Perceptions of Leaders: The Role of Leader Prototypes and Intervention to Improve Judgments of Female Leaders.

Yashna J. Shah

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Psychology

Roseanne J. Foti, Chair

Neil M. A. Hauenstein

Danny Axsom

Robert Stephens

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ABSTRACT

Leader prototypes are our expectations for attributes a leader should possess, and these prototypes guide our perceptions and judgments of others with regard to leadership. This dissertation uses a connectionist perspective of leadership to investigate differences in perceptions and judgments of male and female leaders, and provides the first empirical test of Hogue and Lord's (2007) model for gender bias in leadership. In Study 1, leader prototypes are investigated as the mediating process through which perceptions of male and female leaders differ. Furthermore, leader and perceiver gender as investigated as contextual and person factors which impact the accessibility of leader prototypes, thus consequently impacting perceptions and judgments of leaders. The use of leader prototypes in remembering a leader's past behaviors reflects the use of a semantic memory system, where the leader behaviors recalled are influenced by our expectations of the leader, rather than whether the leader actually demonstrated those behaviors. Thus, masculine leadership behaviors demonstrated by a female leader may be discounted, and the leader behaviors recalled may be influenced by gender roles. Study 2 investigates an episodic memory intervention to increase the memory accuracy of leader behaviors as a means to reduce biases in judgments of female leaders. Overall, Study 1 results suggest that activation of agentic attributes; specifically tyranny and masculinity are impacted by leader gender, such that the accessibility of those attributes was higher for male leaders. Contrary to predictions, female leaders did not result in greater accessibility of communal attributes in the leader prototype. No impact of perceiver gender was seen on this mediation process. Subsequently, accessibility of these attributes impacts participants' perceptions and

judgments of leadership. Study 2 results indicate behavior recognition accuracy of communal behaviors drives participants' negative perceptions and judgments of the female leader. Limitations and directions for future research are discussed.

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GENERAL AUDIENCE ABSTRACT

Gender bias in leadership perceptions and judgments of leaders is pervasive, and the reasons for this gender bias have been studied from a variety of perspectives. Hogue and Lord (2007) propose that this gender bias can be explained through our leader prototypes, which are our expectations for attributes a leader should have. Various situational and person factors differentially impact the accessibility of attributes in the leader prototype, consequently impacting our perceptions and judgments of leaders. In Study 1, I investigate leader and perceiver gender as factors that impact accessibility of leader prototype attributes. In Study 2, I investigate a memory system intervention targeting the use of episodic memory instead of the default semantic memory, in an attempt to increase the recognition accuracy of a leader's behavior, and thus reduce biases in judgments of the leader. Results, limitations, and avenues for future research are discussed.

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Introduction

Despite comprising of almost half of the workforce (48%; U.S. Department of Labor, 2011), women continue to face difficulty in being perceived and accepted as leaders (Carli & Eagly, 2012). Researchers have used a variety of perspectives to understand this gender bias in leadership – gender stereotypes (e.g., Sczesny, Bosak, Neff, & Schyns, 2004), social roles and role incongruity (e.g., Eagly & Karau, 2002), prejudice (e.g., Rudman, Moss-Racusin, Phelan, & Nauts, 2011), social barriers (e.g., Oakley, 2000), organizational barriers (e.g., Lyness & Thompson, 2000), and differences in leadership styles (e.g., Eagly & Johnson, 1990). More recently, Hogue and Lord (2007) propose using a connectionist theory perspective to understand the gender bias seen in leadership where leader and perceiver gender act as powerful constraints on perceptions of leaders, resulting in differences in perceptions of female and male leaders.

People believe that there are specific traits associated with each gender, such that women are expected to be more communal (relationship oriented) whereas men are expected to be more agentic (Eagly, 1987; Fiske & Stevens, 1993). Communal traits ascribed to women include being kind, warm, understanding, and helpful – characteristics concerned with the welfare of others. Agentic traits attributed to men include aggression, confidence, independence, dominance – characteristics concerned with control and assertiveness (Eagly & Karau, 2002).

Just as individuals have expectations for traits women and men possess, they also have expectations for attributes leaders should possess, known as leader prototypes. These leader prototypes contain interconnected attributes typically associated with leaders (Lord, Foti & De Vader, 1984; Lord & Maher, 1991), and they guide our perceptions of leaders. Based on these prototypes, we might expect a leader to exhibit attributes like sensitivity as well as intelligence

and dedication (Foti, Bray, Thompson & Allgood, 2012) or exhibit tyranny in addition to intelligence and dedication (Foti et al., 2012). Our leadership perceptions are based on these expectations of a leader; individuals are categorized and perceived as a leader if they "match" our expectations of a leader. Once an individual is categorized as a leader, subsequent judgments of the leader are based on that perception, not specific instances of behavior (Shondrick & Lord, 2010). As such, when thinking about a leader's past behavior, we may only recall and recognize those behaviors that fit with our leader prototype. Similarly, when using categorization to make judgments, we may discount the individual's behaviors that did not fit with our prototype, and ascribe to the individual attributes that are reflected in our prototypes, but not the individual's behavior. Thus, the leader categorization process can result in inaccurate judgments.

The connectionist model of leadership posits that our leader prototypes are dynamic, in that the connections between attributes in our prototypes are activated or accessed at the time of use (Lord, Brown, Harvey, & Hall, 2001). The activation stage of leader prototypes is sensitive to context, and thus, connections between attributes are accessed based on varying contextual constraints (Lord et al., 2001). Accordingly, contextual factors constrain the pattern of attributes accessed in our leader prototypes. However, with one exception (Boyd, Foti, & Shah, 2016), research investigating the connectionist model of leadership perceptions has focus on a single contextual factor, either gender of the leader OR race of the leader (e.g., Scott & Brown, 2006; Sy et al., 2010). Importantly, Hogue and Lord (2007) have theorized an integrative model to understand gender bias in leadership, where they posited that both gender of the *leader* and gender of the *perceiver* act as a contextual constraint in the accessibility of the attributes contained in the leader prototype. Accordingly, the primary purpose of this dissertation is to

experimentally investigate Hogue and Lord's (2007) proposed model of gender bias in leadership, by investigating contextual and person impacts on the accessibility of leader prototypes, and the role these prototypes play in our perceptions of leaders.

Gender is a salient leader characteristic that has an immediate impact on people's perceptions of leaders as people have differing gender expectations for males and females. From a connectionist framework, when faced with a female/male leader, the communal/agentic attributes of the leader prototype are likely to be accessed. Specifically, Scott and Brown (2006) found that leader gender acted as a contextual constraint in prototype accessibility; their results showed that when the leader was male, participants' more readily encoded agentic behaviors into prototypical leadership attributes than when the leader was female. Accordingly, leader gender influences accessibility of leader prototypes (Hogue & Lord, 2007) by differentially making salient the attributes contained in the prototype, and thus impacting individuals' perceptions of leaders.

In addition to leader gender, perceiver gender also impacts perceptions of a leader through leader prototypes. Perceiver gender results in accessibility of different attributes for leaders, thus constraining the accessibility of leader prototypes. For instance, males compared to females endorse attributes such as dominance and control (Nye & Forsyth, 1991), as well as aggression, competition (Deal & Stevenson, 1998), and strength (Johnson, Murphy, Zewdie, & Reichard, 2008) as characteristic of a leader. In contrast, females endorse attributes such as helpful, awareness of others' feelings (Deal & Stevenson, 1998), and sensitivity (Johnson et al. 2008) as characteristic of a leader. Accordingly, male perceivers are more likely to access the agentic attributes in the leader prototype whereas females are more likely to access communal characteristics in the leader prototype. Thus, gender of the perceiver acts as a constraint on

leader prototype accessibility, and consequently, the differential leader prototypes result in different perceptions of leaders.

Differing perceptions of the behavior of male and female leaders are a challenge for women in the workplace. Women not only face difficulty in being perceived as a leader (Eagly, 1987; Eagly & Karau, 2002), but often times, female leaders are penalized and evaluated negatively (Heilman & Okimoto, 2007; Phelan & Rudman, 2010). Intervening to increase the accuracy of female leader evaluations may reduce differences in how male and female leaders are perceived. Since our recall of a leader's past behaviors is influenced by our categorization processes often resulting in inaccurate memories of leader behaviors (Shondrick & Lord, 2010). When people are asked to recognize a leader's behavior, they refer to their leader prototype and recognize behaviors based on their leader prototype instead of recalling the leader's actual behaviors (Lord et al. 1984; Shondrick et al., 2010). This reliance on the prototype reflects the use of semantic memory (Shondrick et al., 2010). To mitigate the biasing effects of leader prototypes, research needs to focus on a different type of memory system. Episodic memory enhances retrieval of context specific information, thus resulting in greater behavior recognition accuracy (e.g., Naidoo, Kohari, Lord, & DuBois, 2010) than semantic categorization processes. When individuals recognize a leader's past behaviors using a semantic memory system, they recognize behaviors based on a sense of familiarity with the leader. These individuals may not recall specific behavioral details, but "know" the behavior had occurred based on the leader fitting with their leader prototypes. However, individuals are more likely to remember past behavior using an episodic memory system. Thus, recognition of leadership behaviors based on episodic memory are posited to be less influenced by faulty memories than when behavior recognition is based on semantic memory (Shondrick, Dinh, & Lord, 2010).

Overview of Current Studies

The following two studies used connectionist arguments of leadership perceptions to investigate *why* perceptions and judgments of male and female leaders differ, as well as investigate an intervention designed to reduce biases in how female leaders are perceived by targeting behavior recognition accuracy. Study 1 investigated the effects of leader and perceiver gender on the accessibility of leader prototypes that consequently impact perceptions and judgments of leaders (see Figure 1 for conceptual model). Study 2 investigated the effectiveness of an episodic memory instructional set inreducing memory biases and increase the accuracy of recognizing a female leader's behavior.

Study 1 Literature Review

Leader Prototypes and Perceptions

Individuals use cognitive schemas and heuristics to reduce cognitive efforts and simplify information processing. These schemas are used to categorize people – they develop over time and through experience, and allow individuals to make quick decisions about others in social situations. According to Rosch's (1977; 1978) work on cognitive categorization, these cognitive categories develop around a prototype, which is an abstract yet representative example of characteristics associated with that category. Individuals in a category share common features, and these features afford cues to membership in a particular category (Rosch, 1978).

Based on Rosch's work, Lord and colleagues (Lord, Foti, & De Vader, 1984; Lord & Maher, 1991) proposed the Leader Categorization theory which posits that leadership is a matching process where individuals are categorized as leaders based on the comparison to our

leader prototypes. Individuals have a schema or a prototype of a leader, and this prototype contains the attributes they associate with a leader (Lord et al., 1984; Lord & Maher, 1991). Researchers have identified various attributes associated with leader prototypes (e.g., Lord et al., 1984; Offermann et al., 1994; Epitropaki & Martin, 2004). For instance, Offermann et al. (1994) identified eight distinct trait-like factors as representative of one's leader prototype – attractiveness, charisma, dedication, intelligence, masculinity sensitivity, strength, and tyranny, which were consistent regardless of the gender of the perceiver. More recently, Epitropaki and Martin (2004) built on Offermann's work, and found support for six dimensions – dedication, dynamism, intelligence, masculinity, sensitivity, and tyranny across different employee groups.

According to categorization theory, an individual is categorized as a leader by comparing one's schema or prototype of a leader to the individual's behaviors and traits (Lord et al. 1984; Lord & Maher, 1991). If the individual's behaviors and traits "match" those contained in our prototype, we categorize that individual as a leader. This process occurs automatically and our leader prototypes guide subsequent information processing by providing a framework for interpreting the behavior of those categorized as a leader. As such, our prototypes impact how we interpret, encode, remember and perceive leader behaviors. While leader prototypes simplify perceptual processes and free up cognitive resources for other tasks; they have unintended negative consequences when measuring leader behavior (Shondrick, Dinh, & Lord, 2010). For instance, when asked to describe behaviors and traits exhibited by a leader, we might "remember" the traits and behaviors held in our prototype, even if the leader in question did not exhibit those characteristics (Lord et al., 1984; Shondrick et al., 2010). Thus, our leader prototypes impact our memory and influence the characteristics we ascribe to a leader.

While leader prototypes have been found to remain stable and consistent over time (Lord et al., 1984; Epitropaki & Martin, 2004), research shows that context affects the accessibility of leader prototypes. For instance, research has shown some differences in attributes associated with the leader prototype when contextualizing the type of leader, i.e., political vs. religious vs. sport (Lord et al., 1984). The connectionist model of leadership accounts more formally for the role of context in leader prototype accessibility, arguing that context impacts the accessibility of leader prototypes and leader categorization is based on the accessed prototype (Lord et al., 2001). The connectionist model of leadership provides further insight into this accessibility process.

Connectionist Models of Leadership

Connectionist models of leadership further extend leader categorization theory by focusing on how leader prototypes are accessed (Lord et al., 2001). Research illustrating variability in leader prototypes has demonstrated that while the attributes contained in leader prototypes are stable, the accessibility of leader prototype attributes is dynamic and occurs "in the moment" of use (Shondrick et al., 2010). The connectionist model of leader prototypes uses an analogy of a network of neurons in the brain to illustrate the stability and plasticity of leader prototypes (Lord et al., 2001). As such, our minds contain nodes or concepts that have developed over time and through experience. For instance, through our experiences with leaders, we develop nodes for attributes we think a leader should possess. Thus, we might develop nodes for sensitivity, intelligence, dynamism, etc. These nodes are connected in a neural like network, and leader prototypes are represented by a stable pattern of connections between these nodes (Lord et al., 2001; Shondrick & Lord, 2010; Shondrick et al., 2010).

These connectionist networks continuously integrate information obtained from observing a leader's behavior and the environment, resulting in the accessibility or inhibition of nodes and the connections between the nodes (Lord et al., 2001). Thus, the accessibility (or inhibition) of the connections between the nodes is dynamic. For instance, observing a leader's behavior may result in accessibility of attributes related to sensitivity as well as accessibility of other related communal attributes (e.g., caring). Furthermore, accessibility of the sensitivity attribute likely inhibits connections to agentic attributes (e.g., tyranny). Lastly, observation of a leader's behavior also results in accessibility of other attributes in the leader prototype (e.g., intelligence) that are unrelated to gender specific expectations. The pattern created when these networks are accessibility defines leadership prototypes, such that the entire pattern of accessibility is more meaningful than the accessibility of a single attribute.

Using a connectionist perspective, Lord et al. (2001) proposed a multilevel model of leader prototype accessibility, such that different levels interact and work together to generate leadership perceptions. Leader prototype accessibility impacts both encoding and retrieval processes. The first level involves input of behavioral information for potential leaders. The second level contains the leader prototype, which comprises of all the interconnected attributes (e.g., intelligent, dedicated, dynamism) one associates with a leader. Attributes contained in the leader prototype receive behavioral input from the first level. For instance, observing a leader asking about a subordinate's well-being (i.e., being considerate) when interacting with subordinates may increase the accessibility of sensitivity in one's leader prototype. The third level contains the contextual constrains that also serve as an input to the leader prototype (i.e., the second level). Contextual factors (e.g., culture, gender) increase or decrease the accessibility of attributes contained in the leader prototype (Lord, 2017). Input from both first and third levels

demonstrates the dynamic nature of networks. Continuing the above example; observing a leader behave in a considerate manner results in the accessing of and inhibition of different attributes in the leader prototype depending on the context, i.e., the leader's gender. For instance, observing a female leader asking about a subordinate's well-being may result in the accessibility on sensitivity while observing a male leader asking about a subordinate's well-being may result in the inhibition of masculinity. As such, contextual constrains impact the dynamic reconstruction of prototypes by taking into account situational factors during network accessibility. Figure 2 illustrates the multilevel connectionist model of leadership, indicating how contextual factors impact leader prototype accessibility and leadership perceptions.

The Impact of Context on Leader Prototypes

As previously mentioned, Lord et al.'s (2001) third level in the connectionist model of leadership contains various contextual factors that impact prototype accessibility. Leader characteristics, such as race (Sy et al., 2010) and gender (Scott & Brown, 2006), and perceiver characteristics, such as self-identity (MacDonald, Sulsky, & Brown, 2008) and behavior of followers (Boyd et al., 2016), have all been found to act as contextual factors that impact the accessibility of leader prototypes.

While these contextual factors have been posited to interact to affect leader prototype accessibility (Lord et al., 2001), research has typically investigated a single contextual factor – either a leader or a perceiver characteristic. For instance, Sy et al. (2010) investigated leader race (i.e., Asian American vs. Caucasian American) as a contextual factor and found that the extent to which Asian Americans were perceived as leaders was lower compared to Caucasian Americans such that different patterns of prototypes (competent and agentic) were found to

mediate the relation between race and leadership perceptions. While leadership perceptions of Asian Americans were influenced by accessibility of competent prototypic attributes (i.e., intelligence and dedication), leadership perceptions of Caucasian Americans was influenced by accessibility of agentic prototypic attributes (i.e., masculinity, tyranny and dynamism).

