Desirable but not smart: preference for smarter romantic partners impairs women's STEM outcomes

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Abstract

Although women today excel in many areas of society, they are often underrepresented in the traditionally male-dominated fields of Science, Technology, Engineering, and Math (STEM). The present research examined whether traditional romantic partner preferences—specifically, a desire to date partners who are smarter than oneself—affects women's tendency to minimize their intelligence in STEM fields when pursuing romantic goals. Women (but not men) who preferred smarter romantic partners showed worse math performance (Studies 1–2), less identification with math (Study 2), and less interest in STEM careers (Study 3) when the goal to be romantically desirable was activated. A meta-analysis across studies supported results. This research thus demonstrates that partner preferences influence women's STEM outcomes in response to romantic goal pursuit.

Women have made great strides in society, from securing the right to vote to holding public office; however, when it comes to their visibility in the traditionally male-dominated fields of Science, Technology, Engineering, and Math (STEM), women often fall short. Despite earning more than half of all bachelor's degrees overall and comprising nearly half of the U.S. workforce, women remain underrepresented in many STEM majors and careers, especially math, physical sciences, computer science, and engineering (National Science Foundation, 2013; U.S. Department of Commerce, Economics and Statistics Administration, 2011).

Explanations for the gender gap range from gender-role socialization (Eccles, 1987), to gender stereotypes about STEM (Cheryan, Plaut, Davies, & Steele, 2009; Kiefer & Sekaquaptewa, 2007; Nosek, Banaji, & Greenwald, 2002), perceived self-efficacy (Betz & Hackett, 1983; Zeldin & Pajares, 2000), social identity threat (Davies, Spencer, Quinn, & Gerhardstein, 2002; Logel et al., 2009; Schmader, 2002; Spencer, Steele, & Quinn, 1999), being outnumbered in group settings (Inzlicht & Ben-Zeev, 2000; Murphy, Steele, & Gross, 2007; Sekaquaptewa & Thompson, 2003), lack of effective STEM role models (Betz & Sekaquaptewa, 2012; Cheryan, Siy, Vichayapai, Drury, & Kim, 2011; Stout, Dasgupta, Hunsinger, & McManus, 2011), and perceived incongruity between STEM careers and communal goals (Diekman, Brown, Johnston, & Clark, 2010; Diekman, Clark, Johnston, Brown, & Steinberg, 2011; Diekman & Steinberg, 2013).

College women, in particular, face competing pressures to focus on romantic relationships versus academic pursuits (Holland & Eisenhart, 1990). This conflict is especially pronounced when pursuing romantic goals versus intelligence goals in traditionally masculine domains, such as STEM. For example, Park, Young, Troisi, and Pinkus (2011) found that women who were exposed to images or overheard conversations related to romantic goals showed less favorable attitudes toward STEM and less interest in majoring in these fields compared with other academic disciplines. In the present research, we build on these findings by posing the question of who *among women* are most susceptible to the detrimental effects of romantic goal pursuit in predicting STEM outcomes (e.g., math performance, identification with math, and interest in STEM careers). One construct that could be used to identify which women minimize their own intelligence—when the goal to be desirable is activated—is a construct that resides at the intersection of these domains: Preference for a romantic partner who is smarter than oneself.

Drawing on social role theory (Eagly 1987; Eagly & Wood, 1999), we propose that women's (but not men's) preference

for smarter romantic partners may be related to their endorsement of traditional romantic scripts and gender norms in relationships. Women with this particular partner preference may therefore be the ones most likely to shift their attitudes and behavior to align with gender norms—norms that discourage women from demonstrating their ability or identifying with traditionally masculine domains such as STEM—when romantic goals are activated. In contrast, women with less traditional partner preferences (i.e., those who do not strongly prefer smarter partners) may not show decrements in their performance, identification with, or interest in STEM fields when romantic goals are activated. In short, the degree to which individuals prefer smarter romantic partners may provide a window into understanding whether women vary in their responses to romantic goal pursuit, with implications for their STEM-related outcomes.

Romantic goals and intelligence in masculine domains

During the college years, two important sources of self-esteem and goal pursuit are the goal to be romantically desirable (Holland & Eisenhart, 1990; Sanchez & Kwang, 2007) and the goal to be intelligent (Crocker, Luhtanen, Cooper, & Bouvrette, 2003). Interestingly, the young adult years are also a time when men and women diverge in their feelings of self-efficacy and identification with STEM (Lips, 2004). Thus, studying men and women during this period seems particularly fruitful for understanding why some women excel in and identify with STEM, while others do not.

Social role theory (Eagly, 1987) offers a promising explanation for why the sexes may differ in the degree to which they perceive romantic goals to be compatible or not with the goal to be intelligent in STEM. According to this theory, the placement of men and women in different social and occupational roles shapes men's and women's activities, behaviors, and preferences, consistent with the gendered division of labor and hierarchy in society. Whereas men have historically occupied leadership and breadwinner roles in which agentic qualities are valued, women have typically occupied caregiving roles in which other-oriented, communal attributes are valued (Eagly & Wood, 1999).

Gender roles prescribe social and behavioral norms that are deemed appropriate for men and women to enact within a particular culture; these roles then influence the types of goals that individuals are likely to pursue within a given opportunity structure in society (Diekman & Eagly, 2008). Exposure to traditional gender norms and scripts in Western cultures begins at an early age and is reinforced through exposure to sex-typed behavior in the media (Leaper, Breed, Hoffman, & Perlman, 2002; Morgan, 1982; Thompson & Zerbinos, 1995). Whereas men are expected to be dominant and assertive in romantic contexts, women are expected to be passive, admiring, and accommodating in romantic contexts (Rudman & Glick, 2008).

From a social role perspective, men's displays of intelligence in masculine domains (e.g., STEM) are likely to be compatible with appearing romantically desirable. After all, being intelligent in STEM is consistent with gender stereotypes that suggest that men are better than women in traditionally masculine domains, such as math (Spencer et al., 1999). In contrast, women may experience conflict between pursuing traditionally masculine domains, such as STEM, and pursuing romantic goals. For example, Park et al. (2011, Study 3) found that college women engaged in fewer math course activities on days they reported striving to be romantically desirable. Along similar lines, Pronin, Steele, and Ross (2004) found that women showed identity bifurcation; when negative stereotypes about women's math ability were salient, women who were highly identified with math disavowed feminine attributes that were perceived to detract from their potential to succeed in math (e.g., planning to have children).

Research on women and backlash provides additional support for the idea that women experience conflict between appearing romantically desirable and appearing intelligent in masculine domains, such as STEM. Women who deviate from traditional gender norms often experience social and economic backlash for violating perceivers' stereotypic expectations (Moss-Racusin & Rudman, 2010; Rudman & Fairchild, 2004). For example, although women who promote their abilities are perceived as competent, they are liked less by their peers and are judged more negatively and harshly than men enacting similar behaviors (Rudman, 1998; Rudman & Fairchild, 2004; Rudman & Glick, 1999, 2001).

Violating occupational gender stereotypes is costly for women, as well. One study found that 43% of open-ended stories written about a woman in a nontraditional career (e.g., a female electrical engineer) referred to social and personal costs incurred because of educational demands, whereas only 9% of stories in which a man was occupationally deviant (e.g., a male nurse) mentioned such losses (Yoder & Schleicher, 1996). In another study, women who succeeded in male-typed jobs were derogated more than equivalently successful men; moreover, being disliked influenced overall evaluations of these women and affected important career outcomes, such as salary recommendations and special job opportunities (Heilman, Wallen, Fuchs, & Tamkins, 2004). Due to the penalties that women face for succeeding in male-typed domains, women may downplay stereotypically masculine qualities to avoid the disapproval that often accompanies violation of prescribed gender norms (Deaux & Major, 1987).

In sum, the extant literature suggests that for women, but not men, an inverse relationship exists between excelling in masculine domains and being viewed favorably by others. In the romantic context in particular, women appear to distance

themselves from traditionally masculine STEM fields when the goal to be romantically desirable is activated (Park et al., 2011). Importantly, though, not all women may be equally susceptible to the effects of romantic goal priming. In the present research, we focus on preference for smarter romantic partners as a specific instantiation of the degree to which women have internalized the traditional gender norm that women who wish to be romantically desirable should not display high levels of intelligence, particularly in masculine fields. In doing so, we connect research on women and STEM to the growing literature on romantic partner preferences.

Romantic partner preferences as a moderator

Research examining romantic partner preferences (i.e., preference for particular qualities in a partner) and behavior in romantic contexts has exploded over the past decade (Eastwick, Luchies, Finkel, & Hunt, 2014). Although recent studies have explored the *interpersonal* consequences of partner preferences—explaining when these preferences do and do not predict relationship initiation and maintenance—the *intrapersonal* effects of such preferences remain poorly understood. In fact, little research has examined how people's self-reported desires for specific qualities in romantic partners are connected to important behaviors that extend beyond relationship outcomes.

Romantic partner preferences are partly rooted in beliefs about how to maximize outcomes given the constraints of one's social roles (Eagly, Eastwick, & Johannesen-Schmidt, 2009). Consistent with the complementary roles of female homemaker and male provider, women who endorse traditional gender ideologies (Eastwick et al., 2006) or who anticipate occupying a traditionally feminine role (Eagly et al., 2009) prefer provider characteristics, such as good financial prospects, in a mate. Women who endorse traditional romantic gender roles in relationships may therefore prefer partners who are smarter than themselves, given that intelligence is associated with higher occupational status and income levels (Strenze, 2007) and intelligence in masculine domains in particular (e.g., math, engineering) is related to higher earnings (Pepitone, 2009).

