

Linking Gender to Educational, Occupational, and Recreational Choices: Applying the Eccles et al. Model of Achievement-Related Choices

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Despite recent efforts to increase the participation of women in advanced educational training and high-status professional fields and such male-dominated recreational activities as athletics, women and men are still concentrated in different educational programs, occupational fields, and recreational activities. Most important for this chapter, women are still underrepresented in many high-status occupational fields, particularly those associated with physical science, engineering, and applied mathematics (Eccles, 1987; National Science Foundation, 1996; Vetter & Babco, 1986). The differences in educational and occupational attainment are even evident among highly gifted individuals in this country (see Benbow, 1988; Benbow & Minor, 1986; Eccles & Harold, 1992; and Terman & Oden, 1947). Why? Many factors, ranging from outright discrimination to the processes associated with gender-role socialization, undoubtedly contribute to these gendered patterns of

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educational and occupational choices. Discussing all possible mediating variables is beyond the scope of a single chapter. Instead, we focus on a set of social and psychological factors that was first outlined in a book edited by Janet Taylor Spence in 1983, *Perspectives on Achievement and Achievement Motives* (see Eccles [Parsons] et al., 1983).

In that same volume, Spence and Helmreich (1983) summarized their theoretical and empirical work on several facets of achievement motivation and the facets' relations to academic performance in college students and career success among members of several professions. The original impetus of this work came from skepticism about the widely accepted hypotheses that women fail to develop the kind of intrinsic motivation that is necessary to enter and succeed in demanding occupations and that this lack is a major cause of the discrepancy between women's and men's academic choices and vocational attainment. Their data essentially disconfirmed these ideas about gender (e.g., Spence & Helmreich, 1978, 1983). In our approach to gender differences in educational and occupational choice, we have built on this critical work in two fundamental ways: First, their work sensitized us to the need to understand women's behavior from a choice perspective rather than a deficit perspective; second, Spence's approach to conceptualization and measurement of personality has guided our theoretical and methodological work. Spence's subsequent work on gender roles (e.g., Spence, 1993) has informed our stress on the role of values as critical to understanding gendered behaviors. These influences are evident throughout this chapter.

This chapter focuses on a model of achievement-related choices and the ongoing Michigan Study of Adolescent Life Transitions (MSALT) study. After reviewing the support for this model, we provide a brief overview of recent evidence supporting the power of the most proximal predictors of achievement-related choices, expectations for success and subject task value. In the final section, we discuss more specifically how gender roles relate to the model and how gender roles can lead to different educational and occupational choices.

A MODEL OF ACHIEVEMENT-RELATED CHOICES

Over the past 20 years, Eccles and her colleagues have studied the motivational and social factors influencing such achievement goals and behaviors as educational and career choices, recreational activity selection, persistence on difficult tasks, and the allocation of effort across various achievement-related activities. Given the striking gender differences in educational, vocational, and avocational choices, Eccles and her colleagues have been particularly interested in the motivational factors underlying male and female achievement-related decisions. Drawing on the theoretical and empirical work associated with decision making, achievement theory, and attribution theory (see Crandall, 1969; Spence & Helmreich, 1978; and Weiner, 1974), they elaborated a comprehensive theoretical model of achievement-related choices that could be used to guide subsequent research efforts.

This model, depicted in Figure 1, links achievement-related choices directly to two sets of beliefs: the individual's expectations for success and the importance or value the individual attaches to the various options perceived as available. The model also specifies the relation of these beliefs to cultural norms, experiences, aptitudes, and those personal beliefs and attitudes that are commonly assumed to be associated with achievement-related activities by researchers in this field (see Eccles, 1987; Eccles [Parsons] et al., 1983; and Meece, Eccles [Parsons], Kaczala, Goff, & Futterman, 1982). In particular, the model links achievement-related beliefs, outcomes, and goals to interpretative systems like causal attributions, the input of *socializers* (primarily parents, teachers, and peers), gender-role beliefs, self-perceptions and the self concept, and perceptions of the task itself.