A second major contextual factor is perceiver characteristics. MacDonald et al. (2008) investigated perceiver characteristics, specifically the impact of individuals' self-identities on their ratings of leadership prototypically by priming individuals' self-identities to be either interdependent or independent. Subsequently, individuals receiving the interdependent prime rated consideration and inspiration as highly characteristic of leadership whereas those receiving the independent prime rated contingent reward as highly characteristic of leadership, providing support for perceiver self-identity constraining leader prototype accessibility.

At a given point in time, multiple contextual factors will be available when an individual is interacting with a leader. For instance, leader gender and perceiver gender, as well the leadership task and organizational culture are simultaneously available. However, how these contextual factors interact to influence accessibility of leader prototypes is still unknown. I seek advance current research by empirically investigating the interaction of contextual factors, specifically leader and perceiver gender, on the accessibility of leader prototypes and the consequent impact on perceptions of leaders. Understanding this process will provide useful insight into why and how perceptions of male and female leaders differ.

Leader Gender. Leader gender acts as a contextual constraint by differentially impacting the accessibility of nodes contained in the leader prototype (Lord et al., 2001; Hogue & Lord, 2007). Since there is significant overlap in the traits associated with men and the

attributes contained in our leader prototypes, it is easier to accessibility nodes in the leader prototype when observing males (Hogue & Lord, 2007). This results in males being perceived as more leader-like than females.

Leader prototypes are masculine (Eagly & Karau, 2002; Koenig, Eagly, Mitchell & Ristakari, 2011), and this is reflected in the attributes contained in our leader prototypes. Indeed, of Epitropaki and Martin's (2004) six dimensions comprising leader prototype attributes, only one dimension is communal (i.e., sensitivity) whereas three are agentic (i.e., dynamism, masculinity, and tyranny), indicating less overlap with our expectations for women. The remaining two dimensions, i.e., intelligence and dedication are thought to be gender neutral.

As research by Scott and Brown (2006) demonstrates, differences in perceptions of male and female leaders arise from differential encoding of the leader's behavior. Participants found it difficult to access agentic attributes in their prototypes when the leader was female, despite being given the same behavior for both male and female leaders. On the other hand, while individuals were able to access communal prototypes when the leader was female, there is only one communal attribute contained in the leader prototype compared to three agentic attributes, making it difficult for women to be perceived as leaders. Moreover, accessing of communal attributes inhibits the accessing of agentic attributes in the leader prototype because the communal and agentic attributes are in conflict with each other where possessing communal attributes is thought to imply a lack of agentic attributes. Conversely, the accessibility of agentic attributes inhibits the accessibility of communal attributes in the leader prototype. Thus, easier accessibility of agentic nodes when observing male targets, and inhibition of agentic nodes when observing female targets makes it likely that males are seen as leaders to a greater extent than female targets. As such, due to difficulty encoding behavior contrary to gender expectations,

male and female leaders are perceived differently, even when they exhibit the exact same behavior.

Leadership perceptions are the process through which a target individual is classified and recognized as a leader. It involves two steps – the activation of leader prototypes, then classifying the individual as a leader based on "match" with the prototype. However, leadership perceptions are measured as the outcome of this process, and capture whether the leader was perceived as leader-like. Individuals rely on these perceptions and their leader prototype when making judgments or evaluations about leaders. These leader judgments are evaluations of the leader on specific attributes. For instance, transformational leadership, is widely believed to be the most effective style of leadership, and involves a leader demonstrating benevolence (e.g., consideration towards others) as well as competence (e.g., initiating structure). However, while female leaders tend to be more transformational than male leaders (Eagly, Johannesen-Schmidt, & van Engen, 2003), research shows that women are consistently judged as benevolent, but not competent (Broverman, Vogel, Broverman, Clarkson, & Rosenkrantz, 1972). Judgments of benevolence and competence are negatively correlated, where being high on one attribute is perceived as being low on the other (Judd, Hawkins, Yzerbyt, & Kashima, 2005). As a result, individuals are judged as benevolent but incompetent, or cold but competent (Kervyn, Yzerbyt, Judd, & Nunes, 2009). Research shows that judgments of benevolence and other communal attributes are made faster than those of competence related agentic attributes (Abele & Bruckmuller, 2011). Thus, once an individual is judged as being benevolent, it is possible that their behaviors demonstrating competence are not acknowledged, or rather, discounted, especially if the leader is female. As such, the gender of a leader impacts judgments of their benevolence and competence.

The accessibility of different patterns of traits in one's prototype will result in different expectations of behaviors for female and male leaders, and consequently, in differing judgments of female and male leaders (Lord et al., 2001). Given that female leaders are likely to result in accessibility of communal attributes in one's prototype, and male leaders are likely to result in accessibility of agentic attributes in one's prototype, the differing accessibility of communal and agentic traits may lead to women being judged as benevolent and men being judged as competent.

Accordingly, I predict the following:

Hypothesis 1:Leader gender will affect leadership perceptions and judgments such that:

1a: Gender of the leader will affect leadership perceptions such that male targets will be perceived as leaders to a greater extent than female targets.

1b: Gender of the leader will affect leader judgments such that male targets will be rated as competent to a greater extent than female targets.

1c: Gender of the leader will affect leader judgments such that female targets will be rated as benevolent to a greater extent than male targets.

Hypothesis 2: The relationship between gender of the leader and leadership perceptions will be mediated by leadership prototypes such that:

2a: For female leaders, only perceptions sensitivity will affect leadership perceptions.

2b: For male leaders, perceptions of dynamism, masculinity, and tyranny attributes will affect leadership perceptions.

Hypothesis 3: The relationship between gender of the leader and leader judgments will be mediated by leadership prototypes such that:

3a: For female leaders, only perceptions of sensitivity will affect leader judgments.

3b: For male leaders, perceptions of dynamism, masculinity, and tyranny will affect leaders judgments.

Interactions between Contextual and Person Characteristics

In the connectionist perspective, contextual factors interact with each other to adjust or constrain the accessibility of leader prototypes, and this process occurs often outside of conscious awareness (Lord et al., 2001). Hogue and Lord (2007) posit that leader gender interacts with other contextual and person factors to influence perceptions of individuals as leaders. Leader gender potentially interacts with perceiver gender to impact leader prototype accessibility. Since this process typically occurs outside conscious awareness, individuals are most often unaware that their own gender influences their perceptions and interpretations of behaviors as they relate to leadership.

Perceiver Gender. While there has been no research looking at the impact of perceiver gender (or follower gender) on the accessibility of leader prototypes, related research provides support for perceiver gender as a potential constraint on the accessibility of leader prototypes and consequently, acting as a constraint of leadership perceptions. Leader prototypes generalize across gender (e.g., Offerman et al., 1994), such that no differences are seen in the content of leader prototypes for male and female perceivers. However, differences in perceiver characteristics influence the accessibility of attributes contained leader prototypes between male and female perceivers. For instance, Hogue and Lord (2007) posit that self-perceptions

contribute to the gender bias seen in leadership such that women's self-perceptions place a greater emphasis on communal roles and behaviors, thus resulting in women perceiving male and female leaders differently. As such, perceiver gender acts as a proxy variable for our self-perceptions in terms of agentic or communal roles, such that we assume that communal traits are more accessible to women and agentic traits are more accessible to men. Accordingly, perceiver gender is a person variable that impacts the accessibility of prototypes such that it is easier for women to access communal rather than agentic attributes when observing a female leader, which consequently impacts their perceptions of leaders.

Research shows both male and female perceivers have differential expectations of behavior from and perceptions of male and female leaders (Nye & Forsyth, 1991). Indeed, Martell & De Smet (2001) found that female perceivers rated female managers more favorably on inspiring, mentoring, problem solving, rewarding and supporting behaviors compared to male managers. These are characteristics that are communal in nature. On the other hand, male perceivers rated male managers more favorably on delegating, intellectual stimulation, and problem solving behaviors compared to female managers. These characteristics are agentic in nature.

Even when the same leadership behaviors are demonstrated by male and female targets, male and female perceivers have different leadership ratings for the targets. The differential accessibility of leader prototypes results in a "match" or "mismatch" of the target with the leader prototype, which then impacts leadership ratings. For instance, when rating male and female targets on the same behavior, female perceivers rated the female targets higher on transformational leadership (Powell, Butterfield, & Bartol, 2008), suggesting that females are more likely to access communal attributes for female leaders resulting in a "match" between the

female leader and prototype accessed. Additionally, male perceivers are likely to have lower leadership ratings for female targets (e.g., Eagly et al., 1992), suggesting that there is a "mismatch" with the leader and prototype accessed, and that males may be less likely to access agentic attributes for female leaders.

As such, despite male and female leaders exhibiting identical behaviors, they will be perceived differently as leaders due to different patterns of prototype accessibility within male and female perceivers. Female perceivers are likely to encode female leader behavior in terms of communal attributes and less likely to encode female leader behavior in terms of agentic attributes, resulting in a stronger accessibility of sensitivity in the leader prototype, and inhibition of dynamism, masculinity, and tyranny in the leader prototype. Conversely, male perceivers are less likely to encode male leader behavior in terms of communal attributes and more likely to encode male leader behavior in terms of agentic attributes, resulting in a stronger accessibility of dynamism, masculinity, and tyranny in the leader prototype, and inhibition of sensitivity in the leader prototype. Thus, the gender of leader and gender of perceiver interact to impact the accessibility of attributes contained in leader prototypes

Hypothesis 4: Leader gender and perceiver gender will interact to impact leadership perceptions and leader judgments through leader prototype accessibility such that:

4a: A female leader will result in stronger perceptions of sensitivity when the perceiver is also female.

4b: A male leader will result in stronger perceptions of dynamism, masculinity, and tyranny when the perceiver is also male.

Study 2 Literature Review

Individuals rely on their leader prototypes for their perceptions and judgments of a leader. These perceptions and judgments of the leader may be inaccurate and biased by the leader prototype. For instance, increased accessibility of the sensitivity attribute in the leader prototype for a female leader may negatively impact judgments of that leader. In order to reduce bias in leadership judgments, it is necessary to intervene to reduce reliance on the leader prototype in leadership judgments.

Reducing Bias in Leadership Judgments

While leadership measurement is often aimed at assessing *leader* behaviors and traits, early research found that ratings of leadership typically reflect the *rater's* cognitive and emotional processing in addition to the leader's actual behaviors (Eden & Leviatan, 1975). Specifically, once an individual is categorized as a leader, we rely on these leadership perceptions to determine if the leader demonstrated a particular leadership behavior instead of recalling actual behaviors the leader demonstrated. The reliance on our perceptions of a leader when recognizing a leader's past behaviors reflects use of semantic memory (Shondrick & Lord, 2010). Accordingly, behavior recognition is biased and problematic as it relies on prior knowledge and expectations of how a leader should behave (Shondrick et al., 2010), and individuals are more likely to rely on their general impressions of the leader than remember specific instances of leader behavior. When making leader judgments, relying on general impressions of the leader discounts the leader's actual behaviors, which consequently, results in biased and inaccurate judgments of leadership.

Semantic and Episodic Memory. Semantic and episodic memory are two types of memory systems that are used in retrieval processes. Semantic memory "registers and stores knowledge about the world in the broadest sense and makes it available for retrieval" (Tulving, 1993, p. 67). Semantic memory is independent of contextual information, and stores general knowledge, facts and information that accumulate with experience (Tulving, 1993). As such, semantic memory is the default mode of processing information due to its general relevance and ease of use in guiding retrospective judgments. In contrast to semantic memory, episodic memory, which Tulving (1993) refers to a "mental time travel", involves retrieval of information from a specific situation at a specific point in time while being consciously aware of the experience. Thus, episodic memory is highly contextualized and includes memory of vivid experiences and emotion.

With regard to recognizing a leader's past behavior, the two memory systems differ in that semantic memory entails reliance on our leader prototypes and indirect experiences with the category of a leader, such that recall of the leader's past behaviors are made based on fit with those perceptions. On the other hand, episodic memory entails recalling specific examples of leadership behavior that the leader demonstrated (Shondrick et al., 2010). Consequently, the type of memory system raters' use when recognizing past behaviors may have important implications for the accuracy of behavior recognition.

Recently, Shondrick and Lord (2010) proposed that behavioral measurements of leadership that increase raters' reliance on episodic memory increases judgment accuracy compared to the typical measurements which seem to depend on the effects of semantic memory. Since behavior recognition based on semantic memory is biased because it relies on general leadership perceptions, encouraging the use of episodic memory may serve to increase the

accuracy of behavior recognition. Thus, having raters rely on episodic memory and recalling specific instances of leader behavior should result in a more accurate judgments of the leader.

Knowing and *remembering* are two subjective states of awareness, or metacognitions, (Gardiner & Richardson-Klavehn, 2000), which tap into semantic and episodic memory systems respectively. While ratings arising from *knowing* are based on a sense of familiarity, ratings arising from *remembering* are based on the recollection of contextual details or reliving of prior experiences (Curran & Hintzman, 1995; Mandler, 1980). Take for example, ratings of leader intelligence, ratings based on *knowing* would entail feeling confident that the leader being evaluated is intelligent, and thus demonstrating intelligence-related behaviors. In this case, there is no conscious recollection of specific instances where the leader has demonstrated intelligence. Rather, the rater likely inferred intelligence based on strong sense of familiarity from their categorization of the individual as a leader. On the other hand, ratings based on *remembering* would involve recalling specific instances where the leader had displayed intelligence-related behaviors, and specific details of those behaviors, thus leading to the assertion that the leader was intelligent.

Individuals are able to consciously distinguish between behavior recognition based on semantic memory, i.e., *knowing* and episodic memory, i.e., *remembering* (Tulving, 1985). The remember-know procedure was developed by Tulving (1985), where participants are asked to respond to items on the basis of "remember" or "know". Participants had to respond "remember" when they consciously recollected having encountered the item before and had to respond "know" if the item seemed familiar in the absence of recollection. Recent research by Hansbrough, Lord, Schyns, and Foti (under review) found evidence suggesting individuals are aware of and able to distinguish between *knowing* and *remembering*, and being able to verbalize

the metacognition being used. Since raters are able to distinguish between *remembering* and *knowing*, raters can be asked to focus on *remembering* as a basis for their behavior recognition.

Martell and Evans (2005) explored two different mechanisms of behavior recognition to eliminate biases associated with performance expectations. Having raters differentiate between remember and know metacognitions and rely on *remembering* was thought to reduce the bias associated with performance expectations in recognition of prior behavior. Similarly, individuals have expectations for a leader's behavior (leader prototypes), and these leader prototypes influence our ratings of a leader's performance. Moreover, since leader prototypes tend to be masculine (Eagly & Karau, 2002; Koenig et al., 2011), they bias our evaluations of female leaders. Thus, having individuals rely on *remembering* in their recogntion of a leader's behavior should reduce the influence of and biases associated with leader prototypes in recognizing the leader's behavior.

In Martell and Evan's (2005) study, raters in the metacognition condition were given instructions to distinguish between behavior recognition based on remembering (i.e., those reflecting vivid memory of a specific action or behavior) and behavior recognition based on knowing (i.e., general feeling of knowing or familiarity). These raters were asked to select behaviors on a behavioral measure only when they recognized the behavior having occurred based on *remembering*. Raters in the control condition were given no instructions prior to completing the behavioral measure, and their recognition of behaviors was thought to rely on *knowing*. Thus, the behavior recognition measure captured the behaviors respondent's believed had occurred. Hit-rates and false-alarm rates were computed to capture the number of behaviors recognized accurately and inaccurately respectively. They found that that differentiating between *remembering* and *knowing* eliminated the behavior recognition bias associated with

performance expectations. Research by Mitchell, Larsen, and Green (1977) found that performance cue expectations had stronger effects on behavior retrieval processes than encoding processes. Thus, to diminish the effect of leader expectations, intervening at the memory retrieval stage may serve to have greater impact on behavior recognition than intervening at the information encoding stage. Indeed, research by Martell and colleagues (2005), has found that intervening at the retrieval stage is effective in reducing the biases associated with performance cues.

Based on Martell and Evans' (2005) research, *remembering* should result in more accurate recall of specific behaviors that a leader performs. As such, by having individuals focus on metacognitions and rely on *remembering* instead of *knowing*, individuals should be able to more correctly identify behaviors that occurred, as well as behaviors that did not occur. On the other hand, when people recognize behaviors based on *knowing*, their recognition of behaviors that occurred is based on their leadership perceptions, likely resulting in inaccurate recognition. Similarly, when individuals respond to a leadership measure using *remembering*, their recognition of the leader's behavior is expected to be free of their preconceived expectations of leadership, and perhaps be more accurate in recognizing past behavior of the leader.

