Why Don't "Real Men" Learn Languages? Masculinity Threat and Gender Ideology Suppress Men's Language Learning Motivation

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Abstract

Large gender disparities in participation still exist across many university subjects and career fields, but few studies have examined factors that account for gender gaps in female-dominated disciplines. We examine one possible cause: threatened masculinity among men who hold traditional gender ideologies. Past research has linked endorsement of traditional gender ideologies to gender-stereotypical occupational choices, and threats to masculinity can lead men to distance themselves from femininity. After confirming that 1672 undergraduates stereotyped language learning as feminine, we applied a masculinity threat manipulation to investigate 182 men's disinterest in studying foreign languages, a female-dominated university subject. Men with traditional masculinity ideologies reported less interest in foreign language study and less positive attitudes towards foreign language following masculinity threat compared to men whose masculinity was affirmed or who held less traditional masculinity beliefs. Traditional masculine gender roles may lead some men to avoid "feminine"-typed domains such as foreign language learning.

Keywords: gender, social roles, education, masculinity, language, motivation

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Many researchers, educators, and policymakers are concerned about the low proportion of women in STEM (Science, Technology, Engineering, and Mathematics) disciplines, while the related issue of disproportionately fewer men in disciplines such as nursing, education, and foreign languages has been largely ignored (see Croft, Schmader, & Block, 2015). In the U.S., only 30.60% of foreign language majors are male (National Center for Education Statistics [NCES], 2014). This percentage represents a considerably larger disparity than that found in traditionally male disciplines such as physical science, math and statistics, and biology. Although computer science and engineering remain heavily male-dominated, most other university majors with large gender disparities in the U.S. and Canada are now female-dominated ones including nursing and psychology (Canadian Council on Learning, 2009; NCES, 2014; Statistics Canada, 2014). Therefore, this study aims to understand how gender biases may play a role in men's interest in one particular female-dominated educational domain: foreign language study.

Though it is true that, historically, almost all academic disciplines have been male-dominated and the opportunities of women are still limited by sexism today, it is important to study how gender stereotypes and biases affect not only women, but also men. Research to this point has focused on women in STEM in part because STEM fields tend to be high-paying and prestigious, and women and people of color have faced discrimination and low pay in these fields specifically, as well as in society at large. Research on occupational interests and values suggests that boys and men prioritize high pay and prestige to a greater extent than girls and women (e.g., Weisgram, Bigler, & Liben, 2010), and some have assumed that this is a primary cause of occupational and educational segregation and gender pay gaps. However, such

assumptions are undermined by evidence suggesting that as more women enter an occupation, that occupation becomes devalued and its pay decreases (England & Li, 2006; Karlin, England, & Richardson, 2002; Levanon, England, & Allison, 2009; Mandel, 2013). On the other hand, unemployment can be particularly emotionally taxing for men, yet both men and women might be resistant to the idea of men seeking employment in female-dominated fields (Basburg & Sharone, 2017; Chira, 2017). Given that recent reports suggest that job opportunities in female-dominated fields are growing faster than those in male-dominated fields (e.g. Rosin, 2010), men's reluctance to pursue female-dominated areas of education and employment may increase their chances of unemployment.

Research into men's career choices, then, may eventually be beneficial for both men's employment opportunities and societal gender equity. If it is the case that feminization of a field leads to its devaluation, as suggested by Levanon and colleagues (Levanon et al., 2009), encouraging more men into female-dominated fields and professions might reverse the devaluation of these fields, while also broadening options for men. Furthermore, recent research has shown that framing gender inequality as an issue that affects men as well as women increases men's willingness to take action to promote gender equality (Subašić, Hardacre, Elton, Branscombe, Ryan, & Reynolds, 2018). Studies about how gender limits men's educational choices, then, may represent a step in the direction of social change, as well as highlighting an issue with potential relevance to men's place in changing job markets.

Boys and men appear to be at a disadvantage in second and foreign language learning in particular, and gender stereotypes and ideologies may play a role. Female students tend to be more motivated and have more positive attitudes about foreign language learning than male students (e.g. Kobayashi, 2002; You, Dörnyei & Csizér, 2016), and girls tend to outperform boys

in foreign language study (e.g. Glowka, 2014). Women are also stereotyped as being both more talkative and as having stronger language skills than men (Williams, Satterwhite, & Best, 1999; Hartley & Sutton, 2013). Prior research has found that both teachers and students believe that girls are better at language than boys, that teachers pass these stereotypes on to their students, and that boys believe the stereotypes more and more with age (Hartley & Sutton, 2013; Retelsdorf, Schwartz, & Asbrock, 2015). Furthermore, how much students internalize these stereotypes predicts how much boys value language arts study, how competent they feel in language arts, and their school performance (Plante, De la Sablonnière, Aronson, & Théorêt, 2013). Elmore and Oyserman's (2012) findings also suggest that the gender-identity congruence of academic success may be important for boys' motivation. Stereotypes that men are good at math and women are good at languages affect girls' math self-concepts, but they also affect boys' language self-concepts (Good, Rattan, & Dweck, 2012; Retelsdorf, Schwartz, & Asbrock, 2015). This pattern may have implications for boys' performance at school, in the job market, and in intercultural interactions. Both children and adults tend to favor occupations stereotypically associated with their own gender (Weisgram, Bigler, & Liben, 2010), suggesting that individuals internalize occupational gender stereotypes and act on them throughout life. When it comes time to choose classes or university majors, "female"-typed subjects may not even be seriously considered by most male students (Eccles, 1994).

One reason gender disparities in female-dominated fields are more intransigent than those in male-dominated fields may have to do with antifemininity, or the idea that the avoidance of the feminine is a central aspect of the male gender role (Bosson & Michniewicz, 2013). Supporting the idea that male students are avoiding the feminine in the domain of language study, differences in attitudes and motivation towards foreign language appear to vary according

to the perceived masculinity or femininity of the language in question. British boys in grades 7-9 were more motivated to learn German than French because they saw French as being too feminine (Williams, Burden, & Lanvers, 2002). Similar results were found among Irish students, who associated German with the masculine pastimes of war and soccer (Glowka, 2014). Data from the U.S. further corroborates this pattern; German is one of the few foreign language majors that is not heavily female dominated (NCES, 2014).

