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Seeking Congruity Between Goals and Roles: A New Look at Why Women Opt Out of Science, Technology, Engineering, and Mathematics Careers

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Abstract

Although women have nearly attained equality with men in several formerly male-dominated fields, they remain underrepresented in the fields of science, technology, engineering, and mathematics (STEM). We argue that one important reason for this discrepancy is that STEM careers are perceived as less likely than careers in other fields to fulfill communal goals (e.g., working with or helping other people). Such perceptions might disproportionately affect women's career decisions, because women tend to endorse communal goals more than men. As predicted, we found that STEM careers, relative to other careers, were perceived to impede communal goals. Moreover, communal-goal endorsement negatively predicted interest in STEM careers, even when controlling for past experience and self-efficacy in science and mathematics. Understanding how communal goals influence people's interest in STEM fields thus provides a new perspective on the issue of women's representation in STEM careers.

Keywords

gender, goals, occupational choice, science education, sciences, technology, engineering, mathematics

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Women remain a minority in the fields of science, technology, engineering, and mathematics (STEM), both in the United States (Snyder, Dillow, & Hoffman, 2009) and internationally (National Science Board, 2002). Women's absence from STEM is particularly puzzling, given their increased presence in other traditionally male-dominated fields, such as medicine or law. We present a new perspective on this issue by proposing that interest in some careers and disinterest in others results from the intersection of people's goals and their preconceptions of the goals afforded by different careers. We hypothesize that people perceive STEM careers as being especially incompatible with *communion*, or an orientation to care about other people (Bakan, 1966). Because women in particular tend to endorse communal goals, they may be more likely than men to opt out of STEM careers in favor of careers that seem to afford communion.

Several critical factors contribute to women's underrepresentation in STEM, including gender differences in self-efficacy, differential encouragement to pursue careers in science and mathematics, and cultural stereotypes (e.g., for reviews, see Ceci & Williams, 2007; Halpern et al., 2007; Spelke, 2005). However, an examination of career trends in the United States between 1959 and 2007 (see Table 1) reveals that the nearly exclusive focus on agentic explanations, such as those based on competence or achievement, is incomplete. Women have increased their presence at the highest levels of a range of fields, but their gains in male-stereotypic, non-STEM fields surpass their gains in STEM fields (Snyder et al., 2009). For example, women earn approximately 20% to 30% of the highest degrees in STEM, whereas they approach equality with men in non-STEM fields such as medicine, business, and law. Women's substantial gains in these latter fields have occurred even though medicine requires a scientific background, and these careers were all at one time almost exclusively male dominated.

These trends suggest that to explain women's absence in STEM fields, research should focus on factors that differentiate careers in STEM from other careers. We hypothesize that a critical but relatively unexplored factor may be that many non-STEM careers are perceived as fulfilling communal goals,

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Table 1. Temporal Trends in the Percentage of Female Terminal-Degree Holders in Science, Technology, Engineering, and Mathematics (STEM) and Non-STEM Fields

Field	1959–1960	2006–2007
Non-STEM, male-stereotypic		
Dentistry	0.80%	44.56%
Medicine	5.50%	49.22%
Law	2.49%	47.62%
Business	1.48%	41.45%
STEM		
Engineering	0.38%	20.94%
Mathematics, statistics	5.94%	29.76%
Physical sciences and science technologies	3.37%	31.55%
Computer science and information technologies[a]	2.34%	20.56%

Note: Data were compiled from the *Digest of Education Statistics*, *2008* (Snyder, Dillow, & Hoffman, 2009).
[a]For computer science and information technologies, the earlier time period is 1970–1971, the first year for which degree data are available.

such as working with or helping other people. In contrast, STEM careers may elicit thoughts of the "lone scientist" or technology and machinery. This "communion gap" may particularly influence women's STEM decisions, because women tend to endorse communal goals more than men.

A Role Congruity Perspective

We posit that social roles are critical to understanding people's reasons for pursuing STEM careers. First, broader gender roles in a society influence the goals of individuals in that society (Diekman & Eagly, 2008). For example, men have traditionally occupied leadership or breadwinner roles associated with a focus on agency, or self-orientation, whereas women have traditionally fulfilled caretaking roles associated with communion, or other-orientation (Eagly, Wood, & Diekman, 2000). Women are increasingly adopting agentic attributes as they take on male-stereotypic roles (e.g., Twenge, 2001). Moreover, research suggests that, consistent with their continued presence in female-stereotypic roles, women are maintaining high levels of communion: Meta-analyses find that women more often than men report tender-mindedness and warmth (Costa, Terracciano, & McCrae, 2001), as well as benevolent and universalist values (Schwartz & Rubel, 2005).

