CAN WORKING MEMORY INTERFERENCE EXPLAIN NEED FOR COGNITIVE CLOSURE EFFECTS IN THE PERCEPTION OF DISCRIMINATION?

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Abstract

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People often are faced with situations that seem as though they may be discriminatory (e.g., racist, sexist) but which are vague enough to provoke a variety of judgments. Prior research has shown that people take into account the characteristics of the executor of the ambiguous behavior, and also that certain personality traits of the perceivers as well as certain conditions of the environment influence these judgments. One particular construct that has been shown to moderate perceptions of discrimination is the need for cognitive closure (e.g., Bucchianeri & Corning, under review). This need is defined as the tendency to jump quickly to a conclusion – right or wrong – and stick tightly to it. Whereas there is empirical evidence to support the operation of this factor in the perception of discrimination (i.e., heightening one’s tendency toward prototype use), there also is cause for criticism of this construct. In particular, the purpose of the studies presented here was to test whether a more basic and parsimonious explanation, situational interference with working memory, may account for previous studies' results regarding
prototype use in the perception of discrimination. Results provided mixed support for this hypothesis. Contrary to expectations, Study 1 demonstrated that prototype use in the perception of discrimination was in fact related to higher levels of verbal working memory capacity. Study 2 did not support the hypothesized exacerbation of the prototype effect by interference with working memory, but provided preliminary evidence in support of this effect via a near-significant prototype main effect within the working memory interference condition.
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CHAPTER 1:

INTRODUCTION

In contemporary society, people often are faced with situations that seem as though they may be discriminatory (e.g., racist, sexist), but which are sufficiently vague such that it is not clear whether discrimination actually has taken place. Indeed, displays of discrimination have over time become increasingly covert and sometimes go undetected (Dovidio & Gaerner, 1998). When faced with an instance of ambiguous discrimination, people often are motivated to determine whether discrimination has occurred (Heider, 1958; Weiner, 1979; Wong & Weiner, 1981). It is just these types of situations – personally important, yet highly ambiguous – that are likely to invoke biased cognitive processing by the individual.

In making their decisions about whether an act is discriminatory, individuals might draw from a variety of sources by examining features of the situation and the people within it (Fiske & Taylor, 1991). Such situations often are complex, however, prompting individuals to rely on cognitive heuristics (i.e., shortcut-taking) to make their judgments. One set of heuristics highlighted in the literature for their usefulness in simplifying complex information about other humans are prototypes (e.g., Inman & Baron, 1996).

The Prototype Effect in the Perception of Discrimination

Research on the concept of a prototype — a mental representation of the most typical member of a category — originated within cognitive psychology (Rosch, 1973, 1975) and has provided a useful framework for research in social psychology (see Fiske
Ongoing work on the classification of information indicates that people have prototypes for a broad range of categories, from colors (e.g., a prototypic shade of blue) to entire groups of people (e.g., a prototypic American) (see Rosch, 1999).

Applications of this original categorization research suggest that humans develop and maintain category prototypes (see Fiske & Taylor, 1991) to aid in the organization of available social information. As new stimuli present themselves, individuals compare this information to a relevant, stored prototype and form judgments based on the degree of fit with that prototype (Fiske & Taylor). When a situation is ambiguous with regard to the information presented, prototypes become especially influential in shaping an individual’s judgment about the situation (e.g., Devine, 1989; Duncan, 1976; Taylor, Fiske, Etcoff, & Ruderman, 1978). Additionally, people are more likely to use cognitive shortcuts when the stakes are relatively high, as in cases of potential discrimination (e.g., Baron, Burgess, & Kao, 1991; Inman & Baron, 1996).

For this reason, category prototypes can be particularly appealing and popular decision-making aids when interpreting ambiguously-discriminatory situations. It is in fact the case that individuals are more likely to call an ambiguous situation discriminatory if the executor of the ambiguous behavior fits the individual’s prototype of who the typical discriminator is (Baron, Burgess, & Kao, 1991; Inman & Baron, 1996). Indeed, research suggests that people display little variability in their prototypes when it comes to evaluating social information, such as potential acts of discrimination (e.g., Inman & Baron).

In an early study in this area, participants were presented with potentially sexist vignettes depicting a male perpetrator in some cases and a female perpetrator in others,
and asked to indicate their perceptions of the perpetrator. Results indicated that male and female respondents alike were approximately 8 times more likely to perceive sexism in vignettes that featured a male perpetrator versus those that featured a female perpetrator (Baron et al., 1991). Subsequent research replicated these results, finding that both male and female participants are more likely to perceive the ambiguously-sexist behavior of men as more sexist than that of women (e.g., Bucchianeri & Corning, under review; Harris, Lievens, & Van Hoye, 2004; Inman & Baron, 1996; Krumm & Corning, 2008).

Similarly, there is empirical evidence to support the use of prototypes when individuals make assessments of racial discrimination. European American and African American participants reading vignettes depicting varying degrees of racism were most likely to identify vignettes featuring a White perpetrator and Black victim as depicting discrimination, as compared to vignettes featuring any other combination of perpetrator-victim race (Corning & Bucchianeri, 2010; Inman & Baron, 1996).

Overall, then, when a prototypical executor and a non-prototypical executor of a certain type of discrimination exhibit the same behavior, the prototypical executor will be seen as more discriminatory – and people’s executor prototypes do not vary widely: Men generally are perceived as the prototypical perpetrators of sexism, and White persons are perceived as the prototypical perpetrators of White-Black racism (Baron, Burgess, & Kao, 1991; Bucchianeri & Corning, under review; Corning & Bucchianeri, 2010; Inman & Baron, 1996; Inman, Huerta, & Oh, 1998).

However, not everyone uses prototypic information or uses it to the same extent. One possible explanation for this variation – drawn from a motivated social cognition perspective – may be that individuals perceive information in their social environments in
ways that are personally and idiosyncratically convenient to them (Bar-tal & Guinote, 2002; Duckitt, 2001; Dunning, 1999; Fiske & Taylor, 1991; Kruglanski & Freund, 1983; Kruglanski, & Thompson, 1999; Shah et al., 1998). For some individuals, then, it may be subjectively important to rely on prototypes when evaluating a potentially-discriminatory situation; for others, it may not.

Various subjective needs and personality characteristics have been examined for their utility in influencing prototype use. Individuals’ need for control over the discrimination in their lives, for example, has been shown to influence their use of prototypes when perceiving discrimination (Krumm & Corning, 2008). Specifically, participants with a greater need for control were more reliant on the prototype of the typical sexist as a male, perceiving male-perpetrated scenarios as more sexist than those perpetrated by females.

The Need for Cognitive Closure

In addition to personality variables such as perceived control over discrimination, other broader subjective needs have been shown to predict greater stereotype engagement (Kruglanski & Freund, 1983; Shah, Kruglanski, & Thompson, 1998). One construct that has been shown to influence a person’s tendency to rely on cognitive heuristics (such as prototypes) is the need for cognitive closure – a person’s tendency to “seize” upon an idea and “freeze” his or her thinking on that inference (Kruglanski & Webster, 1996, p. 265). The need for cognitive closure construct, as well as the scale designed to assess it (Need for Cognitive Closure Scale [NFCS]; Webster & Kruglanski, 1994), is predicated on the notion that some people are more likely to jump to conclusions and stick tightly to
them than are others: They are said to “seize and freeze” upon a conclusion or answer – any answer – to avoid ambiguity.

The need for cognitive closure is positively related to personality tendencies such as intolerance of ambiguity, dogmatism, impulsivity, and the need for structure, as well as the rigidity and conservatism aspects of authoritarianism (Webster & Kruglanski, 1994). It is negatively correlated with a need for cognition (i.e., a tendency to favor a more elaborative and deliberate style of information processing) and preference for cognitive complexity (i.e., an ability to interpret social behavior in multidimensional ways) (Webster & Kruglanski). In an attempt to avoid ambiguity and arrive at a concrete answer regarding the presence of discrimination, it makes sense that individuals high in need for cognitive closure would make ready use of available heuristics to aid in their decision-making.

Indeed, there is evidence to support the connection between individuals’ need to cognitively close and their reliance on prototypes. Extending prior work on the prototype effect and perceived discrimination (Baron, Burgess, & Kao, 1991; Inman & Baron, 1996; Inman, Huerta, & Oh, 1998; Krumm & Corning, 2008), Corning and Bucchianeri (2010) found that European Americans with higher, versus lower, levels of need for cognitive closure are more likely to rely on the easy-to-use information offered by prototypes when making judgments of potentially racist scenarios. Specifically, high need-for-cognitive-closure European Americans were significantly more likely to rate the behavior of White individuals as racist relative to the behavior of Black individuals.

The same effect emerges when female participants evaluate instances of ambiguous sexism: Need for cognitive closure exacerbates the prototype effect such that
individuals high in need for cognitive closure are more likely than their low-need counterparts to rate the ambiguously-sexist behavior of a man as more discriminatory than that of a woman (Bucchianeri & Corning, under review).

Beyond the role of individual differences in need for cognitive closure, however, common factors in the environment also have been shown to influence one’s reliance on prototypes. Although the need for cognitive closure construct initially was posited as a personality variable, its originators (Webster & Kruglanski, 1994) have stated that it is vulnerable to environmental factors such as ambient noise and time pressure (Freund, Kruglanski, & Schpitzajzen, 1985; Heaton & Kruglanski, 1991; Kruglanski & Freund, 1983; Kruglanski & Webster, 1996; Webster & Kruglanski). Specifically, these situational factors have increased reliance on cognitive shortcuts, and it has been suggested that this is due to a heightening of these individuals’ need for cognitive closure (Freund, Kruglanski, & Schpitzajzen; Heaton & Kruglanski; Kruglanski & Freund; Kruglanski & Webster; Webster & Kruglanski).

Extending prior work on the prototype effect (e.g., Baron, Burgess, & Kao, 1991; Corning & Bucchianeri, 2010; Flouroy, Prentice-Dunn, & Klinger, 2002; Inman & Baron, 1996; Inman, Huerta, & Oh, 1998; Morera, Dupont, Leyens, & Desert, 2004) and the individual-difference variables shown to moderate it (e.g., Krumm & Corning, 2008), Bucchianeri and Corning (under review) tested a potential qualification of this relationship via a series of situational manipulations. Participants were placed in an environment in which they were asked to draw conclusions about the presence of discrimination but in which there was ambient noise (in one study) and in which they were placed under a time pressure (in a second study). According to Kruglanski and
Webster (1996), these environmental pressures heighten their need for cognitive closure. Indeed, results were consistent with what would be expected under conditions of heightened need for cognitive closure: There was an exacerbation of the prototype effect, with participants in these heightened noise and time pressure conditions being more likely to rely on their prototypes of a sexist. Most notably, this situational effect was so powerful that participants’ need to cognitively close on a conclusion operated over and above their trait levels of this construct. It was concluded from these studies that processing ambiguously-discriminatory behavior in a noisy environment or when there is a pressure to process the information quickly has more power over people’s perceptions than does their personality-based need for closure (Bucchianeri & Corning).