When threats to masculinity combine with antifemininity and the perception of certain educational domains as feminine, this combination may lead male students to avoid language learning. In other words, if men perceive foreign language as feminine and also see masculinity and femininity as incompatible opposites, they might avoid foreign language learning, especially if their masculinity is questioned. Masculinity threats challenge the validity of the individual's membership in a social identity; by claiming that a man is not masculine according to some measure, he may become motivated to assert his masculine social identity. As a result, masculinity-threatened men act to disprove the threat and protect their manhood through hyper-masculine behavior (e.g. Cohn, Seibert, & Zeichner, 2009; Maass, Cadinu, Guarnieri, & Grasselli, 2003) or by distancing themselves from the feminine (Cheryan et al., 2015). Masculinity threat, then, involves norm-driven conformity with a masculine social identity.

Gender threat, and masculinity threat in particular, differs importantly from stereotype threat and operates through different psychological mechanisms. Though both threats are related to social identity, stereotype threats imply that members of a certain social identity group are not skilled in certain tasks (e.g. women in math, African-Americans on the GRE). Stereotype threats, then, are threats to the competence of a person based on that person's group identity rather than threats to an individual's prototypicality as a member of a social group, as is the case with gender

threats. Stereotype threat causes negatively stereotyped individuals to feel pressured to disconfirm negative stereotypes about their group, and this pressure undermines the individual's performance on stereotype-relevant tasks (Steele, Aronson, & Spencer, 2007). In other words, in the case of stereotype threat, devaluation of one's identity leads to worry about performance in a valued domain (e.g., women may become worried about their math performance after being told that women are not good at math). As a result, stereotype-threatened individuals underperform and may dissociate from the threatened identity (e.g. stereotype threatened women may dissociate themselves from femininity; Steele et al., 2007). In contrast to stereotype threats, masculinity threats lead men to de-emphasize their connection not to their masculine identity, but to things that might conflict with their threatened social identity. As a result, masculinity threats might lead to devaluation of "feminine" domains such as foreign language learning, rather than to feelings of inadequacy. Thus, our predictions for this study differ from those that might be made under stereotype threat.

Masculinity threat experiments have typically used false feedback to call participants' masculinity into question by informing men that they have scored in the feminine range on tests of personality or strength. These masculinity threats made men more likely to aggress (Cohn et al., 2009), sexually harass a female experimenter (Maass et al., 2003), and express negative attitudes towards effeminate gay men (Glick, Gangl, Gibb, Klumpner, & Weinburg, 2007). Masculinity threat also leads men to engage in actions intended to distance themselves from femininity; masculinity-threatened men express decreased preferences for feminine-typed products and decreased liking for other men who express stereotypically feminine preferences (Cheryan, Cameron, Katagiri, & Monin, 2015; Schmitt & Branscombe, 2001).

Consistent with the idea that masculinity threats may be particularly important in this domain, one study of adolescents suggested that gender threats, but not competence threats, may increase endorsement of gender-stereotypical occupational interests (Sinclair & Carlsson, 2013). Thus it may be masculinity threats, which relate to what men *should* do, and not stereotype threats, which relate to what men *can* do, that have the most effect on men's interest in foreign language.

The Present Studies

The goals of these studies are, first, to confirm that Canadian university students perceive language learning as a stereotypically feminine domain, and second, to test whether threats to male university students' masculinity beliefs will lead them to distance themselves from language learning. The content of participants' beliefs about gender is likely to be important for predicting how masculinity threat will affect men. Prior research has shown that gender ideologies, or beliefs about what a man or a woman should be like, predict gendered educational and vocational interests (e.g. Tokar & Jome, 1998; van der Vleuten, Jaspers, Maas, & van der Lippe, 2016). Men with nontraditional ideas about men's roles, then, might not experience a masculinity threat as relevant to their occupational interests. We therefore believe that masculinity threats will influence language learning interests, intentions, and attitudes only among men who endorse traditional ideas about gender roles.

Primary Hypotheses

Hypothesis 1 (stereotypes of languages): Both male and female students will be aware of cultural stereotypes that foreign language study is considered feminine and STEM subjects are considered masculine. Students will also believe that men have stronger mathematical ability

than women, but that women have stronger verbal and foreign language learning abilities than men.

Hypothesis 2 (interests and intentions): Masculinity threat will lead men to express less intention to study languages in the future and less interest in language-related subjects and careers, but not STEM-related ones. This pattern will be seen only among men with more traditional beliefs about the male gender role.

Hypothesis 3 (attitudes and belonging): Masculinity threat will lead to negative attitudes towards language learning and less sense of membership in the language community among men who hold traditional gender beliefs.

Exploratory Research Questions

In addition to our primary hypotheses, we also investigated two research questions related to whether masculinity threat would influence men's actual or perceived ability to do well at language learning tasks.

Research question 1 (language aptitude): Will masculinity threat have any effect on language aptitude test performance? Threats to masculinity can be considered a threat to identity prototypicality rather than to competence, so we do not expect to find a difference in men's performance on language aptitude tests by condition.

Research question 2 (confidence in language ability): Will masculinity threat influence men's self-ratings of language ability? Whereas language aptitude is believed to be a stable internal characteristic, self-ratings of ability are subjective self-beliefs that may be more situationally variable. As such, we expect that masculinity-threatened men with traditional masculinity beliefs may downplay their ability in feminine domains by reporting lower feelings

of ability to excel in language study. However, it is also plausible that we may see no difference because of the nature of the threat, as posited in RQ1.

Study 1: Canadian Students' Gendered Subject Stereotypes

To determine whether stereotypes that language learning is feminine and that women have stronger verbal abilities than men exist among Canadian university students (hypothesis 1), we surveyed introductory psychology students.