Second, according to role congruity theory (Diekman & Eagly, 2008), specific social roles form an opportunity structure that individuals navigate as they pursue their goals. Individuals therefore select specific roles, such as occupational or family roles, that fulfill important goals. For example, a meta-analysis of job attribute preferences showed that the largest gender differences are women's greater preference for helping other people ($d = -0.35$) and working with people ($d = -0.36$; Konrad, Ritchie, Lieb, & Corrigall, 2000). Women and more feminine individuals favor working with people over things, and this preference predicts differing vocational interests (Lippa, 1998). The greater the value that women place on people-oriented or society-oriented occupations, the greater their preference for health-related careers is, even controlling for their expectations of success in science (Eccles, 2007). Similarly, girls who perceive science to be consistent with altruism tend to show interest in scientific careers (Weisgram & Bigler, 2006).

Applying these role congruity principles (Diekman & Eagly, 2008), we argue that careers vary in the goals they are believed to afford. We propose that women's communal goal orientation intersects with beliefs that STEM careers do not involve helping or working with other people, with the result that even scientifically talented women frequently choose other careers—ones they believe will allow them to fulfill their communal goals.

Overview

In the research presented in this article, we adopted a novel perspective to explain women's avoidance of STEM careers, because research and policy generally focus on how to align women and girls more closely with men and boys, primarily by increasing the self-efficacy or the experience of women in mathematics and science. However, a critical piece of the career-choice puzzle is that STEM careers may be perceived to be incompatible with communion. If women value communal goals, they may therefore avoid STEM careers. We thus examined (a) whether communal-goal affordances are perceived to differ between STEM and other careers, and (b) whether communal-goal endorsement inhibits STEM interest, given consensual beliefs about the goals these careers afford.

Method

Participants

Participants were 333 introductory psychology students (193 women, 140 men) who participated for partial course credit, and 27 paid participants (14 women, 13 men) from STEM classes. The majority (86.94%) were of European American descent. The median age was 19 years, and ages ranged from 18 years to 43 years.

Measures

As part of a larger study, participants completed randomly ordered measures of goal endorsement, career interest, and self-efficacy. Participants then provided goal-affordance ratings and information about their mathematics and science experience.

Table 2. Factor Analysis of Estimated Gender Representation in Selected Careers

	Factor		
Career grouping (a priori)	STEM	MST	FST
STEM			
Mechanical engineer	**.73**	–.02	–.05
Computer scientist	**.73**	–.01	–.09
Aerospace engineer	**.77**	.09	–.05
Environmental scientist	**.63**	–.08	.24
MST			
Lawyer	.22	**.58**	.06
Architect	.36	**.44**	–.01
Dentist	.26	**.49**	–.04
Physician	–.37	**.79**	–.01
FST			
Preschool or kindergarten teacher	–.18	–.06	**.73**
Human resources manager	.09	.28	**.31**
Social worker	.05	.14	**.68**
Education administrator	.14	.31	**.47**
Registered nurse	–.00	–.16	**.68**

Note: A factor analysis of estimates of women in the core careers supported their a priori grouping as science, technology, engineering, and mathematics (STEM) careers; male-stereotypic/non-STEM (MST) careers; and female-stereotypic (FST) careers, as shown by the higher factor loading when each career's a priori grouping matched the emergent factor (loadings in boldface type).

Career items. Our goal was to determine predictors of differential interest in STEM, male-stereotypic/non-STEM (MST), and female-stereotypic (FST) careers. To create scales reflecting these different stereotypic categories, we used archival and primary data. We generated a pool of careers likely to be attractive to college participants, and we included male-dominated (> 65% men) and female-dominated (> 65% women) careers (U.S. Department of Labor, 2009). STEM careers were identified from the male-dominated group following accepted definitions of STEM as natural-physical sciences, technology, engineering, and mathematics (e.g., Chen & Weko, 2009). Table 2 presents these core careers.