Psychometric Questions Regarding the Need for Cognitive Closure

Despite the considerable attention it received following its development, the utility of the Need for Cognitive Closure Scale (NFCS; Webster & Kruglanski, 1994) has been the subject of debate over the past decade. According to Webster and Kruglanski (1994), the scale is both unidimensional (Cronbach’s alpha = .84) as well as (according to their own factor analysis) comprised of five subscales: Preference for Order and Structure ($\alpha = .77$ to .82), Preference for Predictability ($\alpha = .72$ to .79), Decisiveness ($\alpha = .70$ to .79), Discomfort with Ambiguity ($\alpha = .67$ to .80), and Closed-Mindedness ($\alpha = .62$). Questions have arisen, however, about the extent to which this five-factor structure captures the theoretical underpinnings of the construct (see Roets & Van Hiel, 2007, for an overview) – specifically, the “seize” and the “freeze” components of the construct. One alternative structure representing the two-factor, seize-and-freeze components of the
construct was forwarded based on a content analysis of the scale’s items (Neuberg, Judice, & West, 1997). Subsequent testing of this two-factor structure of the NFCS, however, failed to support the conclusion that these two factors reflect the dual dimensions of the construct (i.e., seizing and freezing) forwarded by the construct’s authors (see Roets, Van Hiel, & Cornelis, 2006).

In addition to questions regarding its factor structure, the NFCS has received criticism regarding the questionable construct validity of its Decisiveness subscale (Mannetti et al., 2002). Of particular concern is that this subscale’s items seem to be more reflective of ability than of motivational need (e.g., “When faced with a problem, I usually see the one best solution very quickly.”) (Mannetti; Roets & Van Hiel, 2007).

Furthermore, it is not completely evident that noise and time pressure actually heighten the need for cognitive closure. Placing individuals under a time pressure or in a noisy environment while they read and respond to ambiguous scenarios does result in increased prototype reliance (Bucchianeri & Corning, under review), and both noise and time pressure have been posited to boost situational need for cognitive closure (e.g., Kruglanski & Webster, 1996). However, clear evidence of need for cognitive closure’s role in these results has yet to emerge.

In sum, prior work has yielded strong support for the notion that the prototype effect in the perception of discrimination can be influenced both by individual-difference and situational factors. However, whether the precise mechanism moderating this effect actually is the need for cognitive closure remains unclear. If the robust moderation of the prototype effect evident in these prior studies might be more parsimoniously explained by
a factor more basic than the social-psychological construct, need for cognitive closure, this factor ought to be subjected to a test of its impact.

**Working Memory Capacity and the Need for Cognitive Closure**

One factor that appears quite promising with regard to its connection to need for cognitive closure is the basic availability of one’s cognitive resources. In a recent paper, Kossowska (2007) examined the relation between individual differences in need for cognitive closure and restriction of cognitive resources. Using a Random Interval Generation (RIG) task (Baddeley, 1996; Baddeley et al., 1998) in which participants were prompted to strike a mouse key in as arrhythmic a manner as possible as they made judgments on an information-acquisitions task (SciPic; Payne et al., 1993), participants’ need for cognitive closure was assessed as was the degree to which their cognitive resources were depleted (as measured by reduction in the randomness of the mouse clicks). Results provided support not only for the negative relation between cognitive capacity and need for cognitive closure, but for the hypothesis that individuals’ levels of cognitive capacity would fully mediate the effect of need for cognitive closure on subsequent judgments the individuals made (Kossowska).

These findings provide the basis for a potential clarification of the existing literature on prototype reliance in the perception of discrimination: Specifically, the (more abstract) need for cognitive closure construct actually may be a loose proxy for a more specific and basic explanatory factor – the availability of one’s cognitive capacity. Recent work demonstrates that the two are closely related (Kossowska, 2007); however, the question remains as to which specific types of cognitive resources might be
implicated in this relationship. Prior theorizing has hinted at potential inverse relations
between need for cognitive closure and overall intelligence (Kruglanski & Freund, 1983),
but the relation between this personality construct and measures of intelligence has not
been explicitly tested. Although secondary memory – the storage of newly-acquired
information – is a stronger predictor of fluid intelligence (Mogle, Lovett, Stawski, &
Sliwinski, 2008), it is working memory that may capture more accurately the nature of
the need for cognitive closure construct. Working memory refers to the maintenance and
subsequent use of information in the coordination and control of high-order cognitive
processes (Baddeley & Hitch, 1974). One’s working memory capacity, then, might be
conceptualized as the ability to maintain, and later use, information in the face of
distraction.

A possible relation between working memory capacity and need for cognitive
closure has the potential to provide new interpretations of the documented effects of
environmental noise and time pressure on prototype reliance in the perception of
discrimination (Bucchianeri & Corning, under review). This is particularly compelling
given the lack of evidence to date indicating that need for cognitive closure is the precise
mechanism involved in this process. It seems that if an individual is particularly adept at
maintaining information in the face of distraction, then when asked to make a decision
about an ambiguous situation, he or she would have relatively little use for the heuristic
information prototypes provide. In contrast, an individual who is relatively less adept at
maintaining information when distracted might be more likely to make use of his or her
prototypes and jump quickly to the first available answer. It is possible, therefore, that
interference with one’s working memory capacity is what is responsible for the exacerbation of the prototype effect as observed in prior studies.

Purpose of Proposed Studies

The purpose of the present studies was to determine how one’s cognitive capacity – operationalized as working memory capacity – influences one’s tendency to perceive discrimination when the situation is ambiguous. The first step was to better understand the relationship of the need for cognitive closure construct to individual differences in working memory capacity. In Study 1, I hypothesized that low levels of working memory capacity would be correlated with high levels of need for cognitive closure, and that high levels of one NFCS subscale, Decisiveness (discussed below), would be more strongly related to low levels of working memory capacity than would the others. I also hypothesized that working memory capacity would mediate the role of need for cognitive closure as a moderator of the prototype effect in the perception of discrimination. More specifically, when the executor in an ambiguously-sexist situation is prototypical (i.e., male), I expected that: 1) participants high in need for cognitive closure would be more likely than their high-capacity counterparts to rely on simplified abstractions such as their prototypes, and conclude that sexism has taken place and 2) that this moderation would be mediated by working memory capacity.

In Study 2, I hypothesized that situational interference with working memory would heighten prototype reliance in the perception of discrimination. Specifically, this study provides an experimental test of the impact of interference with working memory on participants’ reliance on prototype information in ambiguously-sexist situations. This
study was designed to assess whether a causal relationship exists between interference with working memory and reliance on prototype information in ambiguously-discriminatory situations.

In summary, the aim of the present work was to help clarify the mechanism underlying the use of prototypes in people's perceptions of discrimination. Whereas prior work has suggested that an individual’s need for cognitive closure is responsible for his or her tendency to rely on the heuristic information afforded by prototypes, it may be that this tendency actually is influenced by a person’s working memory capacity.
CHAPTER 2:

STUDY 1

Method

The purpose of Study 1 was to examine the extent to which working memory capacity is related to need for cognitive closure and to discern the nature of this relation. Toward this end I tested four hypotheses. First, I hypothesized that low levels of working memory capacity would be correlated with high levels of need for cognitive closure. Second, given prior suggestions that a particular subscale of the Need for Cognitive Closure measure, the Decisiveness subscale, is more reflective of the ability to cognitively close than of the need to do so (Roets & Van Hiel, 2007), and because working memory capacity is characterized by a relative ability to hold information in the face of distraction, I hypothesized that the Decisiveness subscale would be more strongly inversely related to individual differences in working memory capacity than would the full measure. Third, I hypothesized that the remaining subscales – Closed-mindedness, Preference for Structure and Order, Preference for Predictability, and Discomfort with Ambiguity – each would demonstrate relatively weaker inverse relations, compared to the Decisiveness subscale, to individual differences in working memory capacity.

Finally, I hypothesized that working memory capacity would mediate the effect of need for cognitive closure on prototype reliance in the perception of discrimination. To test this, participants' working memory capacities, need for cognitive closure, and perceptions of discrimination regarding a set of ambiguously-sexist scenarios were assessed. Specifically, I hypothesized that: 1) participants high in need for closure would
be more likely than their low-need counterparts to rely on simplistic prototype information and hence rate the ambiguous behavior of males as sexist and 2) working memory capacity would mediate need for closure’s moderation of the prototype effect. That is, I expected that once tested in the meditational model (with working memory capacity as mediator) that the need for cognitive closure moderation effect would become non-significant.

Participants and Design

Participants were 151 undergraduate women (ages 17-22 [M = 19.22]) attending a midsized, Midwestern university. They were recruited via email from introductory and other psychology classes and offered as compensation a choice of either course extra credit or entry into a gift card drawing. The design was correlational and quasi-experimental, and the analyses were comprised of a series of Pearson product-moment correlation tests and a series of within-subjects ANCOVAs. Finally, participants were treated in accordance with the Ethical Standards of the American Psychological Association (APA).

Materials, Measures, and Procedure

Participants were welcomed to a campus laboratory by a female experimenter and asked to complete an informed consent form (see Appendix) and a series of counterbalanced measures and tasks (described below). At the conclusion of the session, each participant was provided a debriefing statement (see Appendix), thanked, and invited to ask questions and comment on her participation.
Participants completed a series of electronic measures and tasks comprised of: a) a demographic questionnaire (see Appendix) and measures of social desirability (see Appendix), femininity (see Appendix), and need for cognitive closure (see Appendix); b) a set of working memory capacity tasks; and c) a set of ambiguously-discriminatory stimuli (i.e., scenarios depicting either a prototypical executor or non-prototypical executor in an ambiguously-sexist role; see Appendix), each of which was read and then assessed in terms of the extent to which the participant perceived sexism in the scenario.

Need for cognitive closure. This construct was assessed using the Need for Cognitive Closure Scale ([NFCS] Webster & Kruglanski, 1994). The NFCS consists of 42 items concerning one’s desire for concrete and clear answers. Using a scale ranging from 1 (strongly disagree) to 6 (strongly agree), respondents indicate the extent of their agreement with such statements as, “I don’t like situations that are uncertain” and “I usually make important decisions quickly and confidently.” Higher scores indicate a greater need for cognitive closure. In at least some analyses (Webster & Kruglanski, 1994), this measure has been shown to comprise five subscales: Preference for Order, Discomfort with Ambiguity, Decisiveness, Preference for Predictability, and Closed-mindedness. (Internal consistency estimates have been provided above.) Scoring is achieved by summing across and dividing by the number of items to obtain a mean score for each participant. The overall construct is positively correlated with dogmatism ($r = .29$), impulsivity ($r = .27$), and intolerance of ambiguity ($r = .29$), and is negatively correlated with need for cognition ($r = -.28$) and preference for cognitive complexity ($r = -.30$) (Webster & Kruglanski). Test-retest reliability over a 12-week interval is high ($r = .86$), as are estimates of the measure’s overall internal consistency (e.g., Cronbach’s
alpha = .84) (Webster & Kruglanski).