Although the close relationships literature suggests that both men and women desire intelligence in their partners (Buss & Barnes, 1986; Fletcher, Tither, O'Loughlin, Friesen, & Overall, 2004; Li, Bailey, Kenrick, & Linsenmeier, 2002; Regan & Berscheid, 1997; Regan, Levin, Sprecher, Christopher, & Cate, 2000; Sprecher, Sullivan, & Hatfield, 1994), when it comes to preference for partners *smarter than oneself*, there is reason to believe that women, on average, would have a stronger preference for smarter partners than men. Research by Prentice and Carranza (2002, Study 1) examined the content of gender stereotypes by asking

undergraduate students to rate how desirable and typical it was in American society for a woman/man to possess a series of attributes. Of particular relevance to the present research was their finding that the trait "intelligence" was viewed as less desirable in a woman than in a man in American society (Prentice & Carranza, 2002, Study 1). It therefore seems plausible that women, relative to men, would desire partners who are *more* intelligent than themselves, given the gender norm that intelligence is less desirable in women than in men.

Of course, intellectual equality is important to many people in a relationship. In Fletcher, Simpson, Thomas, and Giles' (1999) research on ideals in intimate relationships, 24% of participants reported that "intellectual equality" was one of their relationship ideals, with an average importance rating of 5.01 out of 7, where 1 = *very unimportant* and 7 = *very important* (Fletcher et al., 1999; Study 2). But these scores leave considerable room for variability; some people may be very comfortable with a relational dynamic in which a partner is smarter than they are, whereas others may be less comfortable. Furthermore, women may prefer this dynamic to a greater extent than do men, and this preference may be related to traditional gender role expectations about the qualities that men and women should and should not bring to a relationship. We conducted a preliminary study to examine these possibilities.

Preliminary study

To provide initial evidence for the assumption that (a) women show stronger preference for smarter romantic partners than do men; and (b) that preference for smarter partners is linked to traditional gender role attitudes, 947 heterosexual, English-speaking undergraduate students at a large, moderately selective public research university in the Eastern United States (461 women, $M_{age} = 19.02$, $SD = 3.96$; 732 Caucasians, 88 Asians, 70 Blacks, 39 Hispanics, and 18 did not indicate ethnicity) reported their preference for smarter partners (i.e., "I would prefer to date someone who is smarter than I am" and "I would feel comfortable dating someone who is smarter than I am"; $r = .41$, $p < .001$) on a scale from 1 (*strongly disagree*) to 5 (*strongly agree*) as part of a larger mass testing survey. Descriptive statistics for the preference for smarter partner measure are reported in Table 1. Using the same response scale, participants also reported their endorsement of traditional gender roles by completing the Sex-Role Attitudes Scale (van Yperen & Buunk, 1991). Sample items were, "A woman should not attempt to take on all kinds of typically male tasks," and "It is acceptable for a woman to have a career, but marriage and family should come first" (17 items, α = .73).

As predicted, women reported significantly greater preference for smarter romantic partners than did men (see Table 1). In addition, preference for smarter partners was positively

Table 1 Descriptive Statistics across Studies for Preference for Smarter Romantic Partners

Study	M_{Women} (SD) % agreement	M_{Men} (SD) % agreement	t value	Cohen's d
Preliminary study	3.60 (.73)	3.46 (.73)	2.87**	.19
N = 947 (461 women)	75%	68%		
Study 1	3.72 (.80)	3.19 (1.04)	2.54**	.57
N = 93 (43 women)	81%	48%		
Study 2	3.91 (.73)	3.28 (.73)	4.71***	.86
N = 115 (59 women)	86%	55%		
Study 3	4.88 (1.17)	4.66 (1.16)	1.43	.19
N = 232 (118 women)	72%	61%		

Notes. N = number of participants who completed the preference for smarter partners items in each study. *t*-values reflect results of independent samples *t* tests. Preference for smarter partners was assessed on a scale from 1 (*strongly disagree*) to 5 (*strongly agree*) in all studies except in Study 3, which was from 1 (*strongly disagree*) to 7 (*strongly agree*) scale. % agreement = percent in agreement with preference for smarter partners above the midpoint of the scale (i.e., above 3.00 in preliminary study and in Studies 1–2; above 4.00 in Study 3).
**$p < .01$. ***$p < .001$.

related to endorsement of traditional gender roles for women, $r = .09$, $p = .05$, and negatively related to traditional gender roles for men, $r = -.09$, $p = .04$. To test whether this sex difference was significant, we conducted a regression analysis that included sex (coded as 1 = female, 0 = male), centered scores for preference for smarter partners, and their interaction as predictors. There were significant main effects of sex, $\beta = -.39$, $p < .001$, and preference for smarter partners, $\beta = -.09$, $p = .04$, qualified by the expected Sex × Preference for Smarter Partners interaction, $\beta = .12$, $p = .005$. These results suggest that women's preference for smarter partners is associated with more traditional gender role attitudes in general, whereas men's preference for smarter partners is associated with less general endorsement of traditional gender roles.

Although preference for smarter romantic partners was related to endorsement of traditional gender roles in general, the correlations were rather low, suggesting that they are not redundant constructs. Moreover, we chose to examine preference for smarter partners in the present research because we were specifically interested in studying the interactive effects of traditional romantic partner preferences in conjunction with romantic goal pursuit. Whereas traditional gender role attitudes reflect general beliefs about how men and women should (or should not) behave in various situations (e.g., "A man who easily becomes emotional and breaks into tears is a softie"; "It looks worse for a woman than for a man to be drunk"), principles of attitude-behavior compatibility (Ajzen & Fishbein, 2005; Kraus, 1995) would suggest that traditional romantic partner preferences—as a specific instantiation of gender role attitudes—will prove to be relevant in romantic (e.g., dating) contexts in particular.

Overview of present research

Given that the focus of the present research was on romantic desirability and intelligence, we examined preference for smarter romantic partners as an indicator of the extent to which women have internalized the traditional script that they cannot appear intelligent and romantically desirable simultaneously. That is, whereas appearing intelligent in masculine domains and appearing desirable are theorized to be compatible goals for men, women who prefer partners who are smarter than themselves were expected to experience conflict when pursuing these goals. Specifically, these women may be less inclined to demonstrate intelligence, to identify with masculine fields, or to express interest in pursuing STEM careers when the goal to appear romantically desirable is activated versus a control condition.

Study 1 examined whether women who preferred smarter partners would underperform on a math test—a traditionally masculine domain—when primed with the goal to be romantically desirable. Study 2 sought to replicate and extend these findings by examining math performance and identification with math (vs. the arts) among a group of women who expressed an initial interest in STEM. Study 3 recruited women with varying levels of initial interest in STEM and examined their interest in STEM careers (vs. traditionally feminine careers) in response to romantic goal priming and the degree to which they preferred partners who were smarter than themselves.

To demonstrate the validity of the hypothesized effects, we sought to rule out alternative explanations (e.g., anxiety, appearance concerns, and gender-based threat concerns), controlled for relevant individual difference variables (e.g., ethnicity, math ability), compared the pursuit of romantic goals to other conditions (e.g., neutral condition, intelligence goal prime condition), and examined effects of romantic goal priming in domains unrelated to STEM (e.g., identification with the arts; interest in traditionally feminine careers). All studies involved English-speaking participants who self-identified as heterosexual at a large, moderately selective public research university in the Eastern United States.

Study 1

Traditional romantic scripts—and the gender norms embedded in these scripts—encourage women not to appear overly masculine in romantic situations. We therefore expected that for women who prefer smarter partners, being primed with a romantic goal might lead them to perform worse on a math test compared with a control condition and possibly, compared with an intelligence goal prime condition—another domain that is important to college men and women. We included an intelligence goal prime condition as an additional comparison group for exploratory purposes; we did not have a priori hypotheses about how romantic partner preference should interact with intelligence goal pursuit, however, so any findings that emerge from this condition should be interpreted as preliminary. Additionally, we sought to test two alternative explanations in this study—that priming romantic goals might trigger (a) anxiety or (b) appearance-related concerns, both of which could negatively affect women's math performance.

Regarding anxiety, researchers have suggested that when individuals are worried about being judged in light of a negative stereotype they may experience heightened anxiety, which is thought to impair cognitive performance on difficult tests, including quantitative tests (Osbourne, 2001; Spencer et al., 1999). If priming romantic goals activates gender stereotypes about women's inferior math abilities, then women may show increased anxiety in the romantic goal priming condition relative to a control condition.

Regarding appearance concerns, women raised in American culture are socialized to self-objectify—to internalize an observer's perspective on their bodies, focusing on how their body appears, rather than how it feels or what it is capable of (Fredrickson & Roberts, 1997; McKinley & Hyde, 1996). Situations that trigger self-objectification consume attentional resources, detracting from women's ability to perform well on mentally demanding tasks, including difficult math tests (Fredrickson, Roberts, Noll, Quinn, & Twenge, 1998). Accordingly, if activating romantic goals triggers appearance concerns, then women may report greater self-objectification when romantic goals are situationally activated than when they are not.

Method

A total of 97 undergraduates (45 women; $M_{age} = 19.85$, $SD = 2.77$) from the introductory psychology subject pool completed the study in exchange for partial course credit. The sample consisted of 64 Caucasians, 19 Asians, and 14 participants of other ethnicities. Table 1 reports means and SD's for the preference for smarter partner measure across all studies.

A few weeks after completing the preference for smarter partner items (two items, $r = .56$, $p < .001$) described in the preliminary study, participants came to the lab in same-sex groups of up to five and were seated at private cubicles. They were told that the purpose of the study was to examine the relation between aspects of people's personality and cognitive outcomes. After giving consent to participate, they were randomly assigned to one of three priming conditions.

