

HOW INTERACTIONS WITH SEXIST MEN
CAN UNDERMINE WOMEN'S PERFORMANCE IN ENGINEERING AND MATHEMATICS

by
Christine Logel

A thesis
presented to the University of Waterloo
in fulfillment of the
thesis requirement for the degree of
Doctor of Philosophy
in
Psychology

Waterloo, Ontario, Canada, 2008

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Abstract

The present research examined how interactions with sexist men can trigger stereotype threat among women, undermining their engineering and mathematical performance. Chapter 1 provides an overview of the literatures on sexism and on stereotype threat. Chapter 2 validates a subtle sentence completion measure of sexism. In Chapter 3, male engineering students who scored highly on this sexism measure behaved in a dominant and sexually interested way towards an ostensible female classmate. In Chapter 4, female engineering students who interacted with such sexist men, or with confederates trained to behave in the same way, performed worse on an engineering test than women who interacted with nonsexist men. Chapter 5 conceptually replicated this finding and showed that women's underperformance did not extend to an English test, an area in which women are not negatively stereotyped. Furthermore, interacting with sexist men lead women to suppress concerns about gender stereotypes, an established mechanism of stereotype threat. Chapter 6 discusses the implications for stereotype threat and for addressing barriers to women's performance at school and in the workplace.

Acknowledgments

I am grateful for the financial support from the Social Sciences and Humanities Research Council of Canada, the Ontario Graduate Scholarship program, and the University of Waterloo.

I would like to thank the Social Division professors for being role models, especially (in alphabetical order) John Holmes, Joanne Wood, and Mark Zanna for their advice and support during our collaborations. I could not possibly capture, in so few lines, my appreciation for my advisor, Steve Spencer, for his endless patience teaching me to analyze data, write, present, and for his encouragement in all other areas as well--so I will not even try.

I could not have completed this project without a dedicated and conscientious team of undergraduate Research Assistants (Jennifer Butcher, Sarah Chatland, Mandy Hogle, Stephanie Koegler, Bjanka Pokorny, Jacqui Robinson, Minella Rodrigues, Lindsay Schaefer and Rachel Spiece) and without my friends and collaborators (Jessica Cameron, Sonya Dal Cin, Danielle Gaucher, Denise Marigold, Jennifer Peach, Danu Stinson and Greg Walton).

Finally, thanks and much love to the Robinsons for creating a family atmosphere that supported continuous learning and for being my cheerleaders through eleven years of higher education, and to Ray and Ally for giving me a life outside of school.

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CHAPTER 1: INTRODUCTION

When two people interact, they engage in a complex process of social perception. In addition to attending to the discussion or the task that is the overt focus of their interaction, each person is likely to be making judgments about their interaction partner, and attempting to determine the judgments their interaction partner is making about them. In interactions between men and women, this process is even more complex, because of gender roles, the potential for sexual attraction, and, most relevant to the present research, the potential to use, or be judged by, gender stereotypes.

Gender stereotypes may be of particular concern during interactions that take place in domains in which these stereotypes could be applied, such as engineering and mathematics, in which women's competence is negatively stereotyped. I suggest that some men may indeed view women as less competent in these fields than men, and that this sexist belief may be revealed in subtle ways when they interact with women. Women, in turn, may determine that they are at risk of being negatively stereotyped, and this may have negative consequences for their ability to succeed in the domain.

Fewer people today than in past generations are willing to endorse old-fashioned, explicitly sexist beliefs (Swim, Aikin, Hall, & Hunter, 1999). However, individual differences in sexist beliefs still exist, for example in the extent to which people deny that women are discriminated against (Swim et al., 1999). Interestingly, however, little research has actually examined whether men with different levels of sexism actually behave differently towards women. It seems plausible that they would--one study found that more sexist men use more sexist language than less sexist men (Swim, Mallet, & Stangor, 2004); another found that they rate other men's behaviours, such as making unwanted sexual advances, as less sexist (Swim, Mallett, Russo-Devosa, & Stangor, 2005).

The differences between more sexist and less sexist men's behaviour are likely to be subtle rather than overt (Dovidio & Gaertner, 2004). Most educational and professional settings explicitly forbid sexual harassment and gender discrimination. However, gender biases continue to be expressed in more ambiguous situations. Men may refrain from discriminating against women when

their actions could be attributed to sexism, for instance, but discriminate in contexts that obscure the bias motivating their behaviour (Uhlmann & Cohen, 2005; see also Monin & Miller, 2001), or praise women's competence but allocate valuable resources to men (Vescio, Gervais, Snyder, & Hoover, 2005).

We hypothesize that even subtly sexist behaviours on the part of a male interaction partner may serve as a cue to women that they are at risk of being stereotyped. Indeed, people are highly sensitive to situations that indicate a threat to one of their social identities (Steele, Spencer, & Aronson, 2002). Research on stereotype threat shows that when people perceive the possibility that they might be judged according to a negative stereotype, the resulting pressure to avoid confirming the stereotype can reduce their prospects of success in the domain. They may conclude that they do not belong (Walton & Cohen, 2007), steer their interests to a domain in which their group does not face a negative stereotype (Davies, Spencer, Quinn, & Gerhardtstien, 2002), or disidentify from the domain altogether (Steele, 1997). Most relevant to the present research, stereotype threat can lead to underperformance in the threatened domain, in part because efforts to avoid thinking about the stereotype may use up mental capacity needed to perform well on the task (Logel, Iserman, Davies, Quinn, & Spencer, in press, Schmader, Johns, & Forbes, in press).

Considerable research has identified individual differences and situational variables that moderate stereotype threat (for a review, see Steele et al., 2002), and the cognitive and affective processes that underlie its effect on performance (e.g., Schmader et al., in press). Far less research has examined the potential triggers of stereotype threat in the real world (cf. Cohen, Steele, & Ross, 1999; Inzlicht & Ben-Zeev, 2000, 2003; Sekaquaptewa & Thompson, 2002; Walton & Cohen, 2007). Manipulations widely shown to create and reduce stereotype threat in the laboratory, such as blatant messages that the test does or does not produce group differences, are probably rare in actual educational and professional settings. Instead, in people's daily lives, a major source of information about how they are viewed comes from the way people behave towards them when they interact (Leary & Baumeister, 2000). If some of these social interactions communicate the risk of being

stereotyped, this would suggest that feelings of stereotype threat, and the associated deficits in performance, might be a consequence of interactions in any educational or professional setting in which people hold demeaning stereotypes about each other.

In the present research, I hypothesized that men's sexism would be conveyed through their behaviour when they interacted with women. I expected that women who were exposed to sexist men's behaviour would detect the possibility that they could be stereotyped, and that this would be revealed in their underperformance in a negatively stereotyped domain.

Overview of Studies

In Studies 1 and 2, I developed and validated a subtle measure of sexism. In Studies 3 and 4, I examined whether men's level of sexism predicted their behaviour towards a woman with whom they interacted. I did not expect men to make blatantly sexist or stereotypic statements or to sexually harass their interaction partner, at least in this closely observed laboratory setting. Instead, I predicted that more sexist men would show more subtle dominance towards, and sexual interest in, the woman (cf McKenzie-Mohr & Zanna, 1990; Rudman & Borgida, 1995). In Study 3, I tested this prediction by observing men's behaviour in a work-related interaction with an ostensible female peer. In Study 4, I again observed men's behaviour, and I also examined the thoughts they activated during the interaction.

In Studies 5--8, I examined the effect of sexist men's behaviour on the women with whom they interact. I sought converging evidence that men's dominant and sexually interested behaviour would serve as cues to women that they could be judged according to the female stereotype. In Study 5, I examined how male participants' sexism scores predicted their female interaction partners' scores on a test in engineering, a field in which women are negatively stereotyped. In Study 6, I manipulated men's behaviour itself, and examined its effect on women's engineering test scores, as well as on women's own impressions of the interaction. In Studies 7 and 8, I examined whether men's dominant and sexually interested behaviour would affect women only in a domain in which they are negatively stereotyped, and whether it would lead them to suppress concerns about the stereotype. These

designs, along with survey measures, allowed me to address alternative explanations for the effects of sexist men's behaviour on women. I thus examined whether women exposed to men's dominant and sexually interested behaviour experienced self-objectification, became distracted by feelings of attraction, or deliberately underperformed to encourage his attention.

CHAPTER 2: DEVELOPING AND TESTING A SUBTLE MEASURE OF SEXISM

I had two reasons for creating a new subtle measure of sexism. The first was theoretical: Among young men in university, even sexism measures created ten years earlier (e.g., Glick & Fiske, 1994; Swim et al., 1995) might be transparent as measures of sexism and men may be reluctant to report their true beliefs. The second was methodological: I did not have the option of pretesting, because my participants were engineering students, many of whom were not taking introductory psychology, and most of whom were unwilling to participate in time-consuming or multi-part studies. It seemed likely that existing sexism scales could arouse men's suspicions about the purpose of the study and lead them to bend-over-backwards to behave in a nonsexist way in the lab, but other subtle measures (such as an Implicit Association Task) could prime thoughts about women's roles relative to men's.

I thought men's ideas about women's roles might be revealed in the way they finished sentences about women. I used sentence stems created by von Hippel, Sekaquaptewa, and Vargas (1997) for their measure of stereotypic explanatory bias, because they included three stems that featured female names enacting tasks associated with female stereotypes: "Shirley asked for help getting home," "Jenny went home to cook dinner" and "Katherine baby-sat the neighbor's kids," along with 19 other stems that served as distracters (see Appendix A for items). Participants were asked to complete each sentence by adding words on the end, such as "Jenny went home to cook dinner *and made pasta.*"

To score the measure, two coders, who were blind to participants' survey scores, used a one-to-five scale to rate the sexism of each target sentence completion.¹ Sentences were rated as more sexist to the extent that the female protagonist was portrayed in a way that was consistent with

¹ von Hippel et al.'s (1997) measure also included male names enacting tasks associated with male stereotypes (e.g., "Bert changed the oil"), but prior research with these materials suggests that people respond more strongly to female stereotypicality than male stereotypicality (Sekaquaptewa & Thompson, 2003), so we treated these sentence stems as distracters. Sentence completions were also coded for explanatory bias, as in von Hippel et al. (1997), but these ratings were unrelated to the variables of interest in the current studies, and thus are not discussed further.

stereotypes about women. For example, responses to the stem “Jenny went home to cook dinner” were rated as a one if they portrayed women as equal to men (e.g., “...because Tim cooked dinner last night”) or in modern roles (e.g., “...after work”). Responses were rated as a five if they portrayed women in historical roles (e.g. “...for her husband”) or as sex objects (e.g., “...naked”).

The purpose of Studies 1 and 2 was to investigate the convergent and discriminant validity of the sentence completion measure of sexism.

Study 1

Male participants completed the sentence completion measure, along with a series of survey measures. I expected higher sexism scores on the sentence completion measure to be associated with higher scores on the measures of sexism and related attitudes, but not to be associated with scores on extraversion or impression management.

Method

Participants

Twenty-six male students (12 Caucasian, 10 East Asian, and four other) enrolled in engineering, mathematics, or science programs participated for partial credit in an introductory psychology course.

Procedure

Participants came into the lab individually for a study on attitudes toward the self and others. They filled out a series of survey measures in the order listed below, followed by the sentence completion measure.

Materials

Old fashioned and modern sexism. The Old Fashioned Sexism and Modern Sexism Scale (Swim et al., 1995) distinguishes between endorsement of blatantly sexist old fashioned sexism (five items; e.g., “Women are generally not as smart as men”), and more subtly sexist statements reflecting denial of discrimination (four items; e.g., “Discrimination against women is no longer a problem in Canada”), antagonism towards women’s demands (two items that are reverse-coded; e.g., “It is easy

to understand why women's groups are still concerned about societal limitations of women's opportunities”) and resentment of special favours (one item; “Over the past few years, the government and news media have been showing more concern about the treatment of women than is warranted by women's actual experiences”).

Hostile and benevolent sexism. The Ambivalent Sexism Inventory (Glick & Fiske, 1996) distinguishes between hostile sexism, an antipathy towards women who are viewed as usurping men’s power (11 items; e.g. “Women are too easily offended”) and benevolent sexism, a subjectively positive (for sexist men) attitude towards women that offers protection and affection to women who embrace conventional roles. Benevolent sexism includes complementary gender differentiation (three items; e.g., “Many women have a quality of purity that few men possess”), heterosexual intimacy (four items; e.g., “Men are incomplete without women”), and protective paternalism (four items; e.g., “In a disaster, women ought to be rescued before men”).

Extraversion. The extraversion subscale of the NEO (Costa & McCrae, 1985) assesses the degree to which people are gregarious and sociable (10 items; e.g., “I am the life of the party”).

Impression management. The impression management subscale of the Balanced Inventory of Desirable Responding (Paulhus, 1984) assesses a tendency to consciously dissemble in order to portray oneself positively (20 items, e.g., “I always obey laws, even if I’m unlikely to get caught”).

Social dominance orientation. The Social Dominance Orientation Scale (Pratto, Sidanius, Stallworth, & Malle, 1994) taps into the desire that one’s in-group dominate out-groups (e.g., “It's OK if some groups have more of a chance in life than others”). It is associated with endorsement of historical gender roles and low levels of support for women’s rights (Pratto et al., 1994).

Demographics. Participants reported their ethnicity and year in school.

Results

Two coders rated the degree of sexism in each of the target sentence completions. Inter-rater agreement was found to be acceptable (r s ranged from .71 to .95),² so their ratings were averaged to form a single rating for each statement, then the three critical statements were averaged to produce one sexism score for each participant ($M = 3.23$, $SD = .69$). I calculated averages for each subscale of each survey measure, standardized them, and entered them simultaneously into a regression analysis predicting scores on the sentence completion measure. Analyses controlled for ethnicity (dummy-coded into Caucasian versus other ethnicity) and year in school. Variables that were non-significant were dropped from the regression.

Three significant predictors of the sexism of participants' sentence completions emerged (see Table 1). Higher scores on Social Dominance Orientation and, marginally, the Denial of Discrimination subscale of the Modern Sexism Scale, and lower scores on the Complementary Gender Differentiation subscale of the Ambivalent Sexism Inventory were associated with more sexist sentence completions. Ethnicity, but not year in school, was a significant control variable, with white participants making less sexist sentence completions than minorities. No other variables were significant predictors, including the discriminant validity measures of extraversion and impression management.