The performance cues provided to participants by Martell and Evans (2005) were that the behaviors were either effective or ineffective. To provide individuals cues with regards to leadership, the target leader may be primed. For instance, when participants are primed with who the leader is, they are likely to rely solely on their leader prototypes when asked to recognize the leader's past behavior or make judgments about the leader. Leader behaviors that fit with the participant's expectations of a leader will be recognized, especially when participants respond based on *knowing*, and thus result in high rates of recognized leader behaviors,

regardless of whether the behavior occurred. However, when no information is provided about the person in question being a leader, recognition of past behavior is influenced by other salient characteristics such as gender. When asked about a female target's behavior, participants will recognize the behavior based on gender role expectations, thus recognizing communal behaviors at higher rates when viewing a woman. When asked about a female leader's behavior, participants responding using a semantic memory system will recognize behaviors that fit with the leader role and the gender role at higher rates, regardless of whether the behavior occurred. When responding based on *remembering*, participants should accurately recognize past behavior, regardless of whether leadership was primed or not.

H5: *There will be a three-way interaction between metacognition strategy, priming leadership, and behavior type on behavior accuracy.*

H5a: *Invoking remembering metacognition will result in high true positive recognition rates regardless the leadership prime for both agentic and communal behaviors, whereas invoking knowing metacognition strategy, the true positive recognition rate will be greater when leadership is primed than when leadership is not primed. Specifically, in knowing metacognition strategy, the true positive recognition rate will be greater when leadership is primed for both agentic and communal behaviors, whereas when leadership is not primed, true positive recognition rate will be greater for communal behaviors compared to agentic behaviors.*

H5b: *Invoking remembering metacognition will result in low false positive recognition rates regardless the leadership prime for both agentic and communal behaviors, whereas in knowing metacognition strategy, the false positive recognition rate will be greater when leadership is primed than when leadership is not primed. Specifically, in knowing metacognition strategy, the false positive recognition rate will be greater when leadership is primed for both*

agentic and communal behaviors, whereas when leadership is not primed, false positive recognition rate will be greater for communal behaviors compared to agentic behaviors.

Behavior Recognition and Leader Judgments. Performance ratings based on actual behaviors have been shown to be superior to those based on general impressions (Murphy, Garcia, Martin, & Balzer, 1982). For instance, Murphy et al. (1982) found that perceivers who accurately reported behaviors exhibited by a target had more accurate overall performance ratings. More recently, Sanchez and de la Torre (1996) found a positive relationship between participants' abilities to recognize behaviors a target did or did not exhibit, and participant's performance rating accuracy. Indeed, Ilgen and Feldman (1983) concluded that perceivers were able to reduce biases in their ratings and recall information accurately when they did not rely on schema-based information. Therefore, it can be expected that judgments based on *remembering* specific behaviors may be free from bias relative to those based on *knowing*. As such, perceivers who accurately recognize past leader behaviors should be more accurate in their leadership judgments. Leadership judgments based on recognition of a leader's behaviors are important because they reduce the biasing influence of our leader prototypes, and allow us to move away from measures based on semantic memory.

Accordingly, by reducing the reliance on leader prototype and perceptions, leadership judgments based on recognition of past leadership behaviors should result in similar ratings of the leader, regardless of whether the leader was primed or not since their judgments are based on remembering, and thus, are less reliant on leader prototypes. Individuals who are able to correctly recognize the leader's behavior should base their judgments on those behaviors. Individuals with lower behavioral accuracy may be more likely to rely on their prototypes for

leadership judgments, and thus, we may expect differences in judgments of the leader depending on the extent of behavior recognition accuracy.

Hypothesis 6a: High behavior recognition accuracy (high true positive rates and low false positive rates) will result in leadership perceptions that are free from bias compared to those with low behavior accuracy (low true positive rates and high false positive rates).

Hypothesis 6b: High behavior recognition accuracy (high true positive rates and low false positive rates) will result in judgments of competence that are free from bias compared to those with low behavior accuracy (low true positive rates and high false positive rates).

Hypothesis 6c: High behavior recognition accuracy (high true positive rates and low false positive rates) will result in judgments of benevolence that are free from bias compared to those with low behavior accuracy (low true positive rates and high false positive rates).

Study 1

Understanding how contextual and person factors influence the leader prototype accessibility in our perceptions is essential to understanding the cognitive processes that result in differing perceptions male and female leaders. Accordingly, the purpose of study 1 was to investigate the impact of leader and perceiver gender on our perceptions of leaders through the accessibility of leader prototypes. While the accessing of leader prototypes is an unconscious process, leader prototypes have been typically measured using self-report on surveys. A similar methodology is used in this study, where a thoroughly validated measure of leader prototypes by Epitropaki and Martin (2005) is used to capture the accessibility or saliency of traits endorsed. In this study, participants observed either a male or a female leader, following which they responded to questions relating to their perceptions and judgments of the leader.

Study 1 Method

Sample

Participants were full time U.S. based working adults recruited through Amazon Mechanical Turk (MTurk). MTurk is found to be a reliable platform for collecting data on the internet, and research suggests MTurk data are high quality (Buhrmester, Kwang & Gosling, 2011), generalizable, and reduce the biases found in traditional samples (Gosling, Vazire, Srivastava, & John, 2004). Participants were compensated $1.50 for their participation. A total of 189 participants completed the survey. Participants who did not watch the videos or participants who failed attention check questions were not included in any analyses. As a result, 24 participants (12.70 % of initial sample) were excluded from the analyses.

This resulted in a final sample of 165 participants. Participants' age ranged from 22 to 65 years (M = 38.58, SD =10.85). 80% of the sample described themselves as White. Participants worked an average of 42 hours per week and worked in a variety of industries ranging from Retail to Manufacturing. Participants took an average of 25 minutes to complete the study.

In the final sample, 84 participants watched the female leader vignettes and 81 participants watched the male leader vignettes. Of those receiving the vignettes containing the female leader, 45 reported their gender as female and 39 reported their gender as male. Of those receiving the vignettes containing the male leader, 41 reported their gender as female and 40 reported their gender as male.

Design

This study had a 2 (gender of leader: female or male) x 2 (gender of perceiver: female or male) between subjects design. Participants were randomly assigned to receive a video of a male or female leader.

Power Analysis

A post hoc power analysis was conducted to compute achieved power given the above sample size of 165 participants. The software G*Power 3.4 (Faul, Erdfelder, Buchner, & Lang, 2009) was used to conduct this analysis. Power analyses were conducted using the independent variable and two parallel mediators as predictors, and revealed sufficient power (.93). According to Buchanan (2016), since model 7 of PROCESS doesn't assess the impact of the moderator on the dependent variable, but rather, the impact of the moderator on the mediator, only the mediators are used to estimate power.

Procedure

MTurk participants who signed up for the study were provided with a Qualtrics link to access the survey. Participants first read the consent form (Appendix A). Participants were then randomly assigned to watch a series of four vignettes containing either a female leader (Sue) or a male leader (Bob). Prior to watching the video, participants were presented with a screenshot indicating the names of the four members, as well as a statement indicating that the leader was either Sue or Bob. Participants then proceeded to watch the videos. Each video consisted of a series of business scenes, where four individuals were meeting to work on various tasks. Both female and male leader vignettes had the exact same script, with the only difference being whether the leader role was played by a man 'Bob' or woman 'Sue'. Next, participants completed a measure of leader prototypes adapted from Epitropaki and Martin (2004). Participants then completed a measure of leadership perceptions assessed using the Global

Leadership Impression scale (GLI; Lord et al., 1984) and a measure of leader judgments (Mayer & Davis, 1999). The order of the items in all the measures was randomized. Lastly, participants filled out a series of demographic questions, including gender, ethnicity, work experience, and whether they had ever had a female boss.

Independent Variables

Leader Gender Stimuli Materials. The video stimuli used in this study are part of the Emerging Leader Video series originally created by Hanges et al. (1998). This series comprises of nine videos depicting various workplace vignettes. Each vignette depicted two male and two female managers interacting in a business setting. Each vignette featured a different theme (e.g., scheduling, budget, and supplies) and had a runtime of less than 4 minutes. There were two sets of these vignettes, one depicting a male leader and one depicting a female leader, with both the male and female leader exhibiting the same behavior; the two sets of vignettes are exactly the same with the only difference being the leader gender. Hanges et al. identified ten agentic and communal attributes depicted in the vignettes as well as identified the corresponding behaviors in the videos.

In this study, a subset of Hanges et al.'s video vignette series were used (vignettes 6 through 9). To manipulate the leader gender, both sets of vignettes 6 through 9 were used resulting in two sets of stimuli vignettes – one containing a female leader and one containing a male leader. Each stimulus set contained four vignettes which depicted a leader that had already emerged, and the leader exhibited more leadership behaviors than the group members. The vignettes followed the same exact script and the leaders displayed the same leadership behaviors; the only difference was that either a female manager (Sue) or male manager (Bob) played the role of a leader. Appendix B contains the list of agentic and communal attributes depicted in the

videos, as well as the frequency of agentic and communal leadership behaviors exhibited by the leader and other managers. These agentic and communal attributes correspond to the attributes contained in the leader prototype, such that the agentic and communal attributes and behaviors contained in the video are representative of dynamism, tyranny, and masculinity, and sensitivity respectively.

Measured Variables

Perceiver gender. Perceiver gender was assessed using a single question at the end of the survey asking participants to indicate their gender. In order to ensure balanced groups, separate MTurk links were provided – one for female participants and one for male participants.

Measures

Measure of Leader Prototypes. Participants' leader prototypes were measured using Epitopaki and Martin's (2004) 21-item leader prototype scale (Appendix C). Epitropaki and Martin (2004) reduced items from Offerman et al.'s (1994) 41item implicit leadership measure to 31 items, which was then further reduced to 21 items. Participants were asked to rate how characteristic the listed attributes (e.g., sincere, dedicated, helpful) were of the leader they watched, with no definition of the trait provided. Participants rated each attribute on a 9 point Likert-type scale ranging from 1 'not at all characteristic' to 9 'extremely characteristic'. The scale includes six dimensions - sensitivity, intelligence, dedication, dynamism, tyranny, and masculinity. Reliability analyses revealed adequate reliabilities for each dimension – sensitivity ($\alpha = .83$), intelligence ($\alpha = .86$), dedication ($\alpha = .90$), dynamism ($\alpha = .82$), tyranny ($\alpha = .90$), and masculinity ($\alpha = .85$).

Leadership Perceptions. Perceptions of leadership were measured using the Global Leadership Impression scale (GLI; Cronshaw & Lord, 1987; Lord et al., 1984). The GLI consists of 5 items and participants responded to each item on a five-point scale ranging from 1 'Not at all' to 5 'Extreme amount'. Reliability analyses revealed adequate reliability for the scale ($\alpha = .93$). The leadership perceptions measure is presented in Appendix D.

Leader Judgments. Mayer and Davis' (1999) 11-item measure of competence and benevolence was be used to assess leader judgments. Six items are associated with competence attributes and five items are associated with benevolent attributes. Participants were asked to evaluate the leader using a five-point scale ranging from 1 'Strongly disagree' to 5 'Strongly agree'. Reliability analyses revealed adequate reliability for the competence ($\alpha = .93$) and benevolence subscales ($\alpha = .92$). This measure is presented in Appendix E.

Control and Exploratory Variables

Demographic and work experience data was collected and controlled for. For instance, participants were asked to indicate their gender, age, ethnicity, and hours worked per week. Participants were also asked to indicate whether they had ever worked with a female boss or manager as research shows that individuals who were satisfied with female managers in the past are significantly more likely to view women as have successful manager characteristics (Duehr & Bono, 2006). Moreover, having a female boss has also been found to impact the recognition of leader behaviors in women (Foti, Knee, & Backertt, 2008).

Participants' self gender schemas were explored as an underlying conceptual construct that perceiver gender taps in to. The Bem Sex Role Inventory (BSRI) was used to assess participant's self gender schemas. The short form of the BSRI contains 10 masculine (BSRI-M)

and 10 feminine (BSRI-F) items. Reliability analyses revealed adequate reliabilities for both BSRI-M ($\alpha = .88$) and BSRI-F ($\alpha = .93$). The demographics and BSRI questionnaires are presented in Appendix F.

Study 1 Results

Descriptive Statistics and Correlations

Means for the six prototype dimensions were calculated using the items contained in the six subscales (Epitropaki & Martin, 2005). Leadership perceptions were computed using the mean of the items in the GLI measure ($M = 3.81$, $SD = .84$). Similarly, judgments of benevolence ($M = 3.87$, $SD = .82$) and competence ($M = 3.94$, $SD = .78$) were computed using the mean of items in Mayer and Davis' (1999) subscales of benevolence and competence respectively.

Table 1 contains the within condition descriptive statistics for the variables of interest in the study. Table 2 contains correlations of variables and covariates. Table 3 contains correlations of variables by leader gender condition. As evidenced in Table 2, the leader prototype attributes were highly correlated. Surprisingly, neither leader gender nor perceiver gender was significantly correlated with sensitivity ($r = .14$ & $r = .07$ respectively, $p > .05$). However, correlations among sensitivity and leadership perceptions ($r = .64$, $p < .05$), judgments of competence ($r = .74$, $p < .05$), and judgments of benevolence ($r = .75$, $p < .05$) were high. As expected, both leader gender and perceiver gender were significantly correlated with tyranny ($r = -.19$ & $r = -.29$ respectively, $p < .05$). The masculinity dimension was only correlated with leader gender ($r = -.88$, $p < .01$), but not perceiver gender. Surprisingly, masculinity was not significantly correlated with the dependent variables. As evidenced in Table 2, leadership perceptions were strongly correlated with judgments of competence ($r = .79$, $p < .05$), and

moderately correlated with judgments of benevolence (r = .58, p < .05), suggesting that being perceived as leader-like makes it likely that the individual is judged as competent.

Having a female boss was significantly correlated with perceiver gender (r = .16, p < .05), indicating that in this sample, the women were more likely to have had experiences with female leaders. However, while prior research has shown having a female boss being related to one's perceptions of female leaders (Foti et al., 2008), in this sample, having a female boss was not significantly correlated with perceptions of judgments of the leader.

Hypothesis Testing

Hypothesis 1a predicted that participants' leadership perceptions would be higher for male leaders than female leaders. An independent samples t-test was conducted to investigate the impact of leader gender on leadership perceptions. Results indicated that there were no differences by leader gender (t(163) = .76, p > .05), such that leadership perceptions did not differ for male (M = 3.72, SD = .88) and female (M = 3.90, SD = .79) leaders. Thus, no support was found for Hypothesis 1a.

Hypothesis 1b and 1c predicted that leader gender would impact leader judgments. Since judgments and competence and benevolence were highly correlated, the two dependent variables were analyzed together using multivariate analyses. To investigate the impact on leader gender on both competence judgments, and benevolence judgments, a *Hotelling* T^2 two group independent analysis was conducted. The multivariate effect of leader gender was significant, *Hotelling* T^2 = 6.85, F (2, 162) = 3.40, p < .05. Follow up univariate t-tests revealed that there were significant differences of leader gender on benevolence judgments (t (1, 163) = -2.56, p < .05) but not competence judgments (t (1, 163) = -1.67, p < .10). As such, judgments of

competence did not differ for male (M = 3.83, SD = .87) and female (M = 4.03, SD = .67) leaders. Thus, no support was found for Hypothesis 1b. Female leaders were judged as more benevolent (M = 4.03, SD = .71) compared to male leaders (M = 3.71, SD = .89). Thus, Hypothesis 1c was supported.

Before testing the hypotheses 2, 3 and 4, a 2-way multivariate analysis of variance (MANOVA) was conducted, with leader and perceiver gender as the independent variables, and the hypothesized attributes (i.e., sensitivity, dynamism, tyranny, and masculinity) as the dependent variables, to test the impact of leader and perceiver gender on the leader prototype attributes. The multivariate interaction effect of leader and perceiver gender was not significant; *Wilks'* λ = .99, F (4, 158) = .13, $p > .05$.

However, the multivariate effect for leader gender was significant, *Wilks'* λ = .18, F (4, 158) = 180.76, $p < .01$. Univariate tests showed that there were significant differences of leader gender tyranny (F (1, 161) = 5.83, $p < .05$), and masculinity (F (1, 161) = 1088.41, $p < .01$). As such, accessibility of tyranny and masculinity were greater for the male leader (M = 4.13, SD = 1.61 & M = 7.41, SD = 1.25 respectively) than for the female leader (M = 3.50, SD = 1.72 & M = 2.25, SD = 1.50 respectively).

The multivariate effect of perceiver gender was also significant, *Wilks'* λ = .90, F (4, 158) = 4.47, $p < .01$. Univariate tests showed that there were significant differences of perceiver gender on tyranny (F (1, 161) = 14.38, $p < .01$) and masculinity (F (1, 161) = 10.35, $p < .05$). Male perceivers (M = 4.32, SD = 1.55) had greater accessibility of the tyranny attribute compared to female perceivers (M = 3.35, SD = 1.69). Similarly, male perceivers (M = 5.13, SD

= 2.89) had greater accessibility of the masculinity attribute compared to female perceivers (*M* = 4.47, *SD* = 2.96).