In the *romantic goal prime* condition, participants were given the following instructions:

> *Please think about a time when you wanted to be attractive/romantically desirable to others. Think about your thoughts, feelings, and behaviors related to this goal of wanting to be perceived as desirable. Now, please write an essay in the space below describing what you were thinking, feeling, or doing to be desirable to others.*

In the *intelligence goal prime* condition, participants received the instructions:

> *Please think about a time when you wanted to appear competent/intelligent. Think about your thoughts, feelings, and behaviors related to this goal of wanting to be competent/intelligent. Now, please write an essay in the space below describing what you were thinking, feeling, or doing to be competent.*

In the *control* condition, participants received the instructions:

> *Please think of the objects that you see in this room. Now, please write an essay in the space below describing this object in detail.*

Next, participants reported how anxious, worried, tense, ashamed, and insecure they felt at the moment on a scale from 1 (*not at all*) to 7 (*very much*); these items were later averaged to create a composite measure of anxiety (five items, α = .77). They also completed the Body Surveillance subscale of the Objectified Body Consciousness scale (eight items, α = .76; McKinley & Hyde, 1996) in reference to how they felt about their bodies (e.g., "I think more about how my body feels than how my body looks," reversed). Participants were then given 20 minutes to complete a paper and pencil test that consisted of 30 challenging questions (e.g., complex algebra, math word problems) from a quantitative section of the Graduate Records Examination (GRE).

To increase participants' investment in the task, we presented the test as an "official" looking test with the title, "QUANTITATIVE EXAMINATION" on the front cover and the label "CTA #478B" underneath it, with instructions stating, "DO NOT OPEN THE TEST BOOKLET UNTIL INSTRUCTED TO DO SO." We also included a section for them to fill in their subject number and the month, day, and year. We did all of this to make the test look as official as

possible, similar to other standardized tests that students are likely to take. Participants were told that their performance would be based on the total number of questions they answered correctly; they were instructed to answer as many questions as possible in the time allotted, but to avoid random guessing. Finally, participants reported demographic information and were then debriefed, given credit, and dismissed.

Results and discussion

Our primary hypothesis was that a three-way interaction would emerge between participants' sex, preference for smarter partners, and romantic goal prime condition versus the control condition. With respect to the underlying simple effects, we predicted (a) that stronger preference for smarter partners would lead women to show worse STEM outcomes when primed with romantic goals (i.e., the simple effect of preference for smarter partners within the romantic goal prime condition for women); and (b) that women with stronger preference for smarter partners (+1 *SD*) would show worse STEM outcomes in the romantic goal prime condition compared with the control condition. The intelligence goal prime condition was included as an additional comparison group for exploratory purposes.

We conducted a series of hierarchical regression analyses to test the hypotheses. In examining math test performance as the dependent variable, we entered ethnicity as a covariate at Step 1, based on past research indicating that quantitative skills differ by ethnicity (Steen, 1987). Specifically, we entered ethnicity as two dummy coded variables: Asian and Other (i.e., non-Asian, non-White) ethnicities, with 1 in each case indicating membership in the particular ethnic group and 0 = not a member of the specified group, yielding Whites as the reference group.

At Step 2, we entered main effects of sex (coded as 1 = female, 0 = male), centered scores for preference for smarter partners, and condition. The dummy codes were set up such that Romantic Goal Prime = 1, Other conditions = 0; Intelligence Goal Prime = 1, Other conditions = 0; and Control condition = 1, Other conditions = 0. We then entered two of the three dummy codes into the regression equation simultaneously (e.g., Romantic Goal Prime = 1 variable and Intelligence Goal Prime = 1 variable). With both variables entered into the regression equation, each variable indicates the effect of the prime condition relative to the omitted condition variable (i.e., the Control condition). At Step 3, all two-way interactions between sex, preference for smarter partners, and priming condition were entered, and at Step 4 all three-way interactions were entered.

For the dependent measures of anxiety and appearance concerns, we entered the same variables and interactions as in Steps 2–4 of the regression equation described above. To probe significant three-way interactions, predicted values were plotted at 1 *SD* above and 1 *SD* below the mean of preference for smarter partners for men and women across conditions (Aiken & West, 1991). For brevity's sake, we report the results of predicted simple effects in the text and all other simple effects in Appendix A. For measures of effect size, we report change in R^2 in Tables (2–5) and semipartial correlations (*sr*) in the text for all hypothesized simple effects.

Math test performance

Table 2 presents the results of the hierarchical regression analysis. As predicted, there was a significant Sex × Preference for Smarter Partners × Romantic Goal Prime vs. Control Condition interaction in predicting math performance (i.e., total number of items answered correctly on the math test). Decomposing this interaction revealed a significant Preference for Smarter Partners × Romantic Goal Prime vs. Control Condition interaction for women, $\beta = -.71$, $p = .02$, but not for men, $\beta = .16$, $p = .38$; see Figure 1. As predicted, having a stronger preference for smarter partners led women to perform significantly worse in the romantic goal prime condition, $\beta = -.64$, $p = .04$, $sr = -.19$. Also, as predicted, among women who preferred smarter partners (+1 *SD*), being primed with a romantic goal led them to perform significantly worse on the math test compared with the control condition, $\beta = -.55$, $p = .03$, $sr = -.21$, and the intelligence goal prime condition, $\beta = -.45$, $p = .04$, $sr = -.19$. No other simple effects were significant for women.

Anxiety

For anxiety, there were significant main effects of the Romantic Goal Prime condition, $\beta = .27$, $p = .03$, and Intelligence Goal Prime condition, $\beta = .28$, $p = .02$, qualified by a significant Gender × Romantic Goal Prime vs. Intelligence Goal Prime interaction, $\beta = -.51$, $p = .01$; no other main effects or higher-order interactions were significant. Specifically, women reported *less* anxiety in the romantic goal prime condition compared with the intelligence goal prime condition, $\beta = -.31$, $p = .05$, $sr = -.19$. These findings help to rule out the alternative explanation that women simply felt more anxious when recalling a time they wanted to appear desirable to others.

Appearance concerns

There were no significant main effects or higher-order interactions in predicting body surveillance as an indication of appearance concerns. Thus, the possibility that priming romantic goals might increase appearance concerns, which would explain our results, was not supported.

Table 2 Results of Hierarchical Regression Analyses Predicting Math Test Performance (Study 1)

| | Standardized betas predicting math performance | | | |
	Step 1	Step 2	Step 3	Step 4
Asian	.21*	.20*	.21*	.17[+]
Other ethnicities	−.32**	−.34**	−.35**	−.36**
Sex		−.23*	−.14	−.22
Preference for smarter partners		.17+	.30	.14
Romantic goal vs. control		−.06	−.04	.02
Intelligence goal vs. control		.03	.09	.05
Sex × preference for smarter partners vs. control			−.13	.19
Sex × romantic goal vs. control			−.08	.16
Sex × intelligence goal vs. control			−.01	−.05
Preference for smarter partners ×romantic goal vs. control			−.06	−.03
Preference for smarter partners × intelligence goal vs. control			−.09	−.04
Sex × preference for smarter partners × romantic goal vs. control				−.41*
Sex × preference for smarter partners × intelligence goal vs. control				−.04
Step 1 R^2 = .17, F (2, 90) = 9.17***				
Step 2 ΔR^2 = .07, ΔF (4, 86) = 2.02+				
Step 3 ΔR^2 = .01, ΔF (5, 81) = .26				
Step 4 ΔR^2 = .07, ΔF (2, 79) = 4.13*				

Notes. Sex was coded as 1 = female, 0 = male. Other ethnicities = non-Asian and non-White.
[+]$p < .10$. *$p \leq .05$. **$p < .01$. ***$p < .001$.

Table 3 Results of Hierarchical Regression Analyses Predicting Math Test Performance (Study 2)

| | Standardized betas predicting math test performance | | | |
	Step 1	Step 2	Step 3	Step 4
Asian	−.16+	−.16+	−.19+	−.17[+]
Other ethnicities	−.19*	−.19*	−.18+	−.15
Most recent math SAT score	.34***	.30**	.29**	.32**
Sex		−.12	−.13	−.11
Preference for smarter partners		−.01	.12	−.04
Romantic goal vs. control		−.14	−.12	−.03
Intelligence goal vs. control		−.10	−.18	−.19
Sex × preference for smarter partners vs. control			.04	.33
Sex × romantic goal vs. control			−.06	−.06
Sex × intelligence goal vs. control			.12	.10
Preference for smarter partners × romantic goal vs. control			−.08	.24
Preference for smarter partners × intelligence goal vs. control			−.21	−.22
Sex × preference for smarter partners × romantic goal vs. control				−.48*
Sex × preference for smarter partners × intelligence goal vs. control				−.05
Step 1 R^2 = .13, F (3, 107) = 6.48***				
Step 2 ΔR^2 = .03, ΔF (4, 103) = .94				
Step 3 ΔR^2 = .02, ΔF (5, 98) = .44				
Step 4 ΔR^2 = .05, ΔF (2, 96) = 2.86+				

Notes. Sex was coded as 1 = female, 0 = male. Other ethnicities = non-Asian and non-White.
[+]$p < .10$. *$p \leq .05$. **$p < .01$. ***$p < .001$.