² Given the small number of items, and the use of two coders to rate the sexism of each item, the best statistic to represent the reliability of the measure is a Pearson Correlation Coefficient for inter-rater reliability (Shaughnessy & Zechmeister, 1990).

Table 1

<i>Scores on Attitude Measures Predicting Sexism on Sentence Completion Measure</i>	
	β
Significant Predictors	
Social dominance orientation	.45*
Denial of discrimination	.33 [†]
Complementary gender differentiation	-.32 [†]
Non-Significant Predictors	
Hostile Sexism	.25
Heterosexual intimacy	-.30
Protective paternalism	-.19
Old fashioned sexism	-.34
Antagonism towards women's demands	.04
Resentment of special favours	-.05
Extraversion	.21
Impression management	-.05
Control Variables	
Ethnicity	-3.33**
Year in school	-.06

[†] $p < .10$, * $p < .05$

Note. β s represent unique contribution, controlling for significant predictors.

Discussion

Results of Study 1 suggest that the sentence completion measure does assess sexism. The more sexist men's sentence completions were, the more support they expressed for dominating outgroups, and the more they tended to deny that women are discriminated against. Men who completed stems in sexist ways also tended to disagree with statements that women are more pure and cultured than men. In past research, agreement with these statements has been positively associated with other sexist attitudes (Glick & Fisk, 1996), but this result suggests that men who

complete sentences about women in sexist ways display a more negatively-valenced sexism that lacks the subjectively positive sexist attitudes that credit women with kindness and purity.

To be more confident that the sentence completion measure would predict behaviour in a work-related interaction with a woman, I designed Study 2 to replicate and extend the results for Study 1. In addition to the attitudes assessed in Study 1, Study 2 examined the degree to which sexist sentence completions were predicted by a tendency to associate women with incompetence in a negatively stereotyped domain. Study 2 also examined whether sexist sentence completions were associated with past experiences with women in subordinate roles.

Study 2

In Study 2, male engineers completed the attitude measures from Study 1, along with an IAT measure of the degree to which they associated male versus female engineers with competence traits. I expected higher sexism scores on the sentence completion measure to be associated with a tendency to associate male engineers with competence and female engineers with incompetence.

In addition, participants responded to questions about their past experiences with women and girls. I expected men who completed sentences in sexist ways to report past experiences in which women and girls were subordinate to men and boys. Within their families, I expected them to report having younger sisters, and mothers who were less educated than their fathers and did not work outside the home. In their peer experiences, I expected more sexist men to report fewer female friends, and fewer experiences working with girls in math and science classes, jobs and clubs, than less sexist men. Participants also completed additional attitude measures.

Method

Participants

Sixty male engineering students (48 Caucasian, six South Asian, five East Asian) participated. One participant's data were excluded because coders determined from his sentence completions that he had not taken the task seriously (e.g., "Jenny went home to cook dinner *and ate her hand*").

Procedure

Participants were recruited outside of an engineering faculty administrative office for a study on attitudes toward the self and others. They completed the sentence completion task, followed by additional measures described below (see Appendix B for complete list of items from the additional measures), and then the same survey measures from Study 1. Finally, they completed the computer task described below on a laptop computer.

Materials

Past experiences with women in subordinate roles. Participants completed items assessing their experiences with women in their family. They reported the number of younger and older sisters they had, whether their mothers worked outside the home, and how educated their mothers were relative to their fathers (distracter items asked about fathers work and education). They also completed items assessing their experiences with peers. They reported the sex of their five closest friends from kindergarten to grade one, from grade two to grade five, and then in high school. They reported how often they had worked with female peers in math and science classes (three items; $\alpha = .82$) or belonged to co-educational clubs, and whether they worked in jobs with girls (two items; $\alpha = .84$). Finally, they reported how many female sexual partners they had had.

Additional attitude measures. Participants responded to a single item assessing self-esteem, (“I have high self-esteem,” $1 = strongly disagree$, $9 = strongly agree$), items assessing the degree to which they believed engineering ability is unchangeable (two items; $\alpha = .79$), and a single item assessing the degree to which they believed they inherited their intelligence from their father versus their mother.

Associations between male and female engineers and competency traits. Participants used a laptop computer to complete a five-block Implicit Association Test (IAT; Greenwald, McGhee, & Schwartz, 1998) designed to tap into the degree to which they associated competence and incompetence with female engineers relative to male engineers. Category labels were “incompetent” (brainless, dumb, helpless, illogical, inept, irrational, slow, stupid, unskilled and weak) versus

“competent” (capable, efficient, expert, intelligent, proficient, qualified, rational, skilled, smart, and strong), and “male engineer” (target words were he, his, him, and himself) versus “female engineer” (she, her, hers, and herself). Following the scoring algorithm recommended by Greenwald, Nosek, and Banaji (2003), we transformed the raw reaction times into a single score, in which higher scores reflected a tendency to associate competence with male engineers and incompetence with female engineers. Nine participants’ scores were excluded because they made errors on more than 15% of the trials in the critical blocks.

Results

Target sentence completions were rated for sexism in the same manner as in Study 1 (r s ranged from .80 to .94; $M = 3.20$, $SD = .67$).

Convergent and Discriminant Validity on Attitude Measures

I calculated averages for each subscale of each attitude measure, standardized them, and entered them into a regression predicting the sexism of participants’ sentence completions. As in Study 1, higher scores on Social Dominance Orientation, marginally, and the Denial of Discrimination subscale of the Modern Sexism Scale, and lower scores on the Complementary Gender Differentiation subscale of the Ambivalent Sexism Inventory were associated with more sexist sentence completions (see Table 2). In addition, higher scores on the implicit association task were marginally associated with more sexist sentence completions, such that participants who tended to associate male engineers with competence and female engineers with incompetence made more sexist sentence completions. Interestingly, higher self-esteem was also associated with more sexist sentence completions. Ethnicity was a marginally significant control variable, with white participants making less sexist sentence completions than minorities, but year in school was not. No other attitude variables were significant predictors, including the discriminant validity measures of extraversion and impression management.

Table 2

<i>Scores on Attitude Measures Predicting Sexism on Sentence Completion Measure</i>	
	β
Significant Predictors	
Social dominance orientation	.25 [†]
Denial of discrimination	.41**
Complementary gender differentiation	-.34**
Associating male engineers with competence and female engineers with incompetence	.23 [†]
Self-esteem	.30*
Non-Significant Predictors	
Hostile Sexism	-.02
Heterosexual intimacy	.25
Protective paternalism	.11
Old fashioned sexism	-.04
Antagonism towards women's demands	-.03
Resentment of special favours	-.06
Belief they inherited intelligence from father	-.03
Belief engineering ability is unchangeable	.03
Extraversion	.18
Impression management	-.09
Control Variables	
Ethnicity	-.25 [†]
Year in school	-.17

[†] $p \leq .10$, * $p < .05$, ** $p < .01$

Note. β s represent unique contribution, controlling for significant predictors.

Past Experiences with Women

To examine whether the sentence completion measure of sexism was uniquely associated with past experiences with women in subordinate roles, over and above existing sexism measures, I

ran a regression analyses predicting scores on the sentence completion task from scores on modern sexism, hostile sexism, benevolent sexism and social dominance orientation, controlling for ethnicity and year in school. The residuals from this analysis thus represented the variance in sexism on the sentence completion task that was not explained by existing sexism measures.

I standardized each measure of past experiences with women, and entered them into a regression equation predicting unique variance in sexism scores on the sentence completion task. Non-significant variables were dropped from the regression. Results revealed that having more younger sisters, and, marginally, a father who had more education than their mother, were associated with making more sexist sentence completions (Table 3). No other variables were significant.

Table 3

Past Experiences with Women Predicting Unique Variance of Sexism on Sentence Completion Measure

	β
Significant Predictors	
Number of younger sisters	.28*
Father more educated than mother	.25 [†]
Non-Significant Predictors	
Number of older sisters	.09
Mother worked outside the home	-.06
Sex of friends from kindergarten to grade one	-.04
Sex of friends from grade two to grade five	-.02
Sex of friends in high school	.10
Work with girls in math and science	.08
Work with girls at a job	-.06
Number of sexual partners	.15

[†] $p \leq .10$, * $p < .05$

Note. β s represent unique contribution, controlling for significant predictors.

Discussion

Results of Study 2 provide additional evidence that the sentence completion measure assesses sexism. Sexist sentence completions were again associated with support for dominating outgroups and denial that women are discriminated against. Men who made sexist sentence completions tended to associate male engineers with competence and female engineers with incompetence. The sexism of sentence completions was again negatively associated with endorsing complementary gender differentiation, that is, men who made more sexist sentence completions disagreed with statements that women are more pure and cultured than men. More sexist sentence completions were also associated with higher self-esteem, perhaps because derogating women, who are stereotyped in math and engineering, boosted sexist men's self-esteem (Fein & Spencer, 1997).

The sexism of men's sentence completions was also associated with some past experiences with women and girls in subordinate roles: relative to less sexist men, more sexist men reported having more younger sisters, and tended to report less educated mothers relative to fathers. Items assessing experiences with female peers were not associated with the sexism of sentence completions, perhaps indicating that experiences in the home play more of a role in attitudes towards women.

Together, results of Studies 1 and 2 suggest that men's sexism can be assessed by rating the sexism of their sentence completions. Meta-analyses across the two studies revealed highly significant associations between the sexism of men's sentence completions and social dominance orientation ($z = 2.75, p = .006$), denial of discrimination ($z = 3.12, p = .002$), and, negatively, complementary gender differentiation ($z = 2.92, p = .004$).

Having established that the sexism of men's sentence completions are associated with sexist attitudes, I proceeded to examine whether they predict behaviour towards a woman in an interaction.

CHAPTER 3: MEN'S SEXISM AND THEIR BEHAVIOUR IN INTERACTIONS WITH WOMEN

The purpose of Studies 3 and 4 was to examine whether men's sexist attitudes predicted their behaviour in an interaction with a woman in a work-related context.

Study 3

In Study 3, I examined whether men's level of sexism would affect their behaviour towards a woman in the context of a conversation about engineering. I expected that more sexist men would exhibit more subtle dominance and sexual interest towards the woman.

Male engineering students completed a subtle measure of sexism, and then participated in a structured, work-related interaction with a female confederate posing as another engineering student. By using a female confederate, I could isolate the man's behaviour while holding constant the woman's behaviour (cf. Word, Zanna, & Cooper, 1974).

Method

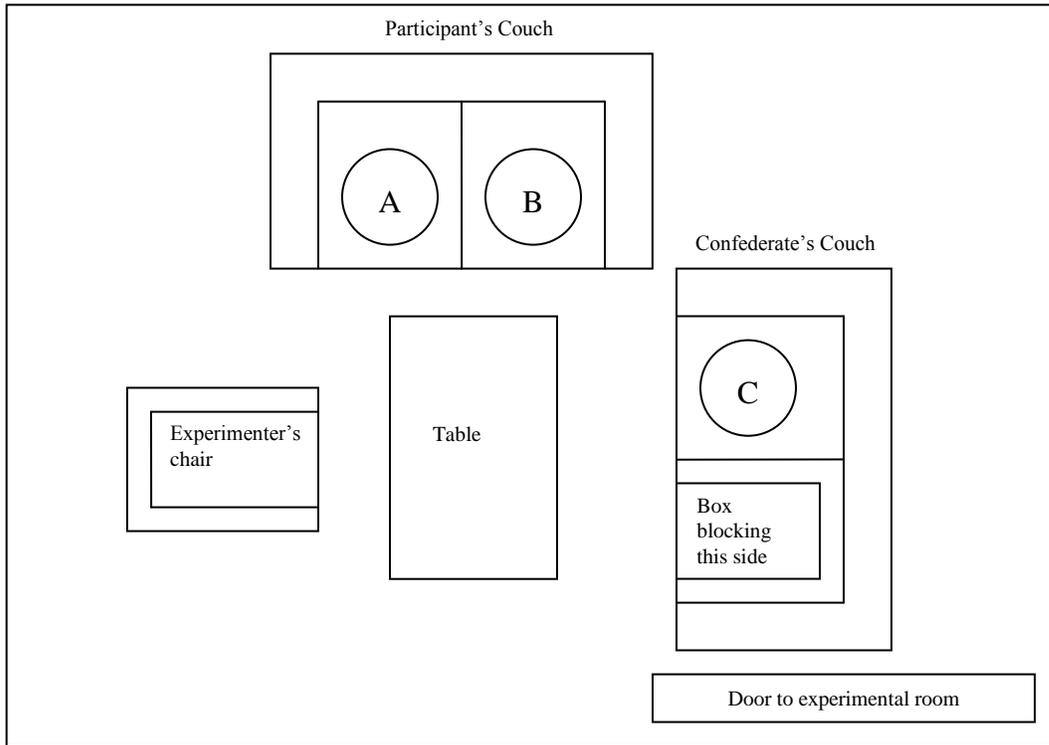
Participants

Twenty-eight male undergraduate engineering students at the University of Waterloo participated for \$6.00 or partial course credit. Nine participants identified their ethnicity as East Asian, seven as Caucasian, and one each as Middle Eastern and South Asian. Ethnicity information was not available for the other ten participants. There were no effects of ethnicity, in Study 3 or subsequent studies, so it is not mentioned further.

Procedure

Students participated individually with a female confederate. Both the experimenter and the confederate were blind to participants' sexism scores. Participants were told that the study investigated how engineering students discuss issues in the media. The experimenter arranged for the confederate to enter the experimental room first, where she sat on the closer of two small couches arranged perpendicular to each other. A box on the couch beside the confederate forced the participant to sit on the second couch, but allowed him to choose how far from her to sit. The layout of the experimental room is illustrated in Figure 1.

Figure 1. An aerial view of the experimental room in Study 3.



Note. Circle A represents a participant who has chosen to sit relatively far from the confederate. Circle B represents a participant who has chosen to sit relatively close to the confederate. Circle C represents the confederate.