Social desirability. The 33-item Marlowe-Crowne Social Desirability Scale (Crowne & Marlowe, 1960) was administered to assess potential social desirability response bias because previous research (e.g., Inman, et al., 1998) suggests that self-presentation concerns may dissuade participants from making attributions of discrimination to lower-power groups. The scale uses a true/false response scale and scores may range from 0 to 33. Higher scores indicate a greater tendency toward socially-desirable responding. Internal consistency in the present study (KR–20) was estimated at .78.

Femininity. To assess individual differences in femininity, due to the potential concern that this construct may influence participants’ perceptions of discrimination in the scenarios, the 8-item Femininity subscale of the Personal Attributes Questionnaire (PAQ; Spence, Helmreich, & Stapp, 1974) was used. The PAQ is a 24-item self-report instrument, designed to measure the degree to which a person can be classified according to masculine or feminine adjectives. Respondents indicate the extent to which they can be characterized in terms of various adjectives (e.g., “active,” “competitive,” “kind”), using a response scale ranging from 1 (not at all) to 5 (very). Internal consistency in the present study (Cronbach’s alpha) was estimated at .77.

Working memory capacity. Two complex span tasks – one verbal and one spatial – were used to assess participants’ individual differences in working memory capacity. An automated operation span (Aospan) task, developed by Unsworth, Heitz, Schrock, and Engle (2005) to allow participants to complete the task independently of the experimenter, was used to assess verbal working memory capacity. The task is driven
entirely by the participant who, seated at a computer, advances each screen by clicking the mouse button. In the task, a series of letters is presented one at a time. Next, a math operation is presented. Participants are instructed to solve the operation mentally and then click the mouse. This advances them to a screen on which a digit is presented, which the participant judges to be either the correct or incorrect answer to the math operation. Finally, participants are asked to recall the correct series of letters in the order in which they appeared earlier (see Unsworth, Heitz, Schrock, & Engle for further details). This substantive portion of the task is comprised of three sequences of each of the set sizes ranging from three to seven (for a total of 75 letters and 75 math problems), and is preceded by a series of three practice trials of set size two.

To assess participants’ spatial working memory capacity, an automated symmetry span (Asymspan) task, developed by Engle (2005) was used. This task was adapted from the symmetry span task described by Kane et al. (2004). Similar to the Aospan task, the Asymspan task is driven entirely by the participant who, seated at a computer, advances each screen by clicking the mouse button. In the task, participants are presented with a matrix in which a sequence of squares within the matrix is illuminated in red, one at a time. Next, a figure is presented. Participants then click the mouse and are asked to judge whether the figure is symmetrical or asymmetrical. Finally, participants are presented with a blank matrix and asked to illuminate the correct squares within the matrix in the order in which they appeared (see Engle for further details). This substantive portion of the task is comprised of three sequences of each of the set sizes two, three, four, and five (for a total of 12 matrices and 12 figures), and is preceded by a series of two practice sets.
Ambiguously-sexist stimulus scenarios. A set of nine ambiguously-sexist stimulus scenarios used in these studies derive from a set developed by Krumm and Corning (2008). Each scenario depicts an everyday, ambiguously-sexist situation that reads as though the participant were present in the situation (e.g., “You arrive at your new job…”) and is treated differently than a male in the situation by either a prototypical (male) or non-prototypical (female) executor. The contexts in each of the scenarios are ones in which attributions of sex discrimination are plausible (e.g., male-dominated classes, physical-labor contexts). The following is an example of a scenario in which the executor is male:

You accept a new job with a company. You begin to develop a mutually pursued dating relationship with a colleague already at the firm. When your boss, Robert, finds out that you have been dating, he informs you both that dating co-workers is against office policy. He states that one of you must leave the company, and you are let go. Your male colleague is allowed to keep his job.

In their development phase, the scenarios underwent iterative rounds of piloting incorporating quantitative ratings as well as qualitative feedback regarding the ambiguity of each scenario with regard to the presence of sexism (i.e., unfair treatment based on sex). The scenarios were refined \( N = 83 \) until final pilot means indicated that each scenario was perceived as ambiguous with regard to the presence of discrimination and their standard deviations would invite adequate variance in response from study participants (see Krumm & Corning [2008] for more detail). Two versions of each scenario were created by the developers, with only the sex of the executor (i.e., male or female) varying across the versions. For example, in the female-executed version of the
above scenario, the name “Robert” is replaced with “Jennifer” and “he” is replaced with “she.” Three distracter scenarios are included in this set. These parallel the stimulus scenarios in every respect (e.g., length, familiarity of the situation, plausibility of discrimination), differing from them only in that they contain no information regarding the executor’s sex (i.e., no name or pronoun is used).

In the present studies, each participant read and responded to nine scenarios. Each participant received three prototypical (i.e, male–executed) scenarios, three non-prototypical (i.e., female–executed) scenarios, and three distracter scenarios. Only the substantive stimuli (not the distracters) were of interest. Finally, the scenarios were distributed such that no participant received both the male version and female version of a given scenario.

Perception of discrimination. Participants’ perception of discrimination in each of the ambiguously-sexist scenarios was assessed following the procedures of Krumm and Corning (2008). Specifically, each scenario was followed by an item that reads, “In your mind, to what extent did this situation depict an instance of unfair treatment based on sex?” This item’s response scale ranges from 1 (not at all) to 6 (very much so), and higher scores indicate a greater perception of sexist discrimination. A mean score was obtained for both the male-executed scenarios and the female-executed scenarios (via summing across the three (male or female) scenarios and dividing by 3 (the number of scenarios)). Each participant, then, produced a mean perception of discrimination score for both the prototypical (i.e., male-executed) scenarios and the non-prototypical (i.e., female-executed) scenarios.
Results

Preliminary Analyses

Preliminary analyses were conducted to assess for the potentially influential roles of socially-desirable responding and degree of femininity. Because previous research (e.g., Inman, et al., 1998) suggests that self-presentation concerns may dissuade participants from making attributions of discrimination to lower-power groups, the first analysis was an examination (via Pearson product-moment correlation tests) of the relation between social desirability and perceptions of discrimination. Correlational tests indicated no evidence, however, of a relation between Marlowe-Crowne and perception of discrimination scores when the executor was either male or female (both \( p_s > .65 \)), and thus social desirability was not examined further. Second, I assessed (via correlational tests) whether perceptions of sex-based discrimination may be influenced by participants’ own degree of femininity. Such tests, however, provided no evidence of a relation between femininity scores and perceptions of discrimination, regardless of the executor’s sex (both \( p_s > .43 \)); this variable, too, was not examined further.

Main Analyses

In terms of the main analyses, four hypotheses were tested to examine the extent to which working memory capacity is related to need for cognitive closure and to discern the nature of this relationship. First, I expected to find (via a correlational test) an inverse correlation between individual differences in overall working memory capacity and individual differences in need for cognitive closure as measured by the full NFCS.
(Descriptive data for all measured variables are summarized in Table 1). Results of a Pearson product-moment correlation test, however, provided no support for such a relation ($r = .04, p = .66$). There also was no support for a relation between need for cognitive closure and the more specific verbal working memory capacity ($r = -.002, p = .98$) or spatial working memory capacity ($r = .08, p = .33$).

Second, Pearson product-moment correlation tests were conducted to test the hypothesis that the Decisiveness subscale of the NFCS is strongly, inversely correlated with individual differences in overall working memory, as compared to each of the remaining subscales’ hypothesized relatively weaker, inverse relations to overall working memory capacity. (Results are summarized in Table 2.) Results, however, failed to support this hypothesis; the Decisiveness subscale showed no relation to individual differences in overall working memory capacity ($r = -.09, p = .27$).

Third, Pearson product-moment correlation tests were conducted to test the hypothesis that the remaining subscales – Closed-mindedness, Preference for Structure and Order, Preference for Predictability, and Discomfort with Ambiguity – each would demonstrate relatively weaker inverse relations, compared to the Decisiveness subscale, to individual differences in working memory capacity. (Results are summarized in Table 3.) However, results revealed that Closed-mindedness ($r = .12, p = .32$), Preference for Structure and Order ($r = .02, p = .56$), Preference for Predictability ($r = .08, p = .47$), and Discomfort with Ambiguity ($r = .00, p = .67$) each was unrelated to overall working memory.
## TABLE 1

**DESCRIPTIVE STATISTICS FOR VARIABLES IN STUDIES 1 AND 2**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Study 1</th>
<th>Study 2</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(N = 151)</td>
<td>(N = 214)</td>
</tr>
<tr>
<td>1. Femininity (^a) (personality trait measure)</td>
<td>3.96(.50)</td>
<td>---</td>
</tr>
<tr>
<td></td>
<td>(\alpha = .78)</td>
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</tr>
<tr>
<td>2. Working memory (total) (^c)</td>
<td>77.19(15.42)</td>
<td>---</td>
</tr>
<tr>
<td>3. Working memory (verbal) (^d)</td>
<td>53.17(12.80)</td>
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</tr>
<tr>
<td>4. Working memory (spatial) (^f)</td>
<td>24.01(7.25)</td>
<td>---</td>
</tr>
<tr>
<td>5. Need for closure (^b) (personality trait measure)</td>
<td>3.74(.49)</td>
<td>3.72(.47)</td>
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<tr>
<td></td>
<td>(\alpha = .87)</td>
<td>(\alpha = .85)</td>
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<tr>
<td>6. Preference for order and structure (^b) (subscale of NFCS)</td>
<td>4.00(.78)</td>
<td>4.01(.79)</td>
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<tr>
<td></td>
<td>(\alpha = .81)</td>
<td>(\alpha = .83)</td>
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<tr>
<td>7. Preference for predictability (^b) (subscale of NFCS)</td>
<td>3.61(.82)</td>
<td>3.64(.82)</td>
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<tr>
<td></td>
<td>(\alpha = .81)</td>
<td>(\alpha = .81)</td>
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<tr>
<td>8. Decisiveness (^b) (subscale of NFCS)</td>
<td>3.35(.93)</td>
<td>3.22(.97)</td>
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<tr>
<td></td>
<td>(\alpha = .79)</td>
<td>(\alpha = .83)</td>
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<tr>
<td>9. Discomfort with ambiguity (^b) (subscale of NFCS)</td>
<td>4.20(.59)</td>
<td>4.25(.57)</td>
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<td>(\alpha = .63)</td>
<td>(\alpha = .59)</td>
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<td>10. Closed-mindedness (^b) (subscale of NFCS)</td>
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<td>(\alpha = .65)</td>
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<td></td>
<td><em>(N = 151)</em></td>
<td><em>(N = 214)</em></td>
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<tr>
<td>Situational Interference with Working Memory</td>
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<td></td>
<td><em>(n = 107)</em></td>
<td><em>(n = 107)</em></td>
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<tr>
<td>11. Perception of discrimination in male-executed scenarios^b</td>
<td>3.78 (.95)</td>
<td>3.79 (1.11)</td>
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<td>3.69 (.89)</td>
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<tr>
<td>12. Perception of discrimination in female-executed scenarios^b</td>
<td>3.57 (.99)</td>
<td>3.56 (.92)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3.59 (1.06)</td>
</tr>
</tbody>
</table>

NOTE: Means are listed first, followed by SDs in parentheses. ^aPossible range: 1-5; ^bpossible range: 1-6; ^cpossible range is 1-40; ^dpossible range is 1-75; ^epossible range is 1-115.
## TABLE 2

### INTER-CORRELATIONS OF STUDY 1 VARIABLES

<table>
<thead>
<tr>
<th>Measure</th>
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<td>2. WM</td>
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<tr>
<td>3. WMV</td>
<td>.01</td>
<td>.88***</td>
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<td>4. WMS</td>
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<td>.57***</td>
<td>.12</td>
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<td>.04</td>
<td>-.00</td>
<td>.08</td>
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<td>6. NFCSO</td>
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<td>-.00</td>
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<td>7. NFCSP</td>
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<td>.08</td>
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<td>8. NFCSD</td>
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<td>-.09</td>
<td>-.10</td>
<td>-.01</td>
<td>.46***</td>
<td>.23**</td>
<td>-.02</td>
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<tr>
<td>9. NFCSA</td>
<td>.07</td>
<td>.00</td>
<td>-.03</td>
<td>.07</td>
<td>.59***</td>
<td>.40***</td>
<td>.40***</td>
<td>.03</td>
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<tr>
<td>10. NFCSC</td>
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<td>.12</td>
<td>.12</td>
<td>.03</td>
<td>.61***</td>
<td>.39***</td>
<td>.37***</td>
<td>.20*</td>
<td>.20*</td>
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<tr>
<td>11. MALE</td>
<td>-.07</td>
<td>.10</td>
<td>.13</td>
<td>-.01</td>
<td>-.05</td>
<td>-.02</td>
<td>-.06</td>
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<td>-.01</td>
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### TABLE 2 (contd.)