Hypothesis 2a predicted that the relationship between leader gender and leadership perceptions would be mediated by the sensitivity attribute, such that female leaders would result in greater accessibility sensitivity. The two-way MANOVA reported earlier revealed no effect of leader gender on sensitivity ($F(1,161) = 3.00$, $p > .05$). As a result, no mediation was possible (Hayes, 2013), and no further analyses were conducted. However, the pattern of means was as expected, with greater accessibility of sensitivity for female leaders (*M* = 6.87, *SD* = 1.38) compared to male leaders (*M* = 6.49, *SD* = 1.42). Thus, no support was found for Hypothesis 2a.

Hypothesis 2b predicted that the relationship between leader gender and leadership perceptions would be mediated by leadership prototypes such that male leaders would result in greater accessibility of the attributes of dynamism, masculinity, and tyranny. To test this hypothesis, a multiple simultaneous mediation model was tested using the PROCESS macro Model 4 (Hayes, 2013) and, direct and indirect effects, as well as 95% bias corrected confidence intervals were using a bootstrapped sample of 10000. Since the attribute of dynamism was not correlated with leader gender and leadership perceptions, dynamism was not included in this analysis. Thus, a bootstrap analysis to test the mediation model was conducted with (a) leader gender as the independent variable, (b) Tyranny and Masculinity as the mediating variables, and (c) leadership perceptions as the dependent variable. Results of the mediation are reported in Figure 3. A 95% bias-corrected confidence interval for the total indirect effect (*ab* = -.88) based on 1000 bootstrap samples did not contain zero (-1.50 to -.39) indicating significant mediation. The results provide support for leader gender affecting leadership perceptions through the leader prototype attributes of tyranny and masculinity. As such, the results suggest that leadership

perceptions are influenced through the tyranny and masculinity attributes for male leaders. Thus, partial support was found for Hypothesis 2b.

Hypothesis 3a predicted that the relationship between leader gender and leadership judgments would be mediated by leadership prototypes such that female leaders would result in greater accessibility of the attribute of sensitivity. Since leader gender did not impact sensitivity, no further analyses were conducted and no support was found for Hypothesis 3a.

Hypothesis 3b predicted that the relationship between leader gender and leadership judgments would be mediated by leadership prototypes such that male leaders would result in greater accessibility of the attributes of dynamism, masculinity, and tyranny. This hypothesis was tested using the PROCESS macro Model 4 (Hayes, 2013) in a similar manner to Hypothesis 2b. Since leader gender did not impact the dynamism attribute, dynamism was not included in this analysis. Two mediation analyses were conducted, with a) competence judgments and b) benevolence judgments as the outcome. Results of the mediation for competence judgments are reported in Figure 3. A 95% bias-corrected confidence interval for the total indirect effect (*ab* = -.91) did not contain zero (-1.53 to -.60), indicating significant mediation. Results of the mediation for benevolence judgments are reported in Figure 4. A 95% bias-corrected confidence interval for the total indirect effect (*ab* = -.76) did not contain zero (-1.30 to -.34), indicating significant mediation. Taken together, these results provide support for leader gender impacting leadership judgments through the leader prototype attributes of tyranny and masculinity. As evidenced by the regression coefficients, accessibility of tyranny and masculinity is greater when the leader is male than when the leader is female. Thus, partial support was found for Hypothesis 3b.

Hypothesis 4a predicted an interaction between leader and perceiver gender such that a female leader will result in stronger accessibility of the sensitivity attribute when the perceiver is also female. Since results of the 2-way MANOVA revealed no impact of leader gender or perceiver gender on sensitivity, no further analyses were conducted. Interestingly, while not significantly different, the pattern of means indicated greatest accessibility of sensitivity when both the leader and perceiver were female (M = 6.90, SD = 1.40). However, no support was found for Hypothesis 4a.

Hypothesis 4b predicted an interaction between leader and perceiver gender such that a male leader will result in stronger accessibility of the dynamism, masculinity, and tyranny attributes when the perceiver is also male. Since results of the MANOVA revealed no impact of leader gender or perceiver gender on dynamism, the dynamism attribute was excluded from further analyses. To test this hypothesis, the full conceptual model was tested thrice, with each of the three dependent variables of leadership perceptions, competence judgments, and benevolence judgments. Three moderated mediations with two simultaneous mediators (i.e., tyranny and masculinity) were conducted using model 7 of the PROCESS macro (Hayes, 2013). Results for each of the three analyses are presented in Table 4. The predicted interaction of leader and perceiver gender on tyranny and masculinity was non-significant. While no support was found for hypothesis 4b, testing the full model provided useful insights into the relationship between the variables of interest.

Exploratory Analyses

Bem's (1981) gender schema theory describes how people develop sex roles and the impact these roles have on how people perceive themselves. The sex roles or gender schemas

function as a guide for our judgments and behaviors. In an attempt to get at an underlying conceptual variable that perceiver gender serves as a proxy for, these sex roles were explored as a potential moderator to the leader gender and leader prototype relationship. The BSRI was used to classify individuals based on their scores on the BSRI-M and BSRI-F. Using the methodology outlined by Bem (1977) and Hoffman and Borders (2001), median splits were used to classify individuals. Those scoring low on both the BSRI-M and BSRI-F are classified as *Undifferentiated* while those scoring high on both are classified as *Androgynous*. Individuals scoring high on the BSRI-M but low on the BSRI-F are classified as *Masculine* and individuals scoring high on the BSRI-F and low on the BSRI-M are classified as *Feminine*. For the purposes of the exploratory analyses, only the Masculine (n = 39) and Feminine (n = 41) sex-typed individuals were used resulting in a sample of 80. Correlations of variables of interest with BSRI classification are presented in Table 5. Interestingly, the correlation between leader gender and sensitivity turned significant when the sample contained only masculine and feminine sex-typed individuals.

Similar analyses as those used to test Hypotheses 4 were conducted, with sex-type used as the moderator instead of perceiver gender. Moderated mediation analyses were conducted using PROCESS Model 7 (Hayes, 2013). First, three moderated mediation analyses were conducted, with leadership perceptions, competence judgments, and benevolence judgments, using the BSRI sex-type classification as the moderator and the leader prototype of sensitivity as the mediator. Results are presented in Table 6. It should be noted that the sample size was extremely small for moderated mediation analyses, resulting in low power. While both leader gender and participant sex-type had an impact on the accessibility of sensitivity such that leader gender resulted in high sensitivity scores and feminine sex-type resulted in higher sensitivity

scores, the interaction between leader gender and sex-type was not significant. Results for the conditional indirect effects at both levels of the moderators are presented in Table 6.

The next set of exploratory analyses were similar, with tyranny as the mediator and competence and benevolence judgments as the outcomes. Since participant sex-type was only correlated with tyranny and not dynamism or masculinity, only tyranny was used for these analyses. Results of the two moderated mediation analyses using a bootstrapped sample of 10000 are presented in Table 7. Results indicate that participant sex-type had an impact on the accessibility of the tyranny attribute, such that feminine sex-typed individuals had low scores for tyranny accessibility compared to masculine sex-typed individuals. The interaction between leader gender and individuals sex-type was not significant. Results for the conditional indirect effects at both levels of the moderator are presented in Table 7.

Study 1 Discussion

Contrary to my predictions, leader gender did not have a direct impact leadership perceptions or judgments of competence. Rather, leader gender impacted leadership perceptions and judgments on competence through the leader prototype attributes of tyranny and masculinity. As expected, benevolence judgments were higher for female leaders compared to male leaders. Prior research has found differences in gender and leader stereotypes for managers and students (Duehr & Bono, 2006), where students were more likely to hold gender stereotypes and view women as possessing fewer characteristics of successful managers and leaders. Since this study used a working adult sample, it is possible that they do not evaluate women leaders as severely as prior research using student samples (e.g., Duehr & Bono, 2006). Alternatively, since Bob

and Sue were identified as leaders, it is possible participants' responses were biased by this information.

Greater overlap in gender and leader stereotypes could also explain why leader gender did not impact the accessibility of leader prototype attributes like sensitivity and dynamism. Interestingly, accessibility of both anti-prototype attributes of tyranny and masculinity were impacted by leader gender, such that the accessibility of these attrivutes were higher for male leaders. Moreover, accessibility of these attributes subsequently impact participants' perceptions and judgments of leadership. Furthermore, moderate to high correlations among the leader prototype attributes suggests that varying degrees of attribute accessibility take place for all attributes in the leader prototype.

Perceiver gender did not interact with leader gender to impact accessibility of leader prototypes. While the predicted interaction was non-significant, the conditional indirect effects indicate that mediation through the leader prototype may function differently depending on perceiver gender, thus providing preliminary support for Hogue and Lord's (2007) model. It is possible that the small sample size and lack of power also contributed to the lack of significant findings.

Lastly, while the correlation of leader gender and sensitivity was non-significant in the initial sample, when looking at only those individuals who had a masculine or feminine gender schema, the correlation turns significant. Our gender schemas contain prescriptive norms for judging others' behaviors and have others ought to behave (Kohlberg, 1966). The Bem Sex Role Inventory (Bem, 1981) is widely used to assess individuals' gender schemas and investigate the effects of gender schema on perceptions of others (Johnson et al., 2008). The BSRI classifies

individuals in to one of four sex-types, which include masculine and feminine sex-types. Accordingly, there may be differences in prototype attribute accessibility for masculine and feminine sex-typed individuals. It is possible that out gender schemas are the underlying mechanism that perceiver gender is thought to capture.

Study 2

Hogue and Lord (2007) posited that both *leader* and *perceiver* gender constraint the accessibility of the attributes contained in the leader prototype, thus leading to differences in how male and female leaders are perceived. Study 1 provided some initial support for Hogue and Lord's (2007) integrative model explaining gender bias in leadership. The accessibility of prototype attributes guide our perceptions, and thus may bias our judgments of female leaders. One way to reduce this bias would be to have individuals not rely predominantly on their leader prototypes for their perceptions and judgments of leaders. Accordingly, the goal of study 2 was to investigate an intervention that could reduce the biases in perceptions and judgments of female leaders. This unique intervention is an adaptation of the 'remember-know' paradigm from cognitive science and memory research (Dewhurst & Conway, 1994; Rajaram, 1996; Roediger & McDermott, 1995), and has been used effectively in reducing biases in performance ratings (Martell and collogues, 1993; 1995; 2003).

Since individuals are able to differentiate between recognizing past events or behaviors as something they *specifically remember* or something they just *know*, having individuals use an episodic memory system will increase behavior recognition accuracy and bypass the impact of leader prototypes in their perceptions and judgments of leaders. Having individuals recognize past behavior based on knowing reflects their use of a semantic memory system and reliance on

leader prototypes in recognition of the leader's behavior and judgments about the leader. When individuals are told who the leader is, they are likely to rely on their general impression of the leader when making leadership judgments. In study 2, participants watched four vignettes of a female leader. These vignettes were the same as those used in Study 1 for the female leader (Sue) condition. Prior to watching the vignettes, participants were either primed with Sue as the leader, or given no information about the leader. After watching the vignettes, participants received either a remember or know intervention.

Study 2 Method

Sample

Participants were full time U.S. based working adults recruited through Amazon Mechanical Turk (MTurk). 194 participants completed the survey. Participants were compensated $1.50 for their participation. Participants who did not watch the leader videos or participants who failed attention check questions were not included in any analyses. Accordingly, 28 participants (14.41% of initial sample) were eliminated from further analyses.

This resulted in a final sample of 166 participants. Participants' age ranged from 19 to 71 years (M = 39.30, SD =10.25). 81% of the sample described themselves as White. Participants worked an average of 43 hours per week and worked in a variety of industries ranging from Retail to Education. On average, participants completed the survey in 24.77 minutes.

Design

This study has a 2 (leader prime: no prime or Sue primed as leader) x 2 (metacognition instructions: knowing or remembering) x 2 (behavior type: agentic or communal behaviors) mixed factorial design with behavior type as the within subjects factor. Participants were

randomly assigned to either receive no instructions about the group leader (no prime; n = 87) or to receive instructions indicating that Sue was the leader of the group (Sue primed; n = 79). Participants were also randomly assigned to receive instructions to invoke knowing (n = 75) or remembering metacognitions (n = 91).

Power Analysis

An a priori power analysis was conducted to compute required sample size for a small effect and power of .80. The software G*Power 3.4 (Faul et al., 2009) was used to conduct this analysis. The sample size computed for a repeated measures ANOVA with a within-between interaction revealed a sample of 145 was required for adequate power. Thus, with a final sample of 166, this study was deemed to have adequate power.

Procedure

MTurk participants who signed up for the study were provided with a Qualtrics link to access the survey. Two links were provided – one for female participants and one for male participants in order to ensure balanced groups. In this survey, participants first completed an informed consent (Appendix A). Participants were then randomly assigned to watch to receive instructions priming Sue as a leader or no instructions about the leader. Participants watched the same female leader videos from Study 1. After watching the videos, participants were randomly assigned to receive either knowing or remembering metacognition instructions. Participants then filled out a behavioral recognition measure adapted from Martell and Evans (2005). The measure items described agentic and communal behaviors, with half the items depicting behaviors that occurred in the videos, and the other half depicting behaviors that did not occur. Participants were asked to identify which behaviors that occurred and which did not occur.

Responses on this questionnaire will be used to calculate hit rates (i.e., correctly identifying behaviors that occurred in the video) and false-alarm (i.e., identifying behaviors that did not occur). The above methodology has been used successfully in numerous other studies (e.g., Martell & Borg, 1993; Ryan et al., 1995). Participants then completed a measure of leadership perceptions assessed using the Global Leadership Impression scale (GLI; Lord et al., 1984), following which they complete a measure of leadership judgments (Mayer & Davis, 1999). The order in which items of each measure was presented was randomized. Lastly, participants completed a demographics measure.

Independent Variables

Prime Instructions. Prior to watching the videos, participants were randomly assigned to receive instructions either priming Sue as the leader, or instructions with no prime. Participants in the 'Sue prime' condition were told that Sue was the leader of the group whereas participants in the 'no prime' condition were told they would watch a group of managers meeting, with no mention of a group leader. Participants in both conditions were encouraged to watch the group members' interactions. Instructions provided to participants in either condition are presented in Appendix G.

Behavior Recognition Instructions. After watching the videos, participants were provided with instructions to either elicit event-based information processing (remember judgments) or schema based informational processing (know judgments). These instructions were adapted from Martell and Evans' (2005) instructions to elicit event-based information processing. The differences between remember and know judgments were explained to the participants in both groups. In the remember metacognition group, participants were asked to

respond to the behavioral questionnaire using remember judgments. In the know metacognition group, participants were asked to respond to the behavioral questionnaire using know judgments. Appendix H contains the complete instructions that were provided to participants in either condition.

Dependent Variables

Behavioral Questionnaire. A 24-item questionnaire was administered with 12 items depicting leadership behaviors that Sue manifested in the video scenarios while the other half depicting leadership behaviors that Sue did not perform. For both the present and absent behaviors, 6 items were agentic behaviors and 6 items were communal behaviors. Participants responded to this questionnaire based on the instructions they received (i.e., knowing or remembering metacognition). Participants responded on a six-point scale ranging from 1 'very certain the behavior did not occur' to 6 'very certain the behavior did occur'. Responses to this questionnaire were used to calculate hit-rates (i.e., correctly identifying behaviors that occurred) and false-alarm rate (i.e., incorrectly identifying behaviors as occurred in the video) using methodology previously used by Martell and colleagues (1991; 1993). The behavioral questionnaire can be found in Appendix I.

Leadership Perceptions. Leadership perceptions were assessed using the same measure as Study 1. Similar to Study 1, reliability analyses revealed adequate reliability for the scale (α = .92).

Leader Judgments. Leadership judgments were assessed using the same Mayer and Davis (1999) measure as Study 1. Similar to Study 1, reliability analyses revealed adequate reliability for the competence and benevolence scales (α = .91 & α = .87 respectively).

Control Variables

Demographic data were collected using the same demographics questionnaire that was used in Study 1.

Study 2 Results

Computing Hit-Rates, False-Alarm rates and Behavior Recognition Accuracy

Hit-rates, false-alarm rates and behavior accuracy were calculated for both agentic behaviors and communal behaviors following the methodology used successfully by numerous prior studies (e.g., Martell & Borg, 1993; Ryan et al., 1995). A hit was defined as a 'yes' response to a previously observed behavior (Martell & Borg, 1993). Ratings of 4, 5 or 6 indicating some degree of confidence of items describing behaviors were scored as a hit (Martell & Guzzo; 1991). The hit-rate is defined as the conditional probability of responding 'yes' to a previously observed (actual) behavior (Martell & Borg, 1993). Hit rates were computed using the following formula: Hit rate = P(yes/actual behavior). Two hit-rates were computed – one for agentic behaviors and one for communal behaviors.