Table 4 Results of Hierarchical Regression Analyses Predicting Math Identification (Study 2)

	Standardized betas predicting math identification			
	Step 1	Step 2	Step 3	Step 4
Most recent math SAT score	.16[+]	.15	.16	.24*
Sex		−.04	−.02	.02
Preference for smarter partners		.01	−.10	−.46
Romantic goal vs. control		−.09	−.09	.05
Intelligence goal vs. control		−.14	−.08	−.03
Sex × preference for smarter partners vs. control			.00	.66*
Sex × romantic goal vs. control			.02	.01
Sex × intelligence goal vs. control			−.10	−.11
Preference for smarter partners × romantic goal vs. control			.05	.59**
Preference for smarter partners × intelligence goal vs. control			.14	.32
Sex × preference for smarter partners × romantic goal vs. control				−.84**
Sex × preference for smarter partners × intelligence goal vs. control				−.37
Step 1 $R^2 = .03$, $F(1, 109) = 2.96+$				
Step 2 $\Delta R^2 = .02$, $\Delta F(4, 105) = .43$				
Step 3 $\Delta R^2 = .01$, $\Delta F(5, 100) = .17$				
Step 4 $\Delta R^2 = .11$, $\Delta F(2, 98) = 6.58**$				

Notes. Sex was coded as 1 = female, 0 = male.
[+]$p < .10$. *$p \leq .05$. **$p < .01$. ***$p < .001$.

Table 5 Results of Hierarchical Regression Analyses Predicting Interest in STEM Careers (Study 3)

	Standardized betas predicting interest in stem careers			
	Step 1	Step 2	Step 3	Step 4
Most recent math SAT score	.14[a]	.04	.04	.03
Initial interest in STEM	.25**	.24***	.24***	.23**
Sex		−.38***	−.27**	−.25*
Preference for smarter partners		−.05	−.01	−.27[+]
Romantic goal vs. control		.06	.16[a]	.19*
Sex × preference for smarter partners			−.02	.26[a]
Sex × romantic goal vs. control			−.17	−.17
Preference for smarter partners × romantic goal vs. control			−.04	.24
Sex × preference for smarter partners × romantic goal vs. control				−.32**
Step 1 $R^2 = .09$, $F(2, 183) = 9.11***$				
Step 2 $\Delta R^2 = .14$, $\Delta F(3, 180) = 11.03***$				
Step 3 $\Delta R^2 = .01$, $\Delta F(3, 177) = .85$				
Step 4 $\Delta R^2 = .03$, $\Delta F(1, 176) = 7.20**$				

Notes. Sex was coded as 1 = female, 0 = male.
[a]$p < .10$. *$p \leq .05$. **$p < .01$. ***$p < .001$.

Overall, the results of Study 1 supported the hypotheses: Women who preferred smarter romantic partners performed worse on a math test when the goal to be desirable was activated compared with a control condition and an intelligence goal prime condition. Romantic goal priming did not affect body surveillance—a measure of self-objectification—and women primed with romantic goals tended to feel *less* anxious, insecure, and ashamed than those in the intelligence goal prime condition, countering the idea that romantic priming increased feelings of anxiety.

A few limitations of the study deserve mention. First, women in the romantic goal prime condition could have performed poorly on the math test—not because the goal to be desirable was activated—but because gender may have been
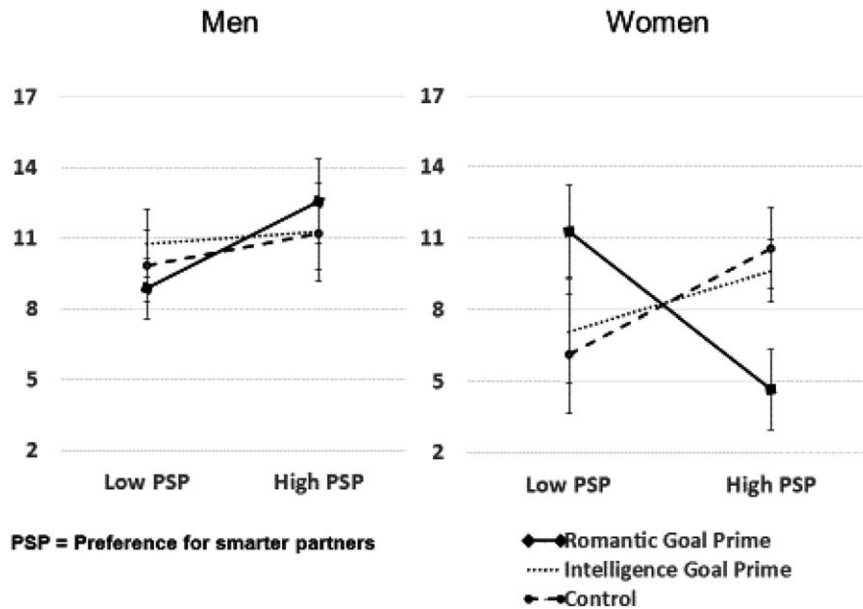
Figure 1   Math test performance (Study 1) adjusted for ethnicity. Predicted values are plotted at 1 *SD* above and below the mean of Preference for Smarter Partners (PSP). Error bars reflect $+/-$ 1 standard error above and below the mean of PSP.

primed, thereby activating the gender stereotype that women are bad at math and inducing stereotype threat (Spencer et al., 1999). This limitation was partially addressed by the inclusion of an anxiety measure, the results of which were not found to be consistent with a stereotype threat explanation. However, given that the current study used only one measure of anxiety, it is possible that other indices of anxiety or threat-related concerns could produce different effects.

Second, although this study controlled for differences in math performance as a function of ethnicity, it would be ideal to control for math ability (e.g., math Scholastic Assessment Test (SAT) scores) in predicting math performance. Third, whereas participants in the romantic goal condition recalled a time when they wanted to appear attractive/desirable *to others*, those in the intelligence prime condition were not given a target audience. Finally, whereas participants were asked to write about a time in which they sought to appear desirable or intelligent, a stronger goal priming manipulation would be to have participants think of a future scenario in which they are striving to meet a goal (e.g., to be desirable). Thus, we conducted a second study to address these limitations.

Study 2

Study 2 sought to provide further evidence that for women who prefer smarter partners, wanting to be romantically desirable might lead them to underperform and distance themselves from masculine domains (e.g., math). In particular, we examined women's math test performance and identification with math versus the arts in response to romantic

goal priming. To address the limitations of Study 1, we controlled for participants' math SAT scores and examined effects of romantic goal priming on gender-based stereotype threat concerns in the current study. We also made the priming instructions more future-oriented and consistent across the experimental conditions. Finally, to investigate the breadth of effects, we recruited participants who reported an initial interest in STEM. Even women who are interested in STEM might underperform and distance themselves from STEM fields if they (a) prefer partners who are smarter than themselves; and (b) are in a situation where the goal to be romantically desirable is activated.

Method

Undergraduate students in introductory psychology courses reported their preference for smarter partners ($\alpha = .74$) and interest in pursuing a degree or career in STEM (i.e., "I am interested in possibly pursuing a degree or career related to math, science (e.g., biology, chemistry, computer science, and physics), technology, or engineering" with a response of *yes* or *no*) as part of an initial mass testing survey. A sample of 119 participants (61 women; $M_{age} = 18.63$, $SD = 1.43$) who reported being interested in STEM participated in the study. The sample consisted of 75 Caucasians, 26 Asian/Asian Americans, 15 participants of other ethnicities, and 3 unreported ethnicities.

For the lab session, participants came to the lab in same-sex groups of up to five for a "Study of Personal Attitudes." They were seated at private cubicles and told that the purpose
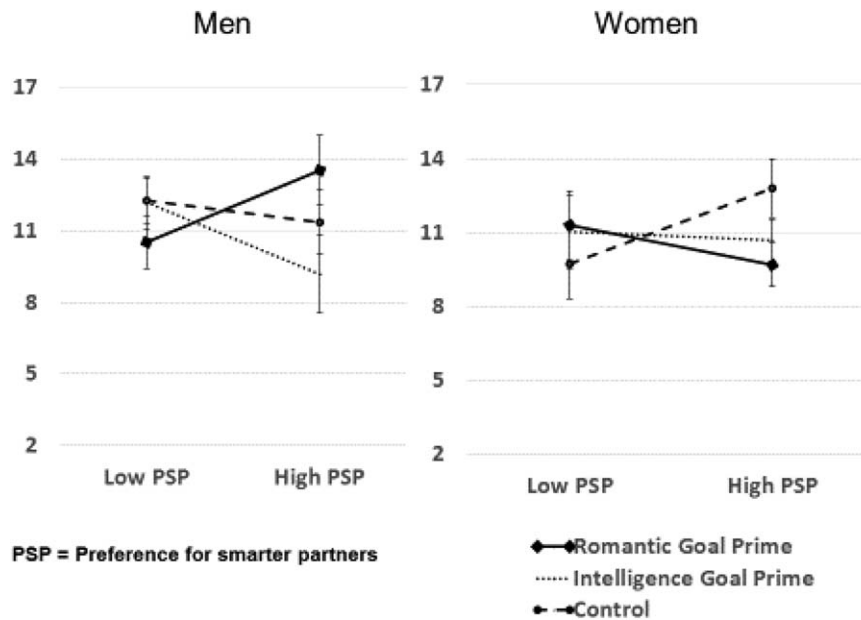
Figure 2 Math test performance (Study 2). Results are adjusted for ethnicity and math SAT scores. Predicted values are plotted at 1 *SD* above and below the mean of PSP. Error bars reflect ±1 standard error above and below the mean of PSP.

of the study was to examine how aspects of people's attitudes relate to various outcomes. They were then randomly assigned to one of three priming conditions.