Although the experimenter introduced the confederate as a fellow participant and as an engineering student, she was actually a drama student trained to behave in a consistently friendly but neutral manner. The experimenter explained that because the study was taking less time than she had expected, she would like them to complete an additional task (the sentence completion task) as a favor to other researchers. All participants agreed. After the participant and the confederate completed the sentence-completion measure, the experimenter asked them to read a newspaper article from the New York Times (2001, December 8) and then to discuss it with each other. The article describes a dispute between Hewlett-Packard's C.E.O., Carleton S. Fiorina, and the sons of one of the founders of the company over a proposed merger with Compaq Computer (see Appendix C for complete article). This article was chosen because it is relevant to engineering, and so the discussion could approximate a work-related interaction. When participants indicated they had read the article,

the experimenter gave them a set of questions to answer in their discussion (e.g., “Do you think Ms. Fiorina is doing a good job managing the merger?”), turned on a video camera to tape the interaction, and left the room.

When the participant and confederate indicated they had finished the discussion, the experimenter brought the confederate into an adjacent room so that she and the participant could each complete a short set of questionnaires in private. Participants reported how attractive the confederate was and how attracted they were to her (e.g., $-5 = \text{not at all attracted}$, $5 = \text{very attracted}$; $\alpha = .81$). Finally, participants were thanked and debriefed.

Coding of Participants' Behaviour

Coders and observers were trained, female undergraduates, who were blind to participants' level of sexism.

Body position and posture. One coder watched the videotaped interactions and scored how close participants sat to the confederate, by marking the participants' and confederate's position on a diagram of the couches and measuring the distance between them. Two coders used a five-point scale to report the openness of participants' postures (i.e., shoulders back and knees wide apart; $1 = \text{very closed posture}$, $5 = \text{very open posture}$). Inter-rater reliability was acceptable ($r = .61$) and disagreements were resolved through discussion.

Observer's impressions. Two observers watched the videos and reported their overall impressions of participants' sexual motivation, dominance, and confidence (e.g., $1 = \text{not confident}$, $5 = \text{very confident}$). Inter-rater reliability for each item was acceptable (r s ranged from .70 to .92) and disagreements were resolved through discussion.

Looking at the confederate's body. After each interaction, the confederate reported how much the participant had looked at her body (e.g., $-5 = \text{not at all}$, $5 = \text{very much}$; cf. von Baeyer, Sherk, & Zanna, 1981). Pilot testing revealed that coders could not clearly see where participants were looking from the videos.

These measures of sitting proximity, openness of posture, confidence, dominance, sexual motivation and looking at the confederate's body formed a reliable composite index ($\alpha = .77$). They were therefore standardized and combined into a single index of dominance and sexual interest.

Overt sexist statements. Two coders, who were blind to participants' sexism scores, watched the videos to identify overtly sexist statements.

Results and Discussion

Subtle Measure of Sexism

Coders' rated the sexism of each target sentence (r_s ranged from .88 to .99) in the same manner as in Studies 1 and 2.

Behaviour in Interaction

Overt sexist statements. Participants made no overtly stereotypic or demeaning verbal statements.

Dominance and sexual interest. I centered men's scores on the subtle sexism measure and entered them into a regression predicting the index of dominance and sexual interest (Aiken & West, 1991). The more sexist participants' sentence completions were, the higher they scored on the index of dominance and sexual interest ($\beta = .57$, $t_{(26)} = 3.56$, $p = .001$).

These results show that men's sexist attitudes predict their behaviour in a work-related interaction with a woman. Men who scored highly on a subtle measure of sexism showed more dominance and sexual interest, according to observer's impressions, ratings of their body posture, and the confederate's reports, than men who scored lower. This finding is consistent with my reasoning that the finding that more sexist men to see female engineers as incompetent relative to male engineers (as in Study 2) would be revealed in their behaviour.

Alternative Explanations

Attraction to the confederate. One alternative explanation for the relation between men's sexism scores and their behaviour is that sexist men were simply more attracted to the confederate than non-sexist men, and that is why they showed more sexual interest. This was not the case. Men's

scores on the sexism measure were unrelated to their reported feelings of attraction to the confederate ($\beta = -.13, t = -.67, p = .51$).

Qualities specific to the confederate. It also could be argued that because men filled out the sentence completion measure of sexism after having met the confederate, their scores and behaviour could reflect something to do with her specifically, rather than with their attitudes towards women in general. Thus, one goal for Study 4 was to replicate the findings that men's attitudes towards women predict their behaviour towards a woman in an interaction, using additional behavioural indices and a different confederate.

An additional goal for Study 4 was to examine whether more sexist men would fail to activate concepts related to competent engineers when anticipating an interaction with an ostensible female peer.

Study 4

Male engineering students participated in the same procedure as in Study 3, with a new confederate and an additional measure. After meeting the confederate, but before interacting with her, participants completed a lexical decision task as a measure of the degree to which they activated thoughts of competent engineers. If sexist men fail to view a female peer as a competent colleague, then I would expect that the higher men score on the subtle sexism measure, the less they would activate concepts related to competent engineers when anticipating an interaction with a woman they believe to be a fellow engineering student.

Method

Participants

Thirty-five male undergraduate engineering majors at the University of Waterloo participated for \$6.00 or partial course credit.

Procedure

The procedure and cover story were the same as Study 3, except that after the experimenter introduced the participant and the confederate to each other, she asked them to complete two tasks for

an unrelated study: the same sentence completion measure of sexism assessed in Study 1, and then a computer-based lexical decision task. All participants agreed. The experimenter then led the participant to a computer in the corner of the room to complete the lexical decision task, and led the confederate out of the room, ostensibly to complete the same task in another room. When the participant indicated he had finished the task, the experimenter brought the confederate back and continued with the sentence completion task and the newspaper article discussion as in Study 3.

Assessment of behaviour. I assessed the same observer- and confederate-based measures of participants' behaviour as in Study 3. In addition, the observers rated the extent to which participants flirted and showed romantic interest in the confederate (e.g., *1 = did not show any romantic interest, 5 = showed a lot of romantic interest*). Finally, the confederate also rated the participants' levels of sexism and sexual motivation (e.g., *-5 = not at all sexually motivated, 5 = very sexually motivated*). The measures formed the same composite index as in Study 3, $\alpha = .83$, and so were standardized and averaged to form a single measure of dominance and sexual interest.

Activation of competent engineer. Letter-strings were presented on a computer screen one at a time. Participants were instructed to press a key to indicate whether each string was a word or a non-word. The computer recorded each response latency. A total of 11 letter-strings tapped concepts related to competent engineers (algebra, clever, competent, education, engineer, geometry, leader, researcher, scientist, skilled, supervisor). Twenty-two letter-strings were neutral words related to household objects (e.g., chair, faucet), chosen to control for individual differences in response speed. An additional 22 letter-strings were non-word strings (e.g., akricot, flabbel). The 55 trials were presented in random order. Participants were instructed to complete the task as quickly and as accurately as possible.

To score the task, I excluded data from trials in which participants made errors and in which participants' response time was identified as an outlier (see Van Selst & Jolicoeur, 1994). A total of 4% of trials were removed. I then calculated the mean reaction time for each participant on competent

engineer words and neutral words. Three participants' scores on this measure were excluded because a program malfunction prevented them from completing the lexical decision task.

Results and Discussion

Subtle Measure of Sexism

Coders' rated the sexism of each target sentence (r s ranged from .82 to .92) in the same manner as in the previous studies.

Behaviour in Interaction

Overt sexist statements. Coders again failed to detect any explicitly stereotypic or demeaning comments.

Dominance and sexual interest. Replicating Study 3, the more sexist participants' sentence completions were, the more dominance and sexual interest they showed in the interaction ($\beta = .38$, $t_{(33)} = 2.33$, $p = .026$).

Men's Self-Reported and Subtle Attitudes

Attraction to the confederate. As in Study 3, participants' sexism was not associated with participants' reports of attraction to the confederate ($\beta = .00$, $t = .02$, $p = .99$).

Activation of competent engineer. Controlling for neutral words to equate individual differences in overall response speed, the more sexist men's sentence completions were, the slower they responded to competent engineer words ($\beta = .35$, $t_{(30)} = 2.02$, $p = .05$). Slower responses indicate less activation, such that the higher men scored on sexism, the less they activated thoughts of competent engineer after meeting the confederate.

It seemed plausible that the degree to which men activated competent engineer words might predict the degree to which men behaved in a dominant and sexually interested way in the interaction, however, this was not the case ($\beta = .06$, $t_{(32)} = .18$, $p = .86$).

The higher men scored on a subtle measure of sexism, the more they acted in a dominant and sexually interested way towards a woman they believed to be a fellow engineer, and the less they activated thoughts about competent engineers.

Together with Study 3, these results demonstrate that men's attitudes towards women predict their behaviour in an interaction with a female engineer. Men who scored highly on the sexism measure did not overtly make stereotypic statements in the interaction or sexually harass their partners. The differences between their behaviour and that of less sexist men were subtle but they were consistent--the sexist men behaved more dominantly and more sexually interested toward the ostensible female peer. Meta-analyzed across Studies 3 and 4, the association between the sexism of men's sentence completions and their dominant and sexually interested behaviour is highly significant ($z = 3.90, p = .0001$).

In Studies 5--8, I investigated the effect of sexist men's behaviour on the women with whom they interacted.

CHAPTER 4: EFFECT OF MEN'S SEXIST ATTITUDES AND BEHAVIOUR ON WOMEN

The goal of Studies 5 and 6 was to examine the impact of sexist men's behaviour on the women with whom they interacted. I expected that sexist men's behaviour would serve as a cue women that they were at risk of being judged through the lens of a negative stereotype, and that this would be revealed in their underperformance in a negatively stereotyped domain. As a first test of this hypothesis, in Study 5 I examined the extent to which men's scores on a subtle measure of sexism predicted women's performance on an engineering test.

Study 5

In Study 5, male and female engineering students completed the subtle sentence completion measure of sexism, and then participated in a structured interaction before completing an engineering test. I expected female participants to underperform on the test to the extent that their male interaction partners scored highly on sexism.

Method

Participants

A total of 32 female and 32 male undergraduate engineering students at the University of Waterloo participated in exchange for \$8.00 or partial course credit. One male-female pair of engineering students participated in each session. Pairs had not met each other prior to the study.

Procedure

Participants came to the lab under the same cover story and basic procedure as in Studies 1 and 2. After being introduced, participants filled out the sentence-completion measure of sexism, and then read and discussed the same newspaper article from Studies 3 and 4. They then completed the engineering test. Written instructions informed participants that the test was "an excellent indicator of engineering ability and aptitude" and that they had 20 minutes to complete it. After the test, participants were thanked and debriefed.

Engineering test. The test was composed of 18 multiple-choice items drawn from practice problems available for the Fundamentals of Engineering Exam (National Society of Professional

Engineers, 2003), an exam engineers must pass to obtain a professional license in the United States. The questions sample from broad areas of engineering, including mathematics, electric circuits, statistics, chemistry, thermodynamics, dynamics, material science and computing (see Appendix D for complete list of questions). One point was assigned for each correct answer, and one quarter of a point was subtracted for each incorrect answer to correct for guessing, and the resulting score was converting to a percentage. Questions from participants' major area were excluded in my calculation of final scores (e.g., chemistry questions were not included for chemical engineering majors), because participants would find these questions easy to answer, and easy questions are not undermined by stereotype threat (Spencer, Steele, & Quinn, 1999).

Results and Discussion

Subtle Measure of Sexism

Two coders rated the sexism of the sentences in the same manner as the previous studies (r s ranged from .74 to .80). Male and female participants did not differ in their levels of sexism, $F < 1$, ($M_{males} = 3.57$; $M_{females} = 3.56$).

Performance on the Engineering Test

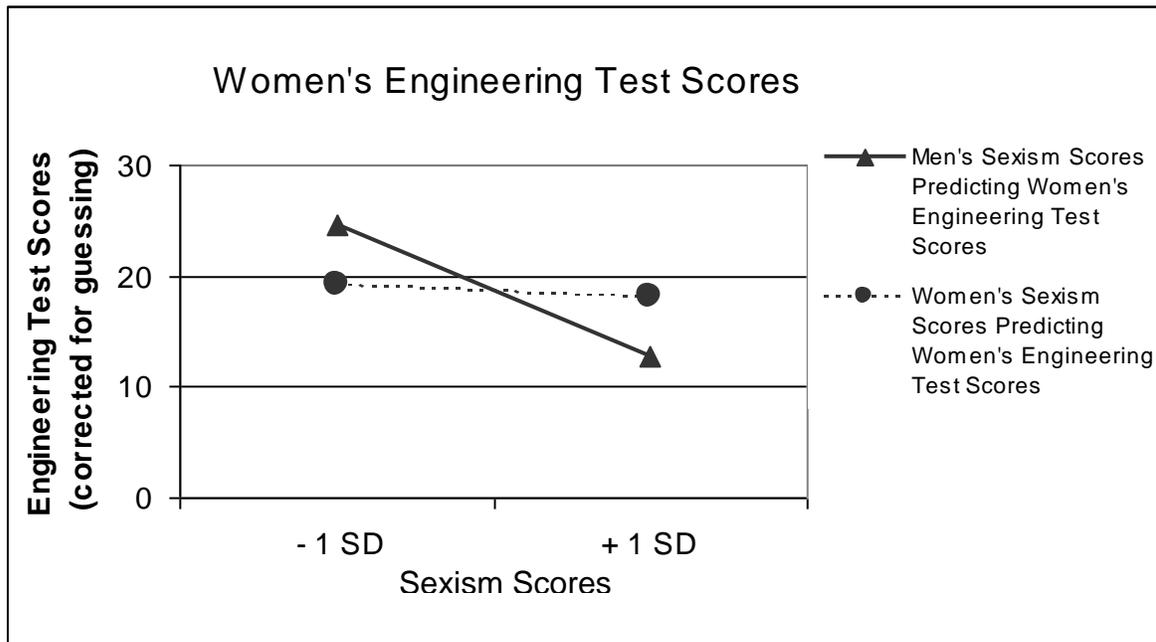
We centered men and women's scores on the subtle sexism measure and then multiplied these two variables to create an interaction term. I regressed first men's test scores and then women's test scores onto these three variables, with the main effects entered first followed by the interaction term (Aiken & West, 1991).

Men's performance on the engineering test. Neither men's own level of sexism nor their female partner's level of sexism, nor the interaction between the two, affected men's test score (β s $< .23$, t s < 1.17 , p s $> .25$).