Method

As part of a large mass testing survey of introductory psychology students, 1673 participants answered questions about perceptions of the masculinity or femininity of various major subjects and ability domains. These measures were included in a large computerized survey offered to all students in introductory-level psychology courses in exchange for course credit. Of these participants, 557 self-identified as male, 1055 identified as female, and 61 did not specify. Participants ranged in age from 17 years old to 40 years old (M = 19.35 years, SD = 2.20). Only 57 of the 538 males and 149 of the 1027 females who responded to both questions reported being enrolled in a language course at the time of testing, but 142 (of 539) male and 372 (of 1017) female participants reported that they intended to study a language other than English in a future semester. Students were enrolled in diverse faculties, with most participants enrolled in the Faculties of Arts or Science; 32.68% of male participants and 36.78% of female participants were enrolled in the Faculty of Arts and 47.22% of male participants and 38.48% of female participants were enrolled in the Faculty of Science. The sample included 310 students who were born outside Canada and who did not have English as a native language, 51 Canadian-born students who did not have English as a native language, 1068 Canadian-born native English speakers, and 202 native English speakers born outside of Canada.

Gender Stereotypes. Participants were asked to answer the question "What do you think is most [university name] students' impression of the following majors in terms of how masculine or feminine they seem?" by rating three popular foreign/second language majors (German, Spanish, and French), two language-related majors (English and East Asian Studies, the latter of which was chosen because majors must concentrate in Japanese, Chinese, or Korean, and because Japanese and Chinese language courses are very popular at the university where this study was conducted), two male-dominated STEM majors (engineering and math), and psychology on a 5-point scale from 1 (*more for males*) to 5 (*more for females*) with 3 as a neutral midpoint. Participants were also asked to rate which sex was better in verbal, mathematical, and foreign language ability on a 5-point scale (1 = *males are much better*, 3 = *males and females are equally good*, 5 = *females are much better*).

Results and Discussion

One-sample t-tests were computed on the three foreign/second language and two STEM subject stereotypes, as well as on psychology, the language-related subjects of English and East Asian Studies, and the three ability stereotype variables. All ability domains and subjects except German differed significantly from the scale midpoint in the expected directions (see Table 1). Results confirmed that both male and female participants stereotype mathematical domains as masculine and languages as feminine. Both Anglo-Canadian students and students who were non-native English speakers born outside of Canada (i.e. migrant students) also reported significantly gendered stereotypes, and these stereotypes were in the same direction as those of the overall sample.

Table 1

Results of one-sample t-tests showing the difference from the gender-neutral midpoint of student stereotypes about university subjects and ability domains.

		Mean Difference	*t*	Sig. (2-tailed)	Cohen's d
What do you think is most [university name] students' impression of the following majors in terms of how masculine or feminine they seem?					
STEM Subjects Overall	Men	-1.05	-34.42	<.001	-1.47
	Women	-1.04	-46.84	<.001	-1.45
Math	Men	-0.81	-22.46	<.001	-0.96
	Women	-0.79	-30.74	<.001	-0.95
Engineering	Men	-1.30	-37.74	<.001	-1.61
	Women	-1.29	-51.69	<.001	-1.60
Foreign Languages Overall	Men	0.26	11.23	<.001	0.48
	Women	0.29	18.16	<.001	0.56
French	Men	0.41	13.37	<.001	0.57
	Women	0.50	22.64	<.001	0.70
Spanish	Men	0.32	11.37	<.001	0.49
	Women	0.35	16.40	<.001	0.51
German	Men	0.04	1.38	.168	0.06
	Women	0.01	0.32	.748	0.01
English	Men	0.50	15.04	<.001	0.64
	Women	0.48	22.72	<.001	0.71
East Asian Studies	Men	0.25	9.01	<.001	0.39
	Women	0.27	13.12	<.001	0.41
Psychology	Men	0.39	11.66	<.001	0.50
	Women	0.51	21.58	<.001	0.67
Which gender do you think is generally better at each of the following?					
Mathematical ability	Men	-0.40	-12.21	<.001	-0.52
	Women	-0.29	-14.07	<.001	-0.44
Verbal ability	Men	0.30	9.28	<.001	0.40
	Women	0.40	18.98	<.001	0.59
Foreign language ability	Men	0.20	6.87	<.001	0.29
	Women	0.20	11.86	<.001	0.37

These results confirm that Canadian university student participants are aware of gendered cultural stereotypes about the masculinity or femininity of academic subjects. These students

also believe that men have greater math ability than women, while women have stronger verbal skills and greater ability to learn foreign languages than men. These beliefs appear to be widespread and consistent across male and female students, as well as among immigrant and international students. This finding is consistent with prior research showing that language tends to be stereotyped as feminine both explicitly (Hartley & Sutton, 2013; Plante et al., 2013; Retelsdorf et al., 2015) and implicitly (Nosek & Smyth, 2011; Passolunghi, Rueda Ferreira, & Tomasetto 2014; Steffens et al., 2010). Though the effect sizes for the gendered image of male-dominated STEM subjects were larger than those for the female-dominated subjects, the language stereotypes still showed robust medium-sized effects.

The size of these effects was also consistent with the size of gender gaps in these majors according to data from the United States of America, Canada's closest neighbor (NCES, 2014). The gender stereotype of engineering had the largest effect size in our study (Table 1), and this lines up with the fact that it is the major with the second largest gender disparity in the U.S. after health professions. The gender gaps in foreign language study (24.07% male for French, 25.26% for Spanish, but almost equal at 46.47% male for German), East Asian Studies (which often includes Japanese and Chinese language concentrations; 42.06%) and English (31.37% male) are comparatively smaller, but still show substantial (except for German), gender disparities in the U.S. In our study, these were associated with less extreme gender stereotypes than STEM. In sum, these data from Canada are largely consistent with educational demographics in the U.S.A.

Study 2: Masculinity Threat Experiment

To examine the effects that these stereotypes of language as a feminine domain might have on men's interests, intentions, attitudes, and sense of belonging towards foreign language learning (hypotheses 2 and 3), we conducted an experiment in which we induced masculinity

threat to see the threat's effects on foreign language interest, future intention to study foreign languages, attitudes about foreign languages, and sense of belonging to language domains. To investigate our research questions, we also included language aptitude tests and self-ratings of ability.