In the *romantic goal prime* condition, participants were given the instructions:

> *Imagine that you're going on a first date tomorrow night with someone you really like. You're feeling very motivated and really want to come across as attractive/desirable to your date. Please describe in detail what you would do leading up to and during your date to appear attractive/desirable to the other person.*

In the *intelligence goal prime* condition, participants received the instructions:

> *Imagine that you're going to an interview tomorrow for a job you really want. You're feeling very motivated and really want to come across as intelligent to the other person. Please describe in detail what you would do leading up to and during the interview to appear intelligent to the other person.*

In the *control* condition, participants received the instructions:

> *In this task, we would like you to imagine your walk/drive to campus or work tomorrow. In the space provided below, please describe in detail your commute tomorrow.*

Next, participants completed a paper and pencil test that consisted of 20 challenging math questions from a quantita-

tive section of the GRE using the same instructions as in Study 1. Afterward, they reported the degree to which they considered themselves to be a "math person" and "more mathematical than artistic" ($\alpha = .85$) and how much they identified with the arts and considered themselves to be an "arts person" ($\alpha = .89$) on a scale from 1 (*not at all*) to 5 (*very much*) (see Nosek et al. 2002).

To assess whether the experimental manipulation affected gender-based threat concerns, participants reported their agreement (1 = *strongly disagree*; 5 = *strongly agree*) with the following items in reference to the math test they took: "I worry that my ability to perform on math tests is affected by my gender"; "I worry that if I perform poorly on this test the experimenter will attribute my poor performance to my gender"; and "I worry that because I know the negative stereotype about women and math, my anxiety about confirming that stereotype will negatively influence how I perform on math tests" (three items, $\alpha = .77$; Rydell, McConnell, & Beilock, 2009). Participants then reported demographic information, their most recent math SAT score, and were debriefed, given credit, and dismissed.

Results and discussion

As in Study 1, we conducted hierarchical regression analyses in which we entered covariates (ethnicity—dummy coded as before in predicting math test performance; centered math SAT scores, and gender-based threat concerns) at Step 1; main effects of sex (coded as before), centered preference for smarter partners scores, and priming condition (dummy
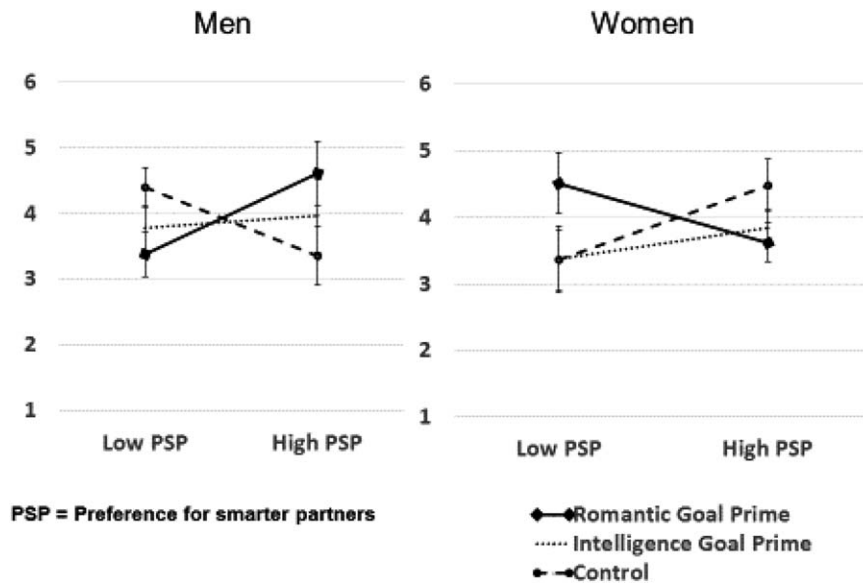
Figure 3   Math identification (Study 2). Results are adjusted for math SAT scores. Predicted values are plotted at 1 *SD* above and below the mean of PSP. Error bars reflect ±1 standard error above and below the mean of PSP.

coded as before) at Step 2; two-way interactions at Step 3; and three-way interactions at Step 4. Nonsignificant covariates were dropped from the final models.

Math test performance

As predicted, there was a significant Sex $\times$ Preference for Smarter Partners $\times$ Romantic Goal Prime vs. Control Condition interaction (see Table 3). Decomposing this interaction revealed a Preference for Smarter Partners $\times$ Romantic Goal Prime vs. Control Condition interaction that approached significance for women, $\beta = -.43$, $p = .07$, but not for men, $\beta = .26$, $p = .22$; see Figure 2. Among women with a strong preference for smarter partners (+1 *SD*), priming romantic goals led them to perform significantly worse on the math test compared with the control condition, $\beta = -.42$, $p = .03$, $sr = -.19$, but not the intelligence goal prime condition, $\beta = -.13$, $p = .40$, $sr = -.08$. No other simple effects were significant for women (see Appendix A).

Math identification

As predicted, the three-way interaction between sex, preference for smarter partners, and the romantic goal prime versus control condition was significant (see Table 4). Decomposing this interaction revealed a significant Preference for Smarter Partners $\times$ Romantic Goal Prime vs. Control Condition interaction among women, $\beta = -.50$, $p = .04$, that reversed in direction among men, $\beta = .61$, $p = .002$; see Figure 3. Specifically, the effect of preference for smarter partners among women in the romantic goal prime

condition was marginally significant and in the expected negative direction, $\beta = -.39$, $p = .09$, $sr = -.16$, whereas this pattern was not found in the control condition, $\beta = .49$, $p = .10$, $sr = .16$, or in the intelligence goal prime condition, $\beta = .20$, $p = .39$, $sr = .08$. Also, women who strongly preferred smarter partners (+1 *SD*) reported marginally less identification with math in the romantic goal prime condition compared with the control condition, $\beta = -.35$, $p = .08$, $sr = -.16$, but not compared with the intelligence goal prime condition, $\beta = -.06$, $p = .73$, $sr = -.03$.

Arts identification

For identification with the Arts, there was a significant Preference for Smarter Partners $\times$ Romantic Goal Prime vs. Intelligence Goal Prime Condition interaction, $\beta = .30$, $p = .04$, and Preference for Smarter Partners $\times$ Intelligence Goal Prime vs. Control Condition interaction, $\beta = -.36$, $p = .03$. No other main effects or interactions were significant. Participants in the intelligence goal prime condition tended to report less identification with the Arts the more they preferred to date smarter partners, $\beta = -.41$, $p = .053$, $sr = -.18$. No other simple effects were significant.

Gender-based threat concerns

Next, we conducted hierarchical regression analysis to predict gender-based threat concerns. Results revealed significant main effects of sex, $\beta = .20$, $p = .04$, $sr = .19$, and preference for smarter partners, $\beta = -.32$, $p = .002$, $sr = -.29$, in the control condition, such that women reported more gender-

based threat concerns than men, and participants with stronger preference for smarter partners reported fewer gender-based threat concerns. No other main effects or higher-order interactions were significant.[1] Thus, we did not find support for the alternative explanation that gender-based threat concerns predicted worse math performance in the romantic goal prime condition.

Overall, Study 2 found that women who preferred smarter partners performed worse on a math test and tended to report less identification with math, but not the arts, when primed with romantic goals (i.e., imagining themselves appearing attractive/desirable to a date) versus doing something neutral (i.e., imagining their commute). A few notable differences emerged across Studies 1 and 2. Whereas Study 1 provided strong support for the hypotheses, Study 2 showed partial support: Although all of the predicted three-way interactions were significant, not all of the lower-order interactions or simple effects were significant, although they were in the expected direction. A potential explanation for this discrepancy is that there were no selection criteria for participants in Study 1, whereas all of the participants in Study 2 were selected based on their initial interest in STEM. Thus, the lack of significant effects for some of the outcomes in Study 2 could be due to less variability in math performance and identification to begin with among this selective sample. The effect of partner preferences and romantic goal pursuit on STEM outcomes may thus be attenuated for women who are already invested in pursuing a degree or career in STEM. We aimed to test this possibility in a follow-up study.

Another difference that emerged was the pattern of results in the intelligence goal prime condition. In Study 1, women who preferred smarter partners showed worse math performance when primed with romantic goals versus the control condition and the intelligence goal prime condition; in Study 2, the romantic goal prime condition differed only from the control condition. One potential explanation for this discrepancy is that in Study 2, women who preferred smarter partners may have envisioned more gender-traditional jobs in the intelligence goal prime condition. In reviewing the essays that participants wrote, however, none of them explicitly mentioned anything related to gender or gendered occupations. Another possibility is that participants recalled a past experience in Study 1, whereas participants wrote about a future scenario in Study 2, in which they imagined themselves striving to appear desirable or intelligent to others. Perhaps envisioning a future interaction heightened impression management concerns for participants in both conditions, reducing potential differences between the two.

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[1] We also tested whether gender-based threat concerns interacted with participants' sex and goal prime condition to predict math test performance and math identification; there were no significant higher-order interactions in predicting these dependent measures.

Finally, we found that women in the control condition showed less gender-based threat concerns the more they preferred smarter partners; there were no significant effects of women's preference for smarter partners in any of the other conditions. Together, these findings suggest that women's tendency to show diminished math performance and identification in this study were not due to increased salience of gender-based threat concerns in the romantic goal priming condition.

Study 3

Study 3 sought to extend the findings of the previous studies by examining women's interest in various careers in response to romantic goal priming. We expected that for women who preferred smarter partners, wanting to be romantically desirable would lead them to express less interest in traditionally masculine domains, such as STEM, but not in other career domains (e.g., traditionally feminine careers, such as teaching). Also, whereas Study 2 focused solely on women who had reported an initial interest in STEM, the current study recruited a more diverse sample of participants who varied in their initial interest in STEM. We did this to determine whether romantic goal priming differentially affected women's interest in STEM as a function of their initial interest in these fields. Finally, we altered the priming instructions to more clearly distinguish the effects of romantic goal priming from priming appearance-related goals in general. We also included a measure of self-objectification, as in Study 1, to further rule out the alternative possibility that romantic goals (activated by the new romantic goal prime) heightened appearance concerns.