Similarly, a false-alarm is defined as a 'yes' response to an unobserved behavior (Martell & Borg, 1993) and ratings of 4, 5 or 6 were scored as a false-alarm (Martell & Guzzo, 1991). The false-alarm rate is defined as the conditional probability of responding 'yes' to an observed (non-occurring) behavior (Martell & Borg, 1993) and were computed using the following formula: False-alarm rate = P(yes/non-occurring behavior). Two false-alarm rates were computed – one for agentic behaviors and one for communal behaviors.

The computed hit-rates and false-alarm rates were then used to calculate behavior accuracy. The hit-rate and false-alarm rate for agentic behaviors was used to calculate the behavior accuracy for agentic behaviors. Likewise, the hit-rate and false-alarm rate for communal behaviors was used to calculate the behavior accuracy for communal behaviors. Behavior accuracy was computed by subtracting the false-alarm rate from the hit-rate. Behavior recognition accuracy ranges from -1.0 indicating totally inaccurate recognition to 1.0 indicating perfect recognition.

Manipulation Check

To investigate whether participants in the no prime condition perceived Sue as the leader, at the end of the survey all participants were asked to indicate which of the four group members they perceived as a leader. An independent samples Chi-square test was conducted to investigate if there were differences in who was perceived as a leader by the prime conditions. Results indicated that there were no significant differences in who the two groups perceived as a leader, χ^2 (3, N = 166) = 7.38, p > .05, such that participants in both groups perceived Sue as the leader.

Descriptive Statistics and Correlations

Table 7 contains the within condition descriptive statistics for the variables of interest in the study. As evidenced in Table 7, overall leadership perceptions and judgments of Sue were higher in the no prime condition compared to the prime condition. Table 8 contains correlations of study variables and potential covariates. Both prime condition and intervention condition were significantly correlated with false-alarm rates for agentic behaviors (r = -.15 and r = -.15 respectively). Similarly, both prime condition and intervention condition were significantly correlated with behavior accuracy for agentic behaviors (r = .19 and r = .16 respectively).

Contrary to expectations, the prime condition and intervention condition were not significantly correlated with hit-rates for agentic and communal behaviors, and false-alarm rates for communal behaviors. While prime condition was significantly correlated with leadership perceptions and judgments of competence and benevolence (r = -.29, r = -.25, & r = -.20 respectively), the directionality was unexpected such that those primed with Sue as a leader perceived her as less leader-like, less competent and less warm than those who weren't primed.

Hypothesis Testing

H5a predicted a three-way interaction such that remembering metacognition would result in high hit-rates for agentic and communal behaviors regardless of the leadership prime, whereas for knowing metacognition, hit-rates would be high when leadership was primed, but hit-rates would be greater for communal than agentic behaviors when leadership was not primed. A repeated measures ANOVA was conducted to test this hypothesis, with the agentic and communal hit-rates as the within subject factors. The three-way interaction was non-significant (F = 1.22, p > .05). Results revealed no significant two-way interactions or main effects, indicating that hit-rates did not differ by prime condition, intervention type and behavior type. In the no prime condition, mean hit-rates for agentic and communal behaviors for the knowing condition were .73 (SD = .22) and .77 (SD = .21) respectively whereas mean hit-rates for agentic and communal behaviors for the remembering condition were .77 (SD = .16) and .79 (SD = .18) respectively. In the prime condition, mean hit-rates for agentic and communal behaviors for the knowing condition were .79 (SD = .14) and .78 (SD = .20) respectively whereas mean hit-rates for agentic and communal behaviors for the remembering condition were .77 (SD = .20) and .80 (SD = .18) respectively. Thus, Hypothesis 5a was not supported.

H5b predicted a three-way interaction such that remembering metacognition would result in low false-alarm rates for agentic and communal behaviors regardless of the leadership prime, whereas for knowing metacognition, false-alarm would be high when leadership was primed, but false-alarm would be greater for communal than agentic behaviors when leadership was not primed. In the no prime condition, mean false-alarm rates for agentic and communal behaviors for the knowing condition were .60 (*SD* = .24) and .56 (*SD* = .25) respectively whereas mean false-alarm rates for agentic and communal behaviors for the remembering condition were .50 (*SD* = .24) and .53 (*SD* = .26) respectively. In the prime condition, mean false-alarm rates for agentic and communal behaviors for the knowing condition were .50 (*SD* = .24) and .44 (*SD* = .25) respectively whereas mean false-alarm rates for agentic and communal behaviors for the remembering condition were .46 (*SD* = .25) and .51 (*SD* = .30) respectively. A repeated measures ANOVA was conducted to test this hypothesis, with the agentic and communal behaviors as the within subject factors. The three-way interaction was non-significant (F (1,162) = .10, $p > .05$). The two-way interaction between behavior type and intervention type was significant, $F(1,162) = 5.92$, $p < .05$ (see Figure 6), with the pattern of means revealing that as predicted, false-alarm rates were higher for agentic behaviors in the knowing condition (*M* = .55) compared to remembering condition (*M* = .48). However, contrary to the predictions, false-alarm rates for communal behaviors were higher in the remembering condition (*M* = .52) compared to the knowing condition (*M* = .50). No other interactions were significant. To further probe this interaction, simple effects analysis was conducted by comparing within-subject means for behavior type at each level of the intervention type. For the know intervention, a paired samples t-test indicated that the difference in false alarm rates for agentic (*M* = .55) and communal behaviors (*M* = .51) was not significant; $t(74) = 1.75$, $p = .08$. For the remember

intervention, a paired samples t-test indicated that the difference in false alarm rates for agentic (M = .48) and communal behaviors (M = .52) was not significant; $t(90) = -1.72$, $p = .09$. Thus, while the interaction was significant, the simple effects were not significant.

H6a predicted that both agentic and communal behavior accuracy would impact perceptions of the leader. Since behavior accuracy for agentic behaviors was not significantly correlated with leadership perceptions (r =-.04, $p > .05$), this hypothesis was tested using only the behavior accuracy for communal behaviors. A regression analyses was conducted using leadership perceptions as the criterion and behavior accuracy for communal behaviors as the predictor. The results indicated that communal behavior accuracy was a significant predictor of leadership perceptions (R^2 = .03, F (1,164) = 5.41, p <.05), such that every unit increase in communal behavior accuracy resulted in a decrease in leadership perceptions by -.49 units. Thus, hypothesis 6a was partially supported.

H6b and 6c predicted that both agentic and communal behavior accuracy would impact judgments of the leader's competence and benevolence respectively. A two-way MANOVA was conducted to test the impact of agentic and communal behavior accuracy on competence and benevolence judgments. The multivariate interaction effect of agentic and communal behavior accuracy was not significant; *Wilks'* λ = .54, F (80, 190) = .87, $p > .05$. Moreover, neither the multivariate effect of agentic behavior accuracy, *Wilks'* λ = .81, F (26, 190) = .81, $p > .05$, nor the multivariate effect of communal behavior accuracy was significant *Wilks'* λ = .79, F (32, 190) = .73, $p > .05$. Additional analyses were conducted testing the two dependent variables separately.

To test H6b, a regression analyses was conducted using judgments of competence as the criterion and behavior accuracy for agentic and communal behaviors as the predictors. The overall model was significant; R^2 = .05, F = 4.66, p < .05. The results indicated that communal behavior accuracy was a significant predictor of competence judgments (t = -.21, p <.01), such that every unit increase in communal behavior accuracy resulted in a decrease in competence judgments by -.51 units. Agentic behavior accuracy was not a significant predictor of competence judgments (t = -.54, p > .05). Thus, hypothesis 6b was partially supported.

H6c predicted that behavior accuracy would impact judgments of the leader's benevolence. A regression analyses was conducted using judgments of competence as the criterion and behavior accuracy for agentic and communal behaviors as the predictors. The overall regression model was significant (R^2 = .08, F(2,163) = 7.01, p <.01), such that while communal behavior accuracy was a significant predictor (β = -.59, p < .01), agentic behavior accuracy was not a significant predictor (β = -.21, p > .05) of judgments of benevolence. As such, every unit increase in communal behavior accuracy resulted in a decrease in benevolence judgments by -.59 units. Thus, hypothesis 6c was partially supported.

Study 2 Discussion

Contrary to my predictions, both hit rates for agentic behaviors and hit rates for communal behaviors were not related to the prime manipulation or the intervention, suggesting that the intervention did not aid in helping participants correctly recognize the behaviors they watched in the videos. False alarm rates for agentic behaviors were lower in the prime condition and were lower for those receiving the remember intervention. False alarm rates for communal behaviors were not related to either manipulated condition. As such, the results indicate that the

remember intervention served to reduce the false-alarm rates, such that participants receiving instruction to respond based on remembering were able to identify agentic behaviors the leader did not exhibit. However, this did not seem to be the case for communal behaviors, and it is possible that consistency of the communal behaviors with the leader's gender led to a larger number of false memories.

The significant two-way disordinal interaction between behavior type and intervention conditions was partially in line with prior predictions. While false-alarm rates for agentic behaviors were indeed lower in the remember condition than the know condition, the pattern of means for the communal behaviors was unexpected. False alarm rates for communal behaviors were higher in the remember condition than in the know condition. It is possible that individuals responding in the know condition were responding based on their impression of Sue as a leader, and thus, discounted the communal behaviors.

Surprisingly, higher behavior accuracy for communal behaviors resulted in a decrease in leadership perceptions and judgments. These results indicate that the behavior recognition accuracy of communal behaviors drives participants' perceptions and judgments of Sue. It is likely that higher accuracy for communal behaviors makes Sue seem at odds with a leader role, thus results in a backlash effect when evaluating Sue. It is possible that being able to accurately recognize behaviors that did occur and behaviors that did not occur leads to a comparative effect, in turn making participants' more strict in their evaluation of the leader, especially in their judgments of benevolence.

Lastly, the leadership prime did not impact participants' behavior recognition. Research shows that leaders are evaluated as "effective" or "good" based on the extent to which their

behaviors *match* the attributes in one's leader prototype. It is possible, that when participants were not given information about how effective the leader was, they relied on their gender expectations instead of leader prototypes, when recognizing past leader behavior.

General Discussion

The purpose of the current set of studies was to investigate a) the impact of contextual and person factors, i.e., leader gender and perceiver gender on leader prototype accessibility and b) an intervention to reduce biases in rating of female leaders by increasing past behavior recognition accuracy. In Study 1, leader gender was manipulated and perceiver gender was measured with the aim of discerning their impact on the leader prototype attributes of sensitivity, dynamism, tyranny and masculinity. In particular, Study 1 aimed at empirically demonstrating the impact of leader and perceiver gender on leader prototype accessibility and the subsequent impact on perceptions and judgments of leadership. Moreover, this research provided the first empirical test of Hogue and Lord's (2007) proposed connectionist model of gender bias in leadership. In Study 2, a remember-know behavior recognition intervention was used to reduce biases in perceptions and judgments of female leaders. To the best of my knowledge, this study is the first to use remember and know judgments as two separate conditions.

Study 1 found no interaction between leader and perceiver gender. Research has consistently found mixed results as to the impact of perceiver gender on evaluations of female leaders. More recently, using a sample from the finance industry, Vial, Brescoll, Napier, and Dovidio (2017) found that respondent gender moderated the relation between supervisor gender and admiration. While Manzi and Heilman (2017) found no effect for perceiver gender on leader ratings, they found that masculinity of the industry or job type was important to perceptions of

women's competence. Accordingly, type of industry could be an important contextual factor that impacts the accessibility of leader prototype attributes. Industry type may interact with both leader and perceiver gender to impact leader prototype accessibility. For instance, certain industries (e.g., nursing) may interact with leader and perceiver gender and result in stronger accessibility of the sensitivity attribute.

Johnson, Sitzmann, and Nguyen (2014) assert that it is not women demonstrating agentic traits that impact perceptions of them as leader; rather, it is demonstration of countercommunal traits that leaders women to be perceived negatively. Countercommunal traits include traits such as abrasive, selfish, untrustworthy, and deceitful (Heilman et al., 2004) and are thought to be a direct violation of the woman gender role (Heilman & Okimoto, 2007). Moreover, countercommunal traits are not the same as agentic traits, and only have a weak positive correlation with agentic traits (r = .12; Johnson et al., 2014; Helmreich, Spence, & Wilhelm, 1981). The countercommunal traits described by Heilman and colleagues (2004; 2007) seem to overlap with tyranny items in Epitropaki and Martin's (2004) measure of leader prototypes. Perhaps then, the accessibility of the tyranny attribute may function differently than the accessibility of the masculinity attribute. Of the outcome measures, tyranny had the largest negative effect on benevolence judgments, further supporting tyranny as a countercommunal trait that has a negative impact on leadership judgments due to gender role violation.

Relatedly, Study 2 revealed that priming Sue as the leader was related to Sue being perceived negatively, and judged as less competent and benevolent than when Sue was not primed as a leader. It is possible that in Study 2, when Sue was primed as a leader, she was perceived to demonstrate countercommunal traits, which would explain the negative evaluations of Sue in the prime condition. The agentic leadership behaviors from Hanges et al.'s coding

scheme include behaviors that illustrate the following: 'Decides what shall be done and how it shall be done', 'Acts without consulting others' and 'Pressuring others to perform'. Such behaviors seem more in line with the countercommunal traits from Heilman et al.'s research.

Alternatively, research by Rudman and colleagues (2001; 2011) shows that women often face backlash when they demonstrate agency such that they may be perceived as capable but not communal enough. However, in Study 2, accurately recognizing communal behaviors predicted lower ratings of leadership perceptions and judgments. High behavior recognition accuracy for communal behavior probably had a reverse impact, where Sue may have been perceived as communal, but lacking the necessary agentic traits to be a leader.

Limitations

As with any online survey, the lack of a controlled environment is a major limitation of the study. The generaliziblity of an MTurk sample is beneficial compared to using a student sample as participants from MTurk have been found to be socioeconomically and ethnically diverse (Casler, Bickel, & Hackett, 2013). While participants through MTurk are found to be more attentive to instructions and perform better on attention check questions than traditional college student subject pools (Hauser & Schwarz, 2016), there was no way to ensure participants paid attention to the videos they were watching. The survey was interspersed with attention check questions, and participants failing any attention check questions were removed from the dataset. Moreover, participants who completed the survey in less time than it should take to watch the videos and respond to the questions were eliminated from the survey. I believe these steps somewhat mitigated the lack of control arising from using MTurk.

The intervention instructions for the remember condition were adapted from Martell and Evans (2005). Their instructions were longer than those used in this study, resulting in a longer time lag between the participants watching the video and responding to the behavior recognition questionnaire. In Study 2, the shorter instructions resulted in a shorter time lag, which could have impacted participant's responses to the behavior recognition questionnaire. Moreover, the instructions for the know condition were created based on the remember condition as prior research has not used a separate such intervention. Cognitive psychology research typically asks participants to state whether they recognize a word based on remember or know (Eldridge, Sarfatti, & Knowlton, 2002; McCabe & Geraci, 2009); remember and know are not treated as two separate interventions. Other research has used remember instructions with a control condition but not a know condition (Martell and colleagues, 2005; 1993). It is possible that the know instructions did not work as intended and additional pilot work is need to ensure the know instructions function well. Lastly, the instructions used in Study 2 contained fewer examples compared to instructions from Martell and Evans (2005). As such, the intervention instructions are a limitation that needs further development which future research should revisit.

Future Research

Study 1 measured accessibility (i.e., 'activation' from Lord et al.'s (2001) model) of leader prototypes via participants' response on an explicit survey measure of leader prototypes. When this survey is typically used to capture individuals' leader prototypes (e.g., Sy et al., 2010), such explicit types of measurement allow participants to think about their responses, and thus, also capture an individual's conscious thought process (Uhlmann et al., 2012). Since the accessibility of leader prototypes is dynamic, future research should investigate prototype accessibility using a more direct, dynamic approach. For instance, Scott and Brown (2006) used

a modified lexical decision making task to investigate encoding of leader attributes. Faster reaction times on the task indicated stronger encoding of the given trait. Boyd et al. (2016) used an implicit association test to investigate the impact of follower behavior and leader affect on leader prototype accessibility. Similar dynamic methodologies should be employed to capture reaction time to leader prototype traits, where quicker response times indicate greater accessibility of a given trait.

In addition to employing dynamic methodologies to capture accessibility of prototype attributes in real-time, future research should also investigate the use of dynamic stimuli. In the present set of studies, the perceivers watched stimuli vignettes of the leader interacting with other individuals, however, the perceivers themselves did not engage with the leader. However, if the stimuli were dynamic, such that the perceiver could interact with the leader, the perceiver may have different activation goals, resulting in differential accessibility in leader prototype attributes. For instance, if an individual's goal is to form an impression of the leader, the accessibility of traits in the leader prototype may be different than when the individuals had some other interactional goal. Moreover, a dynamic interaction with the leader may also impact behavior recognition of the leader's behaviors. Indeed, previous research has shown that observational goal impacts the type of memory system used in recognizing behaviors, as well as behavior recognition accuracy (Foti & Lord, 1987). Hoyt and colleagues (2007) have used virtual reality headsets to immerse participants in a virtual environment where they interact with followers. Use of such technology to create dynamic stimuli is necessary to gain a better understanding of how leader prototype attributes are accessed in real-time.