To ensure the stereotypicality of these groupings, we carried out a factor analysis (promax rotation) of participants' estimated percentages of women in these core careers. The resulting scree plot revealed a three-factor solution, reflecting the a priori groups: STEM careers, FST careers, and MST careers. As shown in Table 2, each item loaded at least .30 on its respective factor. In the rare cases of double loadings, the higher loading was matched to the a priori grouping based on archival data (i.e., architect and physician as male-stereotypic, human resources manager as female-stereotypic). Additionally, two coders blind to hypotheses categorized careers with good interrater reliability (κ = .77).

Perceived goal affordance. For each core career, participants rated how much they considered the career to fulfill agentic goals (*power*, *achievement*, and *seeking new experiences or excitement*; Pohlmann, 2001) and communal goals (*intimacy*, *affiliation*, and *altruism*; Pohlmann, 2001). Ratings were completed on 7-point scales, from 1 (*not at all*) to 7 (*extremely*). We averaged ratings within each career type to produce agentic-goal-affordance scales (α_{STEM} = .79, α_{FST} = .76, α_{MST} = .72) and communal-goal-affordance scales (α_{STEM} = .80, α_{FST} = .78, α_{MST} = .53).

Career interest. Because career interest was our critical dependent measure, participants rated their interest in the core careers, as well as additional careers (selected from archival data as described in the Career Items section). Participants rated their interest in these careers on a 7-point scale from 1 (*not at all*) to 7 (*extremely*). To construct interest scales using the core careers and the additional careers, we added a career if its interest rating correlated highly with interest in one of the three career types (STEM, FST, MST), based on the interest averaged over the core careers. The resulting interest scales thus included the items presented in Table 2 as well as the following careers: for STEM, industrial engineer, chemical engineer, electrical engineer, and network and computer systems administrator; for MST, chief executive, surgeon, chiropractor, and pediatrician; and for FST, elementary-school teacher, administrative assistant, therapist, and health-services advocate. Each scale showed high internal consistency (α_{STEM} = .92, α_{MST} = .84, α_{FST} = .80).[1]

Goal endorsement. Participants rated several goals according to "how important each of the following kinds of goals is to you personally," on scales ranging from 1 (*not at all important*) to 7 (*extremely important*). Indices of agentic-goal and communal-goal endorsements were created by averaging the results within each scale (see Table 3): After examining the scree plot, we chose a two-factor solution, with agentic goals loading on the first factor and communal goals on the second factor. All retained items loaded at least .30 on their respective factors (resulting in the dropping of one item, *other-oriented*). Agentic and communal goals were not significantly correlated across the sample, $r(359) = .08$, $p = .15$. For women, no relationship appeared, $r(206) = .04$, $p = .60$, and for men, the relationship approached conventional levels of significance, $r(152) = .14$, $p = .08$.

Self-efficacy and experience. Measures of self-efficacy included the scientific, mechanical, and computational subscales of the Kuder Task Self-Efficacy Scale (Lucas, Wanberg, & Zytowski, 1997), αs > .83, as well as participants' estimated grades in STEM classes (α = .86). These scales were standardized and averaged to produce a single self-efficacy index (α = .86). Total enrollment in mathematics and science courses was

Table 3. Resulting Goal-Endorsement Factors: Agentic and Communal Goals

Agentic goals (α = .87)	Communal goals (α = .84)
Power	Helping others
Recognition	Serving humanity
Achievement	Serving community
Mastery	Working with people
Self-promotion	Connection with others
Independence	Attending to others
Individualism	Caring for others
Status	Intimacy
Focus on the self	Spiritual rewards
Success	
Financial rewards	
Self-direction	
Demonstrating skill or competence	
Competition	

Note: A factor analysis of goal-endorsement items supported two distinct factors: agentic goals and communal goals. Cronbach's alphas indicate high internal consistency within each scale.