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<tbody>
<tr>
<td>12. FEM</td>
<td>.02</td>
<td>-.04</td>
<td>-.06</td>
<td>-.02</td>
<td>-.00</td>
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<td>-.03</td>
<td>.06</td>
<td>-.02</td>
<td>.37***</td>
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</tbody>
</table>

NOTE: For all measures, higher scores indicate higher levels of the construct assessed. PAQ = Personal Attributes Questionnaire (Femininity subscale); WM = Overall working memory capacity; WMV = Verbal working memory capacity; WMS = Spatial working memory capacity; NFCS = Need for Cognitive Closure Scale; NFCSO = Preference for Order and Structure subscale of NFCS; NFCSP = Preference for Predictability subscale of NFCS; NFCSD = Decisiveness subscale of NFCS; NFCSA = Discomfort with Ambiguity subscale of NFCS; NFCSC = Closed-mindedness subscale of NFCS; MALE = Mean score of male-executor scenario ratings; FEM = Mean score of female-executor scenario ratings.

* $p < .05$
** $p < .005$
*** $p < .0001$
Finally, to test the hypothesis that working memory capacity mediates the role of need for cognitive closure as a moderator of the prototype effect, a within-subjects ANCOVA was conducted, with the prototypicality of the executor (i.e., male vs. female) in the scenarios being the within-subject factor and the continuous individual-difference variables, working memory capacity and need for cognitive closure, being treated as "covariates" in the technical sense, and mediator and moderator, respectively, more substantively speaking. Consistent with results of prior studies, clear evidence of the prototype effect emerged: The ambiguous behavior of male executors was perceived as significantly more discriminatory than that of female executors, $F(1, 150) = 5.59, p < .02$; $M_s = 3.78$ and 3.57, respectively. However, the expected and well-documented interaction between executor sex and need for cognitive closure did not emerge, $F(1, 149) = .22, p = .64$, suggesting, perhaps, that the moderating role of need for cognitive closure is not as robust as previously hypothesized. Therefore, given that this initial, expected interaction did not emerge, I did not carry out the proposed within-subjects ANCOVA to test whether working memory capacity mediates the moderating role of need for cognitive closure. The lack of interaction effect between executor sex and need for cognitive closure is surprising, particularly given that a power analysis indicated that the study was adequately powered: Power to detect interaction effects in the present design, with alpha set at .05, was calculated at .873. Because .80 is the conventional target, it can be inferred that the present study was sufficiently powered to detect the hypothesized effects.
Follow-up Analyses

Given its hypothesized relation to working memory capacity (as both are thought to reflect *ability* rather than *need*), the Decisiveness subscale of the NFCS was tested (via a within-subjects ANCOVA wherein executor type is treated as the within-subjects factor and decisiveness is treated as a covariate) as a moderator of the prototype effect; however, this interaction too was non-significant, $F(1,149) = .13, p = .72$.

Finally, despite that the expected interaction between executor sex and need for cognitive closure was not supported, overall working memory capacity, spatial working memory capacity, and verbal working memory capacity were tested – each for their potential role as individual moderators of the prototype effect. To test this, I conducted a series of within-subjects ANCOVAs wherein executor type was treated as the within-subjects factor and working memory (overall, spatial, and verbal, respectively) was treated as a covariate. Whereas the prototype effect was not moderated by overall working memory capacity ($F[1,149] = 2.49, p = .12$) or by spatial working memory capacity ($F[1,149] = .13, p = .72$), verbal working memory capacity did, in fact, emerge as a significant moderator of this effect, $F(1,149) = 4.50, p = .03$. However, contrary to the hypothesis, the direction of this interaction was such that individuals high in verbal working memory capacity actually were more reliant on prototypes. That is, as verbal working memory capacity increased, so too did perceptions of discrimination in the male-executed scenarios, as compared to female-executed scenarios.
Discussion

The results of Study 1 provide mixed evidence regarding the relationship between need for cognitive closure and working memory capacity, as well as the utility of this relationship in predicting one’s tendency to perceive discrimination when the situation is ambiguous. Inconsistent with its hypothesized inverse relationship with working memory capacity, need for cognitive closure was uncorrelated with overall working memory capacity, and with its subcomponents — verbal and spatial working memory capacity.

Furthermore, although the Decisiveness subscale was hypothesized to be more strongly inversely related to individual differences in working memory capacity than would be the full NFCS (based on prior suggestions that this subscale may be more reflective of the ability to cognitively close than of the need to [Roets & Van Hiel, 2007]), the evidence did not support this. Despite that a link between the ability (or inability) to cognitively close and the ability (or inability) to hold information in the face of distraction may make theoretical sense, the fact that there was not support for this relation is not completely surprising given that the utility of this subscale has been previously questioned (see Roets & Van Hiel).

The substantive hypothesis of this study was that working memory capacity would mediate the moderating effect of need for cognitive closure on prototype reliance in the perception of discrimination, such that participants low in working memory capacity, when presented with a male-executed, ambiguously-sexist situation, would be more likely than their high-capacity counterparts to rely on simplified abstractions such
as their prototypes, and conclude that sexism had taken place. Although results of this study provide further support for the basic operation of the prototype effect in the perception of discrimination, they do not support the role of need for cognitive closure as a moderator of the prototype effect in predicting perceptions of discrimination. This lack of interaction effect is inconsistent with prior findings (e.g., Bucchianeri & Corning, under review [Studies 2, 3, and 4]; Corning & Bucchianeri, 2010), despite that identical methods were employed, and raises the question of whether need for cognitive closure is a reliable moderator of the well-established prototype effect. However, individual differences in verbal working memory capacity emerged as a significant moderator of the prototype effect in the perception of discrimination. Moreover, the interaction between executor sex and verbal working memory capacity ran counter to the hypothesized direction. Specifically, individuals high in verbal working memory capacity, compared to their low-capacity counterparts, were more reliant on prototypes when making judgments regarding the presence of discrimination in the scenarios, and thus judged the ambiguous behavior of male executors to be more sexist than the same behavior executed by women. This finding may point to a process not accounted for in the present study’s hypotheses: It may be that individuals high in verbal working memory capacity are more skillful users of cognitive heuristics (including prototypes) and therefore more likely to make use of these heuristics when making judgments about complex material, such as ambiguously-discriminatory behavior.

Despite the lack of support for a relationship between individual differences in need for cognitive closure and working memory capacity, prior work suggests that these constructs operate both as individual-difference traits and as manipulable variables
(Bucchianeri & Corning, under review; Freund, Kruglanski, & Schpitzajzen, 1985; Heaton & Kruglanski, 1991; Kossowska, 2007; Kruglanski & Freund, 1983; Kruglanski & Webster, 1996; Webster & Kruglanski, 1994). In addition, results of follow-up analyses in the present study revealed that verbal working memory capacity moderates the prototype effect in the perception of discrimination, such that those high in verbal working memory capacity are more reliant on prototype information when reading and making judgments about ambiguously-discriminatory behavior. Therefore, extending the findings of Study 1 regarding the moderating role of trait-level verbal working memory capacity, Study 2 was designed to test whether situational interference with verbal working memory (via a modified sentence span task) has the potential to exacerbate the prototype effect in the perception of discrimination.
CHAPTER 3:

STUDY 2

Method

Whereas Study 1 provided an initial, correlational investigation of the relationship between need for cognitive closure and working memory capacity in the perception of discrimination, in Study 2, it was hypothesized that situational interference with working memory would exacerbate the prototype effect in these perceptions. Specifically, this study provided an experimental test of the impact of interference with working memory on participants’ reliance on prototype information in ambiguously-sexist situations. The aim of this study, then, was to assess whether a causal relationship exists between interference with working memory and reliance on prototype information in ambiguously-discriminatory situations. It was hypothesized that participants in the interference condition would rate male executors as more sexist than female executors, and that these participants would rate male executors as more sexist than would participants in the no-interference (i.e., control) condition.

Participants and Design

Participants were 214 European-American undergraduate women (ranging in age from 18 to 22 \([M = 19.28]\)) attending a midsized, Midwestern university. They were solicited via the Psychology Department online experiment board from introductory and other psychology classes and were offered a choice of either course extra credit or entry into a gift card drawing for participating. The design was a 2 (prototype status: male
executor vs. female executor) × 2 (working memory condition: interference vs. no-interference) mixed factorial design, with the first factor being within-subjects and the second being between-subjects. Participants were randomly assigned to either the interference or no-interference condition. All participants were treated in accordance with the Ethical Standards of the APA.

Materials, Measures, and Procedures

The materials, measures, and procedures of this study were similar to those of Study 1. As in Study 1, participants were welcomed to the lab by a female experimenter and invited to complete a set of electronically-administered measures (described above). However, in Study 2, each participant was randomly assigned to either a working memory interference condition or a control condition. Participants in the working memory interference condition were asked to complete a computer-based interference task during the scenario portion of the study. Participants in the control condition read and responded to the scenarios without such interference.

The remaining measures (i.e., demographic items and need for cognitive closure) were administered to all participants under normal, uninterrupted testing conditions. The order of the measures and tasks were counterbalanced (with half of the participants completing the written measures prior to the scenario portion and half completing these measures after the scenarios) to help control for potential order effects.

Working memory interference manipulation. To interfere with working memory capacity, an automated sentence span task was created because 1) prior research (e.g., LaPointe & Engle, 1990) suggests that this task is a particularly effective method of
draining one’s cognitive resources and 2) the sentence-presentation format provided the opportunity to combine the interference manipulation with the scenario-reading portion of the study, thereby maintaining virtually-equivalent procedures across experimental and control conditions. The task was programmed in E-Prime 1.1 (Schneider, Eschman, & Zuccolatto, 2002) and run on a Windows XP computer with a 22-inch LCD monitor (resolution set to 1024 × 768 pixels).