Women's performance on the engineering test. Women's own level of sexism did not affect their test scores ($\beta = -.03$, $t_{(28)} = -.17$, $p > .86$), nor did the interaction between their level of sexism and the level of sexism of their male partner, ($\beta = .25$, $t = -1.51$, $p = .14$). What did predict women's test scores was the level of sexism of their male partner ($\beta = -.38$, $t_{(28)} = -2.14$, $p = .04$), such that the

more sexist were their male partner's sentence completions, the worse women scored on the engineering test. Women who interacted with a man low in sexism (-1SD) scored an average of 25% on the test—as well as men ($M = 27\%$). But women who interacted with a man high in sexism (+1SD) scored an average of 13%, as illustrated in Figure 1.

Figure 2. Women's engineering test scores, corrected for guessing, as a function of women's own sexism scores and their male partner's sexism scores.



These results begin to demonstrate the consequences that men's sexist attitudes have for the women with whom they interact. The more sexist men's sentence completions were, the worse their female partners performed on an engineering test. These results are consistent with the possibility that women who interacted with more sexist men recognized the possibility that the men might view them stereotypically, rather than as a competent colleague.³ If so, these women may have underperformed on the engineering test because they experienced stereotype threat.

³ Participants' interactions were not videotaped, so it was not possible to examine men's dominant and sexually interested behaviour in the same manner as Studies 3 and 4.

Alternative Explanations

Women's attraction to sexist men. It could be that women were more attracted to men who made more sexist sentence completions, and underperformed on the engineering test because they were distracted by these feelings. As a preliminary examination of this possibility, two female undergraduates watched the videos from Study 4 and rated the attractiveness of the male participants ($1 = \text{very unattractive}$, $5 = \text{very attractive}$, $r = .63$). However, their ratings did not predict men's sexism scores ($r = .17$, $p = .39$) or the degree to which they behaved in a dominant and sexually interested way ($r = .07$, $p = .71$). Nevertheless, we could not examine the attractiveness of the men in this study because they were not videotaped. It remains possible that women's individual experiences of attraction could differ from the raters' views of his attractiveness, so in Study 6 I both held the man's appearance constant, and assessed participants' ratings of his attractiveness.

Another third variable. It is possible that some other third variable covaried with men's sexism scores, and this variable was what undermined women's engineering performance. To be sure that women's underperformance resulted from the more sexist men's dominant and sexually interested behaviour, I manipulated those cues directly in Study 6.

In Study 6, women interacted with a male confederate who was trained to behave like either the more sexist or less sexist men in Studies 3 and 4. In addition, women reported their impressions of the interaction so I could examine whether women noticed the dominant and sexually interested behaviour.

Study 6

Study 6 was designed to conceptually replicate the findings from Study 5 using a different methodology. A male confederate was trained to interact with female engineering students in one of two ways. In the "sexist cues" condition, he reproduced the subtle dominant and sexually interested behaviours of men who scored higher on sexism in Studies 3 and 4. In the "no sexist cues" condition, he behaved in a more neutral way, like the men who scored lower on sexism.

If women who interact with a more sexist man pick up cues from his behaviour suggesting that they are at risk of being stereotyped, then women who are exposed to similar behaviour from a male confederate should underperform on an engineering test compared to women who are exposed to more neutral behaviour, and should report perceiving more dominant and sexually interested behaviour in the interaction.

Method

Participants

Seventeen female undergraduate engineering students at the University of Waterloo participated for payment of \$8.00 or partial course credit.

Confederate Behaviour

Two male confederates were trained to express the subtle dominant and sexually interested behaviours identified by the coders and the confederate in Studies 3 and 4. Specifically, in the “sexist cues” condition, the confederate positioned himself closer to the participants, sat with an open posture (shoulders back, knees wide apart), looked at the participant often during the interaction, and maintained a confident facial expression. In the “no sexist cues” condition he sat farther from the participant, leaned forward, closed his knees, and held a more tentative facial expression. The confederate followed the same verbal script in both conditions. One of two confederates participated in each session. Trained research assistants viewed the videotape after each session to ensure that the confederate’s behaviour stayed consistent over time. Including the individual confederate in the analyses does not moderate or change the pattern of results and so is not discussed further.

Procedure

The confederate randomly assigned participants to either the sexist cues or no sexist cues condition so the experimenter could remain blind to condition. The study featured the same cover story as the previous studies. When participants arrived at the laboratory, the experimenter introduced the participant and the confederate to each other and invited them to sit on couches arranged perpendicular to each other. The procedure, including the engineering test, continued as in Study 5.

Before debriefing, participants completed a six-item survey measure designed to assess how dominant and sexually interested the confederate's behaviour appeared to them. They indicated how confident and friendly their partner was, how attractive he thought they were, and how much he liked them, and how attracted to them he was (e.g., -5 = *not at all attracted*, 5 = *very attracted*). They also reported whether he flirted with them (1 = *my partner did not flirt with me*, 4 = *my partner flirted with me a lot*). These items were standardized and averaged to form an index of perceived dominant and sexually interested behaviour ($\alpha = .67$). They also responded to two items assessing how attractive they thought their partner was, and how attracted they were to him, on the same eleven-point scales ($\alpha = .82$).

Results and Discussion

Engineering Test Performance

Women in the sexist cues condition scored lower on the engineering test ($M = 11\%$) than women in the no sexist cues condition, ($M = 22\%$), $F(1, 15) = 5.67, p = .03$.

Perceptions of Partner's Dominant and Sexually Interested Behaviour

Participants in the sexist cues condition reported perceiving marginally more dominance and sexual interest from the confederate ($M = .27$) than participants in the no sexist cues condition ($M = .24$), $F(1, 15) = 2.90, p = .10$.

It might be argued that the degree to which participants noticed dominant and sexually interested behaviour could predict the degree to which they underperformed on the engineering test. However, an analysis testing this possibility did not approach significance in either cue condition ($\beta_s < .15, t_s < .37, p_s > .72$). This lack of relation may suggest that the effect of sexist cues on women's performance depends not on how strong they perceive the cues to be, but on how they attempt to cope with the resulting concerns they might be judged stereotypically. Alternatively, the lack of relation may result from low power. I address these possibilities in Studies 7 and 8.

Results of Study 6 were consistent with the hypothesis that men's dominant and sexually interested behaviour serves as a cue to women that they are at risk of being stereotyped. When

dominant and sexually interested behaviour was experimentally manipulating using a trained confederate, women underperformed in a domain in which they are stereotyped, and tended to report perceiving higher levels of dominance and sexual interest.

Alternative Explanations

I have argued that women underperformed on the engineering tests in Studies 5 and 6 because they were influenced by cues suggesting that they were at risk of being stereotyped, and thus underperformed in engineering because they experienced stereotype threat. However, three plausible alternative explanations exist for the effect of the confederate's behaviour on women's engineering performance. As described in more detail below, each alternative explanation suggests that women underperformed because of factors that undermined their general intellectual ability. I designed Studies 7 and 8 to address these alternative explanations by comparing the effect of a man's dominant and sexually interested behaviour on women's performance in a domain in which they are stereotyped with their performance in a domain in which they are not, and by examining the effect of this behaviour on the degree to which women suppressed thoughts of the gender stereotype.

Participants' attraction to the confederate. The first alternative explanation for women's underperformance in Studies 5 and 6 is that they were more attracted to the confederate when he behaved in a dominant and sexually interested way, and their feelings of attraction served as a distraction to concentrating on the test. In Study 6, participants in the sexist cues condition did report feeling greater attraction to the confederate ($M = 1.06$) than did participants in the no sexist cues condition ($M = -1.44$), $F(1, 15) = 11.12$, $p = .01$. These reports of attraction, however, did not predict women's scores on the test ($\beta = -.30$, $t_{(15)} = -1.23$, $p = .24$). Still, because the sample size in Study 6 was small, there may have been insufficient power to detect such an effect.

Self-objectification. It could be that participants interpreted the sexist cues as indicating that their partner judged them on their appearance and other external attributes, rather than on their abilities. If so, they could have experienced self-objectification, which may cause cognitive decrements. According to self-objectification theory, a societal focus on women's appearance and

sexuality causes women to take an observer's perspective on themselves, and to become hyper-aware of their external rather than internal attributes (Fredrickson & Roberts, 1997; Fredrickson, Roberts, Noll, Quinn, & Twenge, 1998). This hyper-awareness takes up mental energy, undermining women's performance on tasks requiring focused attention (Fredrickson et al., 1998; Quinn, Kallen, Twenge, & Fredrickson, 2006).

Deliberate underperformance. It could be that women interpreted the sexist cues as indicating that their male partner preferred traditional gender roles. If so, they may have deliberately underperformed to encourage his attention and to make him feel better about his own test score. More than 30 years ago, Zanna and Pack (1975) found evidence for this phenomenon. Of course, gender attitudes have changed dramatically in the past 30 years (Swim et al., 1995), and instructions clearly indicated to participants that their test answers would be confidential. Still, Studies 7 and 8 addressed this and the other alternative mechanisms.

CHAPTER 5: ADDRESSING ALTERNATIVE EXPLANATIONS FOR THE EFFECT OF MEN'S BEHAVIOUR ON WOMEN'S ENGINEERING TEST SCORES

The goal of Studies 7 and 8 was to provide converging evidence that sexist men's behaviour provides a cue to women that they may be stereotyped, and address alternative explanation for the effects of this behaviour on women's engineering test performance in Studies 5 and 6.

Study 7

In Study 7, I examined the effect of sexist cues on women's performance in a domain in which women are negatively stereotyped (i.e., mathematics), and a domain in which they are not stereotyped (i.e., English). If women underperformed in Study 6 due to distraction from their attraction to the confederate, self-objectification, or deliberately to encourage his attention, this should affect their performance regardless of domain. However, if they underperformed because the sexist cues triggered stereotype threat, they should underperform only in a domain in which they are at risk of being viewed stereotypically (see Spencer et al., 1999). This was the primary test of this hypothesis. In addition, to obtain further evidence addressing the different explanations, participants also completed paper-and-pencil measures of attraction to the confederate, as in Study 6, along with self-objectification and motivation to deliberately underperform.

Women interacted with a male confederate who either did or did not display sexist cues, and then completed a test that included items from a domain in which women are negatively stereotyped (i.e., mathematics), and items from a domain in which women are not negatively stereotyped (i.e., English). They also completed paper-and-pencil measures of attraction, self-objectification, and deliberate underperformance.

Method

Participants

A total of 25 female undergraduate students at the University of Waterloo participated for payment of \$8.00 or partial course credit. As women are negatively stereotyped in math and science as well as in engineering, the study included students majoring in math ($n = 6$), science ($n = 8$), and

engineering ($n = 11$). Three participants (two in the no sexist cues condition and one in the sexist cues condition) expressed suspicion about the confederate. Their data were excluded from analyses.

Procedure

The procedure was identical to that of Study 6, except that the test was portrayed as a quantitative and verbal test, and after completing the test, participants completed scale items assessing deliberate underperformance and self-objectification. In addition, participants completed the same items included in Study 6 assessing perceptions of the dominance and level of sexual interest in the partner's behaviour and participants' level of attraction to their partner.

Confederate Behaviour

Three male confederates were trained in the same manner as in Study 6 and followed the same script. One confederate participated in each experimental session. Including the individual confederate in the analyses does not affect the pattern of results and so is not discussed further.

Materials

Mathematics and English test. The test was comprised of five pages of math problems (12 problems total, taken from the Graduate Record Exam in Advanced Mathematics) alternating with five pages of English problems (21 problems total, from the Graduate Record Exam in English Literature; see Appendix E for complete list of questions).⁴ Page order was counterbalanced so that half of the participants had a math page first and half had an English page first. Scores were calculated for math and English separately by summing the number of correct answers and then subtracting one-fifth of a point for each incorrect answer to control for guessing.

Measure of deliberate underperformance. To assess any motivation participants may have had to deliberately underperform to attract the attention of men, I created a 12-item paper-and-pencil Deliberate Underperformance Scale ($\alpha = .75$). Participants used a 9-point scale to respond to items

⁴ The test included more English problems than math problems because pilot tests revealed that the English problems took less time to complete. Due to experimenter error, the test was portrayed as diagnostic of quantitative and English ability for the first sixteen participants, but the test was portrayed as non-diagnostic for the last six participants. The same pattern of results obtained for each set of test instructions.

such as “I believe men in my program prefer women who are less successful than they are” and “I would try to get the best mark possible on a test even if men would resent me for doing well” (reverse-coded; see Appendix F for complete list of items).

Measure of self-objectification. I assessed self-objectification in two ways. First, participants completed the 10-item Self-Objectification Questionnaire (Fredrickson et al., 1998), which compares how important external attributes (e.g., sex appeal; $\alpha = .77$) and internal attributes (e.g., energy level; $\alpha = .88$) are to a person’s self-concept. Following the scoring methods developed by Fredrickson et al. (1998), I calculated an overall score by subtracting the average internal response from the average external response. Higher scores index higher levels of self-objectification.

Second, I administered a more subtle measure of self-objectification. Written instructions directed participants to recall their interaction with their discussion partner. They were then asked to report the perspective from which they recalled this memory, on a 10-point scale with endpoints labeled “completely first person perspective” and “completely third person perspective” (Libby & Eibach, 2002; Libby, Eibach, & Gilovich, 2005). Written explanations clarified the definitions of each perspective (i.e., “With the first-person visual perspective you see an event from the same visual perspective that you originally did; in other words, in your memory you are looking out at your surroundings through your own eye.”) I reasoned that recalling the interaction more from a third-person perspective would reflect seeing the self from an observer’s point of view, a form of self-objectification (see Appendix G for complete measure).