Method

Participants

Male students from a western Canadian university participated in this study in exchange for partial credit towards their introductory psychology course. Six participants who indicated they did not understand the manipulation materials were excluded from analyses, as well as one due to experimenter error and one due to disruptive behavior during the research session. The final sample consisted of 182 men (M = 19.01, SD = 2.70), of whom 50.55% were White, 33.52% were Asian, and the rest reported other ethnicities. All participants were native English speakers (79.12% monolingual and 20.33% bilingual in English and another language). Most participants were in their first (62.64%) or second (22.53%) year of university. Although only 5.49% of participants were enrolled in a language course and only 28.57% were enrolled in faculty programs with language requirements, the majority (n = 152) reported some prior language learning experience. Eighty-eight participants were randomly assigned to the masculinity threatened condition and 94 to the masculinity affirmed condition. No demographic characteristics (age, ethnicity, bilingualism, faculty language requirement, year of university, or language learning experience) differed by condition. We decided to collect between 80 and 100 participants per group; power analysis showed that this sample size would provide over 90% power to detect the effect sizes found by Cheryan et al. (2015, Study 2) for masculinity threat effects on interest in feminine products.

Procedure

Using procedures adapted from Schmitt and Branscombe (2001), participants were told that they would be completing two separate studies, the first of which was a trial program for providing students with results from the psychology department's beginning-of-semester mass testing questionnaire. All participants were required to have previously taken part in the mass-testing survey administered to students in introductory psychology courses for partial course credit. This pre-test took place at least one week, and up to three months, prior to students' participation in the experiment.

At the beginning of the experimental session, participants were given envelopes including false masculinity feedback, as well as false feedback on four filler dimensions, and a letter explaining the "trial program" and how their results should be interpreted (see Appendix A). This feedback was entirely fabricated by the researchers and was independent of the ideology measure and any other measures actually included in the mass testing.

Once participants had completed the "first study" and viewed the manipulated feedback, they were directed to a second consent form and the experimenter informed participants that they would be completing a second study about interest in foreign languages. After receiving this information, participants began the "second study," which consisted of scales and language aptitude tasks. Finally, in compliance with ethical protocols, participants were fully debriefed and shown that all feedback was fake and not based on their actual scores.

Materials

Pre-testing materials. Participants rated their endorsement of traditional masculine gender roles (three items with high factor loadings from different subscales of Thompson & Pleck's [1986] Male Role Norms Scale [MRNS]: "It is essential for a man to always have the

respect and admiration of everyone who knows him; A man owes it to his family to work at the best-paying job he can get; In some kinds of situations a man should be ready to use his fists, even if his wife or girlfriend would object;" $\alpha = .53$) on a 7-point scale (1 = *strongly disagree*; 7 = *strongly agree*) in the aforementioned mass testing questionnaire. The full MRNS scale could not be used in pre-testing due to time constraints, limiting reliability due to the small number of items and the nature of the items as tapping different types of traditional masculinity beliefs: toughness and status. Cronbach alpha is known to be biased towards providing lower values when the number of items is small, as in this case. Briggs and Cheek (1986) suggest that an inter-item correlation between .2 and .4 suggests optimal internal consistency (see also Piedmont & Hyland, 1993; Streiner, 2003). The mean inter-item correlation for our three items was $r = .28$. Furthermore, the items load onto a single factor in EFA with loadings ranging from .52 to .81.

Masculinity threat and manipulation. The masculinity threat manipulation was adapted from Schmitt and Branscombe (2001) and Cheryan et al. (2015). Participants in the masculinity threatened condition received a masculinity score that was close to the stated female average and well below the male average. Participants in the masculinity affirmed condition received a masculinity score that was on the high end of the male average range (see Appendix A for manipulated masculinity feedback). Both versions of the false feedback included scores for four filler traits (openness to experience, agreeableness, self-esteem, and cognitive flexibility), and these scores were the same for both experimental conditions.

Participants completed an eight-item feedback scale also adapted from Schmitt and Branscombe (2001) to bolster the cover story (e.g., "I am pleased with my scores from mass testing;" 1 = *strongly disagree*; 7 = *strongly agree*; $\alpha = .86$). Participants also responded to questions about whether their scores on masculinity and the four filler dimensions were higher,

lower, or the same as they expected on a 9-point scale (1 = *much lower than expected*; 5 = *exactly as expected*; 9 = *much higher than expected*).

Plans for language study. Participants rated seven items on a 7-point scale (1 = *definitely will not study*; *7 = definitely plan to study*) about whether they intended to study six popular foreign languages (French, Spanish, German, Italian, Chinese, and Japanese) in the future.

Attitudes towards foreign languages. Participants responded to a ten-item scale adapted from Gardner, Tremblay, and Masgoret (1997; e.g., "I wish I could speak another language perfectly") on a 7-point scale (1 = *strongly disagree*; 7 = *strongly agree*). A high score reflects a positive attitude towards language learning ($\alpha = .95$).

Sense of membership. Participants responded to four questions on an 8-point scale (1 = *strongly disagree*; 8 = *strongly agree*) adapted from the membership subscale of Good et al.'s (2012) sense of belonging scale (e.g. "I feel that I am a part of the language community;" $\alpha = .95$). The instructions for this scale included information about how "language community" should be interpreted. These instructions were also adapted from Good et al. (2012) and included the following definition: "When we mention the language community, we are referring to the broad group of people involved in that field, including students in a language course (English course, second language course, foreign language course, literature course)."

Interest and self-efficacy in majors and careers. Participants reported their interest in 13 majors including three popular foreign language majors (French, Spanish, and German), five STEM majors (e.g. "Chemistry"), and five filler majors (e.g., "Psychology") on a 5-point scale (1 = *not at all interested*; 5 = *very interested*). They also rated their self-perceived level of ability for the same list of majors on a 9-point scale (1 = *very low ability*; 9 = *very high ability*).

Participants reported their interest in 16 careers, including five foreign language-related careers (translation or interpreting, airline services, language education, teaching English abroad, tourism) and four STEM-related careers (e.g., "Engineer") on a 5-point scale (1 = *not at all interested*; 5 = *very interested*).