Seated at a computer, participants in both conditions were presented with a series of ambiguously-discriminatory scenarios, one at a time, and asked to read and rate each with regard to the presence of sexism. However, whereas in prior studies (and in Study 1) each scenario has been presented as a whole, to be read in its entirety (e.g., Buchianeri & Corning, under review; Corning & Buchianeri, 2010; Krumm & Corning, 2008), in the present study each scenario was presented one sentence at a time, with the participant instructed to read each sentence at her regular pace and then press a button on the keyboard to advance to the next screen and sentence.

Following recommendations forwarded by Kossowska (2007), this experiment was designed within a dual-task framework in which the ambiguous-discrimination scenario evaluations and sentence span task compete with one another for the same cognitive resources. To this end, participants in the interference condition also were instructed to remember the last word in each sentence in each scenario, and were told that they would be asked to list these words at the end of each scenario. This difference between conditions is discussed further in the Discussion. Therefore, participants in the working memory interference condition read and responded to the series of scenarios, one by one, all the while completing the sentence span task. The working memory
interference manipulation, then, was built into the administration of the scenarios, such that each sentence of the scenarios in effect comprised the sentence span task.

In both conditions, during the scenario portion, recall items (see Appendix) were administered to ensure that participants attended to the scenarios. Each participant was presented with a series of five true-false, recall questions after each scenario round (for a total of 45 recall questions). In the working memory interference condition, response patterns (i.e., words listed at the end of each round) on the working memory interference task also were evaluated to determine whether participants fully engaged in the task.

In the working memory interference condition, then, each round consisted of the following sequence of steps. Participants 1) read each scenario, one sentence at a time, knowing that they would be asked to rate the executor’s behavior, answer recall questions, and list the last word in each sentence of the scenario, 2) provided a rating of the executor’s ambiguously-discriminatory behavior, 3) listed as many of the sentences’ last words from the scenario as they could, and 4) responded to the same recall questions that all study participants answered. At the end of each round, participants were presented with a screen announcing the next round and inviting them to press a button on the keyboard to advance to the next round.

In the no-interference control condition, the computer-based working memory interference task was not administered and participants read and responded, uninterrupted, to the scenarios. Therefore, participants in the control condition read and responded to the same scenarios presented in the same fashion as those in the interference condition, and responded to the same recall questions; the critical difference was that, at
the end of each scenario, participants in the control condition immediately completed the recall questions— they were not instructed to list the last word in each sentence of the scenario.

In both conditions, participants advanced through a series of instructional screens, explaining the procedures and clarifying the instructions for each portion of the task. Following the instructional screen, participants in both conditions completed a practice round, during which they were presented with a scenario (see Appendix) that mimicked those presented in the subsequent, substantive portion of the study, and during which they completed the relevant tasks: reading the scenario, rating their level of perceived discrimination in the scenario, answering recall questions and, for those participants in the working memory interference condition, listing the final word in each sentence of the scenario. (Practice-round data were omitted from the analyses.)
Results

Preliminary Analyses

Prior to the main analyses, I conducted an analysis to assess whether participants attended to the scenarios. An ANOVA test of responses to the recall questions revealed that participants in the working memory interference condition, as compared to those in the no-interference control condition, as expected, answered significantly fewer recall questions correctly (respective $M$s = 2.21 and 4.73; $p < .001$).

Main Analyses

The primary hypothesis of this study was that an interaction would be found between executor condition (prototypical [male] or not [female]) and situational condition (working memory interference or not) in the prediction of perceived discrimination. Stated differently, I expected that working memory interference would exacerbate the prototype effect, such that participants in the interference condition would perceive scenarios with male executors as more sexist than scenarios with female executors, and more sexist than would participants in the control condition. Results indicated support, as expected, for the prototype effect: In the full sample, the ambiguous behavior of male executors was perceived as significantly more discriminatory than that of female executors ($F[1, 212] = 3.77, p < .05$; $M$s = 3.74 and 3.58, respectively). However, support for the hypothesized interaction did not emerge: Results of a mixed factorial ANOVA yielded no evidence of an interaction between prototype status and experimental condition, $F(1, 212) = 0.61, p = .43$. 
## Table 3

### Inter-Correlations of Study 2 Variables

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<tr>
<th>Measure</th>
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<th>3</th>
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</tbody>
</table>

**Note:** For all measures, higher scores indicate higher levels of the construct assessed. NFCS = Need for Cognitive Closure Scale; NFCSO = Preference for Order and Structure subscale of NFCS; NFCSP = Preference for Predictability subscale of NFCS; NFCSD = Decisiveness subscale of NFCS; NFCSA = Discomfort with Ambiguity subscale of NFCS; NFCSC = Closed-mindedness subscale of NFCS; MALE = Mean score of male-executor scenario ratings; FEM = Mean score of female-executor scenario ratings.
**TABLE 4**

**INTER-CORRELATIONS OF STUDY 2 VARIABLES BY CONDITION**

<table>
<thead>
<tr>
<th>Measure</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. NFCS</td>
<td>--</td>
<td>.88***</td>
<td>.74***</td>
<td>.41***</td>
<td>.60***</td>
<td>.64***</td>
<td>-.02</td>
<td>.03</td>
</tr>
<tr>
<td>2. NFCSO</td>
<td>.77***</td>
<td>--</td>
<td>.66***</td>
<td>.21*</td>
<td>.45***</td>
<td>.46***</td>
<td>.07</td>
<td>.06</td>
</tr>
<tr>
<td>3. NFCSP</td>
<td>.63***</td>
<td>.44***</td>
<td>--</td>
<td>-.09</td>
<td>.49***</td>
<td>.40***</td>
<td>-.06</td>
<td>.05</td>
</tr>
<tr>
<td>4. NFCSD</td>
<td>.42***</td>
<td>.10</td>
<td>-.08</td>
<td>--</td>
<td>-.05</td>
<td>.24*</td>
<td>.07</td>
<td>-.02</td>
</tr>
<tr>
<td>5. NFCSA</td>
<td>.38***</td>
<td>.16</td>
<td>.22*</td>
<td>-.16</td>
<td>--</td>
<td>.13</td>
<td>-.02</td>
<td>.04</td>
</tr>
<tr>
<td>6. NFCSC</td>
<td>.55***</td>
<td>.26**</td>
<td>.31**</td>
<td>.12</td>
<td>.03</td>
<td>--</td>
<td>.02</td>
<td>-.09</td>
</tr>
<tr>
<td>7. MALE</td>
<td>.14</td>
<td>.08</td>
<td>.05</td>
<td>.08</td>
<td>.21*</td>
<td>.01</td>
<td>--</td>
<td>.25**</td>
</tr>
<tr>
<td>8. FEM</td>
<td>.01</td>
<td>.13</td>
<td>.00</td>
<td>-.08</td>
<td>-.01</td>
<td>-.07</td>
<td>.27**</td>
<td>--</td>
</tr>
</tbody>
</table>

**NOTE:** Correlations for Experimental participants \((n = 107)\) are presented above the diagonal; correlations for Control participants \((n = 107)\) are presented below the diagonal. For all measures, higher scores indicate higher levels of the construct assessed. NFCS = Need for Cognitive Closure Scale; NFCSO = Preference for Order and Structure subscale of NFCS; NFCSP = Preference for Predictability subscale of NFCS; NFCSD = Decisiveness subscale of NFCS; NFCSA = Discomfort with Ambiguity subscale of NFCS; NFCSC = Closed-mindedness subscale of NFCS; MALE = Mean score of male-executor scenario ratings; FEM = Mean score of female-executor scenario ratings.
A power analysis indicated that the study was adequately powered: Power to detect interaction effects in the present design, with alpha set at .05, was calculated at .957. Because .80 is the conventional target, it can be inferred that the present study was sufficiently powered to detect the hypothesized effects.

Follow-up Analyses

Despite the lack of support for the hypothesized interaction, I conducted follow-up $t$-tests to compare executor means within each condition. A paired $t$-test revealed that within the working memory interference condition, male-executed behavior was perceived as more discriminatory than was female-executed behavior – an effect that approached conventional statistical significance, $t(106) = -1.88, p = .06$; Cohen’s $d = -.37$. And although not significant, across-condition comparisons via independent-groups $t$-tests indicated that male-executed behavior assessed in the interference condition was perceived as relatively more discriminatory than both male- and female-executed behavior assessed in the control condition, $t(212) = -.72, p = .47$ (Cohen’s $d = -.10$) and $t(212) = .23, p = .82$ (Cohen’s $d = .03$), respectively. Finally, although there was a main effect of executor sex across conditions supporting the prototype effect, $F(1, 212) = 3.77, p < .05$, counter to our expectations, the prototype effect was not clearly evident within the control condition, $t(106) = -.84; p = .40$, a result that, at least initially, may be surprising given its presence in the overall samples in Study 1 and Study 2, as well as in previous research. In the present study, it appears that the prototype effect is being carried in large part by the experimental manipulation in the working memory interference condition.
Discussion

At first glance, the results of Study 2 do not support the causal relation hypothesized between working memory interference and reliance on prototype information when making attributions of discrimination in ambiguous situations. Indeed, mean scores indicated that participants with whose working memory was interfered did not perceive the behavior of male executors as more discriminatory than did their counterparts in the control condition.

Important to note, however, is the main effect of executor sex that emerged among participants in the working memory interference condition – that is, among those who read and responded to the scenarios while experiencing interference with their working memory. Participants in this condition perceived the behavior of male executors as more discriminatory than they did the same behavior exhibited by female executors; this effect very nearly reached statistical significance.

Thus, there does seem to be at least preliminary evidence that a situational pressure such as interference with working memory may induce closure and cause one to interpret ambiguously-discriminatory situations in a predictable direction – toward attributing bias to people who match the prototype. This is discussed further below.
CHAPTER 4:
GENERAL DISCUSSION

Researchers increasingly have turned their attention to understanding the process of how individuals arrive at their perceptions of discrimination (e.g., Baron, Burgess, & Kao, 1991; Bucchianeri & Corning, under review; Corning & Bucchianeri, 2010; Dovidio, et al., 2005; Inman & Baron, 1996; Inman, Huerta, & Oh, 1998; Krumm & Corning, 2008). I attempted to approach the present questions through an integration of the literature on cognitive heuristics with the motivated social cognition perspective and to investigate a potentially more parsimonious explanation of the need for closure’s moderation of the prototype effect in the perception of discrimination.

Summary of Results

In the present studies, several primary findings emerged. First, contrary to expectations, low levels of overall working memory capacity were uncorrelated with high levels of need for cognitive closure. High levels of need for cognitive closure also were uncorrelated with low levels of the more specific verbal working memory capacity or spatial working memory capacity.

