1) and 'How well do you think that you will perform on the group leadership task?' (Time 2). These items are similar to the responses collected by Cadinu et al. (2005) to examine participants' negative self-thought in response to stereotype threat.

*Task performance*. The Project Planning Situation is scored by subtracting the participants' rankings of each measure from the actual ranking given on a scoring sheet. The absolute values of these differences scores are summed to produce the performance score. Thus, the lower the score, the better the performance. Time 1 was the rank ordering of the 15 project planning tasks. Time 2 performance was the score of the additional 5 items

*Manipulation check*.  To test the efficacy of the solo-status manipulation participants were asked to identify the gender breakdown of their group.  Additionally, to be certain that they read through the stereotype priming material they were asked to answer a series of true/false questions on the information they read.

<div align="center">*Results*</div>

*Manipulation Checks*

The manipulation check for solo status, which said "What is the gender breakdown of your group?," showed that 100% of the participants correctly identified that they were either

about to work with all males or all females on the upcoming group portion of the task indicating

that solo status was very salient for the females who would work with the all male group. To

ensure that participants read the materials in the stereotype threat or control condition, three true

or false questions were asked about the materials. Over 80% of the participants in the

experimental condition were able to answer the questions correctly and the remaining

participants only missed one. Seventy-five percent of the participants in the control condition

answered all questions correctly, with one participant answering two incorrectly, and the

remainder missing only one.

*Stereotype Reactance*

To test the hypotheses, a series of one-tailed independent samples t-tests were conducted.

Hypothesis 1, which suggested that women presented with the stereotype prime would have a

reactance response, was supported ($t(53) = 1.70$, $p < .05$, $\eta^2 = .05$). Participants in the threat

condition had higher levels of reported self-appraisals at Time 1 ($M = 2.70$, $SD = .67$) than those

not presented with the prime ($M = 2.39$, $SD = .69$). However, participants in the threat condition

did not perform better than those in the control condition ($t(53) = -.68$, $p = .25$).

*Stereotype Vulnerability*

Hypothesis 3, which predicted that stereotype threat coupled with solo status would lead

to vulnerability responses, was also supported. Participants' self-appraisal scores at Time 1 and

Time 2 were standardized and a difference score was calculated. Participants' self-appraisals

decreased significantly more in the threat condition compared to the control condition ($t(53) =$

$2.54$, $p < .01$, $\eta^2 = .11$; Figure 1). Participants in the experimental condition experienced a

significant decrease in their self-appraisals ($t(26) = -2.09$, $p < .05$). Participants in the control

condition experienced an increase in self-appraisals ($t(27) = 1.60$, $p = .06$).  Finally, there were

no significant differences in task performance between groups at Time 2, $t(53) = -.19, p = .43$).

*Study 1 Discussion*

This first pilot study tested and supported two of our three hypotheses. Participants presented with the stereotype prime demonstrated reactance to the stereotype in terms of task self-appraisals, operationalized as perceived performance. The addition of solo status to those in the blatant stereotype activation condition resulted in a decrease in self-appraisals. This first study was not without limitations. First, the stereotype threat manipulations did not significantly affect performance, as expected. One possible explanation is that although the task was related to leadership, it did not actually involve leading others, as the participants completed the task independently. A second limitation relates to the repeated measures design of the study. Although this manipulation allowed us to test the *change* in participants' self-appraisals after being presented with a second stereotype threat, the lack of a fully factorial model (in which both blatant stereotype threat and solo status are manipulated) does not allow us to fully explore the effects of each type of stereotype threat on participants' self-appraisals and performance. A third limitation related to the limited scope of the self-appraisal measure. While perceived performance on the upcoming task is an important component of self-appraisal, it is limited. Therefore, a second study was conducted in which female leaders led actual groups of women or men (solo status manipulation) and half received a blatant stereotype threat manipulation. Additional self-appraisal measures were taken.

Study 2

Study 1 supported Hypotheses 1 and 3 that blatant stereotype activation, without solo status, would result in reactance-like responses whereas blatant stereotype activation combined with solo status will result in negative self-appraisals. This study tests those hypotheses and also

tests Hypothesis 2 that solo status would result in reactance-like responses. Thus, this study fully crosses both blatant stereotype activation and solo status to examine all three hypotheses. In Study 2 we also include additional self-appraisal measures to examine the effects of stereotype threat and reactance on a broader number of outcomes to test the generalizability of the effects. Specifically, we examine leadership efficacy after the manipulations but before participants undertake the task, leadership performance self-appraisals immediately after they perform the task, and finally state self-esteem after completing the task. A summary of the hypothesized results is depicted in Figure 2.

*Method*

*Participants and Procedure*

Seventy-three female undergraduates from a small east coast liberal arts university served as participants and were given ten dollars for their participation. Two participants were excluded from analyses because they were suspicious of the research confederates, leaving a sample size of 71 students ranging in age from 18 to 23 ($M = 19.85$, $SD = 1.19$). The experiment employed a 2 (Blatant Stereotype Activation: Primed or Not) x 2 (Solo status: Solo or Not solo) between-subjects experimental design. All participants were the 'randomly chosen' leader of a three-person group task involving two research confederates. Participants were randomly assigned to one of the four threat conditions (see below). Next, all participants received instructions regarding the group task and were given seven minutes to prepare for a three-minute meeting with the other two group members. Participants completed the leadership efficacy measure before the two confederates were brought into the room with the participants for a three-minute meeting. Following the meeting, the participants completed the final self-report measures. Participants were then thoroughly debriefed, thanked, and given payment.