Language aptitude. Participants completed Meara's (2015) four LLAMA tasks as a measure of language aptitude. These tasks consist of computer programs that are freely available online (at the source cited) and involve performing linguistic tasks in an invented language. The tasks measure four components of aptitude for learning foreign languages: vocabulary learning (LLAMA B), phonetic memory (LLAMA D), sound-symbol correspondence (LLAMA E), and grammatical inferencing (LLAMA F). The tasks involve memorizing vocabulary words that correspond to images (LLAMA B), recognizing auditory stimuli (LLAMA D), learning how sounds correspond to an alphabet (LLAMA E), and inferring grammatical rules from simple cartoon images (LLAMA F). We report the general mean for the four combined LLAMA subtests because the results do not differ substantially across the four separate subtests.

Results and Discussion

Manipulation Check and Preliminary Analysis

To test the effect of the manipulation, one-sample t-tests comparing the mean for each condition to the mid-point of the scale were computed. Participants in the masculinity threat condition rated their masculinity score (from the false feedback) as lower than they expected (M = 2.86; SD = 1.56, $t(87) = -12.83$, $p < .001$, CI = [−2.47, −1.81], $d = -1.37$), while participants in the masculinity affirmed condition reported that their masculinity score was higher than expected (M = 6.06 ; SD = 1.37, $t(93) = 7.51$, $p < .001$, CI = [0.78, 1.34], $d = 0.77$). An independent samples t-test confirmed that the conditions differed, $t(180) = 14.70$, $p < .001$, CI = [2.77, 3.63],

d = 2.18. Another independent-samples t-test showed that participants in the threat condition (*M* = 4.84, *SD* = .96) reported being less satisfied with their pre-testing feedback than those in the affirmed condition (*M* = 5.25, *SD* = .80), *t*(180) = 3.19, *p* = .002, CI = [0.16, 0.68], *d* = 0.47. Independent samples t-tests revealed that the moderator, masculinity ideology (MRNS), did not differ between the threat condition (*M* = 4.00, *SD* = 1.28) and the affirmed condition (*M* = 4.07, *SD* = 1.32), *t*(180) = 0.34, *p* = .736, CI = [−0.32, 0.45], *d* = 0.05. These results indicate that the manipulation was successful and that the moderator did not differ by condition. Means, standard deviations, and variable inter-correlations are summarized in Appendix B.

Major Analyses

We ran regression analyses to test the hypotheses and determine whether the effect of masculinity threat on the dependent variables was moderated by endorsement of traditional masculinity ideology (MRNS). Condition (masculinity threatened vs. affirmed), MRNS, and their interaction were regressed on the dependent variables. Results of the regression analyses are presented in Table 2. In cases where the interaction was statistically significant, the simple slopes for high and low levels of the moderator (+1SD and –1SD MRNS) are presented in Table 3. Neither the nature nor significance of the reported interactions changed when bilingual participants were excluded. We thus report all results with these participants included. The main effects of MRNS on STEM interest and self-perceived STEM ability became nonsignificant when bilingual participants were excluded, but the size of the bivariate relation dropped only slightly (from *r*=.16 to *r*=.15 for interest, and from *r*=.17 to *r*=.12 for ability).

Table 2

Linear Regression of Condition, MRNS, and Condition x MRNS on Dependent Variables

	R^2	*b*	*SE*	*t*	*p*	95% CI
Intention to Study FL	.04					
Condition		0.40	0.25	1.59	.110	–0.10, 0.90
MRNS		–0.06	0.06	–0.96	.340	–0.17, 0.06
Condition x MRNS		–0.13	0.06	–2.13	.035	–0.24, –0.01
Interest in FL Majors	.08					
Condition		0.60	0.21	2.91	.004	0.19, 10.00
MRNS		0.01	0.05	0.28	.777	–0.08, 0.11
Condition x MRNS		–0.17	0.05	–3.57	<.001	–0.27, –0.08
Interest in STEM Majors	.04					
Condition		0.18	0.24	0.72	.470	–0.30, 0.65
MRNS		0.12	0.06	2.09	.038	0.01, 0.23
Condition x MRNS		–0.06	0.06	–1.09	.280	–0.17, 0.05
Interest in Language-related Jobs	.01					
Condition		–0.07	0.17	–0.42	.678	–0.43, 0.28
MRNS		–0.04	0.04	–0.98	.328	–0.12, 0.04
Condition x MRNS		–0.01	0.04	–0.22	.824	–0.07, 0.09
Interest in STEM-related Jobs	.07					
Condition		–0.09	0.20	–0.43	.664	–0.49, 0.31
MRNS		0.17	0.05	3.54	<.001	0.08, 0.26
Condition x MRNS		0.02	0.05	0.49	.627	–0.07, 0.12
Attitudes Towards Language Learning	.03					
Condition		0.42	0.22	1.87	.063	–0.02, 0.86
MRNS		–0.02	0.05	–0.33	.739	–0.12, 0.09
Condition x MRNS		–0.11	0.05	–2.17	.031	–0.22, –0.01
Sense of Membership	.02					
Condition		0.11	0.44	0.25	.798	–0.76, 0.99
MRNS		0.08	0.10	0.80	.425	–0.12, 0.29
Condition x MRNS		–0.07	0.10	–0.68	.495	–0.28, 0.14
Self-perceived Foreign Language Ability	.04					
Condition		1.01	0.41	2.46	.015	0.20, 10.84
MRNS		0.03	0.10	0.36	.719	–0.16, 0.23
Condition x MRNS		–0.26	0.10	–2.65	.009	–0.45, –0.07
Self-perceived STEM Ability	.03					
Condition		0.08	0.41	0.21	.837	–0.72, 0.89
MRNS		0.21	0.10	2.22	.028	0.02, 0.41
Condition x MRNS		–0.04	0.10	–0.40	.691	–0.23, 0.15
Language Aptitude (LLAMA)	.05					
Condition		–2.72	4.18	–0.65	.515	–10.96, 5.52
MRNS		–3.01	0.98	–3.06	.003	–4.94, –1.07
Condition x MRNS		0.47	0.98	0.47	.636	–1.47, 2.41

Table 3

Simple Slopes Analyses for Effect of Experimental Condition at ±1SD of the moderator, endorsement of traditional masculine gender roles (MRNS)