Second, contrary to hypotheses, high scores on the Decisiveness subscale of the NFCS were uncorrelated with low levels of working memory; and, third, high scores on each of the remaining NFCS subscales—Closed-mindedness, Preference for Structure and Order, Preference for Predictability, and Discomfort with Ambiguity—were uncorrelated with low levels of overall working memory capacity.
Fourth, consistent with prior work, clear evidence of the prototype effect emerged in Study 1 and in the working memory interference condition of Study 2: The ambiguous behavior of male executors was perceived as significantly more discriminatory than that of female executors. However, the prototype effect did not emerge within the control condition of Study 2—a fact that is surprising but also not wholly unexpected given prior findings (e.g., Bucchianeri & Corning, under review), discussed below.

Fifth, the expected and well-documented interaction between executor sex and need for cognitive closure did not emerge, suggesting, perhaps, that the moderating role of need for cognitive closure is not as robust as previously hypothesized.

Sixth, contrary to its hypothesized relation to working memory capacity (as both are thought to reflect *ability* rather than *need*), the Decisiveness subscale of the NFCS did not emerge as a moderator of the prototype effect.

Seventh, the prototype effect in the perception of discrimination was neither moderated by overall working memory capacity nor by spatial working memory capacity.

Eighth, verbal working memory capacity did emerge as a significant moderator of the prototype effect in the perception of discrimination; however, contrary to the hypothesis, the direction of this interaction was such that individuals high in verbal working memory capacity actually were more reliant on prototypes. Thus, as verbal working memory capacity increased, so too did perceptions of discrimination in the male-executed scenarios, as compared to female-executed scenarios.

Ninth, contrary to hypotheses, situational interference with working memory (via an automated sentence span task) did not exacerbate the prototype effect in the perception of discrimination.
Tenth, despite the lack of support for the hypothesized interaction between working memory interference condition and executor sex, results suggested that within the working memory interference condition, male-executed behavior was perceived as more discriminatory than was female-executed behavior—an effect that approached conventional statistical significance.

Finally, although there was a main effect of executor sex across conditions supporting the prototype effect, counter to expectations, the prototype effect was not clearly evident within the control condition. Therefore, it appears that the prototype effect was being carried in large part by the experimental manipulation in the working memory interference condition.

Theoretical and Practical Implications

The results of these studies have a number of theoretical and practical implications. First, the presence of the prototype effect in Study 1 and in the working memory interference condition of Study 2, but not in the control condition of Study 2 is somewhat surprising given its well-documented presence in the literature (e.g., Baron, Burgess, & Kao, 1991; Barreto & Ellemers, 2005; Bucchianeri & Corning, under review; Corning & Bucchianeri, 2010 [Studies 1, 2, and 4]; Flouroy, Prentice-Dunn, & Klinger, 2002; Inman & Baron, 1996; Inman, Huerta, & Oh, 1998; Krumm & Corning, 2008; Marti, Bobier, & Baron, 2000; Morera, Dupont, Leyens, & Desert, 2004). Beyond the possibility of publication bias (i.e., via the file drawer effect [Rosenthal, 1979]), it also is reasonable to speculate that the lack of replication of the prototype effect in the control condition in Study 2 may be attributable to inherent, expected variability across studies.
That is, statistically, finding a significant effect in 3 out of 4 studies is about what one would expect under even close to ideal conditions, in which power is set at recommended levels of .80. Indeed, at least one study (Bucchianeri & Corning, under review [Study 3]) resulted in this same lack of a prototype effect. Noteworthy, too, is that the prototype effect failed to emerge there, even under control condition administration procedures identical to those used in the other three studies. In this regard, the present study differs; in Study 2, I employed a different method of delivery than anyone previously has, displaying scenarios one sentence at a time on a computer screen. Although these procedures were designed to be equivalent to the usual method of administration (i.e., each scenario presented in its entirety at once), and although the pacing of the scenario presentation was driven by the participant, it is possible that reading the scenarios in this new way interfered with the usual process of reading and making judgments about their content.

Second, contrary to hypotheses, the need for cognitive closure did not moderate the prototype effect in the perception of discrimination in Study 1, as it has in past studies (e.g., Bucchianeri & Corning, under review; Corning & Bucchianeri, 2010). Based on this past work, we would expect to see an exacerbation of the prototype effect due to need for cognitive closure’s moderation, such that male executors clearly are rated as more discriminatory at higher levels of need for cognitive closure, as compared to ratings of female executors, and as compared to individuals low in need for cognitive closure. That this effect did not emerge in the present studies is surprising, and raises questions about the robustness of the moderating role of need for cognitive closure. The file drawer effect (Rosenthal, 1979) is one possible explanation for the lack of effect in Study 1, as it
certainly is plausible that other researchers have tested need for closure’s role as a moderator and yielded no supporting evidence. Another possible explanation centers on the utility of the measure used, the NFCS. This measure has been criticized for its potentially questionable factor structure as well as its theoretical foundation (Mannetti et al., 2002; Neuberg, Judice, & West, 1997; Roets & Van Hiel, 2007; Roets, Van Hiel, & Corenelis, 2006; discussed further below) and thus may yield inconsistent results with regard to need for cognitive closure’s moderation of the prototype effect. It may be the case, therefore, that the interaction effect found in previous studies (e.g., Bucchianeri & Corning, under review; Corning & Bucchianeri, 2010) simply is not a robust effect. It may, for example, be prone to fluctuations based on situational factors or method of administration or other study features. It seems, then, that need for cognitive closure requires much closer scrutiny before it can be concluded with confidence that this construct is a reliable moderator of the prototype effect.

Third, overall working memory, as well as subcomponents of working memory (i.e., spatial and verbal) were not related to need for cognitive closure as measured by the NFCS. Working memory has been defined as the ability to maintain and subsequently use information in the coordination and control of high-order cognitive processes (Baddeley & Hitch, 1974); working memory capacity, then, might be conceptualized as the ability to maintain, and later use, information in the face of distraction. It seems plausible, then, that working memory capacity and need for cognitive closure would be related, as individuals low in need for cognitive closure tend to be able to defer judgments or decision-making even in the face of distraction. However, that a relation between working memory and need for cognitive closure did not emerge raises questions
about this hypothesis. One potential answer lies in the assumptions behind each construct. Whereas working memory points clearly to an ability to hold—and later use—information in the face of distraction, it is not clear that need for cognitive closure is tapping this ability as much as a subjective need to defer judgment and decision-making. These constructs, then, may reflect distinct processes that are not correlated in practice. Another possibility is that the particular measure used to assess need for cognitive closure, the NFCS, may have prevented any actual relation with working memory from emerging. Although it is the only known measure of need for cognitive closure, the NFCS, as stated above, has been criticized regarding inconsistencies in its factor structure across studies. It perhaps is not as sound a measurement tool as is needed to capture any potential relation with working memory.

Fourth, verbal working memory capacity did moderate the prototype effect, but in a fashion that is in direction opposition to what was expected. Specifically, high levels of verbal working memory were related to greater reliance on prototypes. This finding highlights the importance of clarifying whether need for cognitive closure and working memory capacity can or should be considered equivalent moderators of the prototype effect. Results of past work (e.g., Bucchianeri & Corning, under review; Corning & Bucchianeri, 2010) suggest that the need for cognitive closure can moderate the prototype effect in the perception of discrimination, although in Study 1 of this paper it did not. It is possible that positioning working memory capacity (an ability) in the same moderating role as need for cognitive closure (a subjective need) ultimately is not conceptually sound, as need and ability are two distinct concepts. Treating these two constructs as equivalent moderators of the prototype effect may have far-reaching implications,
including issues of measurement and consistency in the literature. Regarding measurement, whereas individual differences in need for cognitive closure typically are conceptualized as a trait-level construct and assessed using the NFCS, working memory capacity is assessed as a trait-level construct but conceptualized as potentially dynamic over time. This difference is reflected by the high temporal stability ratings of the NFCS (Webster & Kruglanski, 1994), as compared to recent evidence suggesting working memory capacity can be developed through training (e.g., Buschkuehl et al., 2008). It seems reasonable, then, to assume that whereas need for cognitive closure and working memory capacity may be theoretically related, in practice they are conceptually different. Related, if need for cognitive closure and working memory capacity are not equivalent in terms of their stability over time, it is plausible to expect that inconsistencies in interaction effects will continue to emerge, should these be used interchangeably.

Finally, the situational manipulation of working memory (via an automated sentence span task) did not enhance the prototype effect, although the effect did appear to be in the expected direction and approaching significance. Exacerbation of the prototype effect via situational interference with working memory seemed reasonable to hypothesize, and such a relation between need for cognitive closure and working memory could have the potential to provide new interpretations of the documented effects of environmental noise and time pressure on prototype reliance in the perception of discrimination (Bucchianeri & Corning, under review). Specifically, it seems that if an individual is particularly adept at maintaining information in the face of distraction, then when asked to make a decision about an ambiguous situation, he or she would have relatively little use for the heuristic information prototypes provide. In contrast, an
individual who is relatively less adept at maintaining information when distracted might be more likely to make use of his or her prototypes and jump quickly to the first available answer. It is possible, therefore, that interference with one’s working memory capacity is what is responsible for the exacerbation of the prototype effect as observed in prior studies. That this primary hypothesis did not bear out in Study 2 is surprising, although there are potential explanations for this. These are offered below.

Limitations and Future Directions

Limitations of the present work provide opportunities for theoretical discussion and provide guidance for future work in this area. First, measurement of need for cognitive closure in the present studies was constrained to the NFCS which, despite its use in prior investigations of the prototype effect and perceived discrimination (Bucchaneri & Corning, under review; Corning & Bucchaneri, 2010), has come under criticism in recent years regarding its psychometric properties and theoretical underpinnings. Given the questions surrounding this measure, future examinations of need for cognitive closure may benefit from a shift from trait-level need for cognitive closure toward an emphasis on conceptualization of the construct as situationally-manipulable because this may increase ease of measurement.

Second, as previously discussed, the positioning of need for cognitive closure and working memory capacity in the present studies as conceptually equivalent may have negative implications for consistent measurement of any resulting effects. Researchers conducting work in need for cognitive closure and working memory capacity are
encouraged to carefully consider the question of *ability* versus *need*, as these constructs likely reflect conceptually different processes.

Third, the method of scenario administration in Study 2 differed from the method used in previous studies (e.g., Bucchianeri & Corning, under review; Corning & Bucchianeri, 2010; Krumm & Corning, 2008); participants read the scenarios one sentence at a time, whereas in previous studies they read each scenario in its entirety. The altered method may have influenced participants’ ability to absorb and make judgments about the ambiguous-discrimination information in the same way that they would under the previously-used scenario administration conditions. It may be preferable in future studies to employ the original method of scenario administration (i.e., each scenario presented in its entirety) and interfere with working memory via a separate task (rather than combining the scenario administration and interference manipulation into one task).

Finally, the lack of exacerbation of the prototype effect via working memory interference in Study 2 raises questions about the interference manipulation used in this study. Based on prior work suggesting that a sentence span task is a particularly effective method of draining one’s cognitive resources (e.g., La Pointe & Engle, 1990), the working memory interference manipulation used in Study 2 required that participants in this condition read and make judgments about each scenario while simultaneously retaining the last word in each sentence of that scenario. Although this seemed to be a reasonable choice of manipulation task, a preliminary analysis of responses to the recall questions revealed that participants in the working memory interference condition, as compared to those in the no-interference control condition, answered significantly fewer
recall questions correctly; whereas this was an expected result, based on this group difference it is possible that the working memory interference task simply made it too difficult for participants in the interference condition to attend sufficiently to the content of the scenarios.