For example, consider course enrollment decisions. The model predicts that people will most likely enroll in courses that they think they can master and that have high task value for them. Expectations for success (and a sense of domain-specific personal efficacy) depend on the confidence the individual has in his or her intellectual abilities and on the individual's estimations of the difficulty of the course. These beliefs are shaped over time by the individual's experiences with the subject matter and subjective interpretation of those experiences (e.g.,

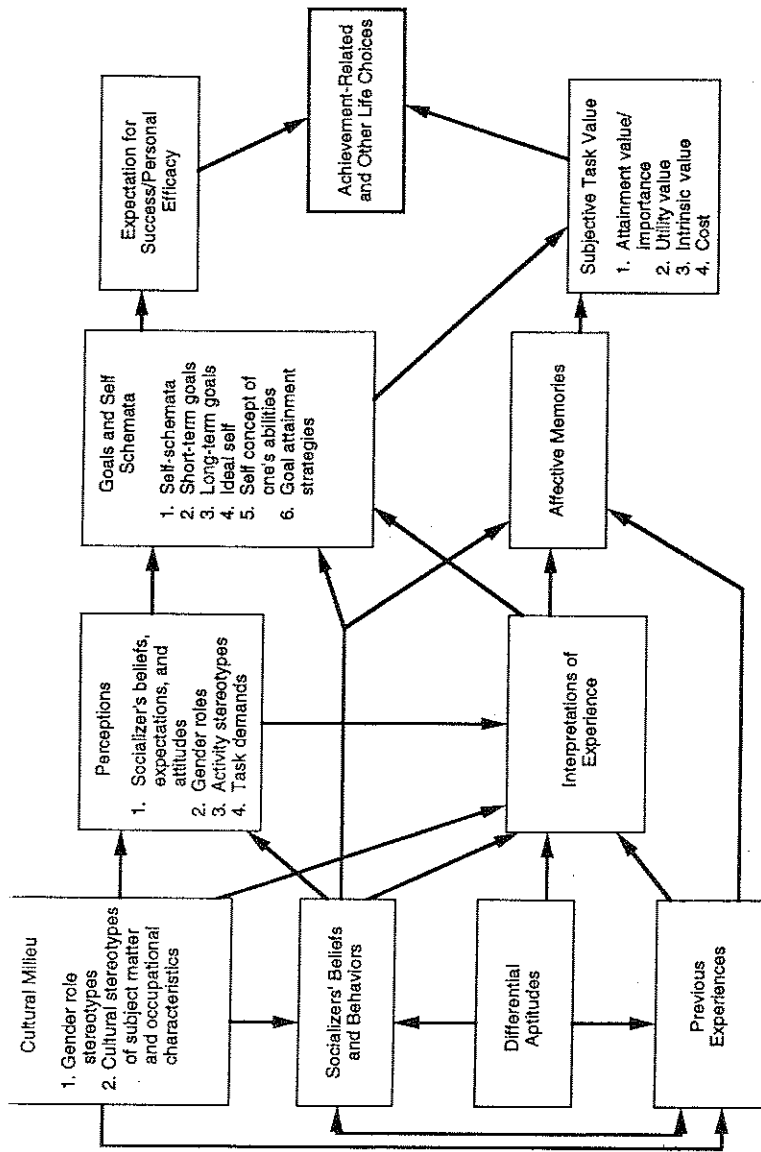


Figure 1

Theoretical model of achievement-related choices developed by Eccles (Parsons) et al. (1983).

Does the individual think that her or his successes are a consequence of high ability or lots of hard work?). Likewise, it is assumed that several factors influence the value of a particular course to the individual: For example, does an individual enjoy studying the subject material? Is the course required? Is the course seen as instrumental in meeting one of the individual's long- or short-range goals? Have the individual's parents or counselors insisted that the individual take the course, or have other people tried to discourage the individual from taking the course? Is the individual afraid of the material the course will cover?

One additional feature of the model is important to highlight: the assumption that achievement-related decisions, such as the decision to enroll in an accelerated math program or to major in education rather than engineering, are made within the context of a complex social reality that presents each individual with a wide variety of choices; each of which has both long-range and immediate consequences. Consequently, the choice is often between two or more positive options or between two or more options that all have both positive and negative components. For example, the decision to enroll in a physics course is typically made in the context of other important decisions, such as whether to take advanced English or a second foreign language, whether to take a course with one's best friend, whether it is more important to spend one's senior year working hard or having fun, and so forth.

Consider, for example, two high school students: Mary and Barbara. Both young women enjoy mathematics and have always done very well in the subject. Both have been offered the opportunity to participate in an accelerated math program at the local college during their next school year. Barbara is also very interested in gymnastics and hopes to win a sport scholarship to college. To accomplish this goal, she needs to train every afternoon for 4 hr. In contrast, Mary hopes to major in biology in college and plans a career as a research scientist. Taking the accelerated math course involves driving to and from the college. Because the course is scheduled for the last period of her school day, it will take the last two periods as well as 1 hr of afterschool time to take the course. What will the young women do? In all likelihood, Mary will enroll in the program because she likes math and thinks that the effort

required to both take the class and master the material is worthwhile and important for her long-range career goals. Barbara's decision is more complex. She may want to take the class but may also think that the time required is too costly, especially given the demands of her gymnastic training schedule. Whether she takes the college course will depend, in part, on the advice she gets at home and from her counselors. If they stress the importance of the math course, then its subjective worth to her is likely to increase. If its subjective worth increases sufficiently to outweigh its subjective cost, then Barbara will probably take the course, despite its cost in time and effort.