	MRNS	*b*	*SE*	*t*	*p*	95% CI
Intention to Study	+1SD	–0.28	0.11	–2.52	.013	–0.49, –0.06
Foreign Language	–1SD	0.05	0.11	.50	.618	–0.16, 0.27
Interest in Foreign	+1SD	–0.33	0.09	–3.66	<.001	–0.50, –0.15
Language Majors	–1SD	0.12	0.09	1.39	.166	–0.05, 0.30
Attitudes Towards	+1SD	–0.19	0.10	–2.00	.047	–0.38, –0.00
Language Learning	–1SD	0.10	0.10	1.08	.283	–0.09, 0.29
Self-perceived Foreign	+1SD	–0.36	0.18	–2.02	.045	–0.72, –0.01
Language Ability	–1SD	0.31	0.18	1.73	.089	–0.04, 0.66

Hypothesis 1: Interests and intentions. There were significant interaction effects of masculinity threat and male role beliefs on intention to study a foreign language in the future (Figure 1), and interest in foreign language majors, but not interest in foreign language-related or STEM-related majors or careers (see Table 3). There were main effects of MRNS on interest in STEM-related majors and jobs, with more traditional men having more interest in these disciplines.

Hypothesis 2: Attitudes and belonging. As hypothesized, the interaction of masculinity threat and male role beliefs on attitudes towards language learning was significant. Threatened men expressed more negative attitudes about language learning than masculinity-affirmed men only if they held traditional masculinity ideologies. No significant main effects or interactions were observed for sense of membership.

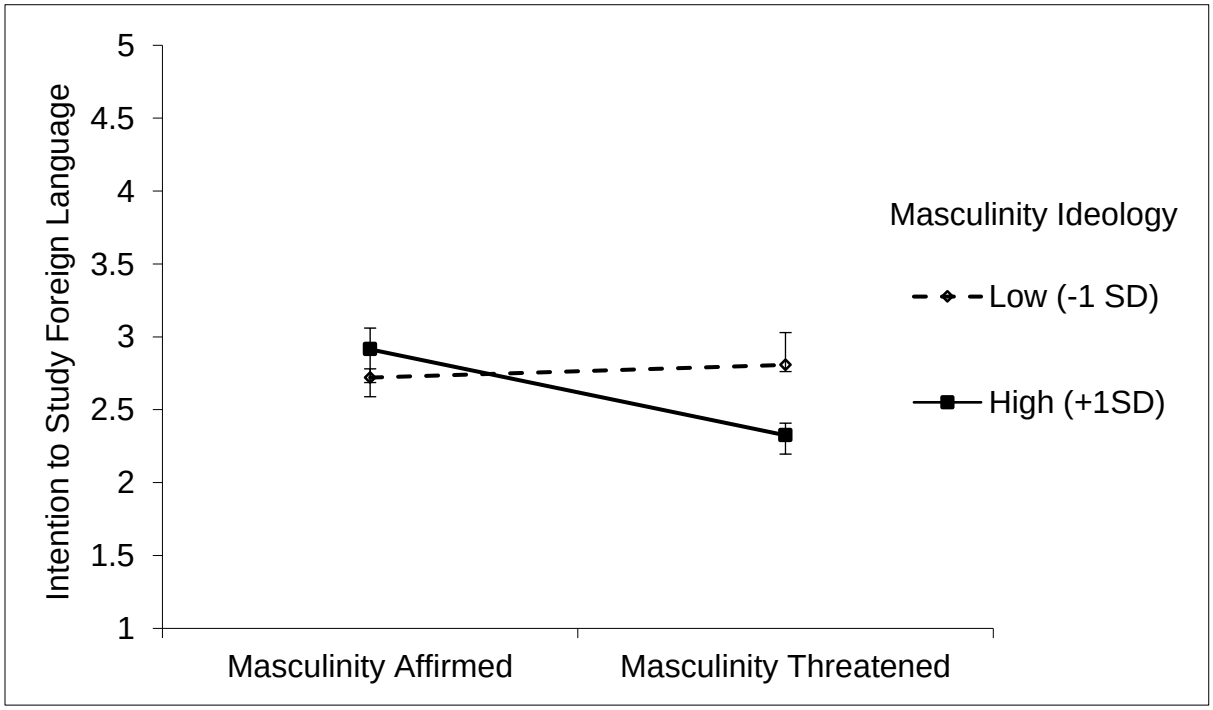
Research Question 1: Language aptitude. In terms of participants' language aptitude as measured by the LLAMA tasks, there were no main effects of condition or interactions. However, there was a main effect of masculinity ideology on LLAMA scores: men with strong

male role beliefs had lower language aptitude. When the four aptitude tasks were analyzed separately, there were no main effects of condition or significant interactions, but the main effect of MRNS was observed only on the sound-symbol correspondence task (LLAMA E; b = -5.05, t (99) = -2.10, p = .038).

Research Question 2: Confidence. There was a significant interaction showing that threatened men high in traditional masculinity ideology were less confident about their ability to excel at foreign language learning than non-threatened men. Beliefs about ability in STEM domains were unaffected by the manipulation, though there was a main effect of MRNS such that higher endorsement of traditional masculine role norms was associated with greater confidence in STEM ability.

Figure 1

Simple slopes analysis showing the effect of the masculinity threat manipulation on intention to study foreign languages in the future, as moderated by male role norm beliefs (MRNS).



Note. Error bars represent 95% Confidence Intervals

In summary, as shown in Table 2 and Figure 1, among participants who strongly endorsed traditional masculine gender roles (+1 SD MRNS), those in the threat condition reported more negative attitudes towards learning foreign languages and towards foreign language majors, less intention to study foreign languages in the future, and less self-perceived competence at foreign language learning compared to those in the affirmed condition. For participants who did not endorse traditional masculinity beliefs (–1 SD), there were no significant differences between the threat and affirmed conditions.