Method

As part of an initial mass testing survey, 232 heterosexual undergraduate students (118 women, $M_{age} = 19.29$, $SD = 1.25$) in introductory psychology courses reported their preference for smarter partners (two items, $r = .48$, $p < .001$) on a scale from 1 (*strongly disagree*) to 7 (*strongly agree*), their most recent math SAT score, and their interest in pursuing a degree or career in STEM (STEM-related field) on a scale from 1 (*not at all interested*) to 7 (*very interested*) ($M = 4.55$, $SD = 1.90$). The sample consisted of 91 Caucasians, 104 Asian/Asian Americans, 36 participants of other ethnicities, and 1 unreported ethnicity. For the lab session, participants were run in same-sex groups of up to five. They were seated at private cubicles and were randomly assigned to one of two essay priming conditions.

In the *romantic goal prime condition*, participants were given the instructions:

> *Imagine that you're doing on a first date tomorrow with someone you really like. You're feeling very motivated*
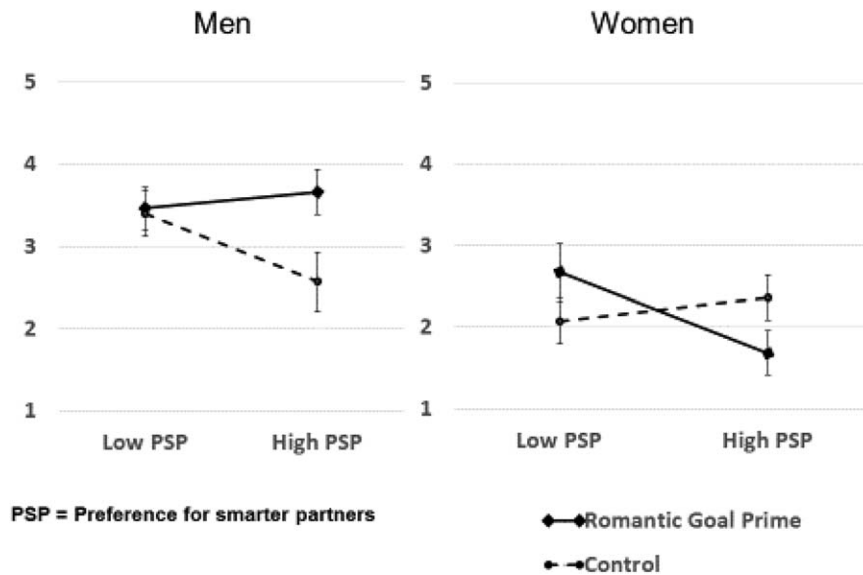
Figure 4 Interest in STEM careers (Study 3). Results are adjusted for math SAT scores and initial interest in STEM. Predicted values are plotted at 1 *SD* above and below the mean of PSP. Error bars reflect ±1 standard error above and below the mean of PSP.

and really want to come across as romantically desirable to your date. Think about your thoughts, feelings, and behaviors related to this goal of wanting to be romantically desirable. Now, please write an essay in the space below describing what you would do leading up to and during the date to appear romantically desirable to the other person.

Participants who were assigned to the *control condition* received the same instructions as in Study 2: to imagine and write about their commute to campus or work tomorrow. To assess appearance concerns, participants completed the Body Surveillance subscale of the Objectified Body Consciousness scale (eight items, α = .75; McKinley & Hyde, 1996), which was adapted to assess how they felt about their bodies "right now" (e.g., "Right now, I am more concerned with what my body can do than how it looks," reversed). Next, they rated, on a scale from 1 (*not at all*) to 7 (*extremely*), how interested they were in careers that reflected STEM careers (e.g., "mechanical engineer," "aerospace engineer," "computer scientist," six items, α = .93) and traditionally feminine careers (e.g., "elementary school teacher," "social worker," "human resources manager," six items, α = .84; Diekman et al., 2010). They then reported demographic information and were debriefed and dismissed.

Results and discussion

We conducted a series of hierarchical regression analyses in which we entered covariates of centered math SAT scores and initial interest in STEM at Step 1; main effects of sex, cen-

tered preference for smarter partners scores, and priming condition (dummy coded as 1 = Romantic Goal Prime, 0 = Control condition) at Step 2; two-way interactions at Step 3; and three-way interactions at Step 4. We also conducted a separate set of hierarchical regression analyses that tested the four-way interaction between participants' sex, preference for smarter partners, priming condition, and participants' initial interest in STEM. Results revealed no significant four-way interactions in predicting appearance concerns, interest in STEM careers, or feminine careers; we therefore focus on the three-way interaction models in the sections that follow.

Interest in STEM careers

As predicted, the three-way interaction between sex, preference for smarter partners, and the romantic goal prime versus control condition was significant (see Table 5). Decomposing the three-way interaction revealed a significant Preference for Smarter Partners × Romantic Goal Prime vs. Control Condition interaction among women, β = −.30, *p* = .03, that reversed in direction among men, β = .24, *p* = .10; see Figure 4. As hypothesized, women in the romantic goal prime condition reported significantly less interest in STEM careers the more they preferred smarter romantic partners, β = −.32, *p* = .04, *sr* = −.13; this was not the case in the control condition, β = .09, *p* = .42, *sr* = .05. Also, among women with a strong preference for smarter partners (+1 *SD*), priming romantic goals marginally diminished their interest in STEM careers compared with the control

condition, $\beta = -.22$, $p = .08$, $sr = -.11$. No other simple effects were significant for women.

Interest in feminine careers

There was only a significant main effect of participants' sex, $\beta = .37$, $p < .001$, $sr = .23$, such that women reported greater interest in feminine careers than men; no other main effects or higher-order interactions were significant.

Appearance concerns

Results revealed only a significant main effect of participants' sex, $\beta = .25$, $p < .001$, $sr = .25$, such that women reported greater appearance concerns than men. No other main effects or higher-order interactions were significant. Thus, the possibility that priming romantic goals might increase appearance concerns, which would explain the results, was not supported.

Overall, the results of Study 3 demonstrated that women who were primed with romantic goals showed less interest in STEM careers the more they preferred smarter romantic partners. Indeed, these women tended to express less interest in pursuing STEM careers when they imagined going on a future date versus pursuing a neutral activity, such as imagining their commute to work or school. Particularly noteworthy is that these findings emerged even after controlling for participants' initial interest in STEM and baseline levels of math ability. Indeed, women who preferred smarter partners showed less interest in STEM when romantic goals were primed, and this response did not depend on participants' initial interest in pursuing a degree or career in STEM.

Furthermore, women did not diminish their interest in all careers when primed with romantic goals; rather, they showed less interest in STEM careers, but *not* feminine careers, supporting the idea that women distance themselves from masculine STEM fields in particular when romantic goals are made salient. Finally, we did not find that women primed with romantic goals showed greater appearance concerns in the study, thus reducing the possibility that the effects observed were simply due to heightened appearance concerns.

Meta-analysis across studies

Across Studies 1–3, we predicted the emergence of four three-way Sex × Preference for Smarter Partners × Romantic Goal Prime vs. Control Condition interactions, all of which were found to be significant (see Figures 1–4). Nevertheless, the simple effects underlying this three-way interaction differed somewhat across studies; also, the two key simple effects—the effect of preference for smarter partners for women within the romantic goal condition, and the effect of the romantic goal prime versus control condition among women who preferred smarter partners—were consistently

in the predicted direction, but not always significant. Thus, to obtain a more complete picture of the pattern of results across studies, we conducted a fixed effect meta-analysis of the four central analyses in Studies 1–3 (i.e., math performance in Studies 1–2; math identification in Study 2; interest in STEM careers in Study 3) as recommended in recent discussions of best practices in scientific research (Braver, Thoemmes, & Rosenthal, 2014; Cumming, 2013; Maner, 2014).

To perform this meta-analysis, we first standardized all continuous variables and covariates (i.e., math SAT score, initial interest in STEM), coded sex as 0 = male and 1 = female, and dummy-coded priming conditions and ethnicity as reported earlier. To calculate each meta-analytic effect, we weighted each of the Bs by the inverse of its variance so that the more precisely estimated effects would have a stronger influence on the overall beta.[2] The meta-analytic standard error for each effect was the square root of the reciprocal of the sum of the weights, and to conduct hypothesis tests, we obtained a z statistic by dividing each meta-analytic beta by this standard error (Eastwick & Finkel, 2012; Luchies, Finkel, McNulty, & Kumashiro, 2010).

The meta-analytic findings are presented in Figure 5 and the simple effect tests are summarized in Appendix B. As expected, the overall three-way Sex × Preference for Smarter Partners × Romantic Goal Prime vs. Control Condition interaction was significant, $B = -1.05$, $z = 4.67$, $p < .001$. The Preference for Smarter Partners × Romantic Goal Prime vs. Control Condition interaction was significant for women, $B = -.61$, $z = 3.83$, $p < .001$, and reversed in direction for men, $B = .39$, $z = 2.60$, $p = .009$. Furthermore, the two hypothesized simple effects were significant for women: (a) preference for smarter partners negatively predicted the dependent variable for women in the romantic goal prime condition, $B = -.38$, $z = 3.24$, $p = .001$; and (b) women who preferred smarter partners ($+1$ SD) showed lower scores on the dependent variable in the romantic goal prime vs. control condition, $B = -.69$, $z = 3.53$, $p < .001$.

In addition to these primary findings, the meta-analyses revealed some additional effects. One effect of interest is that women with low preference for smarter partners (-1 SD) showed better STEM outcomes when primed with romantic goals versus a control condition and the intelligence goal prime condition (see Appendix B). This could be due to the fact that these women, who are less traditional in their gender role attitudes, may have resisted conforming to traditional romantic scripts and gender norms when romantic goals were made salient.