Results and Discussion

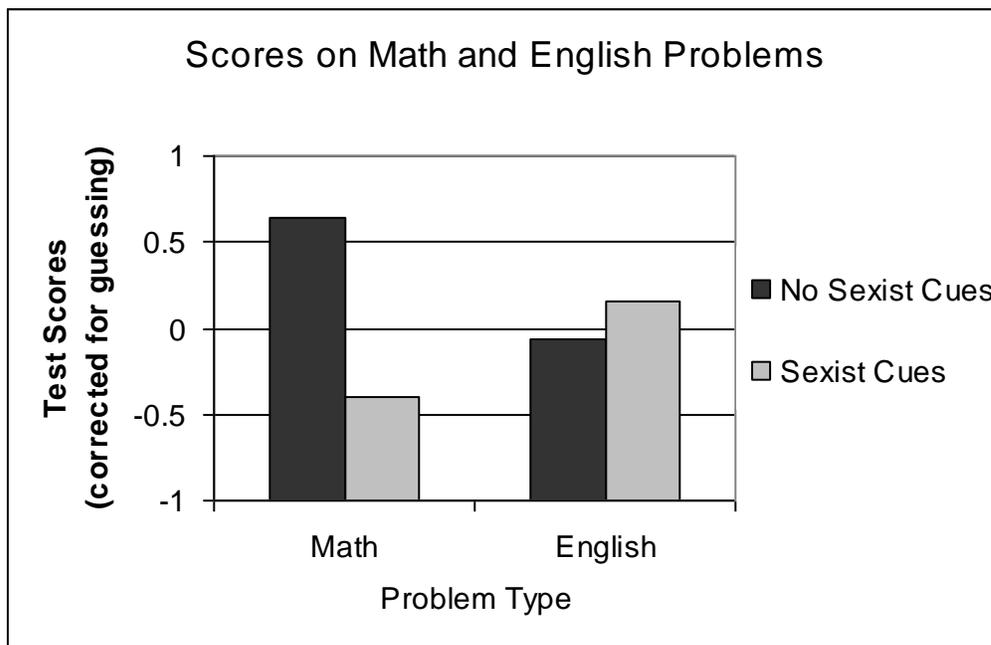
Performance on Mathematics and English Test

To test my main hypothesis, I standardized scores on the math and English problems to put them on the same metric, and conducted a mixed model ANOVA predicting math versus English problem performance from cue condition (sexist cues versus no sexist cues), and page order (page of math questions first versus page of English questions first). Because participants came from three

different programs, I also included their program (math, science or engineering) as a between subjects factor.

As predicted, the interaction between cue condition and math versus English scores was significant, $F(1, 10) = 5.14, p = .05$. As illustrated in Figure 2, participants in the sexist cues condition performed worse on math problems than did participants in the no sexist cues condition, $F(1, 10) = 7.57, p = .02$. However, participants' scores on English problems were not affected by cue condition, $F(1, 10) = .39, p = .54$.

Figure 3. Participants' scores, corrected for guessing and standardized, on math and English problems as a function of cue condition



There were also marginally significant main effects of page order (math page first versus English page first), $F(1, 10) = 4.41, p = .06$, and participants' program, $F(2,10) = 3.00, p = .10$, which were qualified by two-way interactions between the cue condition and participants' program, $F(2,10) = 4.08, p = .05$, and between page order and participants' program, $F(2,10) = 10.81, p = .003$. These two-way interactions were further qualified by a marginally significant three-way interaction between

cue condition, page order and participants' program, $F(2,10) = 3.91$, $p = .06$. This interaction is not particularly meaningful, because my interest was in predicting differences between math and English performance, and these interactions collapse across math and English scores. Cell sizes were too small to examine which means were significantly different using statistical tests (i.e., $n = 1$ in five of the 12 cells; no cell had more than three participants), so the means are reported in Table 4 and the pattern is summarized below.

Table 4

Mean test scores, collapsing across problem type (math versus English), as a function of cue condition, page order and participants' program

Page Order	Cue Condition					
	Sexist Cues			No Sexist Cues		
	Engineering Majors	Math Majors	Science Majors	Engineering Majors	Math Majors	Science Majors
Math first	.19	.13	.08	.24	.17	.12
English first	-.01	.44	.15	.15	.23	.42

Essentially, engineering majors tended to perform better than math and science majors when the test began with a page of math questions, but worse than math and science majors when the test began with a page of English questions. Math majors tended to outperform science majors, except in the no sexist cues condition when the test began with a page of English questions.

Participants' Perception of Confederate's Dominance and Sexually Interested Behaviour

Although results did not reveal a significant effect of cue condition on participants' impressions of the confederate's dominant and sexually interested behaviour, $F(1, 20) = 1.82$, $p = .19$, the direction of the means mirrored the previous study, ($M_{\text{sexist cues}} = .22$; $M_{\text{no sexist cues}} = -.18$), so to examine the reliability of the finding, I standardized the data for this measure from Studies 4 and 5 and then combined them.

Results of this combined analysis revealed that participants in the sexist cues condition reported perceiving more dominance and sexual interest from the confederate ($M = .24$) than

participants in the no sexist cues condition ($M = -.21$), $F(1, 37) = 4.69$, $p = .04$. Their reports of his behaviour still did not predict their score on the engineering test from Study 4 and the math problems from Study 5 ($\beta = -1.00$, $t_{(37)} = -.58$, $p = .57$).

Participants' Reports of Attraction to Confederate

As in Study 6, participants reported feeling more attracted to the confederate in the sexist cues condition ($M = 1.20$) than in the no sexist cues condition ($M = -.63$), $F(1, 20) = 4.56$, $p = .045$. However, as in that study, attraction did not predict participants' score on the math problems ($r = .05$, $p = .88$). To maximize statistical power, I combined these data across Studies 6 and 7 by standardizing them within sample. The combined data set yielded a strong effect of cue condition on feelings of attraction, $F(1, 37) = 14.46$, $p = .001$. There was also a marginally significant tendency for women who felt more attracted to their male partner to perform worse on the math test ($\beta = -.27$, $t_{(37)} = -1.70$, $p = .10$). However, when cue condition was controlled for, attraction was no longer related to math score ($\beta = 0.00$, $t_{(37)} = 0.00$, $p = .99$).

Deliberate Underperformance

There was a main effect of cue condition on self-reported motivation to deliberately underperform $F(1, 20) = 4.68$, $p = .04$. However, participants in the sexist cues condition reported *less* motivation to deliberately underperform ($M = 2.35$) than participants in the no sexist cues condition ($M = 2.93$).⁵

Self-Objectification

There was no effect of cue condition on self-reported self-objectification ($M_{no\ sexist\ cues} = -.42$; $M_{sexist\ cues} = -.72$), $F = 1.05$, $p = .32$ or on the measure of self-objectification assessing perspective in memory ($M_{no\ sexist\ cues} = 3.08$; $M_{sexist\ cues} = 2.30$), $F = 1.03$, $p = .32$.

⁵ Interestingly, in the sexist cues condition, the less participants reported being motivated to underperform, the lower they scored on the math problems ($r = .43$, $p = .22$), although this correlation was not significant, most likely because of the small cell size ($n = 10$). This association may reflect the extra pressure on participants in this condition to perform well to avoid confirming the stereotype derogating women's mathematical ability, which undermined their ability to accurately solve the difficult problems.

Results of Study 7 showed that when a confederate displayed sexist cues, women underperformed on mathematics problems but not on English problems. These results are inconsistent with alternative explanations, which predicted that sexist cues would undermine women's general intellectual ability. They are consistent, however, with a stereotype threat explanation--that the confederate's behaviour served as a cue to women suggesting that they could be judged according to a negative stereotype, and the resultant stereotype threat undermined their performance in the stereotyped domain.

Alternative Explanations

Floor effect on the English problems. It might be argued that participants in the sexist cues condition underperformed only on the math portion of the test because a floor effect on the English questions prevented participants from scoring any lower than they did in the no sexist cues condition. This seemed unlikely because I assigned a correction penalty for guessing, such that chance performance on the unstandardized scores would equal zero. I found that the unstandardized English scores were significantly different from zero ($t_{(21)} = 4.54, p < .001$), suggesting that their scores could have dropped further, if they were being negatively affected by self-objectification, distraction due to attraction, or deliberate underperformance. Still, I designed Study 8 to examine a different kind of evidence that women underperformed due to stereotype threat.

Low power to detect effects. It could be argued that the sexist cues condition did not have an effect on the paper-and-pencil measures designed to further address alternatives to stereotype threat because the relatively small sample size provided low power to detect significant effects. To address this concern I remeasured these constructs in Study 8.

Deliberate underperformance only in the stereotyped domain. It also could be argued that women in the sexist cues condition underperformed only on the math problems because they inferred that the confederate preferred stereotypic women who had stronger English than math abilities. Study 8 was also designed to address this concern.

We have hypothesized that the behaviour of sexist men serves as a cue to women that they could be judged according to a negative gender stereotype. Converging evidence from Studies 5--7 supported this view: women underperformed on an engineering test after interacting with a man with sexist attitudes (Study 5), or whose behaviour displayed sexist cues (Studies 6 and 7), and reported noticing more dominant and sexually interested behaviour when he did so (Studies 6 and 7). Women did not underperform in a domain in which they were not stereotyped (Study 7). I designed Study 8 to provide a different test of whether men's dominant and sexually interested behaviour serves as a cue to women that they could be stereotyped.

Study 8

When people suspect that their performance may be judged according to a negative stereotype, one response to these concerns is to attempt to suppress them in order to concentrate on the task at hand (Logel et al., in press; Schmader et al., in press). Indeed, Logel and colleagues found that under conditions of high stereotype threat, women suppressed thoughts of the gender stereotype compared to conditions of low stereotype threat. If men's dominant and sexually interested behaviour serves as a cue to women that they are at risk of being stereotyped, I would expect them to suppress these concerns that they can concentrate on the task at hand. In contrast, if this behaviour causes women to be distracted by their feelings of attraction, or to experience self-objectification, this mechanism would not lead one to expect women to suppress concerns about the stereotype. And if it causes them to deliberately underperform, either overall or just in a stereotyped domain, I would expect thoughts of the gender stereotype to be activated, rather than suppressed.

To test these competing possibilities, female students in quantitative programs interacted with a confederate who either did or did not display subtle sexist cues. They then completed a lexical decision task assessing thoughts about the negative gender stereotype. I expected women who interacted with a confederate who displayed subtle sexist cues to suppress thoughts of the stereotype more than women who interacted with a confederate who did not display such cues. Because the lack of condition effects on participants' self-reported motivation to deliberately underperform and self-

objectification in Study 7 could have resulted from a lack of statistical power, I also measured these constructs again in Study 8.

Method

Participants

Twenty-six female undergraduate students at the University of Waterloo participated individually for payment of \$8.00 or partial course credit. As in Study 7, participants were either math majors ($n = 11$), science majors ($n = 9$), or engineering majors ($n = 5$). One participant did not specify in which program she was enrolled. One participant in the no sexist cues condition expressed suspicion about the cover story and correctly guessed the purpose of the study. One participant in the sexist cues condition failed to follow the instructions on the computer task. Their data were excluded from the analyses.

Procedure

The procedure and cover story were the same as Study 7, except that after the interaction, participants were asked to first complete the lexical decision task and survey measures before completing the test. Once participants completed the survey measures they were told they would not actually take a test, and were thanked and debriefed.

Confederate behaviour. Three confederates, all male drama students, were trained in the same manner as in Studies 6 and 7 and followed the same script. One confederate participated in each experimental session. Including the individual confederate in the analyses does not change the pattern of results, and so is not discussed further.

Suppression of thoughts of the stereotype. I measured suppression of concerns about the negative gender stereotype using a lexical decision task (Logel et al., in press). Letter-strings were presented one at a time on a computer screen. Participants were instructed to press a key to indicate whether each string was a word or a non-word. The task included 12 words shown in prior research (Logel et al., in press) to be related to the stereotype (illogical, intuitive, weak, indecisive, irrational, emotional, complaining, uncertain, worried, confused, failure, and distracted). Each gender stereotype

word was also matched with a neutral word based on length and language frequency, using norms established by Kucera and Francis (1967) (defining, animated, melon, someone, advisable, door, coal, context, relative, punctuated, saturated, and heating). There were also 12 non-word strings, for a total of 36 trials. Participants were instructed to complete the task as quickly and as accurately as possible. The more participants suppressed concerns about the stereotype, the slower I expected them to respond to the stereotypic words.

Questionnaire measures assessing alternative explanations. I abbreviated the measures of deliberate underperformance (five items), and self-objectification (three external items and three internal items), and included these along with the same one-item memory perspective measure of self-objectification used in Study 5.⁶

Results and Discussion

Suppression of Thoughts of the Stereotype

We arrived at a final score on the lexical decision task using the same procedures described in Study 2. Using these procedures, 5% of the total trials were removed. I then calculated average response latencies for each participant on stereotypic and neutral words.

We conducted an ANCOVA to test the effect of cue condition on participants' reaction time identifying gender stereotypic words. I controlled for their reaction time to the neutral words to account for individual differences in general response speed, and, as in Study 5, included their program of study as a between-subjects factor.

The predicted main effect was significant, $F(1, 17) = 4.58, p = .05$. Participants who had interacted with the confederate who displayed sexist cues responded more slowly to gender stereotypic words ($M = 708.25$ ms) than did participants who had interacted with the confederate who did not display such cues ($M = 658.26$ ms). Reaction time on the neutral words was a significant

⁶ Unfortunately, dropping items to abbreviate these measures resulted in lower internal consistency reliability (deliberate underperformance $\alpha = .68$; self-objectification $\alpha = .54$ for external items and $\alpha = .53$ for internal items).

covariate $F(1, 17) = 136.58, p < .0001$, but there was no significant effect of participants' program, $F = 1.90, p = .18$, nor an interaction between program and condition, $F < 1$.

Deliberate Underperformance

We conducted an ANOVA predicting scores on the deliberate underperformance scale from cue condition. As in Study 5, women tended to report less willingness to deliberately underperform in the sexist cues condition ($M = 2.92$) than in the no sexist cues condition ($M = 3.62$), $F(1, 22) = 3.16, p = .09$.

Self-Objectification

Analysis of self-reported self-objectification yielded a main effect of condition, $F(1, 22) = 4.74, p = .04$. Participants reported *lower* levels of self-objectification in the sexist cues condition ($M = -.82$) than in the no sexist cues condition ($M = -.19$). There was no condition effect on the memory perspective measure of self-objectification, $F(1, 22) = 1.74, p = .20$.

Combined Questionnaire Data Across Studies 7 and 8

We combined the survey data from Studies 7 and 8 to provide more statistical power to detect condition effects on these measures. Correlations between these dependent variables are presented in Appendix H. Across the two studies, women reported less willingness to deliberately underperform in the sexist cues condition ($M = 2.65$) than in the no sexist cues condition ($M = 3.29$), $F(1, 44) = 5.64, p = .02$. Similarly, women reported lower levels of self-objectification in the sexist cues condition ($M = -.89$) than in the no sexist cues condition ($M = -.41$), $F(1, 44) = 5.47, p < .05$. The subtle perspective measure of self-objectification yielded no condition effect, $F(1,44) = 2.18, p = .15$.