General Discussion

This set of studies is the first to investigate gender beliefs and gender threats as interactive mechanisms for explaining gender segregation in an educational discipline. Although women have been increasingly entering male-dominated fields for several decades, the same is not true of men and female-dominated fields (Croft et al., 2015). We focused on the under-studied side of this phenomenon: men in female-dominated subject areas, specifically foreign language. Our first study examined the stereotypes that university students perceive towards different disciplines, confirming that foreign language is stereotyped as a feminine domain. Building on these findings, the second study extended research on gender threat and avoidance of the feminine to the domain of education. Extending the gender threat literature to educational interests and intentions is important because educational choices may have impactful long-term consequences; communication skills, including foreign language skills, are generally considered to be feminine “soft skills,” but men who lack foreign language skills may be disadvantaged in increasingly globalized job markets. The present study suggests that gender threats and men’s masculinity beliefs have important effects on men’s educational choices, which may have major downstream implications for men’s lives, intercultural opportunities, and occupational options.

In support of our first hypothesis, we found that masculinity threat led men with traditional masculinity ideologies to report less intention to study languages in the future and less interest in language majors. Counter to our hypothesis, this effect was not seen for language-related careers. The lack of effect on career interest may have been due to the fact that for our sample of mainly first-year university students, career choices are still a distal concern compared to the choice of courses and majors. Masculinity-threatened men with traditional ideologies also reported more negative attitudes towards language learning but not less sense of membership, partially supporting hypothesis two.

Threatened men with traditional ideologies also reported less confidence in their ability to excel at foreign language study, consistent with our expectations, but the threat manipulation did not actually undermine language aptitude. These findings highlight that male students' motivational deficits in foreign language study are partially rooted in their socially acquired masculine identities. Since previous studies have shown that male students' underachievement in language classes is probably due to a lack of motivation but not a lack of aptitude (Heyder, Kessels, & Steinmayr, 2017), our results provide additional support for the importance of social psychological mechanisms for men's achievement in this domain.

Although language aptitude was not influenced by masculinity threat, its relation with endorsement of traditional masculinity ideologies, a social psychological construct, was unexpected. Aptitude has been assumed to affect language achievement independently of social psychological variables such as motivation and attitudes (Gardner, 1985). We find it curious that this result appears to have been driven by performance on only one of the four language aptitude tasks, with no relation between masculinity ideology and vocabulary learning, phonetic memory, or grammatical inferencing. If this finding proves replicable, it may be that men with poorer

language aptitude interpret their lack of aptitude as evidence that gender essentialist views and traditional gender roles are correct. Or, it may simply be that the cause of the link is that less generally intelligent individuals, who could be expected to also have poorer language aptitude., tend to rely more on stereotypes and traditional social roles to guide their decision-making (Kemmelmeier, 2008). Issues of gender identity, ideology, and stereotyping are complex, and as such further investigation is needed. Future studies should further explore these potential mechanisms and others not considered in the present study.

The fact that masculinity threat effects emerge only among men with traditional masculinity beliefs highlights the importance of cultural beliefs about gender roles in educational decision-making. The content of men's beliefs about appropriate male activities is important when men express interests and form intentions in gender-typed domains. Although we did not find an effect on career interest, masculinity beliefs are likely also relevant to occupational decision-making given that interest predicts career choice over time (e.g. Lauermann, Tsai, & Eccles, 2017). One possible implication of our study is that in order to encourage more men to enter female-dominated areas of study, it may be important to challenge stereotypes about these disciplines.

The present study also differentiates the issue of men's underrepresentation in language study from that of women in STEM by examining masculinity threat rather than stereotype threat. Antifemininity is a unique aspect of the male gender role; women have not been found to feel an analogous anti-masculinity pressure (e.g. Bosson & Michniewicz, 2013). Similarly, researchers have found that female undergraduates do not feel that womanhood is precarious, and that only men show a response to gender prototypicality threats (Vandello, Bosson, Cohen, Burnaford, & Weaver 2008; for a counter-example with adolescent girls, see Sinclair &

Carlsson, 2013). Research with women in STEM has suggested factors including ability stereotypes, anticipation of discrimination, and insufficient early-life experience with certain STEM fields as explanations for women's avoidance of STEM, but not gendered identity affirmation (Cheryan, Ziegler, Montoya, & Jiang, 2017). This study thus highlights an influence on men's educational segregation that is both novel in the educational context and unlikely to affect women in STEM domains. As well, although our manipulation led men with traditional ideologies to devalue language learning, it did not threaten their sense of membership to the language community. Since unstigmatized identities are not susceptible to belongingness threats (Walton & Cohen, 2007), it may be that men's privileged role in society at large (i.e., their unstigmatized identity as men) protects men from feeling out of place in language education.

Conclusion

Men and women tend to choose different educational fields and cluster in different occupations. The male side of this issue is under-studied, but there is growing interest in men's absence from female-dominated occupations (Croft et al., 2015) as well as in boys' underperformance both in language learning (Heyder et al., 2017) and school more generally (e.g. Fortin, Oreopolis, & Phipps, 2015). Outlets such as USA Today, The Atlantic, and The Washington Post have noted that men's reluctance to enter female-dominated fields may hurt them in an economy where these careers are growing faster than male-dominated ones (Swartz, 2017; Rosin, 2010; Guo, 2014), and psychologists have begun to link the pressure to conform to traditional masculine norms to various negative consequences for men (Moss-Racusin & Good, 2015). Our results show that men who have traditional beliefs about what it means to be a man are likely to avoid foreign language study if their status as a "real man" is threatened. Holding traditional gender role beliefs may cause men to handicap themselves by limiting the scope of

educational choices they consider, suggesting that adopting more flexible societal gender roles may benefit not only women, but also men.

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Appendix A

Masculinity Threat Materials and Procedures

Full text of the letter explaining the cover story for the false feedback and instructions for interpretation of scores, including the example figure (Figure A1) appear below:

Trial Program: Mass Testing Feedback Scores

Enclosed please find some selected results from the mass testing questionnaire you completed at the beginning of the term. This feedback is being provided to you as part of a trial program being tested by the Department of Psychology. Students in past semesters have expressed interest in receiving some feedback, so this trial program is aimed at evaluating how best to provide feedback and how students feel about their feedback. For privacy reasons, no identifying information has been included on your feedback sheet.