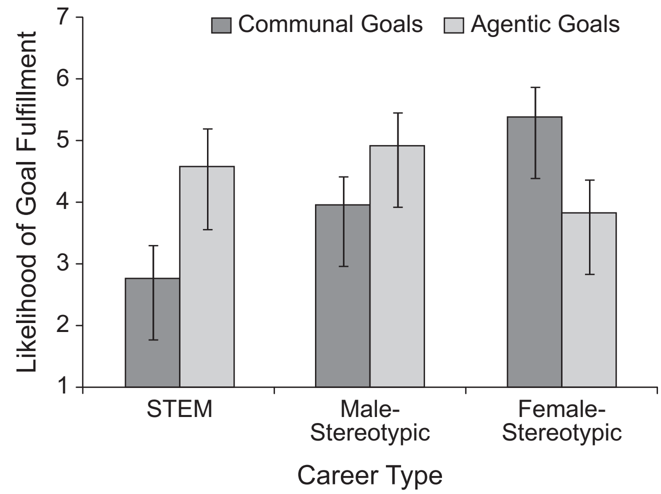

Fig. 1. Participants' mean ratings of the likelihood that communal and agentic goals would be fulfilled by science, technology, engineering, and mathematics (STEM) careers; male-stereotypic careers; and female-stereotypic careers. Error bars reflect standard deviations.

obtained by summing the number of these courses participants had taken or were taking.

Results

First, we examined whether people perceive STEM careers, versus other careers, as uniquely inhibiting the attainment of communal goals, relative to agentic goals. Second, we examined whether communal-goal endorsement was differentially related to interest in STEM relative to other careers, based on these disparate perceptions. Third, we tested whether endorsement of communal goals mediated gender differences in STEM interest.

STEM careers are believed to impede communal goals

Data were analyzed in a 2 (goal) × 3 (career type) × 2 (participant gender) analysis of variance (ANOVA), with participant gender as a between-subjects factor. Main and lower-order effects were omitted from this summary for brevity, and the effect sizes for critical interactions were calculated in the generalized eta-squared statistic (Bakeman, 2005).

The hypothesized Goal × Career Type interaction, $F(2, 716) = 730.69$, $p < .0001$, $\eta^2_G = .31$, is depicted in Figure 1. For communal goals, the simple effect of career type, $F(2, 716) = 741.55$, $p < .0001$, $\eta^2_G = .53$, reflected participants' perceptions that STEM careers afford communion significantly less than MST careers, which in turn afford communion less than FST careers, all ps $< .0001$. For agentic goals, the simple effect of career type, $F(2, 716) = 142.58$, $p < .0001$, $\eta^2_G = .14$, reflected participants' perceptions that FST careers afforded agency less than STEM careers, which in turn afforded less agency than MST careers, all ps $< .0001$.

To compare STEM and MST careers, we conducted a 2 (goal) × 2 (career type: STEM or MST) × 2 (gender) ANOVA with gender as a between-subjects factor. As reflected in the Goal × Career Type interaction, $F(1, 358) = 131.77$, $p < .0001$, $\eta^2_G = .04$, MST and STEM careers differed more on communal goals, $F(1, 358) = 351.70$, $p < .0001$, $\eta^2_G = .25$, than on agentic goals, $F(1, 358) = 31.84$, $p < .0001$, $\eta^2_G = .02$. In short, MST careers differ from STEM careers more in communion than in agency.

Communal-goal endorsement negatively predicts STEM interest

Given these robust differences in perceived goal affordances, we examined whether communal-goal endorsement differentially predicted interest in specific careers. Communal-goal endorsement was expected to negatively predict interest in STEM careers (believed to impede communal-goal pursuit) but to positively predict interest in FST careers (believed to afford communal-goal pursuit). For agentic goals, we expected a different pattern, but one consistent with role congruity logic. In this case, we expected agentic-goal endorsement to positively predict interest in male-dominated careers (STEM and non-STEM) but to negatively predict interest in FST careers.

To explore these hypotheses, we regressed career interest on participant gender, communal- and agentic-goal endorsements, and all interactions (see Table 4). As predicted, for STEM careers, communal-goal endorsement significantly inhibited interest and agentic-goal endorsement facilitated interest. For MST careers, agentic-goal endorsement facilitated interest but communal-goal endorsement had no effect. For FST careers, communal goals facilitated interest and agentic goals inhibited interest.[2]