*Blatant Stereotype Activation Manipulation*

The gender leader stereotype was primed using the paradigm employed by Hoyt and Blascovich (2007). Participants were given a folder to look through while waiting for the experimenter to return. In the blatant stereotype activation condition, the folder contained media images of male leaders and information regarding the gender gap in top leadership roles. In the control condition, the folder contained images of and information regarding the laboratory in the control condition. In the experimental condition, participants were told: '*In nearly all major corporations, the military and political offices, men outnumber women in top leadership roles, and there seems to be a steady gap in men and women in top leadership roles. Though women represent 46% of the U.S. workforce, they hold only about 6% of executive titles like CEO, chairwoman, and executive vice president. And only four women hold CEO positions at Fortune 500 companies.*'[1] Additionally, participants in the experimental condition were also told that the research was aimed at better understanding gender differences in leadership abilities whereas those in the control condition were simply told that the research was designed to better understand leadership abilities.

*Leadership Task Scenario*

All participants took the leadership role in an employee-hiring decision task. As President of the Human Resources division of James Frick Inc., participants, assisted by two Vice-Chairs (the two confederates), chaired a selection committee hiring a new junior associate. The participants were given relevant materials (a memo from the CEO explaining the need for the new associate and two applicant information packets) and seven minutes to prepare for a three-minute meeting with the Vice-Chairs. Their job was to explain the task to the Vice-Chairs, advise them on how they thought the followers should go about accomplishing the task, and

influence and motivate them to make the best hiring decision possible. After the seven-minute

preparation, the leaders held a three-minute meeting with the two Vice-Chairs.

*Measures*

Responses on all self-report scales were recorded on a Likert-type scale ranging from -3

(strongly disagree) to 3 (strongly agree).

*Leadership self-efficacy*. The leadership efficacy measure is a 9-item scale, six items

were modified from the Self-Efficacy for Leadership (SEL) measure developed by Murphy

(1992) and three items were adapted from Hoyt et al.'s (2003) Self-Efficacy for Task scale.

Example statements include "I am confident of my ability to influence a work group that I lead,"

"Overall, I believe that I can lead a work group successfully," "I have confidence in my ability to

do this task," "Most people doing this leadership task can do it better than I can" (reverse

scored), and "I have the abilities to complete this leadership task successfully."

*Leadership performance self-appraisal*. Leaders rated their leadership abilities on five

items similar to those employed by Hoyt and Blascovich (2007): "I performed well on the

leadership task I just completed," "I am confident in my leadership performance," "I have the

ability to give directions clearly," "I have the ability to express my thoughts," and "I have the

ability to persuade others."

*Self-esteem*. State self-esteem was assessed with a measure adapted from Heatherton and

Polivy's (1991) state self-esteem measure. Self-esteem was assessed with 9 items, sample items

include "I am worried about looking foolish," "I feel inferior to others at this moment," "I feel

confident about my abilities," and "I feel I have less leadership ability right now than others."

*Rated Performance.*    In this study leadership performance was measured by ratings of

the leaders' overall leadership effectiveness during the leadership scenario. All interactions were

audio-taped and rated by two trained coders for leadership effectiveness. Ratings of overall

leadership effectiveness were made on a single item scale ranging from 0 (not at all effective) to

10 (extremely effective).  Interrater reliability was computed using a Pearson's r, r = .92, *p* <

.001.

*Manipulation Check.*  To assess the efficacy of the blatant stereotype activation

manipulation, participants were asked to rate the following question: "People's stereotypic idea

of a leader is more often male than female."

<div align="center">

*Results*

</div>

All measures had adequate Cronbach's alphas ( $\geq$ .75). Table 1 presents the Cronbach's

alphas, means, and standard deviations for the measures along with the scale intercorrelations.

*Manipulation Check*

We conducted a one-tailed independent samples t-test to assess the efficacy of the

manipulation. As expected, participants who received the blatant stereotype activation

manipulation were more likely to endorse that "people's stereotypic idea of a leader is more

often male than female" (*M* = 2.27; *SD* = .69) than those who did not receive the stereotype

manipulation (*M* = 1.97; *SD* = .72, *t*(69) = 1.79, *p* < .05, $\eta^2$ = .04).

*Test of Hypotheses*

To test the hypotheses (see Figure 3) self-report dependent variables were analyzed with

a 2 (Blatant Stereotype Activation: Primed or Not) x 2 (Solo Status: Solo or Not Solo) between-

subjects multivariate analysis of variance and the behavioral measure was analyzed with a

between subjects ANOVA. Hypotheses 1 and 2 suggested that female leaders who received a

blatant threat or the solo status threat would experience a "boost" in self-appraisals and

performance, compared to the control condition. Hypothesis 3 suggested that participants in the

double threat condition would have lower self-appraisals and performance compared to the control. The overall MANOVA revealed no significant main effect for threat condition (Wilks' $\lambda$ = .94, $F(3, 65) = 1.42$, $p > .10$, $\eta^2 = .06$) or gender composition (Wilks' $\lambda = .97$, $F(3, 65) = .75$, $p > .10$, $\eta^2 = .03$). There was, however, the expected multivariate effect for the interaction (Wilks' $\lambda = .90$, $F(3, 65) = 2.33$, $p = .08$, $\eta^2 = .10$).  Table 2 contains the results of the Univariate tests for the interaction. The interactions between blatant stereotype activation and solo status were statistically significant for all 3 dependent variables (leadership efficacy, leadership performance self-appraisal, and self-esteem).

To further examine the interactions, planned comparisons were used in which we tested the specific hypothesis that participants in the two single threat conditions (stereotype activation or solo status) would have higher scores than those in the control condition who would have higher scores than those in the double threat condition. The specific contrast used was -1 (control), 2 (single threat), 2 (single threat), -3 (double threat). The results showed that participants in the solo status and blatant threat conditions had higher leadership efficacy, performance self-appraisals, and self-esteem than those in the control condition, who were higher than those in the double threat condition (Table 3).  However, there was no effect of condition on rated performance.