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[2]The two dependent variables from Study 2 were averaged, standardized, and then the regression was rerun with both math SAT score and ethnicity as covariates.
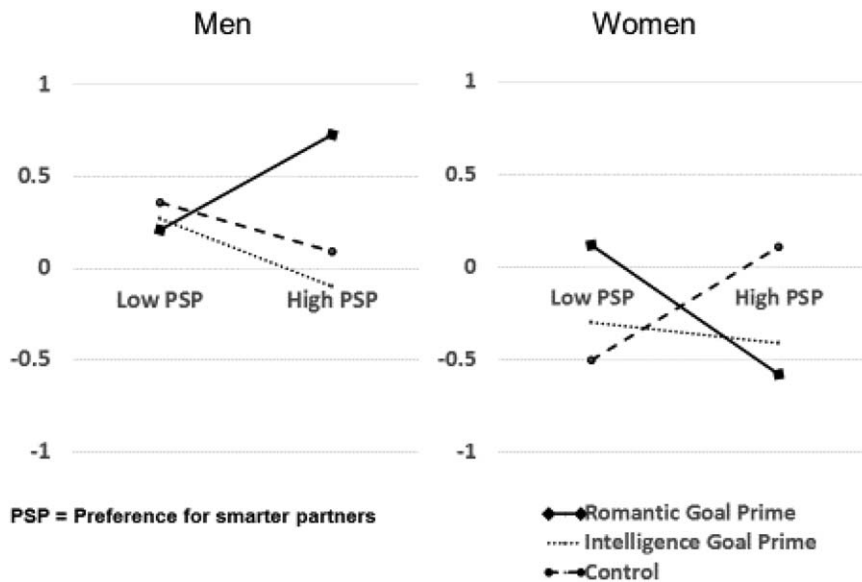
Figure 5 Meta-analyzed results from Studies 1–3 (math test performance in Study 1; math test performance and math identification in Study 2; interest in STEM careers in Study 3) as a function of sex, PSP, and priming condition. Predicted values are plotted at 1 *SD* above and below the mean of PSP. Slopes for the Intelligence Goal Prime condition are solely a function of Studies 1 and 2; all three studies contribute to the other slopes.

The meta-analysis also revealed that for men, preference for smarter partners predicted better STEM outcomes in the romantic goal prime condition. Also, men who preferred smarter partners (+1 *SD*) showed better STEM outcomes in the romantic goal prime versus the control condition (see Appendix B). Given that appearing intelligent in masculine domains is thought to be compatible with being desirable for men (but not for women), activating romantic goals may have incidentally primed men's desire to impress potential partners by displaying their intelligence. In particular, men who prefer smarter partners may believe that their partners expect them to be intelligent as well, so they may have been especially motivated to demonstrate their intelligence in masculine domains to potential partners when a romantic context was made salient.

Finally, we conducted a meta-analysis across all studies, including the preliminary study, to test whether men and women differed in their preference for smarter partners. Specifically, we calculated the mean weighted Fisher's z_r for the effect of participants' sex on preference for smarter partners. Across studies, the effect was significant, such that women reported stronger preference for smarter romantic partners than did men, mean weighted $r = .14$, $z = 4.89$, $p < .001$.

General discussion

Overall, the present studies suggest that women (but not men) who prefer smarter romantic partners show diminished STEM outcomes when the goal to be romantically desirable is activated. Specifically, women with a traditional partner preference (i.e., a preference for smarter romantic partners) performed poorly and distanced themselves from math—a traditionally masculine domain—when the goal to be desirable was activated. In Study 1, women (but not men) who preferred smarter partners performed worse on a math test when they recalled a time when they were striving to appear desirable versus intelligent or a neutral control condition. Study 2 found that even among women who were initially interested in STEM, having a preference for smarter romantic partners led to worse math performance and tended to reduce their identification with math, but not the arts, when the goal to appear desirable was activated compared with a control condition. Study 3 revealed that women reported less interest in STEM careers the more they preferred smarter partners, and tended to diminish their interest in these domains when they were primed with romantic goals versus a neutral condition. Importantly, the effects that emerged were specific to interest in STEM fields and did not generalize to other domains, such as interest in feminine careers.

Moreover, a meta-analytic summary of the findings indicated that both simple effects of interest were reliable: (a) women primed with romantic goals scored lower on the dependent variable to the extent that they preferred smarter partners; and (b) women who preferred smarter partners scored lower on the dependent variable in the romantic goal prime versus control condition.

Connections to other theories

Various explanations have been proposed for the disproportionate dropout rate among women from STEM fields (see

Ceci, Williams, & Barnett, 2009). The present research adds to this literature by suggesting that women who prefer smarter romantic partners underperform and distance themselves from STEM fields (e.g., math) when romantic goals are made salient. Such findings build on past work showing that women report less interest in STEM when the goal to be desirable is activated (Park et al., 2011) and limit their educational aspirations and pursuit of power and leadership roles the more they implicitly associate their romantic partners with chivalry and heroism (Rudman & Heppen, 2003). Extending these findings, the present research indicates that women vary in their susceptibility to romantic goal priming, with effects on their objective performance, identification with, and interest in STEM fields.

The current research also complements previous work showing that women present themselves in ways that are consistent with sex-role stereotypes when they anticipate interacting with a desirable (vs. undesirable) man with traditional (vs. nontraditional) attitudes (Zanna & Pack, 1975). More recently, women who interacted with a man who endorsed sexist attitudes performed worse on an engineering test than women who did not interact with a sexist man (Logel et al., 2009). An important difference between these latter findings and the present research, though, is that the current studies focus on women's personal partner preferences and romantic goal pursuits, independent of the attitudes or characteristics of interaction partners. Thus, even when not interacting with a sexist man, some women may internalize gendered scripts, such that the sexist voice is their own.

Importantly, the present studies demonstrate that not all women distance themselves from STEM fields when pursuing romantic goals. Rather, only women who preferred romantic partners who were smarter than themselves showed decrements in STEM outcomes when romantic goals were activated. These findings thus document an insidious effect of holding a particular partner preference; even though the outcome variables in these studies lie outside the realm of romantic pursuits (i.e., math performance, interest in STEM careers), partner preferences proved to have important intrapersonal consequences in these areas. Interestingly, women who did not strongly prefer smarter partners did not show these decrements; rather, these women showed *better* STEM outcomes when romantic goals were activated, suggesting that these women do not experience conflict between wanting to be desirable and wanting to be intelligent in nontraditional domains.

The present findings also dovetail with recent research suggesting that women experience interference between pursuing goals in masculine domains and pursuing other valued goals, qualities, and identities. Diekman and colleagues' (2010, 2011, 2013) goal congruity theory, for example, suggests that the content of goals and goal affordance stereotypes (i.e., beliefs about activities that can facilitate or hinder goals)

shape people's interest in careers. Given that women tend to value communal goals (e.g., working with others; helping others) more strongly than men, and because STEM careers are perceived to impede fulfillment of communal goals, women may be less likely than men to show interest in STEM careers (Diekman et al., 2010).

Another example of this type of conflict can be seen in reactions to women's success in male domains. For example, Heilman and Okimoto (2007) found that women were perceived negatively when they excelled in traditionally male domains, due to a perceived deficit in their communal qualities (e.g., lacking nurturing, socially sensitive qualities). That is, women were penalized for succeeding in male-typed domains because they were viewed as violating gender-stereotypic prescriptions. Such conflicts also extend to perceptions of incompatibility between one's social identities. For example, female scientists who experience interference between their woman and scientist identities show lowered science performance and psychological well-being. Notably, however, only female scientists who attached centrality to their woman identity, and not their scientist identity, experienced the most identity interference (Settles, 2004).

Consistent with these ideas, the present studies found that women who held more traditional romantic partner preferences (i.e., who preferred romantic partners who were smarter than themselves) were the most susceptible to the detrimental effects of romantic goal priming (e.g., showed worse math performance, reported less identification with and interest in STEM). In contrast, women with less traditional partner preferences (i.e., those who did not prefer smarter partners) showed boosted STEM outcomes, consistent with a less traditional view of gender norms.

Alternative explanations

An alternative explanation for the present findings is that women who were primed with a romantic goal performed worse on the math test because of stereotype threat. Stereotype threat occurs when members of a group feel pressured to avoid being judged in light of a negative stereotype and worry that they could inadvertently confirm the stereotype through their performance in the domain. For example, women under stereotype threat perform poorly on quantitative tasks, consistent with the stereotype that women have inferior ability in these domains (Schmader, 2002; Shih, Pittinsky, & Ambady, 1999; Spencer et al., 1999).

In our view, stereotype threat is unlikely to account for the findings in the studies for several reasons. First, if our romantic goal primes were merely gender primes, then we would have expected to find significant main effects of the romantic goal prime condition on math performance, which could be interpreted as being consistent with stereotype threat effects. We did not, however, find that romantic goal priming

directly affected STEM outcomes in the current studies. Rather, the findings were moderated by women's romantic partner preference. We also directly examined the possibility that gender-based stereotype threat concerns may have been triggered in the romantic goal priming condition, by assessing gender-based stereotype threat concerns in Study 2. Results showed that women in the control condition reported less gender-based threat concerns the more they preferred smarter partners; there were no effects of preference for smarter partners in the romantic or intelligence goal prime conditions in predicting gender-based threat concerns. Overall, then, the findings suggest that it is the combination of women's partner preferences and romantic goal pursuit— and not simply gender activation eliciting threat-based concerns—that are responsible for the results.