Future research may also look at industry type as a contextual factor impacting accessibility of leader prototypes. The extent to which an industry or job type is perceived as

masculine may impact how competent women are viewed. It is possible that the accessibility of attributes in the leader prototype may differ for a traditionally masculine industry such as finance and a traditionally feminine industry such as nursing. The industry in the current studies was non-specific; however, future research can develop vignettes using varying industries.

The exploratory analyses demonstrated that gender schema is a perceiver characteristic that may impact the accessibility of leader prototype attributes. Future research should investigate the impact the four sex-types (masculine, feminine, undifferentiated, and androgynous) have on the accessibility of attributes contained in the leader prototype. Such research could potentially resolve the conflicting findings regarding perceiver gender (e.g., Vial et al., 2017, Mazni & Heilman, 2017).

Having individuals respond to behavior recognition may capture participants' confidence rather than whether they are actually responding based on remembering or knowing (Migo, Mayes, & Montaldi, 2012). Future research should consider employing sophisticated cognitive methodologies to accurately determine a *remember* or *know* response. For instance, studies using event related potentials (ERPs) have shown that remember and know responses show different patterns of activation across the scalp (e.g., Curran, 2004; Duzel, Yonelinas, Mangun, Heinze, & Tulving, 1997). Migo et al. (2012) report that ERP correlates of know responses occur earlier than ERP correlates for remember responses, at 300-500ms in the mid-frontal region of the brain and at 500-800ms across parietal regions of the brain respectively. In a controlled laboratory setting, future research should investigate whether the intervention works as intended and that participants' response are in fact based on remembering or knowing.

There was very little delay between the intervention and participant responses in Study 2. Future research should investigate the effectiveness of the intervention by varying the time lag between intervention instructions and participant responses to determine an adequate amount of time lag. Lastly, to determine if the intervention reduces the gap in judgments of male and female leaders, the intervention should be carried out for both male and female leaders, with a comparison of whether participants judgments of male and female leaders are similar in a remember versus know condition.

Conclusion

This dissertation is the first study to empirically test Hogue and Lord's (2007) connectionist model of gender bias in leadership. The results provide preliminary evidence for leader and perceiver characteristics, specifically gender of the leader and perceiver, constraining the accessibility of leader prototypes, and subsequently impacting our perceptions and judgments of leaders. While the memory intervention did not succeed in reducing the reliance of leader prototypes in the evaluation of female leaders, results from the first study provide support for the importance of investigating interventions that bypass our reliance on leader prototypes in evaluative situations.

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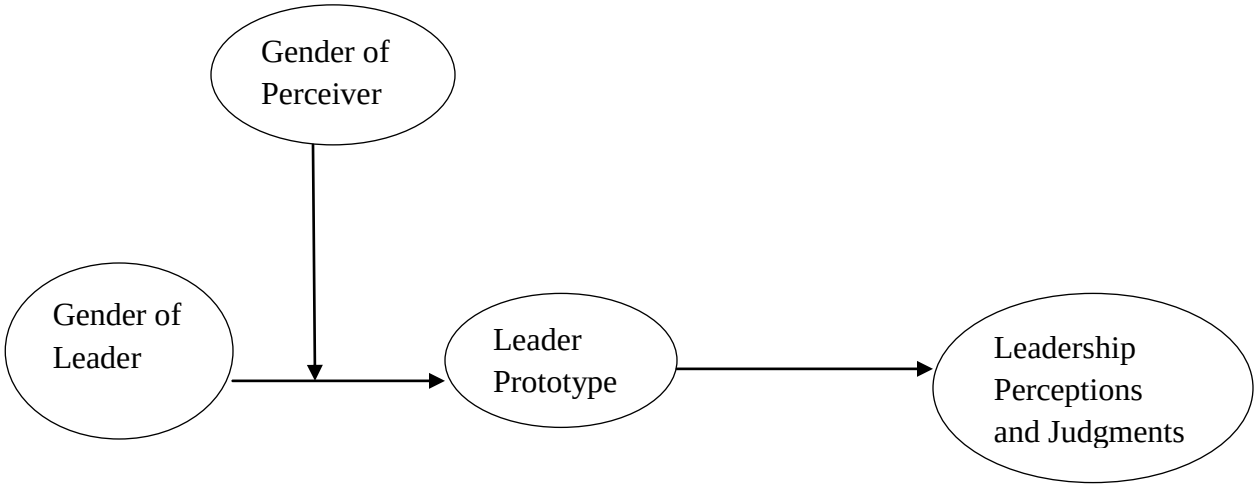

Figure1. Conceptual model for Study 1.

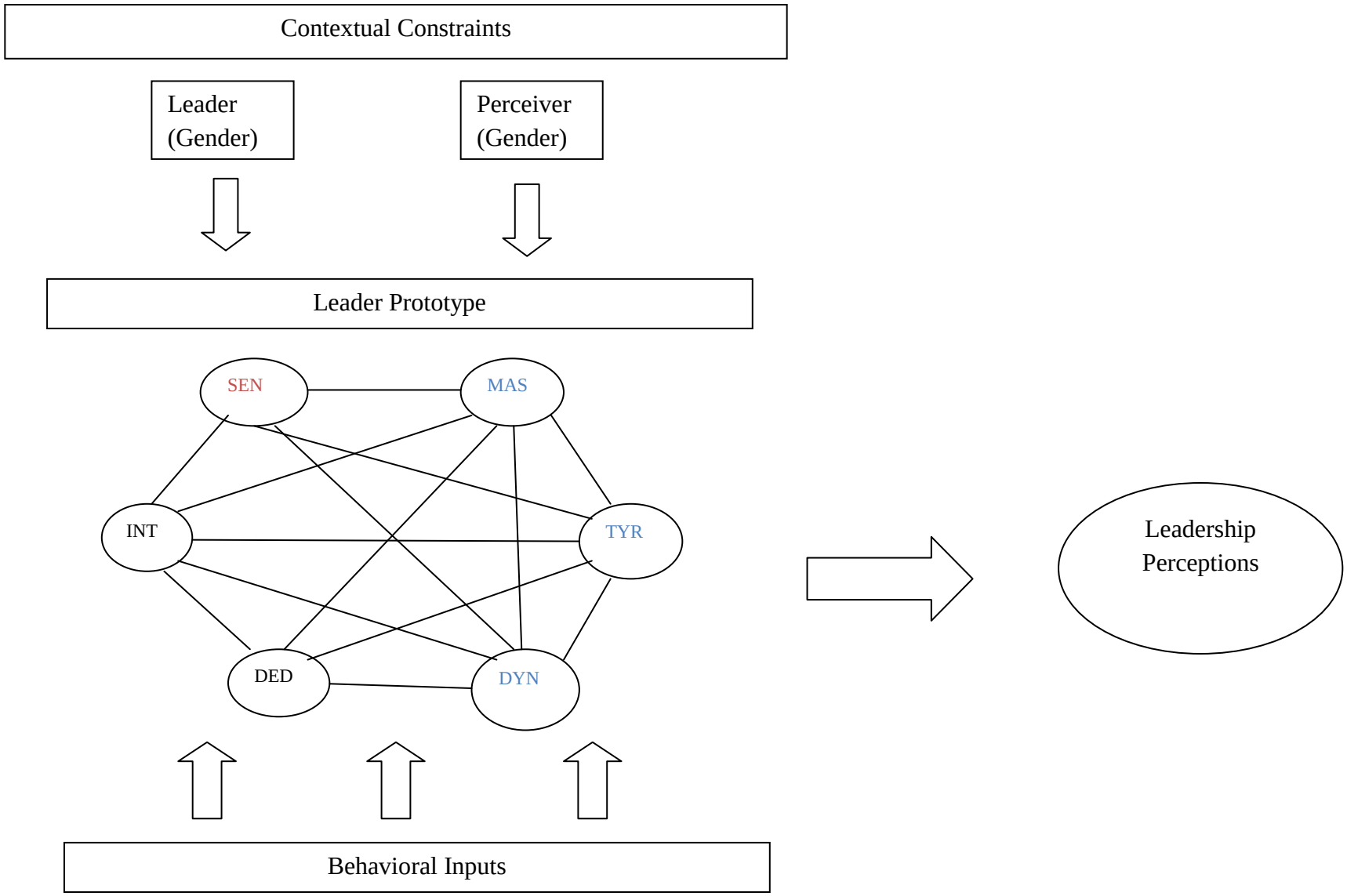

Figure 2. Connectionist model of leadership reflecting impact of contextual constraints on leader prototype accessibility and leadership perceptions. Different colors in leader prototype reflect different patterns of trait activation. This figure is based on models by Hogue and Lord (2007) and Sy et al. (2010). Leader prototype attributes: SEN = Sensitivity, MAS = Masculinity, TYR = Tyranny, DYN = Dynamism, DED = Dedication, INT = Intelligence.

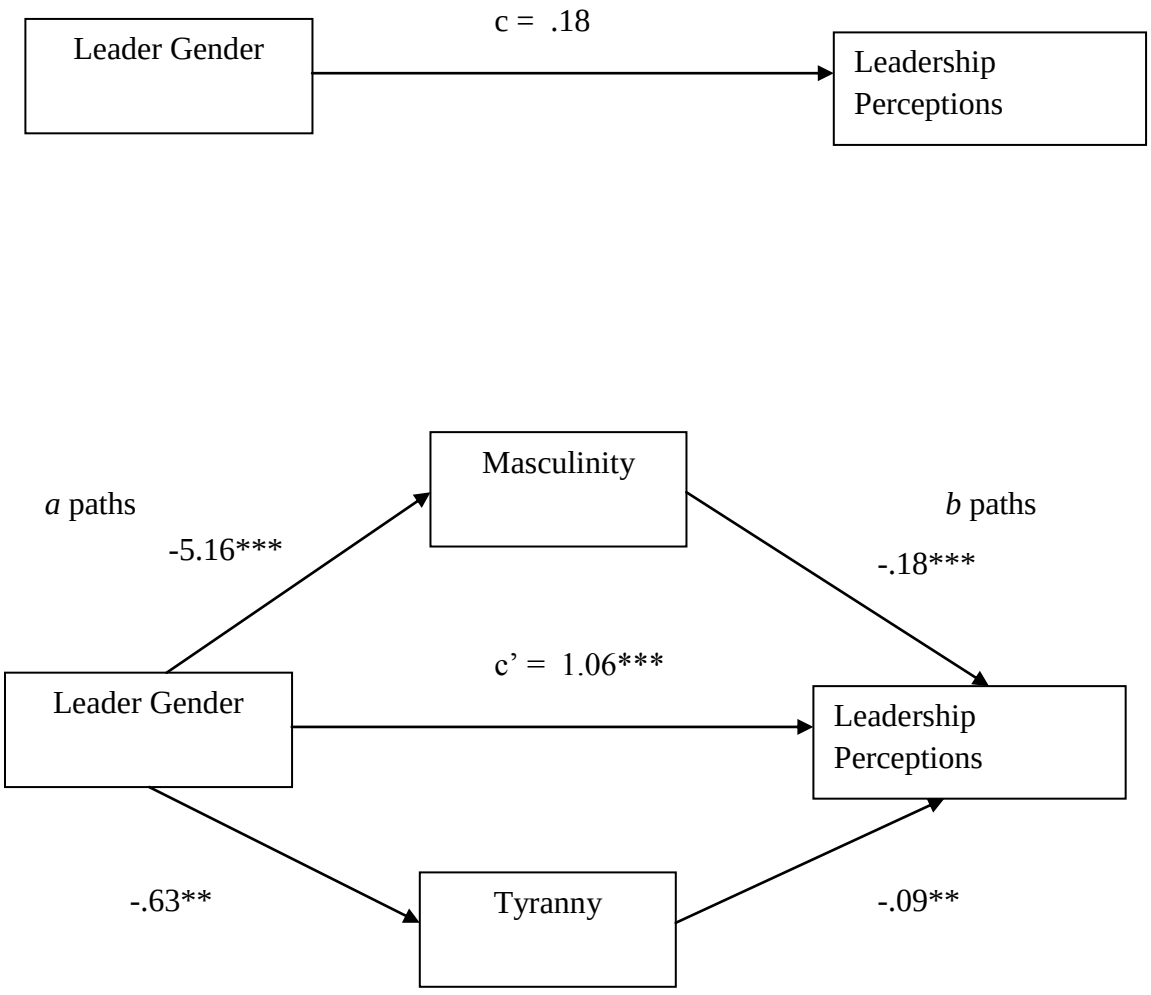

Figure 3. Masculinity and tyranny as mediators of the leader gender and leadership perceptions relationship. The numbers represent regression coefficients derived from a bootstrap procedure of 10000 from PROCESS Model 4 by Hayes (2013). Leader gender was coded as 0 = male, 1 = female. Negative and positive estimates indicate activation for males and female leaders respectively. The 'a' paths represents the relationship between the predictor variable and the mediator variables, the 'b' paths represents the relationship between the mediator variables and the outcome variable, the 'c' path represents the total effect, and the 'c prime' path represents the direct effect. ** $p < .05$. ***$p < .01$.

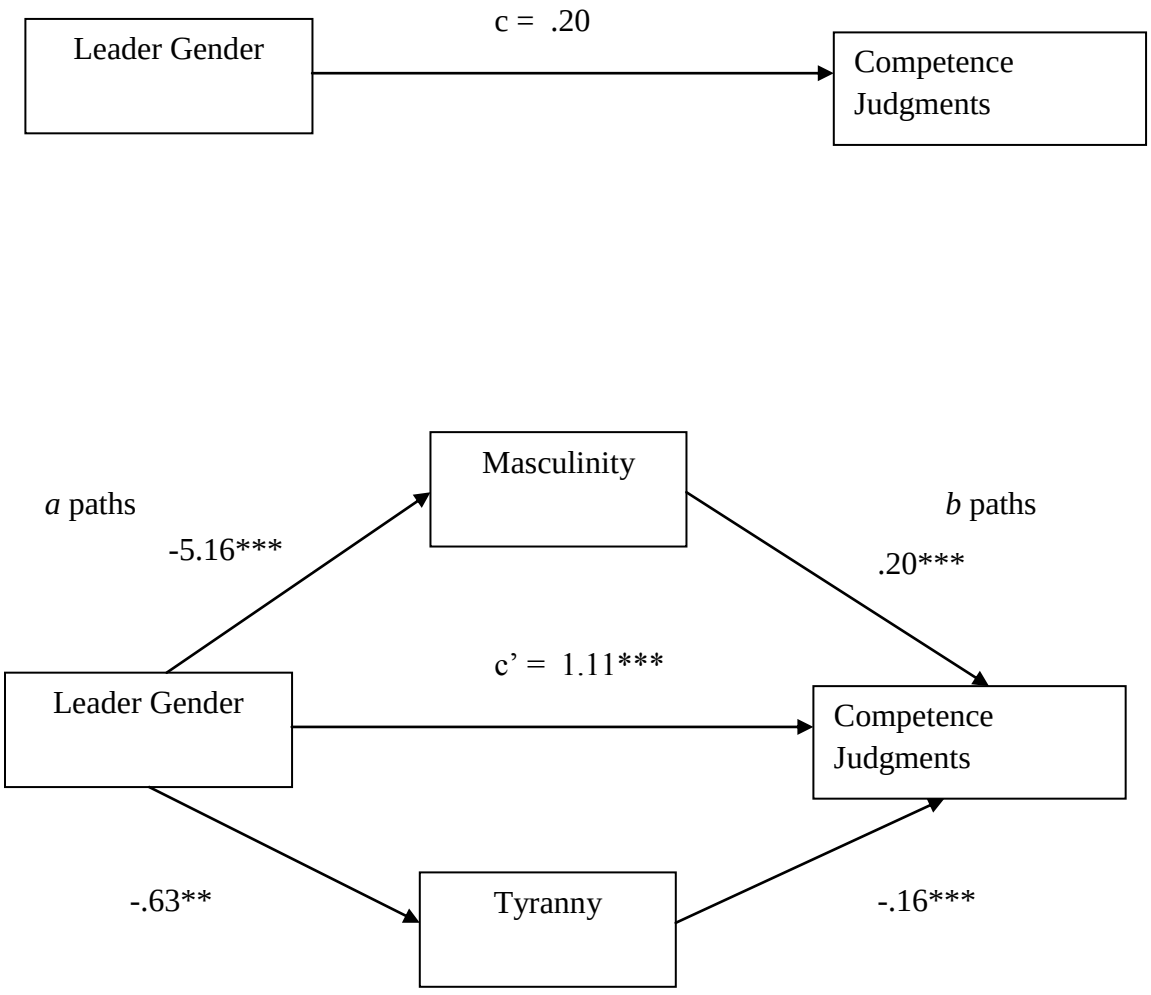

Figure 4. Masculinity and tyranny as mediators of the leader gender and competence judgments relationship. The numbers represent regression coefficients derived from a bootstrap procedure of 10000 from PROCESS Model 4 by Hayes (2013). Leader gender was coded as 0 = male, 1 = female. Negative and positive estimates indicate activation for males and female leaders respectively. The 'a' paths represents the relationship between the predictor variable and the mediator variables, the 'b' paths represents the relationship between the mediator variables and the outcome variable, the 'c' path represents the total effect, and the 'c prime' path represents the direct effect. ** $p < .05$. ***$p < .01$.