### *Study 2 Discussion*

In this study we examined our hypotheses by fully crossing the sex-composition of the group the participants led and whether they received a blatant stereotype manipulation or not.  In addition, we assessed outcomes including leadership self-efficacy taken right before they engaged in the leadership task, leadership performance self-appraisals measured after the leadership task, and self-esteem. The results support the predictions that either blatant stereotype

activation or solo status alone elicits positive reactance responses, whereas the combination of the two threats results in the most negative results.  The only outcome measure that did not show this pattern was the omnibus leadership effectiveness rating made by trained raters.  We surmise that this single item measure may not be a good assessment of leadership performance. In particular, general and non-specific leadership effectiveness ratings are highly informed by implicit theories of leadership, people's preconceptions regarding the traits, characteristics, and behaviors that make for a good leader (Lord, Foti, & DeVader, 1984; Offerman, Kennedy, & Wirtz, 1994), such that oftentimes effectiveness is gauged by the fit of the leader to perceiver's implicit theories (Lord, 1985).  We remedy this concern in Study 3 by more concretely assessing leadership performance with measured, and specific, leadership behaviors.  Furthermore, in this last study we were interested in examining leader anxiety as well as the impact of mixed-sex groups on female leaders.

<div align="center">Study 3</div>

Both Studies 1 and 2 demonstrated that female leaders who receive a blatant stereotype threat or a solo status threat evince a reactance-type response in terms of their self-appraisals. When both threats are combined, they result in a vulnerability response. However, we have yet to test our prediction that female leaders would have the same responses to working with mixed-sex groups as they do when working with two men (solo status).  Further, neither study demonstrated actual differences in leadership performance. Finally, we have suggested that the combined threats may serve to increase anxiety levels, although anxiety was not measured. Therefore, we designed a final study in which women completed a leadership task leading mixed (1 man, 1 woman) or gender neutral (2 women) groups after receiving a blatant stereotype threat manipulation or not. Also, in this third study we code actual leadership behavior and collected

self-report and rated anxiety in order to assess this hypothesis. Leadership and task-efficacy were again measured.

<div align="center">Method</div>

*Participants and Procedure*

One hundred fifty-seven female undergraduate students from a large university in the rocky mountain region served as the focal leaders for this study. All participants received course credit for their participation. The students ranged in age from 18 to 24 ($M = 18.52$, $SD = 0.89$). The experiment employed a 2 (Blatant Stereotype Activation: Primed or Not) x 2 (Mixed-sex group, Female group) between-subjects experimental design.[2] Participants arrived at the laboratory in groups of three and were introduced to their group members. After completing an initial questionnaire the participants were taken to three separate experimental rooms and given further instructions. All instructions were presented in a written document. The document explained that they had been chosen as the leader of the group (all three members received this instruction) and that they would have to complete a leadership task. They were told that this study focused on leadership in a virtual environment and, therefore, they would be giving their team members/followers instructions on how to complete a leadership task via a web camera.

Half of the participants received the blatant stereotype threat manipulation and half received the control instructions. In addition, group gender composition was manipulated in terms of the gender of the focal leader's other team members (either two women or a man and a woman). After receiving the instructions and manipulations participants reported their self-efficacy, completed their leadership speech, and then completed post questionnaires. All participants were thoroughly debriefed and thanked for their participation.

*Blatant Stereotype Activation Manipulation*

Blatant stereotype threat was manipulated by a statement in the instruction packet. In the blatant stereotype threat condition participants read the following statement, *"Past research shows that there are gender differences in the effectiveness and performance ratings of leaders. We would like to know more about this process. This is particularly relevant considering that 98% of the CEO's of Fortune 500 Companies are men. Additionally, considering that there are only 13 women in the U.S. Senate and only 61 women in the House of Representatives the prevalence of men in leadership position represents 86%. We want to explore why gender differences in leadership performance exist."* In the non-threat condition participants read, *"Past research shows that there are individual differences in leadership performance. We hope to learn about your perceptions and feelings about leadership."*

*Leadership Task Scenario*

Then, all participants read a description of the leadership task. This involved reading a set of instructions about a fictitious company and its new recruitment and hiring process and then relaying that information to one's teammates, ostensibly so that they could complete a hiring task. This task has been used in past research on leadership (Johnson, in press; Towler, 2003). The participants delivered the instructions to the web camera, expecting that their team members could view their instructions and complete the task. In reality, no one completed the hiring task.

*Pre-Measures*

Responses on all self-report scales were recorded on a Likert-type scale ranging from 1 (strongly disagree) to 7 (strongly agree).

*Baseline leadership self-efficacy.*  The leadership efficacy measure is an 8-item scale, developed by Murphy (1992). Example statements include "I am confident of my ability to influence a work group that I lead" and "Overall, I believe that I can lead a work group

successfully." Past studies have found reliability ranging from .75 to .86 and convergent and discriminant validity with measures such as self-esteem, and self ratings of perceived leadership experience (Murphy, 1992; Murphy & Ensher, 1999).

*Post-Measures*

One of the post measures was completed after the leader received the manipulations and instructions but before the participants completed the task (task self-efficacy). The remaining self-report measures (post self-efficacy, anxiety) were completed immediately after the leader completed her leadership task.

*Task efficacy.* Before engaging in the leadership task, the leaders' task self-efficacy was assessed.  The measure was adapted from Hoyt et al.'s (2003) Self-Efficacy for Task scale.  The scale consisted of the following three items: "I have confidence in my ability to do this task," "Most people doing this leadership task can do it better than I can" (reverse scored), and "I have the abilities to complete this leadership task successfully."

*Post self-efficacy.* After the leaders explained the task to the followers, they were asked to assess their abilities related to the task they completed. This measure is a modified version of the highly reliable ($\alpha = .88$) leadership efficacy evaluation employed by Hoyt (2005).  They were asked seven questions, "I have the ability to give directions clearly," "I have the ability to express my thoughts," "I have the ability to persuade others," "I have the ability to communicate my thoughts in an organized way," "I have the ability to get others to follow my directions," "I have the ability to be a qualified leader," "I have the ability to perform as a leader."