Thus, building on the work of Spence and Helmreich (e.g., 1983; Spence, 1993), the model is based on the assumption that women's and men's behaviors are determined by a complex set of factors. The fact that women and men may differ in their choices is likely to reflect gender differences in a wide range of predictors, mediated primarily by differences in self-perceptions, values, and goals rather than motivational strength, drive, or both. Such an approach changes the issue from "Why don't women make the same choices as men?" to "Why do women make the choices they do?" This change, in turn, moves us beyond a deficit model of women's behavioral choices and focuses our attention on both the positive and negative reasons why women and men make the choices they do. This change also leads us to question whether differences favoring men necessarily reflect a strength for men and a deficit for women. For example, like others, both Spence and Eccles have consistently found that men score higher than do women on measures of interpersonal competitiveness. Both have also found, however, that this characteristic does not necessarily lead to either better performance or more intrinsically motivated behavioral choices. Consequently, whereas others have interpreted such a gender difference as one of the "strengths" that facilitate men's achievement (e.g., Goldberg, 1973), our approach makes this an empirical question in need of appropriate, contextually sensitive, causal modeling.

In summary, as outlined in Figure 1, we assume that achievement-related choices (e.g., educational and occupational choices), whether made consciously or unconsciously, are guided by the following: (a)

one's expectations for success on and sense of personal efficacy for the various options, (b) the relation of the options to both one's short- and long-range goals and one's core self identity and basic psychological needs, (c) one's gender-role-related schemas, and (d) the potential cost of investing time in one activity rather than another. All of these psychological variables are influenced by one's experiences, cultural norms, and the behaviors and goals of one's socializers and peers.

THE MICHIGAN STUDY OF ADOLESCENT LIFE TRANSITIONS

Before going on however, we want to provide information about the particular study we focus on in our summaries of our findings. These analyses were done using data from the MSALT. This longitudinal study is being conducted by Jacquelynne Eccles and Bonnie Barber. It began in 1982, with a sample of approximately 3,000 sixth graders in 12 different school districts of southeastern Michigan; these districts serve primarily working-class and middle-class small-city communities. The sample is predominantly White but does include about 150 African American adolescents. Approximately 2,000 of these adolescents have been tracked well into their early adulthood years with standard survey questions either designed by Eccles, Barber, and their colleagues or borrowed from other investigators. Emboldened by Spence's advice to create their own measures, they designed all of the scales reported in this chapter. Most have been used in a variety of studies and have well-established reliabilities and good predictive and face validity. The longitudinal sample differs from the original random sample in only a few regards: The adolescents in the longitudinal sample came from slightly wealthier families and were more likely to complete high school and go on to college than the original sample of 3,000. However, the longitudinal sample is still quite diverse and representative of the working/middle-class populations of southeastern Michigan: Slightly less than 50% have gone on to a 4-year college by the time they were age 20, and only 35% finished a bachelor's degree by the time they were age 25.

EXPECTATIONS AND PERSONAL EFFICACY AS MEDIATORS OF ACHIEVEMENT-RELATED CHOICES

Expectations for success, confidence in one's abilities to succeed, and personal efficacy have long been recognized by decision and achievement theorists as important mediators of behavioral choice (e.g., Atkinson, 1964; Lewin, 1938; Weiner, 1974). Numerous studies demonstrate the link between expectations for success and a variety of achievement-related behaviors. For example, Hollinger (1983) has documented the relation between gifted girls' confidence in their math abilities and their aspirations to enter math-related vocations, such as engineering and computer science. Similarly, Terman (1926) has found a positive relation between gifted students' subject matter preferences and their ratings of the ease of the subject for themselves. More recently, Betz and Hackett (1986) demonstrated a link between ratings of personal efficacy in various academic subjects and career choice (see also Betz & Fitzgerald, 1987).