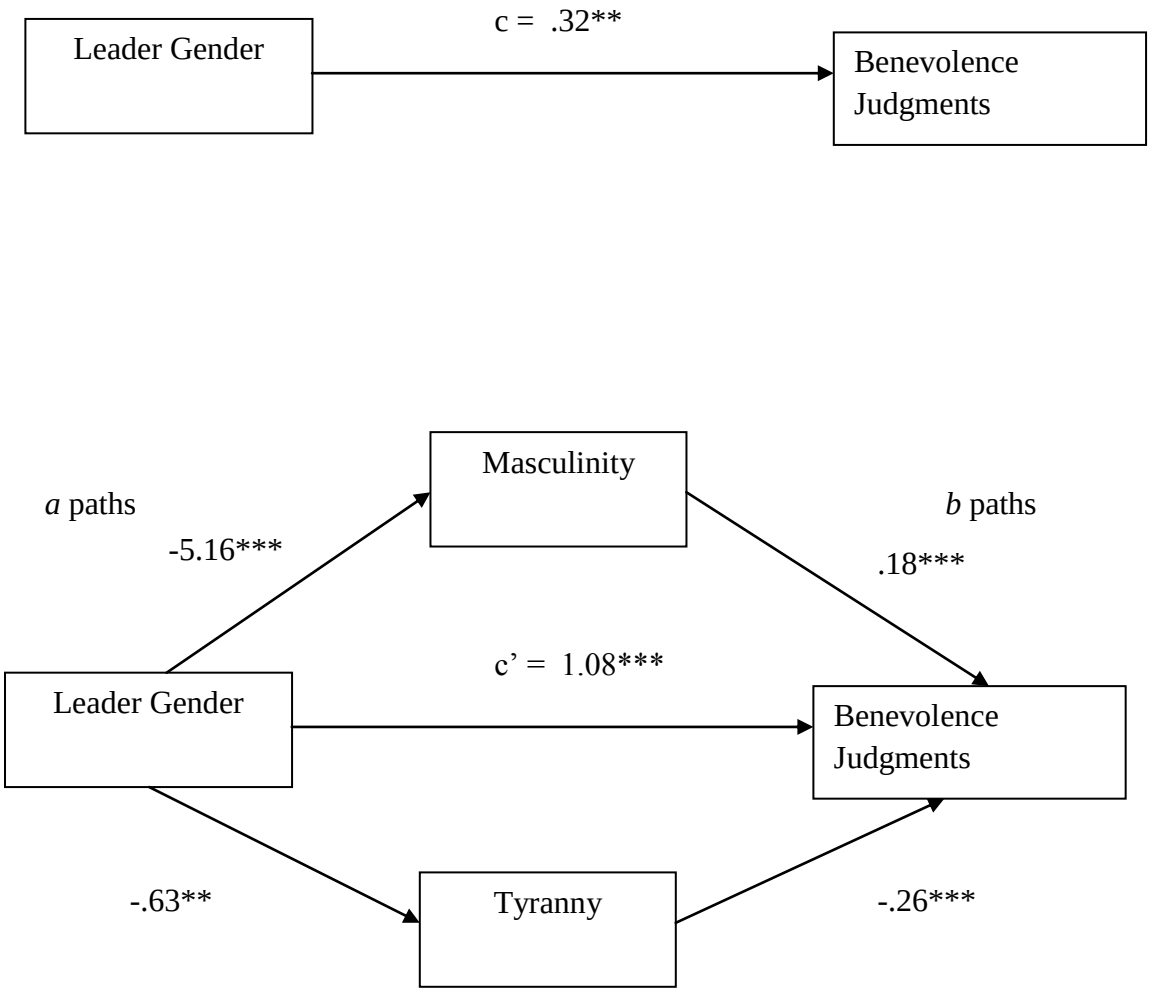

Figure 5. Masculinity and tyranny as mediators of the leader gender and benevolence judgments relationship. The numbers represent regression coefficients derived from a bootstrap procedure of 10000 from PROCESS Model 4 by Hayes (2013). Leader gender was coded as 0 = male, 1 = female. Negative and positive estimates indicate activation for males and female leaders respectively. The 'a' paths represents the relationship between the predictor variable and the mediator variables, the 'b' paths represents the relationship between the mediator variables and the outcome variable, the 'c' path represents the total effect, and the 'c prime' path represents the direct effect. ** $p < .05$. ***$p < .01$.

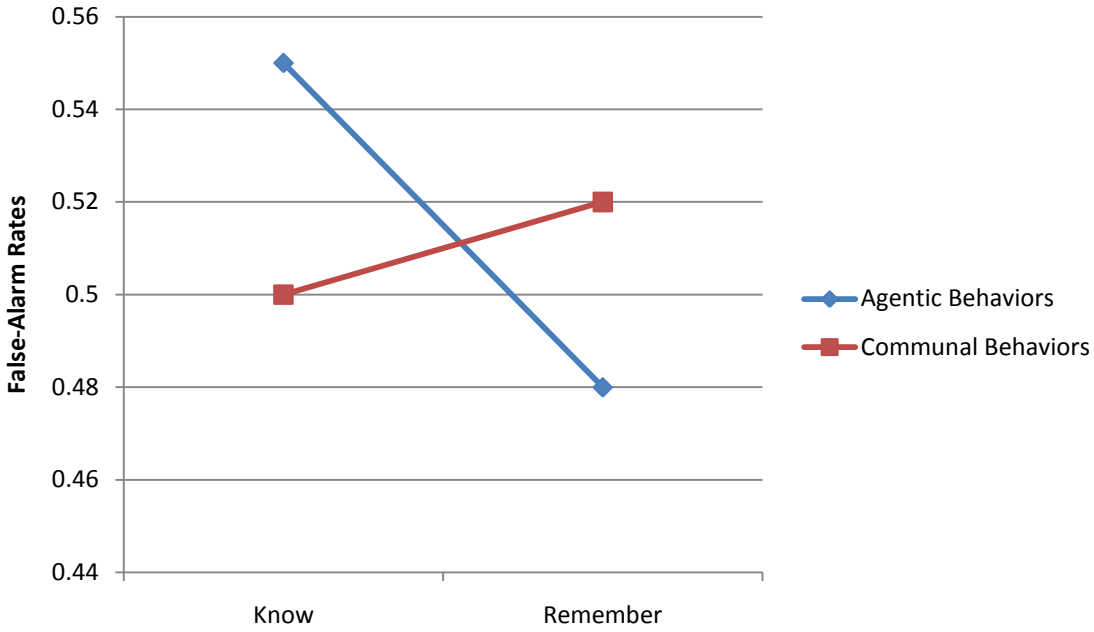

Figure 6. Disordinal interaction between intervention type and behavior type for false-alarm rates.

Table 1. *Within Condition Descriptive Statistics for Study 1.*

		Male Perceivers		Female Perceivers	
Leader Gender	Variable	Mean	SD	Mean	SD
Male	Sensitivity	6.33	1.45	6.66	1.39
	Intelligence	6.68	1.22	6.89	1.25
	Dedication	6.69	1.53	6.94	1.52
	Dynamism	5.83	1.43	5.94	1.54
	Tyranny	4.63	1.58	3.65	1.50
	Masculinity	7.61	1.03	7.23	1.42
	Leadership Perceptions	3.69	.86	3.75	.90
	Competence Judgments	3.80	.92	3.87	.81
	Benevolence Judgments	3.67	.95	3.75	.84
Female	Sensitivity	6.84	1.38	6.90	1.40
	Intelligence	6.81	1.14	7.07	1.22
	Dedication	7.26	1.14	7.41	1.34
	Dynamism	6.32	1.26	6.22	1.74
	Tyranny	4.00	1.48	3.07	1.82
	Masculinity	2.58	1.68	1.97	1.28
	Leadership Perceptions	4.04	.63	3.78	.89
	Competence Judgments	4.06	.61	4.01	.73
	Benevolence Judgments	3.91	.75	4.13	.66

Table 2. *Study 1 Intercorrelations between Variables of Interest across Conditions.*

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. Leader Gender	-	.03	.14	.07	.19*	.13	-.19*	-.88**	.11	.13	.20*	.11	-.07	-.06
2. Perceiver Gender		-	.07	.10	.08	.004	-.29**	-.11	-.06	.01	.1	-.16*	-.12	.27**
3. Sensitivity			(.83)	.74**	.78**	.67**	-.43**	-.04	.64**	.74**	.75**	.08	.04	.31**
4. Intelligence				(.86)	.77**	.77**	-.15	.03	.63**	.69**	.53**	.02	.10	.28**
5. Dedication					(.90)	.75**	-.28**	-.07	.67**	.78**	.66**	-.02	.00	.24**
6. Dynamism						(.82)	.02	.06	.68**	.68**	.50**	-.01	.12	.31**
7. Tyranny							(.90)	.30**	-.10	-.27**	-.46**	-.09	.14	-.21**
8. Masculinity								(.85)	.02	.001	-.10	-.04	.11	.10
9. Leadership Perceptions									(.93)	.78**	.58**	-.02	.03	.20**
10. Judgments of Competence										(.93)	.79**	-.05	-.06	.26**
11. Judgments of Benevolence											(.92)	.01	-.06	.28**
12. Female Boss												-	-.10	.08
13. BSRI-M													(.88)	-.02
14. BSRI-F														(.93)

Note: * p < .05, ** p< .01. Leader gender was coded as male = 0, female = 1. Perceiver gender was coded as male = 0, female = 1. Reliability coefficients are contained on the off-diagonal. Point-biserial correlations are reported for correlations with dichotomous variables. Pearson correlations are reported for correlations of continuous variables.

Table 3. *Study 1 Intercorrelations between Variables of Interest within Leader Gender Condition.*

	1	2	3	4	5	6	7	8	9	10	11
1. Perceiver Gender	-	.02	.11	.06	-.03	-.27*	-.20	-.17	-.04	.16	-.26*
2. Sensitivity	.12	-	.72**	.77**	.61**	-.39**	-.01	.58**	.71**	.65**	.04
3. Intelligence	.09	.75**	-	.74**	.73**	-.13	-.02	.60**	.62**	.38**	-.03
4. Dedication	.08	.78**	.80**	-	.73**	-.27*	-.07	.65**	.70**	.52**	-.09
5. Dynamism	.04	.72**	.81**	.76**	-	.06	.17	.73**	.69**	.36**	-.08
6. Tyranny	-.31**	-.45**	-.15	-.24*	.02	-	.40**	-.06	-.21	-.42**	-.04
7. Masculinity	-.16	.41**	.47**	.50**	.61**	.16	-	.08	.01	-.10	.08
8. Leadership Perceptions	.04	.70**	.65**	.68**	.63**	-.11	.44**	-	.72**	.42**	-.09
9. Judgments of Competence	.04	.76**	.75**	.82**	.67**	-.29**	.47**	.82**	-	.70**	-.19
10. Judgments of Benevolence	.05	.82**	.65**	.73**	.60**	-.48**	.40**	.69**	.84**	-	-.14
11. Female Boss	-.05	.11	.06	.01	.07	-.13	.18	.02	.07	.11	-

Note: * p < .05, ** p< .01. Perceiver gender was coded as male = 0, female = 1.
Correlations above the off-diagonal are for the female leader condition.
Correlations below the off-diagonal are for the male leader condition.
Reliability coefficients are contained on the off-diagonal.
Point-biserial correlations are reported for correlations with dichotomous variables.
Pearson correlations are reported for correlations of continuous variables.

Table 4. *Results from the Moderated Mediation Analyses with Tyranny and Masculinity as Mediators.*

DV	a11	a21	a31	a12	a22	a32	b1	b2	c'	W	Conditional Indirect Effect through Tyranny	95% Bias Corrected CI	Conditional Indirect Effect through Masculinity	95% Bias Corrected CI
Leadership Perceptions	-.69	-.98**	.06	-4.82**	-.39	-.22	-.09*	.18**	1.06**	Male	.05	.00, .17	-.91	-1.56, -.39
										Female	.05	.00, .17	-.95	-1.58, -.40
Competence Judgments	-.69	-.98**	.06	-4.82**	-.39	-.22	-.16**	.20**	1.11**	Male	.10	.00, .24	-.99	-1.63, -.49
										Female	.09	-.01, .25	-1.03	-1.68, -.52
Benevolence Judgments	-.69	-.98**	.06	-4.82**	-.39	-.22	-.26**	.18**	1.08**	Male	.16	.00, .36	-.90	-1.44, -.47
										Female	.15	-.03, .36	-.94	-1.47, -.48

Note. *p < .05, **p < .01. IV – Leader Gender . W – Perceiver Gender

a11- Effect of IV on M1 (Tyranny). a12- Effect of IV on M2 (Masculinity).

a21 – Effect of W on M1. a22 – Effect of W on M2.

a31 - Effect of interaction between IV and W on M1. a32 - Effect of interaction between IV and W on M2.

b1- Effect of M1 on DV. B2- Effect of M1 on DV.

c' - Direct effect of IV on DV.

CI - Lower and upper 95% bias corrected confidence interval for indirect effect from 10000 bootstrap samples.

Table 5. *Study 1 Intercorrelations with BSRI classification*.

	1	2	3	4	5	6	7	8	9	10
1. Leader Gender	-	.36**	.26*	-.28*	-.86**	.30**	.31**	.36**	.000	-.12
2. Sensitivity		-	.67**	-.47**	-.11	.67**	.76**	.80**	.15	.23*
3. Dynamism			-	-.06	.01	.70**	.69**	.56**	.14	.20
4. Tyranny				-	.33**	-.20	-.32**	-.46**	-.30**	-.19
5. Masculinity					-	-.05	-.08	-.18	-.09	.14
6. Leadership Perceptions						-	.84**	.74**	.06	.14
7. Judgments of Competence							-	.86**	.20	.20
8. Judgments of Benevolence								-	.15	.24*
9. Perceiver Gender									-	.33**
10. BSRI Classification										-

Note: * p < .05, ** p< .01. Leader gender was coded as male = 0, female = 1. BSRI gender schema was classified as masculine = 0, feminine = 1. Point-biserial correlations are reported for correlations with dichotomous variables. Pearson correlations are reported for correlations of continuous variables.

Table 6. *Exploratory moderated mediation analyses with BSRI & Sensitivity*.

IV	DV	a1	a2	a3	b	c'	W	(a1+a3*w)*b	95% Bias Corrected CI
Leader Gender	Leadership Perceptions	1.74*	1.04**	-.44	.34***	.15	Masculine	.45	.13, .89
							Feminine	.30	.06, .57
Leader Gender	Competence Judgments	1.74*	1.04**	-.44	-.11**	.39**	Masculine	.13	.02, .39
							Feminine	.10	.00, .32
Leader Gender	Benevolence Judgments	1.74*	1.04**	-.44	.41***	.19	Masculine	.54	.14,1.04
							Feminine	.36	.06, .69

Note. *p < .10, **p < .05, ***p < .01

(a1+a3*w)* - Conditional indirect effect of IV on DV through M (mediator, i.e., sensitivity) at levels of W (moderator, i.e., BSRI classification).

a1- Effect of IV on M. a2 – Effect of W on M. a3 - Effect of interaction between IV and W on M.

b - Effect of M on DV. c' - Direct effect of IV on DV.

w - Values of moderator.

CI - Lower and upper 95% bias corrected confidence interval with 1000 bootstrap samples.

Table 7. *Exploratory Moderated Mediation Analyses with BSRI & Tyranny.*

IV	DV	a1	a2	a3	b	c'	W	(a1+a3*w)*b	95% Bias Corrected CI
Leader Gender	Competence Judgments	-1.47	-.9*	.28	-.11**	.39**	Masculine	.13	.02, .39
							Feminine	.10	.00, .32
Leader Gender	Benevolence Judgments	-1.47	-.9*	.28	-.18***	.42**	Masculine	.22	.03,.56
							Feminine	.17	.00,.48

Note. *p < .10, **p < .05, ***p < .01

(a1+a3*w)* - Conditional indirect effect of IV on DV through M (mediator, i.e., tyranny) at levels of W (moderator, i.e., BSRI classification).

a1- Effect of IV on M.

a2 – Effect of W on M.

a3 - Effect of interaction between IV and W on M.

b - Effect of M on DV.

c' - Direct effect of IV on DV.

w - Values of moderator.