Results of Study 8 provide further evidence that women are influenced by cues in men's dominant and sexually interested behaviour indicating that they may be stereotyped. Women who interacted with a confederate who displayed subtle sexist cues suppressed thoughts of the negative gender stereotype relative to women who had interacted with a confederate who did not display such cues. This finding is inconsistent with alternative explanations, but consistent with my argument that

men's dominant and sexually interested behaviour serves as a cue to women suggesting that they might be stereotyped.

CHAPTER 6: GENERAL DISCUSSION

Because women are minorities in fields such as engineering and mathematics, most of their interactions are likely to be with men. The present research suggests that some of these interactions can have negative consequences for women's performance in these fields.

In Studies 1 and 2, men who completed sentences about women in sexist ways reported attitudes consistent with sexism, and tended to associate male engineers with competence and female engineers with incompetence. In Studies 3 and 4, the higher men scored on this sentence completion measure of sexism, the more dominance and sexual interest they exhibited towards a female confederate whom they believed to be a fellow engineering student. More sexist men also failed to activate thoughts about competent engineers after meeting her. Studies 5--8 examined how such behaviour affects women, providing converging evidence that cues in sexist men's behaviour can undermine women's performance in stereotyped domains through the experience of stereotype threat. As a consequence, women who interacted with a sexist man (Study 5), or with a male confederate trained to behave like one (Study 6), underperformed on an engineering test relative to women who had interacted with a non-sexist man. Their underperformance was confined specifically to a domain in which women are negatively stereotyped (Study 7), and they suppressed thoughts of gender stereotypes (Study 8). Additional measures ruled out alternative explanations (Studies 6--8).

These studies are among the first that I know of to show that men's sexist attitudes predict their actual behaviour in an interaction with a woman (cf McKenzie-Mohr & Zanna, 1990; Rudman & Borgida, 1995). The differences between more sexist and less sexist men's behaviour were subtle, consistent with research on cross-race interaction (Dovidio & Gaertner, 2004). The sexist men in my studies did not make overtly sexist statements or sexually harass their interaction partners. Instead, they exhibited subtle patterns of dominance and sexual interest. By first measuring this dominance and sexual interest (Studies 3 and 4), and then manipulating it (Studies 5--8), these studies show that such behaviour is a mechanism by which women experience stereotype threat (Spencer, Zanna, & Fong, 2005).

In doing so, these studies contribute to a literature that is beginning to examine the potential triggers of stereotype threat in real-world educational and professional settings (cf. Cohen et al., 1999; Inzlicht & Ben-Zeev, 2000, 2003; Sekaquaptewa & Thompson, 2003; Walton & Cohen, 2007). In real schools and workplaces, people rarely get blatant messages that a task produces group differences, or is diagnostic of a negatively stereotyped ability. But people *do* get subtle messages from others when they interact, about how they might be judged. If these subtle messages can communicate the risk of being stereotyped, then experiences of stereotype threat may be ubiquitous in any setting in which people hold negative stereotypes about each other.

Implications

By highlighting how stereotype threat can be an interpersonal phenomenon, the present research illustrates the rationality that can be inherent in people's experience of stereotype threat. Women's fears that they could be judged according to negative gender stereotypes did not reflect irrational fears or imagined threats. Instead, women experience stereotype threat in response to dominant and sexually interested behaviours that accurately predict that they are at risk of being stereotyped.

These studies also suggest how sexist men's behaviour may be self-reinforcing, despite its negative effect on women. Even as women underperformed intellectually, they reported feeling more attracted to the man who displayed dominant and sexually interested behaviour. This result underscores the complexity, and potential intractability, of patterns of interaction between men and women. If sexist men's behaviour is reinforced by increased success in obtaining romantic and sexual partners, it may create a cycle that further impairs women's ability to succeed in negatively stereotyped domains.

These results are consistent with findings on the developmental trajectory of gender differences in quantitative performance. If anything, girls slightly outperform boys in elementary school, but boys begin to surpass them in high school and continue to do so through college and early adulthood (Hyde, Fennema, & Lamon, 1990). From early childhood through middle childhood, girls

and boys prefer same-sex playmates and socialize in gender-segregated groups (LaFrenier, Strayer, & Gauthier, 1984; Maccoby, 1990). This limits the potential for male-female peer interactions to undermine girls' quantitative performance. But beginning in middle school and increasing thereafter, adolescents date and socialize in mixed-sex groups (Pellegrini, 2001). Some adolescent boys are likely to hold sexist attitudes, and as girls come to see themselves as women for whom stereotypes about women's math ability apply (Steele, 2003), sexist boys' behaviour may begin to undermine girls' quantitative performance.

These findings add to a growing recognition of the situational and psychological barriers women may face in male dominated fields. Women and men both feel angry when they are patronized by a powerful man in a masculine domain (that is, given written praise for their competence, but allocated few resources), but this treatment motivates men to perform better, whereas it undermines women's motivation such that they perform worse (Vescio et al., 2005). The present studies suggest that even subtle behavioural cues can undermine women's performance in these domains, even if they are highly motivated to perform well.

Future Directions

Interactions involve complex processes of social perception, and this can be especially true for interactions between men and women. The present research suggests that if a man holds sexist attitudes, and a woman studies or works in a field in which women are negatively stereotyped, even a brief work-related discussion between them can have negative consequences for the woman's ability to perform well. But in increasingly diverse classrooms and workplaces, interactions between men and women are unavoidable and often essential. How can organizations reap the benefits of collaborations between men and women, without putting women's performance at risk?

Social psychologists have developed several interventions that restore the performance of negatively stereotyped groups, and future research should examine whether these are effective at reducing the negative consequences of women's interactions with sexist men. Affirming self-integrity (Cohen et al., 1999) or increasing feelings of belonging (Walton & Cohen, 2007) has been shown to

improve minority students' school performance. Providing women with role models (McIntyre, Paulson, & Lord, 2004; Marx & Roman, 2002) or giving them techniques to facilitate suppression of their concerns about being stereotyped (Logel et al., in press) allows women to perform equally to men.

One finding in the present research suggests that organizations can also intervene with the men themselves. In Study 5, the test participants completed was portrayed as diagnostic of engineering ability; a high-threat situation meant to approximate a real-world testing environment. In such circumstances, women typically perform worse than man (Walton & Cohen, 2003). However in this study, women who were paired with a man who was low in sexism performed as well as men. Much as the results of Studies 6--8 show how men's subtle sexist behaviours can have meaningful negative consequences, this finding could potentially suggest that men's subtle egalitarian behaviours might have meaningful positive consequences. If so, educational and professional organizations may be able to benefit from male-female collaborations, and increase the productivity and performance of women, by encouraging egalitarian attitudes and behaviours from men.

Appendix A: Sentence Completion Task in Studies 1--4

In this task you will see a series of behaviours. These are really the beginnings of various sentences. We would like you to add words to form longer sentences. You can add words to form any type of sentence you would like, as long as it is grammatically correct.

1. Linda swatted at the flies
2. Elaine went to Florida on spring break
3. Marvin let the waiter ignore him for fifteen minutes
4. Bob confronted the man
5. Helen crammed for the test
6. Crystal caught a bad cold
7. Rich studied the engineering manual
8. Laura ate a sandwich
9. Shirley asked for help getting home
10. Sam read the newspaper
11. Jenny went home to cook dinner
12. Lisa went to the auto show
13. Ted watched the TV news
14. Sarah wiped off her glasses
15. Karen paid for their dinner
16. Katherine baby-sat the neighbour's kids
17. Tom bottle-fed the baby
18. Bert changed the oil
19. Rebecca brushed her teeth
20. Joanne directed the operation
21. Monica went on a blind date
22. Jeff sewed the button back on

Appendix B: Survey Measures in Study 2

FRIENDSHIP QUESTIONS

On this page, you will be asked to think of your five closest friends in elementary school and record their initials below. Then you will be asked a short question about each friend you have listed.

If you cannot remember all five friends in each category, that is okay.

If you cannot remember both initials, that is okay too. Just record something that allows you to recognize which friend you are thinking of.

Please think of your five closest friends when you were between the ages of four and six (e.g., from kindergarten through to Grade 1). Please list their initials below.

Please indicate each friend's gender by circling the correct response.

Friend #1 _____ Gender: Male Female
Friend #2 _____ Gender: Male Female
Friend #3 _____ Gender: Male Female
Friend #4 _____ Gender: Male Female
Friend #5 _____ Gender: Male Female

Please think of your five closest friends when you were between the ages of seven and ten (e.g., between Grade 2 and Grade 5). It is okay if they are the same or different from the friends you listed above. Please list their initials below.

Friend #1 _____ Gender: Male Female
Friend #2 _____ Gender: Male Female
Friend #3 _____ Gender: Male Female
Friend #4 _____ Gender: Male Female
Friend #5 _____ Gender: Male Female

Please think of your five closest friends when you were between the ages of fourteen and eighteen (e.g., between Grade 9 and Grade 12). It is okay if they are the same or different from the friends you listed above. Please list their initials below.

Friend #1 _____ Gender: Male Female
Friend #2 _____ Gender: Male Female
Friend #3 _____ Gender: Male Female
Friend #4 _____ Gender: Male Female
Friend #5 _____ Gender: Male Female

BACKGROUND INFORMATION

The following demographic questions how people's attitudes on certain variables are associated with their background. As with any of the questionnaires in this study, you may decline answering any items you prefer not to answer. Further, all of the information you provide will be kept confidential.

1. How many younger or older sisters do you have, if any? (please circle)

Younger sisters: none one two three four or more

Older sisters: none one two three four or more

2. Do you have a girlfriend? Yes No

3. What is your sexual orientation? Heterosexual Bisexual Homosexual

4. IQ has been found to have a strong genetic link. Which of your biological parents do you think you inherited most of your intelligence from?

I inherited my intelligence:

Almost all from my mother	Most from my mother	Slightly more from my mother	Slightly more from my father	Most from my father	Almost all from my father
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The following questions refer to your parents. If you have step-parents or other parental figures in your life, please consider the female and male parent figures you identify with the most:

5. Who has had better education, your mother or father?

My mother's education is a lot better	My mother's education is somewhat better	My mother's education is slightly better	My parents have had equal educations	My father's education is slightly better	My father's education is somewhat better	My father's education is a lot better
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6. When you were growing up, did your father work outside the home? (please circle)

No, he was primarily a caregiver	Yes, part-time	Yes, full-time
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7. When you were growing up, did your mother work outside the home? (please circle)

No, he was primarily a caregiver	Yes, part-time	Yes, full-time
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BACKGROUND INFORMATION II

1. What is the highest degree of education your father has obtained? (Please circle)

- Some high school
- High School
- Some College
- College
- Some University
- University
- Some Post-Graduate Education
- Post-Graduate Degree

2. What is the highest degree of education your mother has obtained? (Please circle)

- Some high school
- High School
- Some College
- College
- Some University
- University
- Some Post-Graduate Education
- Post-Graduate Degree

3. I have high self-esteem.

Disagree Very Strongly	Disagree Strongly	Disagree Somewhat	Disagree Slightly	Neutral	Agree Slightly	Agree Somewhat	Agree Strongly	Agree Very Strongly
1	2	3	4	5	6	7	8	9

4. What is your ethnicity? (e.g., East Asian, Black, White, etc.) _____

5. What faculty are you in? (Please circle)

- Arts
- Environmental Studies
- Applied Health Sciences
- Math
- Science
- Engineering

6. What is your major? (e.g., Chemical Engineering, Psychology, etc) _____

7. What year are you in school? (e.g., second year, 3B, etc) _____

Engineering Questions

1. People have a certain amount of engineering ability and they can't do much to change it.

Strongly Agree	Agree	Somewhat Agree	Somewhat Disagree	Disagree	Strongly Disagree
1	2	3	4	5	6

2. People can do things differently, but their engineering ability can't really be changed.

Strongly Agree	Agree	Somewhat Agree	Somewhat Disagree	Disagree	Strongly Disagree
1	2	3	4	5	6

Work / Project Experience

In high school, did you:

1. Have a female lab partner in your science classes?

Never	Rarely	Sometimes	Often	Almost always
1	2	3	4	5

2. Work with girls on math or science assignments?

Never	Rarely	Sometimes	Often	Almost always
1	2	3	4	5

3. Study with girls for math and science tests?

Never	Rarely	Sometimes	Often	Almost always
1	2	3	4	5

4. Belong to co-ed clubs or teams?

None One Two Three Four Five or more

5. Ever have a part-time job where you worked with girls? Yes No

6. Ever have a summer job where you worked with girls? Yes No

The next two questions ask about a topic that may be sensitive for some people. As with any question in this survey, you do not have to answer them if they make you uncomfortable.

1. Have you had sexual intercourse? Yes No

2. If yes, how many women have you had sex with? _____ (please write the number)

Appendix C: Newspaper article and discussion questions in Studies 3--8

December 8, 2001

Foundation Deals Setback to Hewlett-Packard's Plans

By STEVE LOHR and CHRIS GAITHER

SAN FRANCISCO, Dec. 7 The family foundation that is Hewlett-Packard's largest shareholder dealt a severe blow today to the company's plan to buy Compaq Computer, declaring its intention to vote against the merger, the largest in computing history.

The move by the David and Lucile Packard Foundation, which holds 10.4 percent of Hewlett-Packard's shares, unites the heirs of William Hewlett and David Packard, who founded their company in 1938 in a garage in Palo Alto, Calif., and the family foundations against not only the \$24 billion deal, but also against the CEO of Hewlett-Packard. Last month, Walter Hewlett and David Woodley Packard, the two oldest sons of the founders, announced their opposition to the merger and said they would vote the 7.5 percent of company shares they controlled against the deal.

If the deal ultimately fails, it will probably bring the downfall of Carleton S. Fiorina, a young charismatic executive who was given perhaps the most challenging job in corporate America since Louis V. Gerstner Jr. was asked to turn around another technology standard-bearer, I.B.M. Her exit, if it occurs, would come largely at the hands of two families that are institutions in Silicon Valley.

In the last few weeks, Mr. Hewlett has begun a campaign to try to persuade other large shareholders to oppose the merger.

Although the 18 percent of Hewlett-Packard shares now united in opposition do not kill the deal, this is clearly a setback for the boards and management teams of Hewlett-Packard and Compaq, and especially so for Ms. Fiorina, the 47-year-old chairwoman of Hewlett-Packard. She was recruited two years ago from Lucent Technologies, and was charged with improving the Hewlett-Packard's fortunes.