But do the male and female populations differ on measures commonly linked to expectations for success? Even more important, do the female and male populations differ in their expectations for success at various academic subjects and in various occupations in a traditional gender-role-stereotyped manner? In most but not all studies, the answer to both these questions is *yes*. For example, at the general level, Fox (1976) found that highly motivated gifted girls have lower self-confidence than do equally highly motivated gifted boys; similarly, both Terman (1926) and Strauss and Subotnik (1991) found that gifted girls were more likely to underestimate their intellectual skills and their relative class standing whereas gifted boys were more likely to overestimate theirs. But even more important for this chapter, in several studies the pattern of gender differences in young children's and adolescents' confidence in their abilities and expectations for success mirrors traditional gender-role stereotypes. For example, girls rated themselves as having more English and social ability but less athletic and math ability than did their male peers (e.g., Eccles, 1987; Eccles [Parsons], Adler, & Meece,

1984; Eccles & Harold, 1991; Eccles et al., 1989; Eccles, Wigfield, Harold, & Blumenfeld, 1993; Wigfield, Eccles, Mac Iver, Reuman, & Midgley, 1991).

In contrast, several studies of gifted youth find no gender differences on measures of general self concept, locus of control (a construct often linked to self-confidence and personal efficacy beliefs), general self-confidence and assertiveness, and general self-esteem (Dauber & Benbow, 1990; Schunk & Lilly, 1982; Terman, 1926; Tomlinson-Keasey & Smith-Winberry, 1983). Furthermore, although the girls in the study of gifted elementary schoolchildren reported higher estimates for their reading ability than did the boys, the boys and girls reported equivalent confidence in their mathematical ability (Eccles & Harold, 1992). Finally, in the longitudinal study of intellectually capable students, gender differences in expectations for success in future math courses did not mediate the gender differences in math course enrollment, but the perceived value of the math course did (Eccles [Parsons] et al., 1984).

Given this mixed set of results for intellectually able and gifted youth, it is not clear that gifted girls are either less confident than are gifted boys of their intellectual abilities in general or of their mathematical ability in particular. Although the differences, when found, do support this conclusion, these differences are always quite small and are often not found at all. It is also not clear whether this difference, even when found, is the primary mediator of gender differences in the educational and occupational decisions of either intellectually able or gifted youth. Thus, it is also not clear that the gender differences in the selection of careers in math and science among intellectually able youth are primarily due to gender differences in their expectations for success in mathematics. Gender differences in task value may be just as important. These differences are discussed in the next section.

Occupational Ability Self Concepts

Eccles and Barber have extended their work on academic and athletic self concepts by looking at adolescents' competence ratings for skills more directly linked to adult occupational choice. As the MSALT sample moved into and through high school, they were asked a series of ques-

tions directly related to future job choices. First, the sample was asked to rate how good they were compared with other students at each of several job-related skills. Second, the sample was asked to rate the probability that they would succeed at each of a series of standard careers. The results from their responses when they were seniors are summarized in Table 1.

On the one hand, the results are quite gender-role stereotyped: The female students were less confident of success than were the male students in science-related professions and in male-typed skilled labor occupations; in contrast, the male students were less confident of their success than were the female students in health-related professions and female-typed skilled labor occupations (Jozefowicz, Barber, & Eccles, 1993). On the other hand, there were no gender differences in these seniors' ratings of either their confidence of success in business and law or their leadership, independence, intellectual, and computer skills. Furthermore, although the male students were more confident of success in physical science and engineering fields, the female students were more confident than were the male students of success in health-related fields that involve extensive scientific training. Clearly, these young women see themselves as quite efficacious in terms of possible future occupational pathways. Which particular pathway they select or end up on likely has as much, if not more, to do with their values as with their sense of efficacy. In the next section, we review findings regarding gender differences in achievement-related values.

Subjective Task Values as Mediators of Achievement-Related Choices

Subjective task value is the second major component of the expectancy-value model of achievement-related choices, as shown in Figure 1: Decisions regarding course enrollments, college majors, and occupational choice are assumed to be influenced by the value individuals attach to the various achievement-related options they believe are available to them. Furthermore, given the probable impact of gender-role socialization on the variables associated with subjective task value, gender differences in the subjective value of various achievement-related op-

Table 1
Gender Differences in Values, Expectations, and Perceived Ability:
Multiple Analysis of Variance