Table 4. Predicting Career Interest From Goal Endorsement

	STEM careers (R^2 = .17***)		Male-stereotypic careers (R^2 = .10***)		Female-stereotypic careers (R^2 = .21***)	
Predictor	*b*	β	*b*	β	*b*	β
Gender	0.80***	0.32	0.23†	0.10	–0.51***	–0.21
Communal goals	–0.35***	–0.25	–0.01	–0.01	0.50***	0.37
Agentic goals	0.18†	0.12	0.25*	0.17	–0.30**	–0.22
Communal Goals × Gender	0.24†	0.11	0.13	0.06	–0.06	–0.03
Agentic Goals × Gender	–0.01	–0.00	0.31*	0.14	0.15	0.07
Communal Goals × Agentic Goals	–0.05	–0.03	–0.08	–0.06	0.13	0.09
Gender × Communal Goals × Agentic Goals	–0.02	–0.01	0.28†	0.14	–0.18	–0.09

Note: STEM = science, technology, engineering, and mathematics.
†*p* < .10. **p* < .05. ***p* < .01. ****p* < .001.

We found that communal-goal endorsement differentially predicted interest across the three career types (see Fig. 2), which was consistent with our primary hypothesis. We statistically compared these slopes by regressing discrepancies between interest in STEM and interest in other careers on gender, goals, and all interactions. In other words, we examined whether the divergent interest in STEM careers versus other careers was differentially related to communal-goal endorsement. Communal-goal endorsement predicted the discrepancy between STEM and FST careers, $b = 0.85$, $p < .0001$, $\beta = 0.43$, as well as the discrepancy between STEM and MST careers, $b = 0.34$, $p < .001$, $\beta = 0.23$.

Self-efficacy and experience

We also tested whether communal-goal endorsement inhibited STEM interest even when controlling for mathematics-science experience and self-efficacy. We regressed STEM interest on gender, goal endorsements, and new variables reflecting past

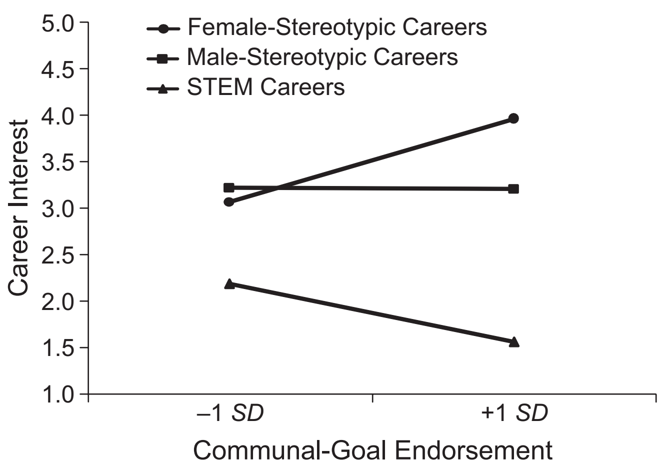

Fig. 2. Interest in female-stereotypic, male-stereotypic, and science, technology, engineering, and mathematics (STEM) careers as a function of endorsement of communal goals.

and current enrollment in STEM courses and STEM self-efficacy. We found that self-efficacy significantly predicted interest, $b = 0.83$, $p < .0001$, $\beta = 0.56$, whereas course enrollment did not, $b = 0.00$, $p = .57$, $\beta = 0.02$.

We find it particularly important that communal-goal endorsement was significant, even when controlling for participants' self-efficacy or experience: Communal-goal endorsement negatively predicted STEM interest, $b = -0.19$, $p = .001$, $\beta = -0.13$. In contrast, agentic-goal endorsement was reduced to nonsignificance, $p = .16$. Even though self-efficacy is a robust predictor of STEM interest, communal-goal endorsement predicts STEM interest above and beyond self-efficacy.

Communal goals mediate gender differences in STEM interest

To investigate whether communal goals underlie gender differences in STEM interest, we conducted a series of path analyses (Kenny, Kashy, & Bolger, 1998). As shown in Figure 3, gender predicted communal-goal endorsement (women more than men endorsed communal goals), communal goals predicted STEM interest, and the relationship between gender and STEM interest decreased when controlling for communal-goal endorsement, Sobel $Z = 2.08$, $p = .04$.

In addition to this mediational model, we tested alternative models, and the pattern of results suggested that communal-goal endorsement uniquely underlies STEM interests. One alternative tested whether agentic goals mediate the gender difference in STEM interest. This mediation failed because gender did not predict agentic goals, $p = .34$. Another model tested whether communal goals mediate the gender difference in interest in MST careers. This model failed because communal goals did not predict interest in MST careers, $p = .24$. The success of the communal-goals/STEM model, compared with these alternatives, suggests that communal-goal endorsement might uniquely explain women's disinterest in pursuing STEM careers.