*Self-reported anxiety.* Self-reported anxiety was assessed using an eight-item adjective list ($\alpha = .94$). Participants were asked to indicate the extent to which they felt under pressure,

tense, nervous/jittery, confident, uneasy, calm, afraid of not doing well, and uncomfortable. The items were reversed so that a higher score indicates that one feels less anxiety.

*Leadership performance: Trained coders*

There were also two sets of ratings which were used as performance criteria (anxiety, leadership behaviors). These ratings were made by trained coders.

*Leadership behavior.* Six coders rated the tapes on leadership behaviors related to Path Goal Theory (House, 1971). Path Goal Theory identifies four effective leadership behaviors: directive, supportive, participative, and achievement oriented. The coders were trained on identifying these different behaviors. Three specific behaviors were identified for each dimension based on a scale presented by Northouse (2006), but were adapted for this specific task and situation.[3] A total of six coders rated the tapes, with three of the coders rating half of the tapes and the other three coders rating the second half of the tapes. There was an adequate level of agreement between raters on each of the scales, as assessed by ICC (directive = .78, supportive = .83, participative = .80, achievement = .77).

*Anxiety ratings.* A second set of eight trained coders rated a subset of videos on the extent to which the leaders demonstrated anxiety. They rated the leaders on three items (uncomfortable, nervous, and relaxed). Several other nonverbal behaviors (e.g., eye contact, hand gestures, facial expressions) were also coded, but there were no differences by condition. Two of the coders also served as coders for the leadership behaviors. Because each coder rated a different subset and number of tapes, all of the coders' ratings were z-scored before they were combined to standardize the scores. The ratings were combined with the goal that each tape would be rated by four of the coders. Some had fewer ratings in which case the missing data was replaced with the grand mean. There was an adequate level of agreement between the four coders on each of the

three items (ICCs .74, .75, .76). The scale was reversed so that a higher score indicates that one

appears less anxious. A constant was added to the scores so that all values were positive.

<div align="center">Results</div>

Intercorrelations and Cronbach's α s are reported in Table 4. Missing data were replaced

with the grand mean. Data did not violate the assumptions of the normal distribution. Hypotheses

were analyzed using a Multivariate Analysis of Covariance (MANCOVAs) for the self-report

measures, using one's baseline leadership self-efficacy as a covariate. For the ratings of

leadership behavior five additional ANCOVAs were conducted and included the length of the

speeches and baseline self-efficacy as covariates, considering that longer speeches are likely to

include more behaviors than shorter speeches. The behavioral ratings were not analyzed with a

multivariate test as there is no theoretical or practical reason to expect that these distinct

behaviors will relate to one another. For example, directive behavior may increase in response to

threat whereas supportive behavior may decrease.

*Test of Hypotheses*

To test the hypotheses (see Figure 2) dependent variables were analyzed with a 2 (Blatant

Stereotype Activation: Primed or Not) x 2 (Mixed-sex or Women) between-subjects

MANCOVAs. Hypotheses 1 and 3 suggested that female leaders who received a blatant threat or

the solo status threat would experience a "boost" in self-efficacy and performance, compared to

the control or double threat conditions. All hypotheses were tested using contrasts, just as in the

previous studies. The overall MANCOVA revealed no significant main effect for threat

condition (Wilks' $\lambda$ = .99, $F(3, 150)$ = .73, $p > .10$, $\eta^2$ = .01) or gender composition (Wilks' $\lambda$ =

.96, $F(3, 150)$ = 2.20, $p > .10$, $\eta^2$ = .04). There was, however, the expected multivariate effect for

the interaction (Wilks' $\lambda$ = .90, $F(3, 150)$ = 5.29, $p < .01$, $\eta^2$ = .10). As such, only the Univariate

tests for the interaction were examined.

Table 5 contains the results of the Univariate ANCOVAs. The covariate (baseline

leadership self-efficacy) had a significant impact on all of the dependent variables ($p < .001$).

The interactions between blatant stereotype activation and solo status were statistically

significant for post self-efficacy and self-reported anxiety. The task self-efficacy ratings which

were taken immediately before they completed the task did not reveal the expected interaction.

To further examine the interactions, planned comparisons were used to test our specific

hypotheses that participants in the two single threat conditions (stereotype activation or mixed-

sex) would have higher scores than those in the control condition who would have higher scores

than those in the double threat condition. The specific contrast used was -1 (control), 2 (single

threat), 2 (single threat), -3 (double threat), just as in the previous study. The interaction contrast

was statistically significant for post self-efficacy and self-reported anxiety, as presented in Table

6.

Next, to test differences in leadership performance (rated anxiety and leadership

behaviors), five additional ANCOVAs were conducted, controlling for initial self-efficacy in all

and the length of the speech in the four analyzing the leadership behaviors. The expected

interactions were statistically significant for rated anxiety and achievement behaviors and

planned contrasts revealed that they were in the expected directions (Table 5, 6, Figure 4). There

was not a significant difference between conditions on the behaviors of directive, supportive, or

participative behaviors. The covariate of speech length had a significant impact on all four of the

leadership behaviors ($p < .001$), although baseline leadership self-efficacy was not significantly

related to any of the leadership behaviors ($p > .05$).

General Discussion

Stereotypes can result in detrimental vulnerability responses and more adaptive reactance responses for female leaders. While a number of factors can influence the nature of the responses, including the leader's self-efficacy, the explicitness of the stereotype, and the power of the leader, this study examined the individual and combined impact of group sex-composition and blatant stereotype activation on female leaders (Bergeron, Block, & Echtenkamp, 2006; Hoyt & Blascovich, 2007, Kray et al, 2001; Kray et al., 2004). Study 1 demonstrated that female leaders who receive a blatant stereotype threat have a reactance type response in terms of their self-appraisals. However, when a solo status threat is added to that initial threat, it results in a vulnerability response. The results from Study 2 demonstrate the same pattern of results, but also demonstrated that a reactance response can be elicited by either blatant stereotype activation or solo status on a broad range of self-appraisal outcomes including leadership efficacy, leadership performance appraisals, and self-esteem. Finally, in Study 3 we showed that this effect extends to leading a mixed-sex, rather than all-male, group and we demonstrated that the effects extend to self-reported anxiety levels as well as leadership performance as assessed by rated anxiety levels and achievement-oriented leadership behaviors. The replication of these findings across tasks, stereotype manipulations, and outcome measures speaks to the generalizability of these results.