Interpreting Your Scores

The enclosed sheet tells you your scores on five personality dimensions measured in the mass testing questionnaire. Also shown are the average ranges for University of Alberta students over the past 3 semesters. 75% of students score within the average range. For personality dimensions that have shown large gender differences, average ranges will be separated by gender. Your score is reported both numerically and visually in comparison to other students.

The x-axis of each graph represents the score, and the height of the distribution on the y-axis represents how common a particular score is, with a greater height indicating that that score was achieved by a large number of students. In the case of characteristics with gender differences, the distributions of male and female scores will be shown separately,

with the female distribution indicated by a dotted line. The average ranges on the figure are indicated beneath the x-axis by a **}** symbol.

Students received average feedback scores on all filler dimensions in both the masculinity threatened and affirmed conditions; only masculinity feedback differed (see Figures S2 & S3).

Figure A1

Example feedback given to participant as part of the instructions for how to interpret their false feedback scores.

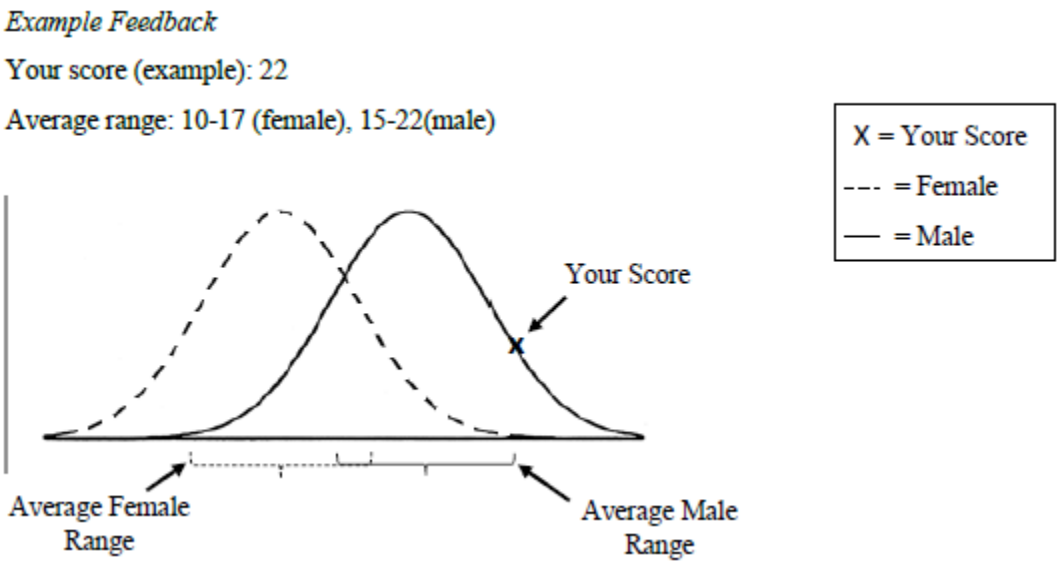


Figure A2

Threat Condition Feedback

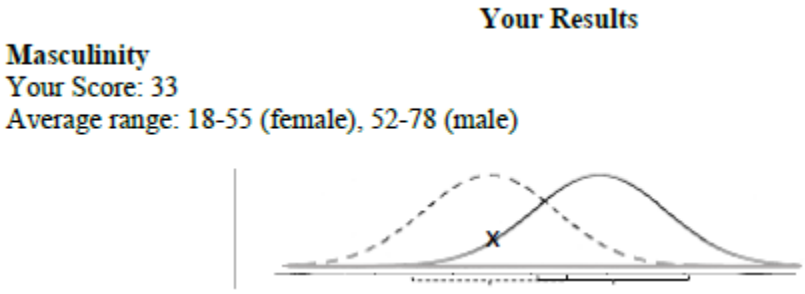
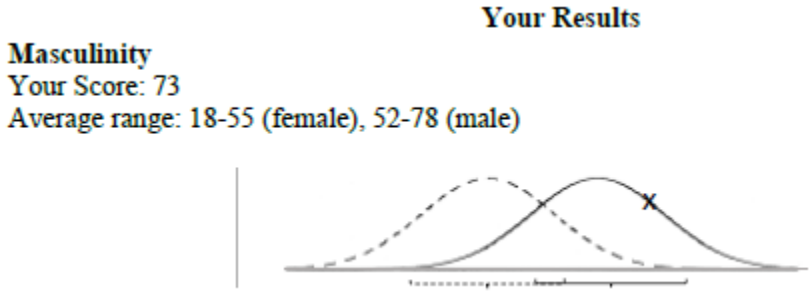


Figure A3

Affirmation Condition Feedback



Appendix B: Descriptive Statistics and Intercorrelations

Table A1

Means, standard deviations, and correlation coefficients of variables used in major analyses

		Mean	SD	1	2	3	4	5	6	7	8	9	10	11
1.	Condition	--	--											
2.	MRNS	4.04	1.30	–.03	--									
3.	Intention to Study FL[a]	2.71	1.05	–.10	–.06	--								
4.	Interest in FL Majors	2.06	.87	–.12	.04	.55**	--							
5.	Interest in STEM Majors	3.04	1.00	–.08	.16*	.14	.25**	--						
6.	Interest in Language-related Jobs	1.78	.77	–.05	–.07	.38**	.46**	–.02	--					
7.	Interest in STEM-related Jobs	2.53	.86	.00	.26**	.12	.13	.69**	.13	--				
8.	Attitudes Towards FL Learning	5.03	.92	–.05	–.01	.49**	.50**	.11	.37**	–.04	--			
9.	Self-perceived FL Ability	3.38	1.72	–.02	.04	.38**	.49**	.04	.23**	.03	.37**	--		
10.	STEM Ability	5.94	1.70	–.05	.17*	.07	.06	.77**	–.14	.57**	.03	.22**	--	
11.	Sense of Membership	4.34	1.83	.10	.07	.21**	.24**	.11	.29**	.08	.30**	.11	.04	--
12.	Language Aptitude	51.38	17.40	–.04	–.23**	.09	.01	.09	.12	.08	.10	.02	.07	.12

[a] Foreign Language

*. Significant at the .05 level (2-tailed).

**. Significant at the .01 level (2-tailed).