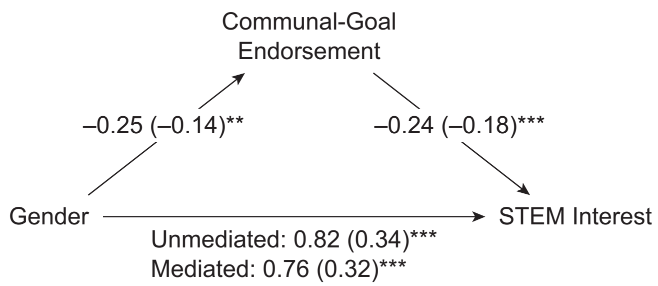

Fig. 3. Results of a path analysis of endorsement of communal goals as a mediator of the relationship between gender and interest in science, technology, engineering, and mathematics (STEM) careers. Unstandardized regression coefficients are given outside of parentheses, and standardized regression coefficients are given in parentheses. Asterisks indicate significance of relationships (***p* < .01, ****p* < .001). Participant gender was dummy-coded (1 = men, 0 = women).

General Discussion

Understanding communal motivations can provide unique information about why women opt out of STEM career paths. STEM careers are perceived as inhibiting communal goals: When individuals highly endorse communal goals, they are less interested in STEM. If women perceive STEM as antithetical to highly valued goals, it is not surprising that even women talented in these areas might choose alternative career paths. Certainly, traditionally studied predictors of STEM interest, such as agentic motivations or self-efficacy, continue to be critical factors, as illustrated in our data. Our argument is not that the study of communal motivations should replace agentic motivations or self-efficacy, but that this traditional approach overlooks critically important information. Indeed, studying communal motives along with other variables is promising, because the current data illustrate that communal motives provide a distinct explanation of STEM interest. Given the importance of increasing participation in STEM, a range of approaches should be used to address the challenge. Even small effects of communal motivation could lead to women opting out of STEM careers, especially if such small effects accumulate over time (e.g., Martell, Lane, & Emrich, 1996).

It is ironic that STEM fields hold the key to helping many people, but are commonly regarded as antithetical (or, at best, irrelevant) to such communal goals. However, the first step toward change is increasing knowledge about this belief and its consequences. Interventions could not only provide opportunities for girls and young women to succeed in mathematics and science but also demonstrate how STEM fields involve helping and collaborating with other people. For example, our current research investigates how portraying science or engineering careers as more other-oriented fosters positivity. Indeed, science-related fields with the greatest influx of women are those that are most obviously involved in helping people, such as psychological science and the biomedical sciences (Snyder et al., 2009). Psychological science could play a desperately needed role in helping people understand why STEM paths are chosen or, more often, not chosen (Newcombe et al., 2009). If one barrier to the participation of women in particular is a perceived misalignment between STEM and communal goals, psychological science can help change this perception.

Declaration of Conflicting Interests

The authors declared that they had no conflicts of interest with respect to their authorship or the publication of this article.

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Notes

1. Analyses of interest in the core careers showed patterns similar to those reported in the Results section. MST interest moderately correlated with STEM interest, $r(359) = .43$, and FST interest, $r(359) = .33$. STEM interest did not correlate with FST interest, $r(359) = -.06$.
2. Tentative evidence for gender-differentiated goal-interest relationships emerged. For STEM, the marginal Communal Goals × Gender interaction, $p = .10$, reflected a stronger inhibitory effect of communal-goal endorsement on STEM interest for women than for men. For MST careers, the Agentic Goals × Gender interaction, $p = .05$, reflected a stronger effect of agentic goals for men than for women; the Agentic Goals × Communal Goals × Gender interaction, $p = .08$, reflected a stronger interaction between agentic and communal goals for men than for women.

References

Bakan, D. (1966). *The duality of human existence: An essay on psychology and religion*. Chicago: Rand McNally.

Bakeman, R. (2005). Recommended effect size statistics for repeated measures designs. *Behavior Research Methods*, *37*, 379–384.

Ceci, S.J., & Williams, W.M. (Eds.). (2007). *Why aren't more women in science? Top researchers debate the evidence*. Washington, DC: American Psychological Association.