Although there is no conclusive answer as to when and why individuals will respond to stereotypes with a vulnerability versus a reactance response, we tested and supported our predictions that the stressors of group sex-composition and blatant stereotype threat combine to produce vulnerability responses, whereas one stressor alone was more often met with positive reactance responses. The leaders' self-appraisals were impacted across all three studies. Self-

efficacy, perceptions of one's leadership performance, and self-esteem were all impacted by the gender leader stereotype; these self-appraisal measures are good indicators of leadership persistence, identification, and performance (Bandura, 1997; Hoyt & Blascovich, 2007).

We surmised that a single stereotype threat for female leaders would be met with low levels of anxiety and a desire to dispel the stereotype resulting in positive outcomes whereas multiple threats would result in greater levels of anxiety (Ben-Zeev et al., 2005; Blascovich et al., 2001; O'Brien & Crandall, 2003) and poor outcomes. In Study 3 we measured both self-reported anxiety levels as well as ratings of behavioral anxiety indicators and the predicted patterns of vulnerability and reactance (Figure 2) were clearly demonstrated across both measures: participants evidenced the greatest anxiety when presented with both threats and the lowest levels of anxiety when only one threat was present.

Importantly, this research demonstrated the threat and reactance responses on actual leader performance in Study 3.  Neither Study 1 nor Study 2 demonstrated effects of stereotype threat on actual performance. It is likely that the performance outcomes examined in these studies did not lend themselves to the effects of stereotype threat. In Study 1, performance was measured in terms of one's ability to effectively rank order project planning tasks in terms of their importance and it was completed alone, without followers. In Study 2, performance was assessed by a single, subjective rating of overall leadership ability which is likely strongly influenced by implicit leadership theories (Lord, 1985). In Study 3 we had trained raters assess objective leadership behaviors and anxiety. Our findings demonstrated strong performance effects on both achievement-oriented behaviors as well as anxiety levels as demonstrated through the leaders' communication. Leaders who demonstrate achievement-oriented behaviors set high standards of excellence, and they challenge their followers to work at their highest levels by not

only expecting a lot from them, but by demonstrating a high level of confidence in them as well (Northouse, 2006).

*Implications*

There are a number of theoretical and practical implications of this research. Recent advances into the mechanisms behind stereotype threat reveal the complexity of the processes (Schmader, Johns, Forbes, 2008).  Although there have been significant theoretical advances in the stereotype threat literature, the present research contributes to under-researched aspects of this phenomenon.  Most of the experimental research on stereotype threat is focused on the academic domains with a scant interest in understanding the impact of stereotypes on female leaders. Furthermore, this research examines women placed in actual leadership positions as opposed to previous research examining leadership intent (Davies, Spencer, Steele, 2005). Moreover, the majority of the stereotype threat research focuses on vulnerability responses to negative stereotypes whereas investigation into the positive reactance responses associated with stereotype threat is in its infancy. Finally, extant stereotype threat literature has primarily examined the impact of one source of stereotype threat whereas in this research we sought to expand the scope by examining the independent and interactive effect of two sources of stereotype activation on female leaders.

Despite the fact that women who do traverse the leadership gap and find themselves in top leadership positions often find themselves in solo (or near solo) status and mixed-sex situations, there is little research examining the influence of the sex composition of the group on female leaders (Berdahl, 1996). We found that being in a group of men can both positively and negatively affect female leaders' self-appraisals. Although studies 2 and 3 demonstrated that solo status and leading a mixed-sex group led to a reactance response, when these group situations

were paired with blatant stereotypes women showed the most detrimental responses. This indicates that women are in a very precarious situation when leading a group of men in a situation that explicitly activates the gender leader stereotype. Indeed, blatant stereotype threat is often communicated via the media (Davies et al. 2002), and solo status and mixed-sex groups is a reality for most women in high level management positions (Daily et al., 1999), making this a very real and important organizational situation.

One of the strengths of the present research is that it examined the interplay of factors that influence responses to stereotype activation, group sex-composition and blatant stereotype activation, using two different approaches. One of the primary goals of this research was to increase the external validity of this area of experimental research by examining more than one source of stereotype threat at the same time. Women often encounter more than one stereotype threat simultaneously, and whereas previous research showed how resilient some women can be to the threat, our research highlights the boundary conditions for these reactance responses. In the first study we specifically examined the effects of *adding* a solo status threat to an already stereotype threatened woman. In doing so we were able to show the boost from stereotype reactance on the women's responses and the subsequent detriment to their responses after the solo status manipulation. This approach provides greater validity to the argument that adding one threat to the other hurts responses by examining reactance and threat within an individual over time. That is, it supports the notion that combined effects of the different stressors results in such a high level of anxiety that it hinders responses.  Conversely, in studies 2 and 3, we examined the difference between women who had received one threat (group sex-composition or blatant threat) and those who had received both threats. All three studies demonstrated the same effects:

one threat can lead to reactance, but both threats combined lead to the negative effects of stereotype vulnerability.