The fact that the main effect of executor sex within the interference condition of Study 2 (with male executors perceived as more discriminatory than female executors) closely approached significance suggests that this effect may emerge more fully given the appropriate interference manipulation. Prior work has demonstrated that cognitive load can induce stereotype use (Macrae, Milne, & Bodenhausen, 1994; also see Kruglanski & Chun, 2008, for a review) and prototype reliance when evaluating instances of potential discrimination (Marti, Bobier, & Baron, 2000). Perhaps selection of an interference task that heightens cognitive load without interfering with scenario comprehension would yield the interaction effect that was hypothesized (and nearly emerged) in Study 2. Future studies, then, may be enhanced by more careful task selection and iterative piloting rounds to assess for both cognitive load and content comprehension.

Conclusions

Prior research has shown that when perceiving instances of ambiguously-discriminatory behavior, people take into account characteristics of the executor of the behavior, and also that certain personality traits of the perceivers as well as certain conditions of the environment influence judgments. One particular construct that has been shown to moderate perceptions of discrimination is the need for cognitive closure. Whereas empirical evidence supports the operation of this factor in the perception of
discrimination (i.e., heightening one’s tendency toward prototype use), there also is cause for criticism of this construct. The purpose of the studies presented here was to test whether a more basic and parsimonious explanation, situational interference with working memory, may account for previous studies’ results regarding prototype use in the perception of discrimination. Results provided mixed support for this hypothesis. Contrary to hypotheses, Study 1 demonstrated that prototype reliance in the perception of discrimination was associated with higher levels of verbal working memory capacity. Study 2 did not support the hypothesized exacerbation of the prototype effect by interference with working memory, but provided initial evidence in support of this effect via a near-significant prototype main effect within the working memory interference condition. Based on the findings that emerged in the present studies, as well as the limitations discussed here, future work in this area likely will benefit from improved assessment of the need for cognitive closure construct, careful consideration of the conceptual relation between the need for cognitive closure and working memory capacity constructs, and the choice of working memory interference tasks.
Informed Consent Form

Informed Consent to Participate in Research
2009-2010
Please Read Carefully

We are researchers in the Department of Psychology at the University of Notre Dame. Ms. Michaela M. Bucchianeri, the primary investigator, is a graduate assistant, and Dr. Alexandra F. Corning is a faculty member in the Department. The purpose of this study is to learn about individual thoughts and opinions. Important in this study are your personal perspectives and opinions; there are no right or wrong answers.

Procedures. The procedures of this study entail completing a set of questionnaires as well as a computer-based activity.

Benefits and Risks. The potential benefits to you of participating in this study include gaining greater insight into how psychologists conduct research. The researchers are happy to talk with you after completion of the study about any aspect of it that interests you. Additionally, you will receive 1 extra credit point in your psychology course for your participation. Researchers also are obligated to discuss with participants in advance any risks, if they exist, to participants; we see no foreseeable to risks to participating in this study.

Voluntary Participation. Participation in the study is completely voluntary. You may stop participating at any time, including bypassing items or discontinuing participation, with no penalty, negative consequence, loss of benefit, or effect on your relationship with the University. You must be at least 18 years of age to participate.

Confidentiality. Your responses in this study will be kept private. Additionally, if you choose to participate, we ask that after you read this Informed Consent form that you provide your understanding of and agreement with it by signing below. You should know as well that the individual data of the study will be kept completely confidential and that any published summaries of this study will refer only to the aggregated (grouped) data.

If you have any questions, comments, or concerns related to this study, we welcome and encourage you to contact one or both of us before, during, or after the study.

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574.631-9928

I have read and understand the above Informed Consent, agree to participate in this study, and am at least 18 years of age.

________________________________________________________________________ ___________________________________________________________________
Signature Date
Debriefing Form

Debriefing Statement

2009-2010

The principal investigators of this study are researchers in the Department of Psychology at the University of Notre Dame. We are pleased you decided to participate in this study and are happy to talk with you about any aspect of it that interests you. Please feel free to use the information below to contact one or both researchers with any questions, concerns, or feedback that you may want to share.

Your participation involved completing a set of measures and reading and, in some cases, responding to a series of scenarios. We are interested in a number of personality and situational variables, and how people perceive and respond to the scenarios, based on these variables.

We want to remind you that your individual responses to the study are anonymous and will be kept private and confidential. Any published summaries of this study will refer only to the aggregated (grouped) data. If you, yourself, would like to request a copy of the results (in aggregated form) once they become available, just contact one of us.

Finally, we must ask you to be sure to refrain from discussing your experiences with and responses to this study with anyone. We are interested in each individual’s personal opinion. Sharing information about the study with others such as friends and classmates will bias their expectations and responses, thereby nullifying our results. Therefore, we rely on, and thank you in advance, for your respect for our work.

Once again, we thank you for your participation. If you have any questions, comments or concerns regarding this study, we welcome and encourage you to contact one or both of us at any time.

Principal Researchers/Contact Persons

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Demographic Items

Background Information

1. What year are you?
   1 First-Year    2 Sophomore    3 Junior    4 Senior    5 Other

2. What is your race/ethnicity? (circle all that apply)
   1. African American
   2. Asian American
   3. Hispanic/Latino
   4. Native American
   5. European American/White Non-Hispanic
   6. Other, specify: ________________

3. How old are you? _______
# The Marlowe-Crowne Social Desirability Scale

**Instructions.** Listed below are a number of statements concerning personal attitudes and traits.

<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Before voting, I thoroughly investigate the qualifications of all the candidates.</td>
<td>T</td>
<td>F</td>
<td></td>
</tr>
<tr>
<td>2. I never hesitate to go out of my way to help someone in trouble.</td>
<td>T</td>
<td>F</td>
<td></td>
</tr>
<tr>
<td>3. It is sometimes hard for me to go on with my work if I am not encouraged.</td>
<td>T</td>
<td>F</td>
<td></td>
</tr>
<tr>
<td>4. I have never intensely disliked anyone.</td>
<td>T</td>
<td>F</td>
<td></td>
</tr>
<tr>
<td>5. On occasion, I have had doubts about my ability to succeed in life.</td>
<td>T</td>
<td>F</td>
<td></td>
</tr>
<tr>
<td>6. I sometimes feel resentful when I don't get my way.</td>
<td>T</td>
<td>F</td>
<td></td>
</tr>
<tr>
<td>7. I am always careful about my manner of dress.</td>
<td>T</td>
<td>F</td>
<td></td>
</tr>
<tr>
<td>8. My table manners at home are as good as when I eat out in a restaurant.</td>
<td>T</td>
<td>F</td>
<td></td>
</tr>
<tr>
<td>9. If I could get into a movie without paying and be sure I was not seen, I would probably do it.</td>
<td>T</td>
<td>F</td>
<td></td>
</tr>
<tr>
<td>10. On a few occasions, I have given up doing something because I thought too little of my ability.</td>
<td>T</td>
<td>F</td>
<td></td>
</tr>
<tr>
<td>11. I like to gossip at times.</td>
<td>T</td>
<td>F</td>
<td></td>
</tr>
<tr>
<td>12. There have been times when I felt like rebelling against people in authority even though I knew they were right.</td>
<td>T</td>
<td>F</td>
<td></td>
</tr>
<tr>
<td>13. No matter who I'm talking to, I'm always a good listener.</td>
<td>T</td>
<td>F</td>
<td></td>
</tr>
<tr>
<td>14. I can remember “playing sick” to get out of something.</td>
<td>T</td>
<td>F</td>
<td></td>
</tr>
<tr>
<td>15. There have been occasions when I took advantage of someone.</td>
<td>T</td>
<td>F</td>
<td></td>
</tr>
<tr>
<td>16. I'm always willing to admit it when I make a mistake.</td>
<td>T</td>
<td>F</td>
<td></td>
</tr>
<tr>
<td>17. I always try to practice what I preach.</td>
<td>T</td>
<td>F</td>
<td></td>
</tr>
<tr>
<td>18. I don't find it particularly difficult to get along with loud-mouthed, obnoxious people.</td>
<td>T</td>
<td>F</td>
<td></td>
</tr>
<tr>
<td>19. I sometimes try to get even, rather than forgive and forget.</td>
<td>T</td>
<td>F</td>
<td></td>
</tr>
<tr>
<td>20. When I don't know something, I don't at all mind admitting it.</td>
<td>T</td>
<td>F</td>
<td></td>
</tr>
<tr>
<td>21. I am always courteous, even to people who are disagreeable.</td>
<td>T</td>
<td>F</td>
<td></td>
</tr>
<tr>
<td>22. At times, I have really insisted on having things my own way.</td>
<td>T</td>
<td>F</td>
<td></td>
</tr>
<tr>
<td>23. There have been occasions when I felt like smashing things.</td>
<td>T</td>
<td>F</td>
<td></td>
</tr>
<tr>
<td>24. I would never think of letting someone else be punished for my wrongdoings.</td>
<td>T</td>
<td>F</td>
<td></td>
</tr>
<tr>
<td>25. I never resent being asked to return a favor.</td>
<td>T</td>
<td>F</td>
<td></td>
</tr>
<tr>
<td>26. I have never been irked when people expressed ideas very different from my own.</td>
<td>T</td>
<td>F</td>
<td></td>
</tr>
<tr>
<td>27. I never make a long trip without checking the safety of my car.</td>
<td>T</td>
<td>F</td>
<td></td>
</tr>
<tr>
<td>28. There have been times when I was quite jealous of the good fortune of others.</td>
<td>T</td>
<td>F</td>
<td></td>
</tr>
<tr>
<td>29. I have almost never felt the urge to tell someone off.</td>
<td>T</td>
<td>F</td>
<td></td>
</tr>
<tr>
<td>30. I am sometimes irritated by people who ask favors of me.</td>
<td>T</td>
<td>F</td>
<td></td>
</tr>
<tr>
<td>31. I have never felt that I was punished without cause.</td>
<td>T</td>
<td>F</td>
<td></td>
</tr>
<tr>
<td>32. I sometimes think when people have a misfortune they only got what they deserved.</td>
<td>T</td>
<td>F</td>
<td></td>
</tr>
<tr>
<td>33. I have never deliberately said something that hurt someone's feelings.</td>
<td>T</td>
<td>F</td>
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</tbody>
</table>
Personal Attributes Questionnaire

The items below inquire about what kind of person you think you are. Each item consists of a pair of characteristics, with the letters A-E in between. For example:

    Not at all Artistic A.....B.....C.....D.....E Very Artistic

Each pair describes contradictory characteristics---that is, you cannot be both at the same time, such as very artistic and not at all artistic.

The letters form a scale between the two extremes. You are to choose a letter which describes where you fall on the scale. For example, if you think you have no artistic ability, you would choose A. If you think you are pretty good, you might choose D. If you are only medium, you might choose C, and so forth.