The Compaq acquisition, Ms. Fiorina has said, is an opportunity to improve Hewlett-Packard's competitive strength quickly in a computer business that is in a steep downturn. But opponents of the deal have pointed out that big mergers in the fast-changing high-technology industries rarely succeed and, they say, Hewlett-Packard is paying too much for Compaq. Also, David Packard, in particular, has been very outspoken, saying the projected job cuts of 15,000 were draconian and contrary to the corporate culture his father had fostered.

Wall Street's reaction to the deal was skeptical when it was announced in early September, with investors selling shares in both companies.

At least among the founders' heirs, and their foundations, the opposition view has prevailed. Today, in Los Altos, Calif., after hearing a presentation from its financial adviser, Booz Allen & Hamilton, the chairman of the Packard foundation, said in a statement, "The board of trustees understands the strategic considerations being addressed by management, but after thorough study and analysis the board has preliminarily decided, on balance, that the best interests of the foundation would be better served by Hewlett-Packard not proceeding with the proposed transaction."

Though termed a "preliminary" decision, there was scant prospect the foundation would reverse itself.

The boards of Hewlett-Packard and Compaq issued a joint statement this afternoon, saying they were disappointed by the foundation's decision but vowing to press on with the merger plan. A full shareholder vote will not come until late February at the earliest.

"We are disappointed by the Packard Foundation's preliminary decision," the Hewlett-Packard and Compaq boards said. "Nevertheless, our responsibility to shareowners, customers and employees requires that we maintain a pragmatic view of the business and a focus on the future. Our firm commitment to this merger stems from our conviction that it will deliver the industry leadership and earnings growth our share-owners expect and our employees deserve."

Analysts said, however, that the merger could still succeed, even though the odds have lengthened. "It's not impossible, but it's going to be uphill," said Daniel Kunstler, an analyst for J. P. Morgan.

Nell Minow, an expert on shareholder issues and founder of the Corporate Library, an online research service for corporate governance issues suggested that foundation may be too conservative in its views. "A foundation makes a particularly bad steward for a high-technology company," she said.

Questions for Discussion

1. What are the positive aspects of the proposed merger between Hewlett-Packard and Compaq?
2. What are the negative aspects of the proposed merger between Hewlett-Packard and Compaq?
3. Do you think Ms. Fiorina is doing a good job managing the merger?
4. Do you think Hewlett and Packard are justified in attempting to persuade other shareholders to oppose the merger?
5. Overall, do you think the merger is a good idea or a bad idea?

Appendix D: Fundamentals of Engineering Exam in Studies 5 and 6

1. The graph of the general quadratic equation $3x^2 - 10xy + 3y^2 + 8 = 0$ is:
 - (A) an ellipse
 - (B) a parabola
 - (C) a hyperbola
 - (D) a circle

2. The general solution of the differential equation $\frac{dy}{dx} + 3y = 0$ with $y(0) = 1$ is:
 - (A) $y = e^{-3x}$
 - (B) $y = e^{3x}$
 - (C) $y = \ln 3x$
 - (D) $y = xe^{3x}$

3. The volume of the solid generated by revolving the area bounded by $y = \sqrt{x}$, $y = 2$ and the y -axis about the y -axis is:
 - (A) 8π cubic units
 - (B) $\frac{16\pi}{3}$ cubic units
 - (C) $\frac{32\pi}{5}$ cubic units
 - (D) $\frac{8\pi}{3}$ cubic units

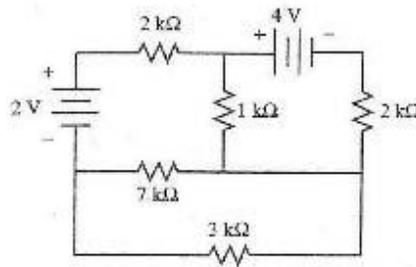
4. For $0 < x < \frac{\pi}{2}$, the trigonometric expression $\tan x \csc x \cos x$ is equal to:
 - (A) 1
 - (B) 0
 - (C) $\sin x$
 - (D) $\cos 2x$

5. What is the sum of the infinite geometric series $\sum_{i=1}^{\infty} (0.3)^i$?

- (A) $\frac{3}{10}$
- (B) $\frac{1}{5}$
- (C) $\frac{2}{5}$
- (D) $\frac{3}{4}$

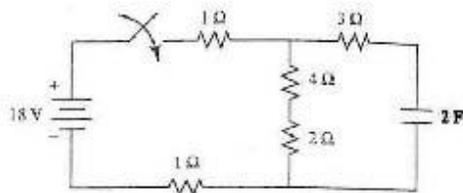
6. The equation of the tangent to the curve $x^2 + 3y = 25$ at point (3, 4) is:

- (A) $4x - 3y = 0$
- (B) $3x - 4y = -7$
- (C) $4x + 3y = 24$
- (D) $3x + 4y = 25$

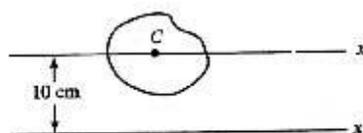


7. What is the voltage drop across the 1-kilohm resistor shown in the diagram above?

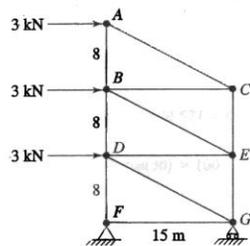
- (A) 0.294 V
- (B) 3.24 V
- (C) 1.43 V
- (D) 4.56 V



8. The initial capacitor voltage in the circuit shown above is 0 volt. What voltage will be measured across the capacitor 2 seconds after the switch is closed?
- (A) 8.65 V
 (B) 1.23 V
 (C) 10.64 V
 (D) 2.18 V



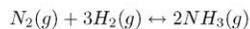
9. If in the above diagram, the area moment of inertia with respect to the x -axis (centroidal axis) is $2,000 \text{ (centimeters)}^4$ and with respect to x' -axis is $7,000 \text{ cm}^4$, the area is most nearly:
- (A) 100 cm^2
 (B) 20 cm^2
 (C) 30 cm^2
 (D) 90 cm^2



10. In the above diagram, the force in member DE is most nearly:?

- (A) 9 kN
- (B) 24 kN
- (C) 6 kN
- (D) 9.6 kN

11. What is the correct expression for the equilibrium constant K_c for the chemical reaction shown below?

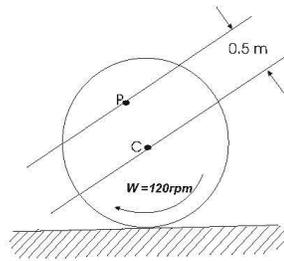


- (A) $K_c = \frac{[NH_3]}{[H_2][N_2]}$
- (B) $K_c = \frac{2[NH_3]}{3[H_2][N_2]}$
- (C) $K_c = \frac{[NH_3]^2}{[N_2][H_2]^3}$
- (D) $K_c = \frac{[N_2][H_2]^3}{[NH_3]^2}$

12. Which of the following is an intensive property?

- (A) Pressure
- (B) Entropy
- (C) Internal energy
- (D) Enthalpy

13. An ideal gas ($k = 1.4$), with an initial specific volume of 30 cubic meters per kilogram, experiences an isothermal compression from 200 kilopascals to 800 kilopascals. What is the final specific volume of the gas?
- (A) 7.5 m³/kg
 (B) 11.14 m³/kg
 (C) 120 m³/kg
 (D) 75 m³/kg



14. A tractor wheel has a diameter of 1.5 meters and rolls with a constant angular speed of 120 rpm, as illustrated above. The speed of point P, measured with respect to the center C of the wheel, is:
- (A) 9.4 m/s
 (B) 60.0 m/s
 (C) 6.3 m/s
 (D) 18.8 m/s
15. A tensile specimen with a diameter of 10 millimeters is subjected to a load of 500 newtons. What is the engineering stress?
- (A) 50 N/mm
 (B) 30 ksi
 (C) 5.2 N/mm²
 (D) 6.36 MN/m²

16. How many times will the line labeled "START" execute in the following program?

```
        I=4
        J=4
START   J=J+1
        I=J2
        IF I<100 THEN GO TO START
        ELSE GO TO FINISH
FINISH  PRINT J
```

- (A) 3
- (B) 4
- (C) 5
- (D) 6

17. After leaving a company and setting up your own engineering practice, a former competitor contacts you to solve a problem similar to one you solved while working at the company. Your previous design seems to be a solution to this former competitor's problem. Can you accept this assignment?

- (A) No. Information from the original design would be required.
- (B) Yes. Knowledge transfer happens.
- (C) No. One should not accept money twice for the same job.
- (D) Yes. No stated nondisclosure statement was signed.

18. The annual payment into a fund is \$800, and payments will be made for 15 years. Each payment is made at the end of the year. How much will the fund be worth when it matures if interest is 10% per year?

- (A) \$31,215
- (B) \$25,418
- (C) \$35,600
- (D) \$26,400

Appendix E: Math and English Test in Study 7 (Version with Page of Math Questions First)

1. $\int_0^\pi e^{\sin^2 x} e^{\cos^2 x} dx =$

- (a) π (b) $e\pi$ (c) e^π (d) $e^{\sin^2 x}$ (e) $e^\pi - 1$

2. Which of the following is true of the behaviour of

$$f(x) = \frac{x^3 + 8}{x^2 - 4} \text{ as } x \longrightarrow 2$$

- a) The limit is 0
b) The limit is 1
c) The limit is 4
d) The graph of the function has a vertical asymptote at 2
e) The function has unequal, finite left-hand and right-hand limits
3. A newscast contained the statement that the total use of electricity in city A had declined in one billing period by 5 percent, while household use had declined by 4 percent and all other uses increased by 25 percent. Which of the following must be true about the billing period?
- a) The statement was in error
b) The ratio of all other uses to household use was 29:1
c) The ratio of all other uses to household use was 29:16
d) The ratio of all other uses to household use was 29:19
e) None of the above

Questions 4-6 refer to the excerpts below.

4. Which refers to Shakespeare?

5. Which refers to Milton?

6. Which refers to Wordsworth?

(a) Here lies a king, that ruled as he thought fit
The universal monarchy of wit;
Here lie two flamens, and both those the best;
Apollo's first, at last the true God's priest.

(b) He was not of an age, but for all time!
And all the muses still were in their prime
When like Apollo he came forth to warm
Our ears, or like a Mercury to charm.

(c) A timorous foe, and a suspicious friend;
Dreading even fools; by flatterers besieged,
And so obliging that he ne'er obliged;
Like Cato, give his little senate laws,
And sit attentive to his own applause

(d) Poet of Nature, thou hast wept to know
That things depart which never may return;
Childhood and youth, friendship and love's first glow,
Have fled like sweet dreams, leaving thee to mourn.

(e) O mighty-mouthed inventor of harmonies,
O skilled to sing of Tim or Eternity,
God-gifted organ-voice of England

7. Therefore is the name of it called _____; because the Lord did there confound the language of all the earth: and from thence did the Lord scatter them abroad upon the face of all the earth.

Which of the above correctly completes the sentence above?

(a) Babylon (b) Mount Sinai (c) Babel (d) Jerusalem (e) Bethlehem

8. A central precept of the New England philosophy of transcendentalism is the belief in the

- (a) "good life" as one which automatically provides the greatest good for the greatest number
- (b) value of science to the discovery of truth, which is unchanging and unchangeable
- (c) importance of the natural as opposed to the supernatural in controlling human destiny
- (d) struggle of human beings with and against nature and each other
- (e) unity of spirit and the world, and the immanence of spirit in the world

9. If f is the linear transformation from the plane to the real numbers and if $f(1,1) = 1$ and $f(-1,0) = 2$, then $f(3,5) =$

- (a) -6 (b) -5 (c) 0 (d) 8 (e) 9

10. Suppose that an arrow is shot from a point p and lands at a point q such that at one and only one point in its flight is the arrow parallel to the line of sight between p and q . Of the following, which is the best mathematical model for the phenomenon described above?

a) A function f differentiable on $[a,b]$ such that there is only and only one point c in $[a,b]$ with:
$$\int_a^b f'(x) dx = c(b - a)$$

b) A function f whose second derivative is at all points negative such that there is one and only one point c in $[a,b]$ with:

$$f'(c) = \frac{f(b) - f(a)}{b - a}$$

c) A function f whose first derivative is at all points positive such that there is one and only one point c in $[a,b]$ with:

$$\int_a^b f(x) dx = f(c) * (b - a)$$

d) A function f continuous on $[a,b]$ and $f(a) < d < f(b)$ such that there is one and only one point c in $[a,b]$ with $f(c) = d$

e) None of the above.

11. She is a recluse who lives among the crumbs of a rat-infested wedding cake, her mind fixed, like the clocks in her mansion, on the hour her husband-to-be deserted her years ago.

The sentence above describes

- (a) Miss Havisham in *Great Expectations*
- (b) Sissy Jupe in *Hard Times*
- (c) Esther Summerson in *Bleak House*
- (d) Agnes Wakefeild in *David Copperfield*
- (e) Sairey Gamp in *Martin Chuzzlewit*

Questions 12-14

Yet Do I Marvel

I doubt not God is good, well-meaning, kind,
And did He stoop to quibble could tell why
The little buried mole continues blind,
Why flesh that mirrors Him must some day die,
Make plain the reason tortured Tantalus
Is baited by the fickle fruit, declare
If merely brute caprice dooms Sisyphus
To struggle up a never-ending stair.
Inscrutable His ways are, and immune
To catechism by a mine too strewn
With petty cares to slightly understand
What awful brain compels His awful hand.
Yet do I marvel at this curious thing:
To make a poet black, and bid him sing!

“Yet Do I Marvel” from *On These I Stand* by Countee Cullen. Copyright, 1925 by Harper & Row, Publishers, Inc.; renewed, 1953 by Ida M. Cullen. Used by permission of the publishers.

12. Which of the following most closely restates the speaker’s view of God?

- (a) God is just but vindictive.
- (b) God need not inspire a poet to write a poem.
- (c) God is benevolent and merciful to all living things.
- (d) God’s intentions are beyond human understanding.
- (e) The ways of God can be explained only in metaphorical language.