*Limitations*

As with any laboratory research, there are methodological limitations of this approach. Both of these studies employed undergraduate students convening only for a short duration and thus they have limited generalizability. However, these laboratory investigations into leadership, although rare, have a lot to offer and researchers have demonstrated that laboratory investigations into organizational behavior result in similar findings as field research (Locke, 1986, Wofford, 1999). In addition, effects of stereotyping revealed in undergraduate students have been shown to generalize (although with different effect sizes) to other groups; for example, effects related to the stereotype of physical attractiveness found in undergraduate students are also found to have very important and meaningful effects on salaries of female and male business professionals (Frieze, Olson, & Russell, 1991). It is also important to note that the measure of performance in Study 3 was a perceptual measure of how the leader behaved, rather than a measure of how the leader's behavior affected follower performance. Although we assume that leaders who use an achievement-oriented style will elicit better performance from followers, we did not test this outcome. Future research should explore the impact of leader stereotype threat effects on followers' performance.

We demonstrated the stereotype inducing effects of being the sole woman in a group of men and even being in the majority in a mixed-sex group (2 women, 1 man).  It would be of great theoretical and practical relevance to determine if the effects held when women were the solo representative of their gender in groups larger than three or four or were in larger mixed-sex groups. Furthermore, these ad hoc groups were comprised of people who did not know each

other; it would be interesting to examine the impact of group sex-composition with female and male colleagues who are well-acquainted.  Also, much of the hypothesizing behind this research stems from a 'resource' perspective in that whether a woman responds more or less positively in a given situation is determined in large part by the ratio of her perceived resources to perceived demands. This approach is similar to the biopsychosocial (BPS) model of the motivational states of challenge and threat (Blascovich & Mendes, 2000). In the BPS model challenge occurs when personal resources are evaluated as equaling or exceeding the demands of the situation and threat occurs from the evaluation that demands exceed resources. Future research should more directly examine the role of perceived resources and demands in women leaders' responses to the leader gender stereotype which may provide greater insight into the point at which responses transform from reactance to vulnerability.

*Conclusion*

The fact that we find ourselves using the word "woman" when referring to "woman leader", "woman manager", "female CEO" and rarely consider using the terms "man leader", "man manager", "male executive/CEO" speaks volumes about our collective understanding of today's work world. Research has shown that stereotypes can influence women's advancement in organizations in a number of ways. The current research highlights the critical roles of group sex-composition and blatant stereotype activation in women's self-appraisals and performance in leadership positions. While both blatant stereotype activation or solo status/leading a mixed-sex group individually lead to reactance responses, when coupled, they resulted in negative vulnerability responses. This provides a very slippery slope for women leaders who find themselves surrounded by men. These situations are often not just male-dominated, but they are also often rife with biased perceptions and expectations. A clearer understanding of the processes

involved in women leaders' responses in such situations will help us counteract potentially

detrimental responses.

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Table 1

*Scale Means, Standard Deviations, Standardized Item Alphas, and Intercorrelations Study 2*

| Scale | 1. | 2. | 3. | 4. | *M* | *SD* |
|---|---|---|---|---|---|---|
| 1.  Leadership self-efficacy | **.85** | .66** | .56** | .10 | 1.28 | .67 |
| 2.  Leadership performance self-appraisal | | **.89** | .67** | .31* | 1.08 | .95 |
| 3.  Self-esteem | | | **.90** | .40** | .80 | 1.10 |
| 4.  Rated performance | | | | -- | 4.72 | 2.24 |

Note: All constructs are coded such that higher scores indicate more of it. Scales 1-3 and 5-7 range from -3 to 3; scale 4 ranges from 0-10.

All correlations are 2-tailed tests; * = $p < .05$; ** = $p < .01$;

Table 2

*Analyses of Variance (Blatant Stereotype Activation x Solo Status) for all Dependent Variables*

*(Study 2)*

| Results by DV | $F$ value | $p$ | $\eta^2$ |
|---|---|---|---|
| DV = Leadership self-efficacy | | | |
| Blatant Threat | 1.25 | .27 | .02 |
| Solo Status | .87 | .35 | .01 |
| Blatant Threat X Solo Status | 6.03* | .02 | .08 |
| DV = Leadership performance self-appraisal | | | |
| Blatant Threat | .30 | .59 | .00 |
| Solo Status | .05 | .83 | .00 |
| Blatant Threat X Solo Status | 4.76* | .03 | .07 |
| DV = Self-esteem | | | |
| Blatant Threat | 3.23 | .08 | .05 |
| Solo Status | .20 | .65 | .00 |
| Blatant Threat X Solo Status | 4.65* | .04 | .07 |
| DV = Rated performance | | | |
| Blatant Threat | .38 | .54 | .01 |
| Solo Status | .32 | .58 | .01 |
| Blatant Threat X Solo Status | .63 | .43 | .01 |

*Note*: $n = 73$. Performance $n = 56$. * $p < .05$

Table 3

*Planned Contrasts Testing the Prediction that Participants in the Single Threat Conditions,*

*Stereotype Activation (n = 23) or Solo Status (n = 11), will Score Higher than Those in the*

*Control Condition (n = 23) Who in Turn will Score Higher than Those in the Stereotype plus*

*Solo Status Condition (n = 14)*

| Dependent Variable | Stereotype Activation | | Solo Status | | Control | | Both Threats | | *F* value |
|---|---|---|---|---|---|---|---|---|---|
| | *M* | *SD* | *M* | *SD* | *M* | *SD* | *M* | *SD* | |
| Leadership self-efficacy | 1.34 | .61 | 1.68 | .58 | 1.13 | .62 | 1.10 | .80 | 6.65** |
| Leadership performance appraisal | 1.30 | .71 | 1.38 | .98 | .92 | .95 | .74 | 1.18 | 3.87* |
| Self-esteem | .83 | .98 | 1.43 | 1.14 | .73 | 1.07 | .37 | 1.19 | 5.58** |
| Rated performance | 4.76 | 2.44 | 4.00 | 2.25 | 4.88 | 2.15 | 4.92 | 2.23 | 0.88 |

*Note*: total *n* = 73. Performance *n* = 56. ** $p < .05$, * $p = .05$.