Explanations for additional findings

A few unpredicted, yet noteworthy findings emerged in the studies. First, the meta-analysis revealed that women with low preference for smarter partners showed *better* STEM outcomes when primed with romantic goals. Why might this be? One explanation is that women with low preference for smarter partners, who are less traditional in their gender role attitudes in relationships, were motivated to impress a potential partner with their intelligence. That is, these women may have sought to be as smart as, or smarter than, a potential partner when romantic desirability goals were activated, but not in the context of a job interview (Study 2) or in the presence of an unspecified other (Study 1). Thus, whereas women with strong preference for a smarter partner may have dampened their performance and reported interest in STEM careers when romantic goals were activated, women with low preference for smarter partners may have wanted to appear smarter to partners, or believed that their intelligence made them appear more appealing to potential partners.

Another unexpected finding was that men who preferred smarter partners showed better STEM outcomes when they were primed with romantic goals. Such findings are in contrast to the pattern found for women who preferred smarter partners, who showed worse math performance and decreased identification with and interest in STEM when romantic goals were made salient. One explanation is that for men, being competent and intelligent in masculine domains, such as math, is compatible with gender stereotypes for men. Thus, in romantic contexts, men who prefer smarter partners may have been particularly motivated to display their masculine qualities to potential partners in romantic contexts, but not in a job interview or neutral context. In other words, men who prefer smarter partners may have sought to impress potential partners with their intelligence when romantic goals were primed, similar to women with low preference for smarter partners, who showed parallel effects.

Limitations and future directions

The present research focused on romantic gender scripts and norms within opposite-sex interactions in Western cultures; it remains an open question as to whether similar findings would emerge among women who are not heterosexual or who have not been socialized in traditionally Western ways of thinking and behaving in romantic contexts. Future research would also benefit from examining the mechanisms underlying the effects of romantic goal priming that emerged in the studies. For example, whereas women who prefer smarter partners might self-handicap or downplay their intelligence in masculine domains when the goal to be desirable is activated, women with low preference for smarter partners may boost their identification with and interest in masculine fields when the goal to be desirable is activated, to prove their nonconformity to traditional romantic scripts and gender norms.

Research could also investigate the extent to which these motivational processes are relatively purposeful and strategic, or less deliberate and automatic, which could have important implications for interventions. In the present research, women were asked to recall a time when they were striving to appear desirable or to imagine themselves pursuing this goal in the future. Given that these goal-priming manipulations were explicit (i.e., participants were aware of the primes), it seems plausible that women's underperformance and diminished identification with and interest in STEM may reflect a strategic process. However, if women repeatedly downplay their intelligence in masculine domains in romantic settings, then over time, mere exposure to such contexts could automatically activate desirability goals, which could then undermine their performance and pursuit of masculine fields.

Although women's preference for smarter partners could very well be related to their minimizing or downplaying of intelligence, we do not view them as equivalent. Rather, downplaying intelligence could be one of several potential situation-specific consequences of the individual difference variable *preference for smarter partners*. In other words, in our framework (and consistent with the current methodological approach and findings), preference for smarter partners is the stable between subjects variable, and the consequence— emerging only in romantic contexts—is that women may downplay their own intelligence.

Researchers could also examine the malleability of romantic partner preferences. If partner preferences are shaped by sociocultural pressures (e.g., peers, media), then changing normative beliefs about women's intelligence in masculine fields and being romantically desirable could be one route to shifting preferences and ultimately, women's STEM outcomes. Indeed, research suggests that gendered dating preferences may be shifting in terms of the qualities that are preferred in potential romantic partners (e.g., men prefer ambitious, successful, and financially independent partners; Strassberg & Holty, 2003)

and a recent meta-analysis found that the extent to which earning prospects/ambition inspires romantic desire does not differ between men and women (Eastwick et al., 2014). Such knowledge, in turn, might shape women's partner preferences, with downstream effects on STEM-related outcomes.

Conclusion

Although women have made important advances in society, subtle influences continue to prevent women from reaching their full potential in the male-dominated fields of STEM. While there are many factors that contribute to the gender gap in STEM, the present research suggests that partner preferences (i.e., preference for smarter romantic partners), combined with the goal to be romantically desirable, impairs women's math performance, identification with math, and interest in STEM careers. This research thus provides an important step in identifying aspects of the person and the situation that interact to predict STEM outcomes. Future research would benefit from investigating further the antecedents and consequences of romantic partner preferences and goal pursuit to understand how, when, and why pursuit of certain goals hinders progress toward other goals in shaping women's STEM-related outcomes.

Acknowledgment

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Appendix A: Simple Effects for Women and Men across Studies

Study	Outcome	Prime condition	Simple slope of PSP	Simple slope at +1 SD PSP	Simple slope at −1 SD PSP
WOMEN					
Study 1	Math performance	Romantic goal	−.64*		
Study 1	Math performance	Intelligence goal	.27		
Study 1	Math performance	Control	.47		
Study 1	Math performance	Romantic goal vs. control		−.55*	.52
Study 1	Math performance	Romantic goal vs. intelligence goal		−.45*	.42
Study 1	Math performance	Intelligence goal vs. control		−.10	.09
MEN					
Study 1	Math performance	Romantic goal	.39*		
Study 1	Math performance	Intelligence goal	.18		
Study 1	Math performance	Control	.14		
Study 1	Math performance	Romantic goal vs. control		.14	−.10
Study 1	Math performance	Romantic goal vs. intelligence goal		.13	−.19
Study 1	Math performance	Intelligence goal vs. control		.03	.09
WOMEN					
Study 2	Math performance	Romantic goal	−.23		
Study 2	Math performance	Intelligence goal	−.04		
Study 2	Math performance	Control	.42		
Study 2	Math performance	Romantic goal vs. control		−.42*	.21
Study 2	Math performance	Romantic goal vs. intelligence goal		−.13	.04
Study 2	Math performance	Intelligence goal vs. control		−.29	.17
MEN					
Study 2	Math performance	Romantic goal	.37		
Study 2	Math performance	Intelligence goal	−.41		
Study 2	Math performance	Control	−.04		
Study 2	Math performance	Romantic goal vs. control		.17	−.23
Study 2	Math performance	Romantic goal vs. intelligence goal		.53[+]	-.22
Study 2	Math performance	Intelligence goal vs. control		−.37	.17
WOMEN					
Study 2	Math identification	Romantic goal	−.39[+]		
Study 2	Math identification	Intelligence goal	.20		
Study 2	Math identification	Control	.49[+]		
Study 2	Math identification	Romantic goal vs. control		−.36[+]	.48[+]
Study 2	Math identification	Romantic goal vs. intelligence goal		−.06	.51[+]
Study 2	Math identification	Intelligence goal vs. control		−.31	−.03
MEN					
Study 2	Math identification	Romantic goal	.54*		
Study 2	Math identification	Intelligence goal	.08		
Study 2	Math identification	Control	−.40[+]		
Study 2	Math identification	Romantic goal vs. control		.53[+]	−.42*
Study 2	Math identification	Romantic goal vs. intelligence goal		.30	−.14
Study 2	Math identification	Intelligence goal vs. control		.23	−.03
WOMEN					
Study 3	Interest in STEM careers	Romantic goal	−.32*		
Study 3	Interest in STEM careers	Control	.09		
Study 3	Interest in STEM careers	Romantic goal vs. control		−.22[+]	.20
MEN					
Study 3	Interest in STEM careers	Romantic goal	.06		
Study 3	Interest in STEM careers	Control	−.27[+]		
Study 3	Interest in STEM careers	Romantic goal vs. control		.35*	.02

Note. Simple effects reflect standardized betas for women and men at high (+1 SD) and low (−1 SD) levels of PSP (i.e., Preference for Smarter Partners).

[+] $p \le .10$. * $p \le .05$. ** $p < .01$. *** $p < .001$.

Appendix B: Meta-Analysis of Simple Effects for Women and Men Across Studies

WOMEN	Outcome	Prime condition	Simple slope of PSP	Simple slope at +1 SD PSP	Simple slope at −1 SD PSP
Meta-analysis	Across all outcomes	Romantic goal (studies 1–3)	−.38** (z = 3.24)		
Meta-analysis	Across all outcomes	Intelligence goal (studies 1 & 2)	.17 (z = 1.00)		
Meta-analysis	Across all outcomes	Control (studies 1–3)	.20+ (z = 1.94)		
Meta-analysis	Across all outcomes	Romantic goal vs. control		−.69*** (z = 3.53)	.57* (z = 2.40)
Meta-analysis	Across all outcomes	Romantic goal vs. intelligence goal		−.43+ (z = 1.68)	.81* (z = 1.98)
Meta-analysis	Across all outcomes	Intelligence goal vs. control		−.57+ (z = 1.95)	.16 (z = .37)
MEN					
Meta-analysis	Across all outcomes	Romantic goal	.22* (z = 2.38)		
Meta-analysis	Across all outcomes	Intelligence goal	−.07 (z = .37)		
Meta-analysis	Across all outcomes	Control	−.13 (z = 1.14)		
Meta-analysis	Across all outcomes	Romantic goal vs. control		.63** (z = 2.67)	−.21 (z = 1.15)
Meta-analysis	Across all outcomes	Romantic goal vs. intelligence goal		.71+ (z = 1.71)	−.41 (z = 1.47)
Meta-analysis	Across all outcomes	Intelligence goal vs. control		−.17 (z = .41)	−.14 (z = .51)

Note. Simple effects reflect unstandardized betas for women and men at high (+1 SD) and low (−1 SD) levels of PSP (i.e., Preference for Smarter Partners). For the meta-analysis, each beta was weighted by the inverse of its variance and then averaged across studies (z values in parentheses).
$^{+}p < .10.$ $^{*}p \leq .05.$ $^{**}p < .01.$ $^{***}p < .001.$