13. The poem differs in form from the kind of English sonnet that Shakespeare wrote in that

- (a) its turning point comes after the first quatrain
- (b) it uses imperfect rhyme
- (c) it reverses the usual order of the sestet and octave
- (d) it ends in a couplet
- (e) it substitutes couples for the third quatrain

14. This sonnet is concerned with what philosophers call the

- (a) appeal to prejudice and ignorance
- (b) hasty generalization from irrelevant evidence
- (c) use of syllogistic reasoning
- (d) problem of evil in the universe
- (e) conventional approach to religious belief

15. Let \emptyset be the binary operation on the rational numbers given by:

$$a \emptyset b = a + b + 2ab$$

Which of the following are true?

- I. \emptyset is communicative
- II. There is a rational number that is a \emptyset – identity
- III. Every rational number has a \emptyset – inverse

a) I only (b) II only (c) I and II only (d) I and III only (e) I, II, and III

16. k digits are to be chosen at random (with repetitions allowed from $\{0,1,2,3,4,5,6,7,8,9\}$). What is the probability that zero will not be chosen?

- (a) $1/k$ (b) $1/10$ (c) $(k-1)/k$ (d) $(1/10)^k$ (e) $(9/10)^k$

17. The school of poetry known as Imagism is associated with

- (a) Emily Dickson
- (b) Amy Lowell
- (c) Vachel Lindsay
- (d) Walt Whitman
- (e) Edgar Lee Masters

18. I maintain that all great men or even men a little out of the common, that is to say capable of giving some new word, must from their very nature be criminals.

The "I" of the passage above is

- (a) Iago
- (b) Emma Bovary
- (c) Hedda Gabler
- (d) Captain Ahab
- (e) Raskolnikov

Questions 19-20

My poem's epic, and is meant to be
Divided in twelve books; each book containing,
With love, and war, a heavy gale at sea,
A list of ships, and captains, and kings reigning,
New characters; the episodes are three:
A panoramic view of hell's in training,
After the style of Virgil and of Homer,
So that my name of Epic's no misnomer.

19. The stanza as a whole is most accurately described as

- (a) a parody of the epic invocation
- (b) a satire on the epic apparatus
- (c) a burlesque of the epic simile
- (d) an example of epic high seriousness
- (e) an imitation of classical epic meter

20. The stanza above appears in

- (a) Byron's *Don Juan*
- (b) Milton's *Paradise Regained*
- (c) Wordsworth's *The Prelude*
- (d) Browning's *The Ring and the Book*
- (e) Coleridge's *Christabel*

21. If $c > 0$ and $f(x) = e^x - cx$ for all real numbers x , then the minimum value of f is

- (a) $f(c)$ (b) $f(e)^c$ (c) $f(1/c)$ (d) $f(\log c)$ (e) nonexistent

22. If $\sin^{-1} x = \pi/6$, then the acute angle value of $\cos^{-1} x$ is

- (a) $5\pi/6$ (b) $\pi/3$ (c) $\sqrt{(1-\pi^2/65)}$ (d) $1 - \pi/6$ (e) 0

Question 23-26

23. Which of the following provides examples of Newspeak?
24. Which of the following is an example of jabberwocky?
25. Which of the following is an example of stream of consciousness?
26. Which of the following is an example of the speech of Mrs. Malaprop?
- (a) 'Twas brillig, and the slithy toves
Did gyre and gimble in the wabe:
And mimsy were the borogoves,
And the mome raths outgrabe.
 - (b) There, sir, an attack upon my language! what do you think of that?
an aspersion upon my parts of speech! was ever such a brute! Sure,
if I reprehend any thing in this world it is the use of my oracular
tongue, and a nice derangement of epitaphs!
 - (c) The words of the B vocabulary even gain in force from the fact that
nearly all of them were very much alike. Almost invariably these
words-*good-think*, *Minipax*, *prolefeed*, *sex-crime*, *joycamp*, *Ingsoc*,
belly-feel, *thinkpol*, and countless others- were words of two or three
syllables, with the stress distributed equally between the first syllable
and the last.
 - (d) The deer was, as you know, sanguis, in blood; ripe as the
pomewater, who now hangeth like a jewel in the ear of caelo the sky,
the welkin, the heaven; and anon falleth like a crab on the face of
terra, the soil, the land, the earth.
 - (e) O by the by that lotion. I knew there was something on my mind.
Never went back and the soap not paid. Dislike carrying bottles like
that hag this morning. Hynes might have paid me that three
shillings. I could mention Meagher's just to remind him. Still if he
works that paragraph. Two and nine. Bad opinion of me he'll have.
Call tomorrow. How much do I owe you? Three and nine? Two
and nine, sir. Ah. Might stop him giving credit another time. Lose
your customers that way. Pubs do.

27. For all $x > 0$, if $f(\log x) = \sqrt{x}$ then $f(x) =$

- (a) $e^{(x/2)}$ (b) $\log \sqrt{x}$ (c) $e^{\sqrt{x}}$ (d) $\sqrt{(\log x)}$ (e) $\frac{\log x}{2}$

28. Let x and y be positive integers such that $3x + 7y$ is divisible by 11. Which of the following must also be divisible by 11?

- (a) $4x + 6y$ (b) $x + y + 5$ (c) $9x + 4y$ (d) $4x - 9y$ (e) $x + y - 1$

29. $\lim_{x \rightarrow \pi} \frac{e^{-\pi} - e^{-x}}{\sin x} =$

- (a) $-\infty$ (b) $-e^{-\pi}$ (c) 0 (d) $e^{-\pi}$ (e) 1

Questions 30-33

A noiseless patient spider,
I mark'd where on a little promontory it stood isolated,
Mark'd how to explore the vacant vast surrounding
It launch'd forth filament, filament, filament, out of itself
Ever unreeling them, ever tirelessly speeding them.

And you O my son where you stand,
Surrounded, detached, in measureless oceans of space,
Ceaselessly musing, venturing, throwing, seeking the spheres to connect them,
Till the bridge you will need be form'd, till the ductile anchor hold,
Till the gossamer thread you fling catch somewhere, O my soul.

30. "I mark'd where" (line 2) can best be paraphrased as

- (a) I observed that
- (b) I told one that
- (c) I made a note that
- (d) I remembered where
- (e) I puzzled over where

31. The syntactic parallelism in this passage is stylistically most similar to the phrasing characteristic of :

- (a) Greek epic poetry
- (b) Shakespearean sonnets
- (c) morality plays of the fourteenth century
- (d) the King James' version of the Old Testament
- (e) the Scottish ballads of Robert Burns

32. Which of the following pairs of words does NOT express a parallelism of meaning in the analogy between the Spider and the speaker's soul?

- (a) promontory (line 2)..anchor (line 9)
- (b) isolated (line 2)..detached (line 7)
- (c) vacant (line 3)..measureless (line 7)
- (d) filament (line 4)..gossamer (line 10)
- (e) ever (line 5)..ceaselessly (line 8)

33. The author of the poem above is:

- (a) Edwin Arlington Robinson
- (b) Ralph Waldo Emerson
- (c) Carl Sandburg
- (d) Walt Whitman
- (e) Ezra Pound

Appendix F: Measure of Deliberate Underperformance in Study 7

For each item, please circle a number to indicate the extent to which you agree with the statement.

1. I believe men in my program prefer women who are less successful than they are.

1	2	3	4	5	6	7	8	9
Very strongly disagree	Strongly disagree	Moderately disagree	Slightly disagree	Neutral	Slightly agree	Moderately agree	Strongly agree	Very strongly agree

2. I never worry that a man in my class will not like me if I outperform him.

1	2	3	4	5	6	7	8	9
Very strongly disagree	Strongly disagree	Moderately disagree	Slightly disagree	Neutral	Slightly agree	Moderately agree	Strongly agree	Very strongly agree

3. Sometimes I am tempted to do less well on tests so men in my class will not be intimidated by me.

1	2	3	4	5	6	7	8	9
Very strongly disagree	Strongly disagree	Moderately disagree	Slightly disagree	Neutral	Slightly agree	Moderately agree	Strongly agree	Very strongly agree

4. I do not think men in my program feel uncomfortable around very intelligent women.

1	2	3	4	5	6	7	8	9
Very strongly disagree	Strongly disagree	Moderately disagree	Slightly disagree	Neutral	Slightly agree	Moderately agree	Strongly agree	Very strongly agree

5. I think men in my program will like me better if they get better grades than I do.

1	2	3	4	5	6	7	8	9
Very strongly disagree	Strongly disagree	Moderately disagree	Slightly disagree	Neutral	Slightly agree	Moderately agree	Strongly agree	Very strongly agree

6. It is important to men in my program that they outperform their girlfriends on tests.

1	2	3	4	5	6	7	8	9
Very strongly disagree	Strongly disagree	Moderately disagree	Slightly disagree	Neutral	Slightly agree	Moderately agree	Strongly agree	Very strongly agree

7. I would try to get the best mark possible on a test even if men would resent me for doing well.

1	2	3	4	5	6	7	8	9
Very strongly disagree	Strongly disagree	Moderately disagree	Slightly disagree	Neutral	Slightly agree	Moderately agree	Strongly agree	Very strongly agree

8. Men in my program do *not* prefer to be smarter than the women they are interested in.

1	2	3	4	5	6	7	8	9
Very strongly disagree	Strongly disagree	Moderately disagree	Slightly disagree	Neutral	Slightly agree	Moderately agree	Strongly agree	Very strongly agree

9. I might deliberately get questions wrong on a test to get the attention of a man I am interested in.

1	2	3	4	5	6	7	8	9
Very strongly disagree	Strongly disagree	Moderately disagree	Slightly disagree	Neutral	Slightly agree	Moderately agree	Strongly agree	Very strongly agree

10. Men in my program like women who need their help on their school work.

1	2	3	4	5	6	7	8	9
Very strongly disagree	Strongly disagree	Moderately disagree	Slightly disagree	Neutral	Slightly agree	Moderately agree	Strongly agree	Very strongly agree

11. I worry that if I do better than a man I am interested in on a test, he will resent it.

1	2	3	4	5	6	7	8	9
Very strongly disagree	Strongly disagree	Moderately disagree	Slightly disagree	Neutral	Slightly agree	Moderately agree	Strongly agree	Very strongly agree

12. I would consider purposely doing badly on a test to get the attention of a man I like.

1	2	3	4	5	6	7	8	9
Very strongly disagree	Strongly disagree	Moderately disagree	Slightly disagree	Neutral	Slightly agree	Moderately agree	Strongly agree	Very strongly agree

Stop!

Before you go on to the next page, please follow these instructions:

- **Think about the interaction you had with the other participant, when the two of you discussed the newspaper article.**

- **Take a minute to think through your memory of the interaction and try to really recall it.**

When you have thought through the interaction, please go on to the next page.

Please read these instructions carefully:

Memories of events from your life are often accompanied by visual images of the event, meaning that you can “see” the past event in your head when you remember it. You might see images from different perspectives:

- With the **first-person visual perspective** you see an event from the same visual perspective that you originally did; in other words, in your memory you are looking out at your surroundings through your own eyes.
- With the **third-person visual perspective** you see an event from an observer’s visual perspective; in other words, in your memory you can actually see yourself, as well as your surroundings.

As you have been thinking about your interaction with the other participant, what kind of visual imagery have you had of that event? Has it been primarily first-person, primarily third-person, or somewhere in-between? Make an “X” in one of the boxes along the continuum below to indicate your answer:

Completely first-person imagery					completely third-person imagery				

How well do you remember your interaction with the other participant?

1	2	3	4
I do not remember it at all	I remember it vaguely	I remember it fairly well	I remember it very well

How clear is your memory of your interaction with the other participant?

1	2	3	4
Not at all clear	Somewhat clear	Fairly clear	Very clear

Appendix H: Correlations Between Dependent Variables in Studies 7 and 8

Table A1						
<i>Correlations between dependent variables aggregated across Studies 7 and 8, collapsing across condition</i>						
	1	2	3	4	5	6
1. Math Score (Study 7 only)	-					
2. Verbal Score (Study 7 only)	.04	-				
3. Suppression of Thoughts of the Stereotype (Study 8 only)	-	-	-			
4. Deliberate Underperformance	.00	.14	.09	-		
5. Self-Objectification Scale	-.11	-.29	-.27	-.04	-	
6. Memory Perspective Measure of Self-Objectification	.37 [†]	.11	-.22	.34*	.18	-

[†] $p < .10$, * $p < .05$

Note. Math Score and Verbal Score are controlling for participants' program and page order. Suppression of Thoughts of the Stereotype is controlling for participants' program and reaction time to neutral words.

Math and Verbal Score: $n = 22$; Suppression of Thoughts of the Stereotype: $n = 23$; Memory Perspective Measure: $n = 45$; All other variables: $n = 46$.

Table A2						
<i>Correlations between dependent variables aggregated across Studies 7 and 8, no sexist cues condition</i>						
	1	2	3	4	5	6
1. Math Score (Study 7 only)	-					
2. Verbal Score (Study 7 only)	-.04	-				
3. Suppression of Thoughts of the Stereotype (Study 8 only)	-	-	-			
4. Deliberate Underperformance	-.45	.28	.08	-		
5. Self-Objectification Scale	-.39	-.11	-.12	-.23	-	
6. Memory Perspective Measure of Self-Objectification	.30	-.18	-.20	.22	.06	-

Note. Math Score and Verbal Score are controlling for participants' program and page order. Suppression of Thoughts of the Stereotype is controlling for participants' program and reaction time to neutral words.

Math and Verbal Score: $n = 12$; Suppression of Thoughts of the Stereotype: $n = 11$; Memory Perspective Measure: $n = 22$; All other variables: $n = 23$.

Table A3						
<i>Correlations between dependent variables aggregated across Studies 7 and 8, sexist cues condition</i>						
	1	2	3	4	5	6
1. Math Score (Study 7 only)	-					
2. Verbal Score (Study 7 only)	.44	-				
3. Suppression of Thoughts of the Stereotype (Study 8 only)	-	-	-			
4. Deliberate Underperformance	.43	.08	.42	-		
5. Self-Objectification Scale	-.15	-.41	-.14	-.13	-	
6. Memory Perspective Measure of Self-Objectification	.39	.55	-.07	.37 [†]	.12	-

Note. Math Score and Verbal Score are controlling for participants' program and page order. Suppression of Thoughts of the Stereotype is controlling for participants' program and reaction time to neutral words.

Math and Verbal Score: $n = 10$; Suppression of Thoughts of the Stereotype: $n = 12$; All other variables: $n = 23$.

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