Table 4

*Intercorrelations among dependent variables for Study 3*

|  | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|---|---|---|---|---|---|---|---|---|---|
| 1. Baseline self-efficacy | **.86** | .58*** | .42*** | .32*** | .14 | .14 | .09 | .10 | .24** |
| 2. Task efficacy | | **.79** | .59*** | .47*** | .19* | .18* | .15 | .14 | .35*** |
| 3. Post self-efficacy | | | **.94** | .48*** | .22** | .19* | .06 | .16* | .40*** |
| 4. Self-reported anxiety[1] | | | | **.94** | .12 | .18* | .05 | .10 | .33*** |
| 5. Directive | | | | | **.84** | .50*** | .16 | .38*** | .20** |
| 6. Supportive | | | | | | **.93** | .65*** | .63*** | .18* |
| 7. Participative | | | | | | | **.86** | .60*** | .06 |
| 8. Achievement | | | | | | | | **.94** | .12 |
| 9. Rated anxiety[1] | | | | | | | | | **.90** |

*Note*: $n = 157$. * $p < .05$, ** $p < .01$, *** $p < .001$. Cronbach's αs appear on the diagonal.  [1] Self-reported and ratings of anxiety were reversed so that a higher value indicates less anxiety.

Table 5

*ANCOVA results for all dependent variables (Study 3)*

| Results by DV | $F$ value | $p$ | $\eta^2$ |
|---|---|---|---|
| DV = Task efficacy | | | |
| Blatant Threat | 0.34 | .56 | .00 |
| Gender composition | 4.71* | .03 | .03 |
| Blatant Threat X Gender | 0.48 | .49 | .00 |
| DV = Post self efficacy | | | |
| Blatant Threat | 0.40 | .53 | .00 |
| Gender composition | 4.38* | .04 | .03 |
| Blatant Threat X Gender | 5.02* | .03 | .03 |
| DV = Self-reported anxiety[1] | | | |
| Blatant Threat | 0.73 | .39 | .01 |
| Gender composition | 1.09 | .30 | .01 |
| Blatant Threat X Gender | 7. 70** | .006 | .03 |
| DV = Rated anxiety[1] | | | |
| Blatant Threat | 1.45 | .23 | .01 |
| Gender composition | 0.38 | .54 | .00 |
| Blatant Threat X Gender | 5.66* | .02 | .04 |
| DV = Directive | | | |
| Blatant Threat | 0.06 | .82 | .00 |
| Gender composition | 0.35 | .56 | .00 |

| | | | |
|---|---|---|---|
| Blatant Threat X Gender | 0.34 | .62 | .00 |
| **DV = Supportive** | | | |
| Blatant Threat | 0.10 | .76 | .00 |
| Gender composition | 0.00 | .97 | .00 |
| Blatant Threat X Gender | 0.71 | .40 | .01 |
| **DV = Participative** | | | |
| Blatant Threat | 0.03 | .85 | .00 |
| Gender composition | 0.71 | .40 | .01 |
| Blatant Threat X Gender | 0.34 | .56 | .00 |
| **DV = Achievement** | | | |
| Blatant Threat | 0.03 | .86 | .00 |
| Gender composition | 3.53 | .06 | .02 |
| Blatant Threat X Gender | 4.22* | .04 | .03 |

*Note*: $n = 157$.  $* p < .05$, $** p < .01$, $** p < .001$. All analyses include baseline self-efficacy as a covariate. Ratings of leadership behaviors (directive, supportive, participative, achievement) and rated anxiety also include length of speech as a covariate. [1] Self-reported and ratings of anxiety were reversed so that a higher value indicates less anxiety.

Table 6

*Planned Contrasts Testing the Prediction that Participants in the Single Threat Conditions,*

*Stereotype Activation (n = 41) or Mixed-Gender(n = 40), will Score Higher than Those in the*

*Control Condition (n = 44) Who in Turn will Score Higher than Those in the Stereotype plus*

*Solo Status Condition (n = 32) for Study 3.*

| Dependent Variable | Control | | | | Blatant Stereotype Threat | | | | Contrast |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | Women | | Mixed | | Women | | Mixed | | |
| | *M* | *SD* | *M* | *SD* | *M* | *SD* | *M* | *SD* | |
| Task efficacy | 4.77 | 0.85 | 4.45 | 0.88 | 4.76 | 0.83 | 4.59 | .82 | -0.13 |
| Post self-efficacy | 4.77 | 0.95 | 4.79 | 0.81 | 5.16 | 0.79 | 4.58 | 1.10 | 1.38* |
| Self-reported anxiety[1] | 3.78 | 1.34 | 4.13 | 1.48 | 4.17 | 1.39 | 3.39 | 1.08 | 2.68** |
| Directive | 2.94 | 1.18 | 3.11 | 0.78 | 3.05 | 1.12 | 3.07 | 1.06 | 0.18 |
| Supportive | 2.92 | 1.04 | 3.04 | 0.89 | 3.09 | 1.02 | 2.96 | 1.26 | 0.46 |
| Participative | 3.12 | 1.15 | 2.90 | 0.72 | 3.06 | 0.99 | 3.02 | 1.25 | -0.26 |
| Achievement | 3.01 | 0.99 | 3.04 | 0.99 | 3.37 | 1.18 | 2.74 | 1.01 | 1.60* |
| Rated anxiety[1] | 4.49 | 1.60 | 4.97 | 1.92 | 4.85 | 1.89 | 4.12 | 1.78 | 2.64* |

*Note*: $n = 157$.  * $p < .05$, ** $p < .01$, ** $p < .001$. All analyses include baseline self-efficacy as a

covariate. Ratings of leadership behaviors (directive, supportive, participative, achievement) and

rated anxiety also include length of speech as a covariate. [1] Self-reported and ratings of anxiety

were reversed so that a higher value indicates less anxiety.

Footnotes

[1] These statistics were accurate when the experiment was conducted.

[2] We initially planned to have a condition in which a female leader led two male participants but there were not enough participants in this cell to analyze the data. All data from those groups were excluded.