<table>
<thead>
<tr>
<th></th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Not at all aggressive</td>
<td>○ ○ ○ ○ ○ Very aggressive</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>2. Not at all Independent</td>
<td>○ ○ ○ ○ ○ Very independent</td>
<td></td>
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<tr>
<td>3. Not at all emotional</td>
<td>○ ○ ○ ○ ○ Very emotional</td>
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<tr>
<td>4. Very submissive</td>
<td>○ ○ ○ ○ ○ Very dominant</td>
<td></td>
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<tr>
<td>5. Not at all excitable in a major crisis</td>
<td>○ ○ ○ ○ ○ Very excitable in a major crisis</td>
<td></td>
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<tr>
<td>6. Very passive</td>
<td>○ ○ ○ ○ ○ Very active</td>
<td></td>
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</tr>
<tr>
<td>7. Not at all able to devote self completely to others</td>
<td>○ ○ ○ ○ ○ Able to devote self completely to others</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>8. Very rough</td>
<td>○ ○ ○ ○ ○ Very gentle</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>9. Not at all helpful to others</td>
<td>○ ○ ○ ○ ○ Very helpful to others</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10. Not at all competitive</td>
<td>○ ○ ○ ○ ○ Very competitive</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>11. Very home oriented</td>
<td>○ ○ ○ ○ ○ Very worldly</td>
<td></td>
<td></td>
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<tr>
<td>12. Not at all kind</td>
<td>○ ○ ○ ○ ○ Very kind</td>
<td></td>
<td></td>
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<tr>
<td>13. Indifferent to others approval</td>
<td>○ ○ ○ ○ ○ Highly needful of others approval</td>
<td></td>
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<tr>
<td>14. Feelings not easily hurt</td>
<td>○ ○ ○ ○ ○ Feelings easily hurt</td>
<td></td>
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<td></td>
<td></td>
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<tr>
<td>15. Not at all aware of feelings of others</td>
<td>○ ○ ○ ○ ○ Very aware of feelings of others</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>16. Can make decisions easily</td>
<td>○ ○ ○ ○ ○ Has difficulty making decisions</td>
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<tr>
<td>17. Gives up very easily</td>
<td>○ ○ ○ ○ ○ Never gives up easily</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>18. Never cries</td>
<td>○ ○ ○ ○ ○ Cries very easily</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>19. Not at all self-confident</td>
<td>○ ○ ○ ○ ○ Very self-confident</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>20. Feels very inferior</td>
<td>○ ○ ○ ○ ○ Feels superior</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>21. Not at all understanding of others</td>
<td>○ ○ ○ ○ ○ Very understanding of others</td>
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</tbody>
</table>
**Need for Cognitive Closure Scale Items**

(Asterisk denotes reverse-scored item; Decisiveness subscale items are italicized)

1. I think that having clear rules and order at work is essential for success.
2. Even after I’ve made up my mind about something, I am always eager to consider a different option.
3. I don’t like situations that are uncertain.
4. I dislike questions which could be answered in many different ways.
5. I like to have friends who are unpredictable.
6. I find that a well ordered life with regular hours suits my temperament.
7. When dining out, I like to go to places where I have been before so that I know what to expect.
8. I feel uncomfortable when I don’t understand the reason why an event occurred in my life.
9. I feel irritated when one person disagrees with what everyone else in a group believes.
10. I hate to change my plans at the last minute.
11. I don’t like to go into a situation without knowing what I can expect from it.
12. *When I go shopping, I have difficulty deciding exactly what it is that I want.*
13. When faced with a problem I usually see the one best solution very quickly.
14. When I am confused about an important issue, I feel very upset.
15. *I tend to put off making important decisions until the last possible moment.*
16. I usually make important decisions quickly and confidently.
17. *I would describe myself as indecisive.*
18. I think it is fun to change my plans at the last moment.
19. I enjoy the uncertainty of going into a new situation without knowing what might happen.
20. My personal space is usually messy and disorganized.
21. In most social conflicts, I can easily see which side is right and which side is wrong.
22. *I tend to struggle with most decisions.*
23. I believe that orderliness and organization are among the most important characteristics of a good student.
24. *When considering most conflict situations, I can usually see how both sides could be right.*
25. I don’t like to be with people who are capable of unexpected actions.
26. I prefer to socialize with familiar friends because I know what to expect from them.
27. *I think that I would learn best in a class that lacks clearly stated objectives and requirements.*
28. When thinking about a problem, I consider as many different opinions on the issue as possible.
29. I like to know what people are thinking all the time.
30. I dislike it when a person’s statement could mean many different things.
31. It’s annoying to listen to someone who cannot seem to make up his or her mind.
32. I find that establishing a consistent routine enables me to enjoy life more.
33. I enjoy having a clear and structured mode of life.
34. *I prefer interacting with people whose opinions are very different from my own.*
35. I like to have a place for everything and everything in its place.
36. I feel uncomfortable when someone’s meaning or intention is unclear to me.
37. *When trying to solve a problem I often see so many possible options that it’s confusing.*
38. I always see many possible solutions to problems I face.
39. I’d rather know bad news than stay in a state of uncertainty.
40. I do not usually consult many different opinions before forming my own view.
41. I dislike unpredictable situations.
42. *I dislike the routine aspects of my work (studies).*
Ambiguously-Sexist Scenarios

Practice Scenario

**Scenario 0.** You walk into your first weightlifting class five minutes late and take a seat next to the only other female student in the room. The instructor, Mr/s. Jones, announces that there are only three days left in which to switch to another gym course if anyone is interested in doing so. At the end of the class session as you are preparing to leave, Mr/s. Jones approaches you and asks if you are thinking of switching to the tennis class that is offered at the same time.

Distracter Scenarios

**Scenario A.** You and your brother are having lunch at an upscale restaurant. You both order the same salad. When you order, the server asks if you would like the half- or full-sized portion. You answer, and then the server turns and leaves your table.

**Scenario B.** You and your brother are attending a distant relative's funeral. As you sit down next to him to listen to the eulogy, the person sitting in the row behind you hands you a tissue and says, "Just in case."

**Scenario C.** While house-sitting for your brother, you answer the phone to be greeted by a telemarketer. The representative begins to pitch a special offer for a table saw, then pauses to apologize for mistaking what product was on special that week. You then hear a description for the latest deal on a gardening kit.

Substantive Scenarios

**Scenario D.** You and a male peer are hired for the same position at the university library. Neither of you has any prior experience and you are very similarly matched on general job skills, GPA, and people skills. When you compare salaries, you learn that he has been given 25 cents more per hour than you have. When you ask the head librarian, Linda/Mark, for a reason for the difference in salaries, s/he explains that your male peer was willing to do the lifting and high climbing that is needed when sorting and shelving books, and you were not.

**Scenario E.** You overhear your friend Elizabeth/James tell her/his brother s/he’s proud of him for being able to date two girls at one time. You later ask Elizabeth/James for advice about whether to accept a date offered by a guy in your class. S/he responds, “Aren’t you already dating someone else?” You explain that you have casually dated another guy over the past few weeks, but that it is understood that the two of you do not have a commitment. S/he says, “I don’t really know if it’s a good idea.”

**Scenario F.** You accept a new job with a company. You begin to develop a mutually pursued dating relationship with a colleague already at the firm. When your boss, Jennifer/Robert, finds out that you have been dating, s/he informs you both that dating co-workers is against office policy. S/He states that one of you must leave the company, and you are let go. Your male colleague is allowed to keep his job.
Ambiguously-Sexist Scenarios (contd.)

**Scenario G.** You are in a conference room filled with men and women waiting to be called into an interview. When it is your turn, you are invited into another room and the interview begins. During the interview, the interviewer, Lisa/William, comments on the ring located on your left hand. When you say it is your engagement ring, s/he begins to talk about how busy life can get all of a sudden and that it is really hard balancing a career and a family.

**Scenario H.** You arrive at a university office to start your work-study job. You introduce yourself to the secretary, Karen/David, and s/he greets you warmly. S/He says, “They said they were sending a male student. I have quite a few heavy things that need to be done. Anyway, I’m so glad you are here to help. For example, there are pictures in the back room that still need to be hung in the hallways and all those books need to be moved to the storage room. Why don’t you get started on doing those things?”

**Scenario I.** Your brother and you are attending a church service event where there are numerous projects in progress. Your brother and you decide to help with the restoration of tile in the church kitchen. As you go to join the group already working there, you are stopped by the coordinator, Nancy/Thomas. S/He hands your brother the tools needed to help with the tile, and encourages each of you to work on whatever project interests you the most.
Comprehension Questions

Scenario 0

1. True/False: You arrived early to your first class.
2. True/False: You sat next to a male student.
3. True/False: You are in a weightlifting class.
4. True/False: There are 5 days left in which to switch into another class.
5. True/False: The teacher asks if you are thinking of switching to the swimming class.

Scenario A

1. True/False: This scenario took place at an upscale restaurant.
2. True/False: You were eating a meal with your sister.
3. True/False: The server asks both you and your brother if you want the half- or full-sized portion.
4. True/False: You ordered steak and salad.
5. True/False: You were eating lunch at the restaurant.

Scenario B

1. True/False: You are attending a wedding.
2. True/False: You were attending a distant relative’s funeral.
3. True/False: You were handed a tissue.
4. True/False: You were sitting in the last row.
5. True/False: You are with your cousin.

Scenario C

1. True/False: You received a phone call while sitting in your own apartment.
2. True/False: You answered the phone and were greeted by a neighbor.
3. True/False: The telemarketer pitched the Special of the Month.
4. True/False: The telemarketer first pitched a special offer for a table saw.
5. True/False: The second deal pitched was for a cooking kit.

Scenario D

1. True/False: You and your peer have similar job skills.
2. True/False: Your peer has worked in a library before.
3. True/False: Your peer was willing to do the high climbing needed for shelving.
4. True/False: You have worked at the university library in the past.
5. True/False: Your peer has a significantly higher GPA.
Comprehension Questions (contd.)

Scenario E

1. True/False: In this scenario you asked for advice about a job.
2. True/False: You are in the midst of a long-distance relationship.
3. True/False: Your friend has a brother.
4. True/False: Your friend’s brother is dating more than one person.
5. True/False: You were advised not to go on a date with the guy in your class.

Scenario F

1. True/False: In this scenario, you start a new job.
2. True/False: Your colleague was let go.
3. True/False: It is against office policy to date a co-worker.
4. True/False: You were dating a colleague.
5. True/False: This scenario clearly takes place at a company picnic.

Scenario G

1. True/False: This scenario depicted a job interview.
2. True/False: There are others waiting with you for interviews.
3. True/False: The interviewer says it is hard balancing a career and a hobby.
4. True/False: You are wearing an engagement ring.
5. True/False: The interview takes place in the conference room.

Scenario H

1. True/False: The job in this scenario involves waiting tables.
2. True/False: A clock needs to be hung in the hallway.
3. True/False: You were greeted warmly.
4. True/False: The books need to be moved to the hallway.
5. True/False: You were greeted by the librarian.

Scenario I

1. True/False: This scenario depicted a church service event.
2. True/False: You are attending the event alone.
3. True/False: You were the first ones to arrive.
4. True/False: The kitchen needs its tile restored.
5. True/False: You were handed a hammer.