CI - Lower and upper 95% bias corrected confidence interval with 10000 bootstrap samples.

Table 8. *Within Condition Descriptive Statistics for Study 2.*

Prime	Intervention	DV	Mean	Std. Deviation
No prime	Knowing	Agentic Hit Rate	.73	.22
		Communal Hit Rate	.77	.21
		Agentic False Alarm Rate	.60	.24
		Communal False Alarm Rate	.56	.25
		Agentic Accuracy (H-FA)	.12	.28
		Communal Accuracy (H-FA)	.21	.30
		Leadership Perceptions	4.23	.68
		Judgments of Competence	4.25	.59
		Judgments of Benevolence	4.20	.59
	Remembering	Agentic Hit Rate	.77	.16
		Communal Hit Rate	.79	.18
		Agentic False Alarm Rate	.50	.24
		Communal False Alarm Rate	.53	.26
		Agentic Accuracy (H-FA)	.27	.26
		Communal Accuracy (H-FA)	.26	.27
		Leadership Perceptions	4.24	.56
		Judgments of Competence	4.19	.59
		Judgments of Benevolence	4.13	.64
Sue Primed	Knowing	Agentic Hit Rate	.79	.14
		Communal Hit Rate	.78	.20
		Agentic False Alarm Rate	.50	.24
		Communal False Alarm Rate	.44	.25
		Agentic Accuracy (H-FA)	.30	.28
		Communal Accuracy (H-FA)	.32	.26
		Leadership Perceptions	3.67	.90
		Judgments of Competence	3.82	.77
		Judgments of Benevolence	3.79	.85
	Remembering	Agentic Hit Rate	.77	.20
		Communal Hit Rate	.80	.18
		Agentic False Alarm Rate	.46	.25
		Communal False Alarm Rate	.51	.30
		Agentic Accuracy (H-FA)	.31	.25
		Communal Accuracy (H-FA)	.29	.28
		Leadership Perceptions	3.89	.80
		Judgments of Competence	3.92	.68
		Judgments of Benevolence	3.97	.66

Table 9. *Study 2 Intercorrelations between Variables of Interest across Conditions.*

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.
1. Prime	-	.07	.08	.03	-.15*	-.11	.19*	.13	-.29**	-.25**	-.20**
2. Intervention		-	.04	.08	-.15*	.03	.16*	.02	.06	-.01	.02
3. Agentic Hit Rate			-	.19*	.23**	.18*	.47**	-.04	.25**	.22**	.12
4. Communal Hit Rate				-	.11	.27**	.03	.43**	.09	.05	.09
5. Agentic False Alarm Rate					-	.53**	-.75**	-.42**	.23*	.30**	.29**
6. Communal False Alarm Rate					.	-	-.36**	-.75**	.29**	.28**	.35**
7. Agentic Behavior Accuracy							-	.36**	-.04	-.13	-.17*
8. Communal Behavior Accuracy								-	-.18*	-.23**	-.27**
9. Leadership Perceptions									-	.82**	.63**
10. Judgments of Competence										-	.75**
11. Judgments of Benevolence											-

Note: * p < .05, ** p< .01. Prime was coded as 'no prime' = 0, 'Sue prime' = 1. Intervention was coded as know = 0, remember = 1. Point-biserial correlations are reported for correlations with dichotomous variables. Pearson correlations are reported for correlations of continuous variables.

Appendix A

Informed consent

Please read the following information. VIRGINIA POLYTECHNIC INSTITUTE AND STATE

UNIVERSITY Informed Consent for Participants in Research Projects Involving Human Subjects

Investigators(s): Dr. Roseanne Foti & Yashna J. Shah

I. Purpose of this Research/Project: The purpose of this experiment is to explore speople's perceptions of leaders.

II: The Participant will be asked to complete an online survey that should take no more than one hour to complete. Participants will watch a series of leadership videos, followed by a series of questionnaires. Participants will also be asked demographic questions such as age, race, gender, and leadership experience.

III. Risks - The only potential risk to the participants in this study would be discomfort. Should participants feel uncomfortable at any time during the survey, they can choose to exit the survey at any time.

IV. Benefits - Participation in this study may help researchers understand leadership. You may request a summary of the results of this study by contacting the researcher, Yashna Shah, at yshah@vt.edu, which will be available by summer 2017.

V. Extent of Anonymity and Confidentiality - The researchers will not release the results of the study to anyone other than individuals working on the project without written consent. The investigators listed at the top will be given access to the survey results in order to transcribe the data. All information given during this study will remain confidential. The survey will provide information from a wide array of participants from numerous organizations to ensure a large number of participants; therefore, individuals will not be identifiable from any information submitted in the study. All data will be kept confidential with only the researcher having access to the data. Answers from all identifying information will be used for matching purposes only and will be deleted promptly before any analysis takes place. These files may be accessible to the Virginia Tech Institutional Review Board and Human Subjects Committee, should an audit be required.

VI. Compensation - Participants will earn $1.50 upon completion of the survey. Approximate time to complete the survey is 30 minutes.

VII. Freedom to Withdraw - Participation in this study is voluntary; participants may discontinue their participation at any time without penalty. If for any reason participants decide that they

would like to discontinue participation, they can simply exit the survey. Participants may also return an incomplete survey to they if choose not to fully complete the study.

VIII. After reading this document, if you agree to the information stated, agree below and continue with the survey document.

IX. Who to Contact for Research Related Questions: For questions about the research itself, or to report any adverse effects during or following participation, contact the researcher, Yashna Shah, at yshah@vt.edu. You may also contact Dr. Harrison, Chair of the Psychology Department's Human Subjects Committee, at dwh@vt.edu or Dr. Moore, Chair of the IRB, at moored@vt.edu.

X. You must be 18 years of age or older may participate in this study.

- ☐ I consent
- ☐ I do not consent

Appendix B

Communal and agentic leader attributes depicted in the videos.

Communal Leader Attributes	**Agentic Attributes**
Appreciative	Decisive
Considerate	Independent
Appeasing	Confident
Cooperative	Pushy
Praising	Competitive

Number of agentic (blue font) and communal (red font), leadership behaviors by manager and scene number for female and male leader condition.

Female Leader Condition

Scene	6	7	8	9	Total
Manager 1/ Leader (Sue)	6, 5	5, 5	5, 5	5, 5	21, 20
Manager 2 (Bob)	3, 2	2, 2	2, 1	0,1	7, 6
Manager 3 (Dave)	1, 1	2, 0	0, 0	0, 0	3, 1
Manager 4 (Libby)	1, 1	0, 1	0, 0	0, 2	1, 3

Male Leader Condition

Scene	6	7	8	9	Total
Manager 1/ Leader (Bob)	6, 5	5, 5	5, 5	5, 5	21, 20
Manager 2 (Sue)	3, 2	2, 2	2, 1	0,1	7, 6
Manager 3 (Dave)	1, 1	2, 0	0, 0	0, 0	3, 1
Manager 4 (Libby)	1, 1	0, 1	0, 0	0, 2	1, 3

Appendix C

Measure of Leader Prototypes

Please rate how characteristic each of the 21 attributes presented below are for the leader you watched in the video, i.e., {Sue/Bob}, using the scale provided

Understanding

1 2 3 4 5 6 7 8 9

Sincere

1 2 3 4 5 6 7 8 9

Helpful

1 2 3 4 5 6 7 8 9

Intelligent

1 2 3 4 5 6 7 8 9

Knowledgeable

1 2 3 4 5 6 7 8 9

Educated

1 2 3 4 5 6 7 8 9

Clever

1 2 3 4 5 6 7 8 9

Motivated

1 2 3 4 5 6 7 8 9

Dedicated

1 2 3 4 5 6 7 8 9

Hardworking

1 2 3 4 5 6 7 8 9

Energetic

1 2 3 4 5 6 7 8 9

Strong

1 2 3 4 5 6 7 8 9

Dynamic

1 2 3 4 5 6 7 8 9

Domineering

1 2 3 4 5 6 7 8 9

Pushy

1 2 3 4 5 6 7 8 9

Manipulative

1 2 3 4 5 6 7 8 9

Loud

1 2 3 4 5 6 7 8 9

Conceited

1 2 3 4 5 6 7 8 9

Selfish

1 2 3 4 5 6 7 8 9

Masculine

1 2 3 4 5 6 7 8 9

Male

1 2 3 4 5 6 7 8 9

Appendix D

Measure of Leadership Perceptions

Based on the business scenarios you watched, please respond to the following question regarding the leader's behaviors. Please respond to the statements below using a 5 point scale, where 1 = *nothing* and 5 = *extreme amount*

1. To what extent does {Sue/Bob} fit your image of a leader?

2. How typical was {Sue/Bob} of a leader?

3. How much leadership did {Sue/Bob} exhibit?

4. To what extent does {Sue/Bob} engage in leadership behaviors?

5. If you had to choose a leader for a new task, how willing would you be to choose {Sue/Bob} as the leader?

Appendix E

Measure of Leader Judgments

Please evaluate the leader on the following dimensions using the scale provided.

Use a 5 point scale, where 1 = *strongly disagree* and 5 = *strongly agree*

1. {Sue/Bob} is very capable of performing her/his job.
2. {Sue/Bob} is known to be successful at the things she/he tries to do.
3. {Sue/Bob} has much knowledge about the work that needs done
4. I feel very confident about {Sue/Bob}'s skills.
5. {Sue/Bob} has specialized capabilities that can increase team performance.
6. {Sue/Bob} is well qualified.
7. {Sue/Bob} is very concerned about my welfare.
8. My needs and desires are very important to {Sue/Bob}.
9. {Sue/Bob} would not knowingly do anything to hurt me.
10. {Sue/Bob really looks out for what is important to me.
11. {Sue/Bob will go out of its way to help me.

Note: Items 1-6 represent competent attributes and items 7-11 represent benevolent attributes

Appendix F

Demographics Measure

Please answer the following demographic questions as accurately as possible:

Please indicate your age: _____

Please indicate your major: _____

Please indicate your race (*Select one*):

White **American Indian/Alaska Native** **Asian**

Black or African American **Native Hawaiian or Other Pacific** **Other**

More than one race

Do you have a job (*Select one*): **Yes** **No**

If Yes, approximately how many hours a week do you work: _____

Have you currently or in the past had a female boss or supervisor at work? (Select one)

Yes **No**

Exploratory Measure – Bem Sex Role Inventory (Bem, 1987)

Rate the extent to which the following words describe you on a scale ranging from (1) Never or almost never true to (7) Always or almost always true.

Assertive (M)
Leadership ability (M)
Dominant (M)
Strong personality (M)
Forceful (M)
Aggressive (M)
Willing to take a stand (M)
Independent (M)
Defends own beliefs (M)
Willing to take risks (M)
Understanding (F)
Sympathetic (F)
Eager to soothe hurt feelings (F)
Sensitive to needs of others (F)
Compassionate (F)
Loves children (F)
Affectionate (F)
Gentle (F)
Warm (F)
Tender (F)

Note: Parentheses indicate whether the item belongs to BSRI-M (M) or BSRI-F (F).

Appendix G

Prime Instructions

No Prime Group

Please read the following information carefully.

You will now watch four workplace scenarios where a group of four managers are meeting to work on various business tasks like budgeting, scheduling, supplies, etc. You are strongly encouraged to carefully observe the group members' interactions as you watch these scenarios. The graphic below illustrates the names of the four managers.

Please minimize any distractions and focus on your computer screen only. Remember to turn up your volume so you can clearly hear the conversation between these individuals. Click next when you are ready to begin watching the first scenario.

Prime Group

Please read the following information carefully.

You will now watch four workplace scenarios where a group of four managers are meeting to work on various business tasks like budgeting, scheduling, supplies, etc. *Sue* is the leader of this group. You are strongly encouraged to carefully observe Sue's as well as other group members' interactions as you watch these scenarios. The graphic below illustrates the names of the four managers.

Please minimize any distractions and focus on your computer screen only. Remember to turn up your volume so you can clearly hear the conversation between these individuals. Click next when you are ready to begin watching the first scenario.

Appendix H

Behavior Recognition Instructions

Remember Group

There are two different ways we make judgments about other people – **remembering and knowing**. **Remembering** is based on mentally reliving or having a vivid recollection of a specific instance or behavior. For example, we might describe someone as outgoing because we can recall specific examples of their outgoing behavior. **Knowing** is based on a sense of familiarity or a general feeling or impression about a person. For example, we might describe someone as outgoing because seeing the person triggers a general feeling that the person is outgoing, even when we are unable to recall specific examples of their outgoing behavior.

It is important to note that both types of judgments are useful and that one is not inherently better than the other. Moreover, judgments based on remembering and knowing do not differ in confidence and we can be equally confident in recognizing a person's behavior based on remembering and or a knowing.

For the questionnaire you will complete next, please indicate "yes" for only those leadership behaviors that you recognize on the basis of ***remembering*** (and not knowing). Recognizing a behavior based on **remembering** means that you have a conscious recollection of observing that specific leader behavior in the video you watched earlier or mental picture of the leader's behavior at the time you observed it in the video. This might include your confidence in observing the leader's behavior due to:

- your recollection of the way the behavior was performed
- what you were thinking about at the time you observed the leader's behavior
- how you felt when you observed the behavior

Know Group

There are two different ways we make judgments about other people – **remembering and knowing**. **Remembering** is based on mentally reliving or having a vivid recollection of a specific instance or behavior. For example, we might describe someone as outgoing because we can recall specific examples of their outgoing behavior. **Knowing** is based on a sense of familiarity or a general feeling or impression about a person. For example, we might describe someone as outgoing because seeing the person triggers a general feeling that the person is outgoing, even when we are unable to recall specific examples of their outgoing behavior.

It is important to note that both types of judgments are useful and that one is not inherently better than the other. Moreover, judgments based on remembering and knowing do not differ in confidence and we can be equally confident in recognizing a person's behavior based on remembering and or a knowing.

For the questionnaire you will complete next, please indicate "yes" for only those leadership behaviors that you recognize on the basis of ***knowing*** (and not remembering). Recognizing behaviors based on knowing means that even though you are unable to recall that specific behavior in the video, you recognize the behavior from the video because of your general impression of the leader or your expectations based on past experiences with leaders. This might include your confidence in observing the leader's behavior due to:

- the behavior being consistent with your initial evaluation of the person
- recognizing the behavior based on your general knowledge of leaders

your belief the behavior fits your expectations of that person

Appendix I

Behavior Recognition Questionnaire

Please use the following scale to indicate your certainty about the following behaviors occurring in the video scenarios you saw.

Use a 6 point scale, where 1 = *very certain the behavior did not occur*, *No* and 6 = *very certain the behavior did occur, Yes*

1. The leader was quick to assign responsibilities for the new employee orientation (A, Yes)
2. The leader decided how to split money between projects (A, Yes)
3. The leader frequently set the tone for meetings by deciding which issues (e.g., scheduling) needed to be discussed (A, Yes)
4. The leader told Dave it was important he set up a meeting right away (A, Yes)
5. The leader decides to hire Dr. Hall and asks a team member to contact him for the contracts (A, Yes)
6. The leader directed Libby to help Dave with the fax machine (A, Yes)
7. The leader acknowledged and appreciated others for new suggestions (C, Yes)
8. The leader demonstrated concern for a stressed out employee and asked a co-worker to check in on the employee (C, Yes)
9. The leader praised Dave for his excellent job forecasting expenses (C, Yes)
10. The leader decided to host a dinner to build group spirit and make group members feel comfortable at the conference (C, Yes)
11. The leader inquires what other group members' schedules look like (C, Yes)
12. The leader thanks Libby for her help with purchasing of new office equipment (C, Yes)
13. The leader tells Libby to call Human Resources and inquire about the missing interview notes(A, No)
14. The leader asks Dave to double check the applicants credentials (A, No)
15. The leader says they called Office Max to order new desks (A, No)
16. The leader asks Dave to obtain cost estimates from different supply distributors (A, No)
17. The leader tells Libby to rebalance the budget (A, No)
18. The leader directs the group members to get their employees motivated (A, No)
19. The leader expresses concern for the staff being overworked (C, No)
20. The leader praised Libby for her insightful remarks (C, No)
21. The leader demonstrated concern for a sensitive employee struggling with poor performance (C, No)
22. The leader asks Dave for his thoughts about contacting a temp agency (C, No)
23. The leader inquires when other group members are taking vacations (C, No)
24. The leader expresses concern for an employee recovering from surgery (C, No)

Note: A indicates agentic behaviors and C indicates communal behaviors. 'Yes' indicates behaviors that did occur in the videos and 'No' indicates behaviors that did not occur in the videos. All 'Yes' behaviors occur in the videos only once. For ease of reference, items are presented by behavior type and occurrence. Items will be randomized when presented to participants with no mention of behavior type and occurrence.