[3] Directive consisted of, "The leader let subordinates know what is expected of them, The leader informed subordinates about what needs to be done and how it needs to be done, The leader gave vague explanations of what is expected of subordinates on the job." Participatory consisted of, "The leader asked for suggestions from subordinates concerning how to carry out assignments, The leader suggested that s/he would solicit input from them, The leader left some decisions up to the subordinates." Supportive consisted of, "The leader said little things that make you think it would be pleasant to be a member of the group, The leader behaved in a manner that is thoughtful of subordinates' personal needs, The leader tried to create a friendly working relationship with subordinates." Achievement consisted of, "The leader explained the level of performance that is expected of subordinates, The leader set challenging goals for subordinates to attain, The leader let subordinates know that s/he expected them to perform at their highest level."

Figure Captions

*Figure 1.*  Changes in self-appraisals as a function of experimental condition (Study 1).  The

decreases evident in the stereotype plus solo status condition depict stereotype vulnerability.

*Figure 2.* Hypothesized results for Studies 2 and 3. Positive responses include greater self-

appraisals, greater performance, and lower anxiety.

*Figure 3.* Self-reported leadership self-efficacy, leadership performance appraisal, and self-
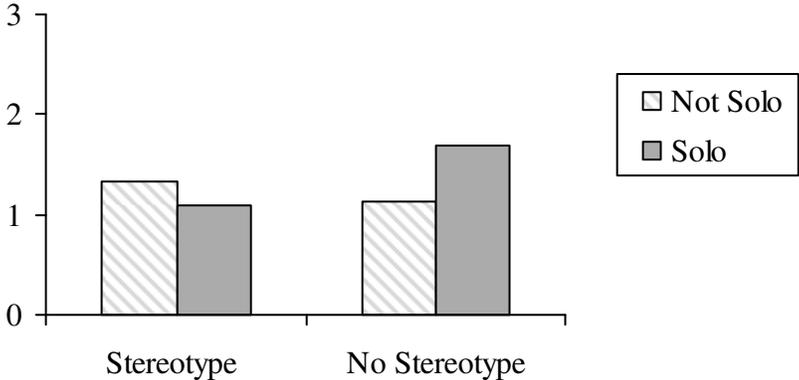
esteem (Study 2).

*Figure 4.* Self-reported self-efficacy and anxiety (reversed) along with rated achievement-

oriented behavior and rated anxiety (reversed; Study 3).
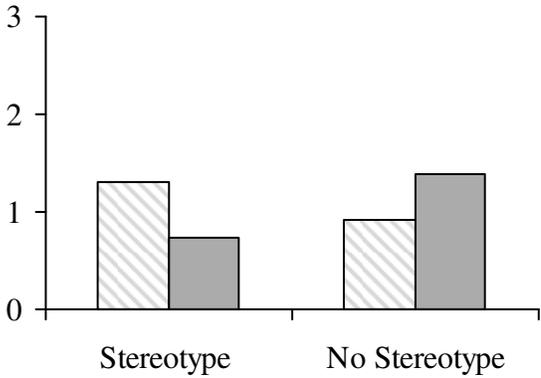
Changes in Self-Appraisals

☐ Stereotype + Solo          ◼ No Stereotype + No Solo
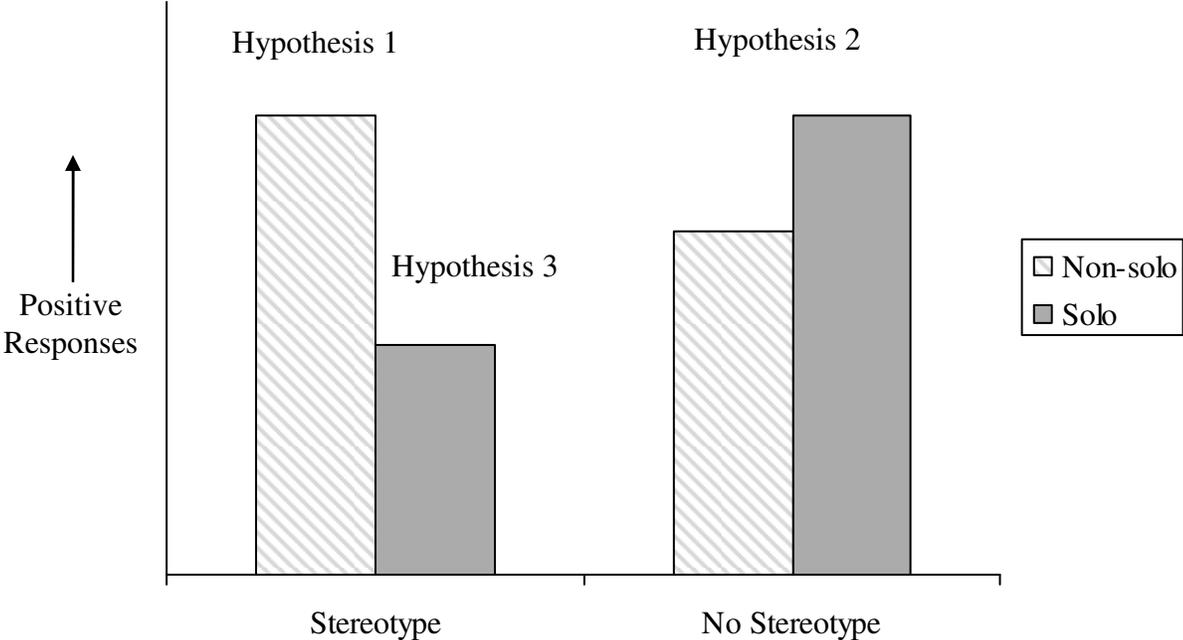
## Leadership Self-Efficacy



## Leadership Performance Self-Appraisal



## Self-Esteem

## Post Self-Efficacy



## Self-Reported Anxiety



## Rated Achievement



## Rated Anxiety