Chen, X., & Weko, T. (2009). *Students who study science, technology, engineering, and mathematics (STEM) in postsecondary education*. Washington, DC: U.S. Department of Education, National Center for Education Statistics.

Costa, P.T., Jr., Terracciano, A., & McCrae, R.R. (2001). Gender differences in personality traits across cultures: Robust and surprising findings. *Journal of Personality and Social Psychology*, *81*, 322–331.

Diekman, A.B., & Eagly, A.H. (2008). Of men, women, and motivation: A role congruity account. In J.Y. Shah & W.L. Gardner (Eds.), *Handbook of motivation science* (pp. 434–447). New York: Guilford.

Eagly, A.H., Wood, W., & Diekman, A.B. (2000). Social role theory of sex differences and similarities: A current appraisal. In T. Eckes & H.M. Trautner (Eds.), *The developmental social psychology of gender* (pp. 123–174). Mahwah, NJ: Erlbaum.

Eccles, J.S. (2007). Where are all the women? Gender differences in participation in physical science and engineering. In S.J. Ceci &

W.M. Williams (Eds.), *Why aren't more women in science? Top researchers debate the evidence* (pp. 199–210). Washington, DC: American Psychological Association.

Halpern, D.F., Benbow, C.P., Geary, D.C., Gur, R.C., Hyde, J.S., & Gernsbacher, M.A. (2007). The science of sex differences in science and mathematics. *Psychological Science in the Public Interest*, *8*, 1–51.

Kenny, D.A., Kashy, D.A., & Bolger, N. (1998). Data analysis in social psychology. In D.T. Gilbert, S.T. Fiske, & G. Lindzey (Eds.), *The handbook of social psychology* (4th ed., Vol. 2, pp. 233–265). New York: Oxford University Press.

Konrad, A.M., Ritchie, J.E.J., Lieb, P., & Corrigall, E. (2000). Sex differences and similarities in job attribute preferences: A meta-analysis. *Psychological Bulletin*, *126*, 593–641.

Lippa, R. (1998). Gender-related individual differences and the structure of vocational interests: The importance of the people-things dimension. *Journal of Personality and Social Psychology*, *74*, 996–1009.

Lucas, J.L., Wanberg, C.R., & Zytowski, D.G. (1997). Development of a career task self-efficacy scale: The Kuder Task Self-Efficacy Scale. *Journal of Vocational Behavior*, *50*, 432–459.

Martell, R.F., Lane, D.M., & Emrich, C. (1996). Male-female differences: A computer simulation. *American Psychologist*, *51*, 157–158.

National Science Board. (2002). *Science and engineering indicators—2002*. Arlington, VA: National Science Foundation.

Newcombe, N.S., Ambady, N., Eccles, J.S., Gomez, D., Linn, M., Miller, K., & Mix, K. (2009). Psychology's role in mathematics and science education. *American Psychologist*, *64*, 538–550.

Pohlmann, K. (2001). Agency- and communion-orientation in life goals: Impacts on goal pursuit strategies and psychological well-being. In P. Schmuck & K.M. Sheldon (Eds.), *Life goals and well-being: Towards a positive psychology of human striving* (pp. 68–84). Seattle, WA: Hogrefe and Huber.

Schwartz, S.H., & Rubel, T. (2005). Sex differences in value priorities: Cross-cultural and multimethod studies. *Journal of Personality and Social Psychology*, *89*, 1010–1028.

Snyder, T.D., Dillow, S.A., & Hoffman, C.M. (2009). *Digest of education statistics, 2008* (NCES 2009-020). Washington, DC: U.S. Department of Education, National Center for Education Statistics, Institute of Education Sciences.

Spelke, E.S. (2005). Sex differences in intrinsic aptitude for mathematics and science? A critical review. *American Psychologist*, *60*, 950–958.

Twenge, J.M. (2001). Changes in women's assertiveness in response to status and roles: A cross-temporal meta-analysis, 1931–1993. *Journal of Personality and Social Psychology*, *81*, 133–145.

U.S. Department of Labor. (2009). *Women in the labor force: A databook* (2009 ed.). Washington, DC: U.S. Department of Labor, Bureau of Labor Statistics.

Weisgram, E.S., & Bigler, R.S. (2006). Girls and science careers: The role of altruistic values and attitudes about scientific tasks. *Journal of Applied Developmental Psychology*, *27*, 326–348.