Measure	Female <i>M (SD)</i>	Male <i>M (SD)</i>
Expected efficacy in jobs		
1. Health related ^b	4.2 (1.9)	3.7 (1.7)*
2. Science related ^a	3.5 (1.6)	4.1 (1.7)*
3. Skilled labor (male)/protective services ^a	2.4 (1.0)	4.2 (1.2)*
4. Skilled labor (female)/human services ^b	4.5 (1.2)	3.3 (1.2)*
5. Business and law ^b	4.6 (1.4)	4.9 (1.4)
6. Artist ^a	3.5 (1.9)	3.3 (1.7)
Self-perception of skills		
1. Working with others ^b	5.5 (0.9)	4.8 (1.0)*
2. Leadership ^a	5.3 (1.1)	5.3 (1.0)
3. Independence ^a	5.2 (1.1)	5.3 (1.0)
4. Intellectual ^a	5.1 (1.2)	5.3 (1.0)
5. Mechanical ^a	2.3 (1.4)	4.2 (1.7)*
6. Computers ^a	4.0 (1.7)	4.2 (1.6)
Lifestyle values		
1. High status/competitive ^a	4.4 (1.4)	4.8 (1.4)*
2. Risk taking ^a	4.7 (1.1)	5.1 (1.0)*
3. Careerism ^a	5.7 (1.0)	5.5 (1.0)
4. Family and friends before work ^b	4.5 (1.0)	4.0 (1.1)*
5. Material wealth ^a	4.7 (1.2)	5.1 (1.1)*
Valued job characteristics		
1. Flexibility to meet family obligations ^a	5.5 (1.1)	5.4 (1.0)
2. People/society oriented ^b	5.7 (1.0)	5.1 (1.1)*
3. Prestige/responsibility ^a	5.4 (1.1)	5.6 (0.9)
4. Creative/educational ^a	5.7 (1.2)	5.8 (1.1)
5. Machinery/manual work ^a	3.0 (1.2)	3.9 (1.6)*
6. Math/computer work ^a	3.9 (1.5)	4.2 (1.5)*

Note. Both multianalyses of variances (MANOVAs) were significant at the $p < .001$ level. Significant relationships reported in the table are based on univariate tests of significance. ^aFirst MANOVA set. ^bSecond MANOVA set. * $p < .001$.

tions are predicted to be important mediators of gender differences in educational and occupational choices in both typical and gifted populations.

Eccles (Parsons) et al.'s (1984) data support this hypothesis. In a longitudinal study of the math course enrollment decisions of intellectually able, college-bound students, gender differences in students' decisions to enroll in advanced mathematics were mediated primarily by gender differences in the value the students' attached to mathematics. More specifically, the girls were less likely than the boys to enroll in advanced mathematics primarily because they felt that math was less important, useful, and enjoyable than did the boys. Eccles and Harold (1992) also found clear evidence of gender differences in the value attached to various school subjects and activities in their study of elementary schoolchildren enrolled in a gifted program. Even though there was no gender difference in expectations for success in mathematics, these girls reported liking math less than the boys did; the girls also rated math as less useful than did the boys. In addition, the boys also attached greater importance to sports than did the girls.

Other studies have yielded similar findings. When asked to name their favorite school subjects, gifted girls rated English, foreign languages, composition, music, and drama higher than did gifted boys; in contrast, the boys rated the physical sciences, physical training, U.S. history, and sometimes mathematics higher than did the girls (Benbow & Stanley, 1982; George & Denham, 1976; Terman, 1926). Similarly, when asked their occupational interests and anticipated college major, gifted girls rated domestic, secretarial, artistic, and biological sciences and both medical and social service occupations and training higher than did the boys, whereas the boys expressed more interest than did the girls in both higher status and business-related occupations in general and the physical sciences, engineering, and the military in particular (Benbow & Stanley, 1982; Fox, Pasternak, & Peiser, 1976; Terman, 1926). Finally, when asked their leisure time activities and hobbies, similar differences in interest patterns emerged. At all ages, gifted girls both liked and reported spending more time than did the boys on reading, writing, and participating in a variety of activities related to arts and

crafts, domestic skills, and drama; in contrast, gifted boys spent more time engaged in sports, working with machines and tools, and involved with scientific, math-related, or electronic hobbies (Dauber & Benbow, 1990; Fox, 1976; McGinn, 1976; Terman, 1926; Terman & Oden, 1947).

In summary, there is substantial evidence of gender differences in the valuing of various educational and occupational options. But do these differences explain gender differences in educational and occupational choice? As noted above, evidence shows that the answer is *yes*, and Eccles (Parsons) et al. (1984) have provided more evidence (as discussed later). Additional support for this hypothesis comes from the work of Benbow and Stanley (1982). Gifted girls in their study were less likely than gifted boys to take advanced mathematics in part because they liked language-related courses more than they liked mathematics courses. In addition, Benbow and Stanley found weak but consistent positive relations in their gifted samples between the liking of biology, chemistry, and physics and subsequent plans to major in biology, chemistry, and physics, respectively. In addition, students' interest predicted their course taking in high school and college (Benbow & Minor, 1986).

The more fundamental question, however, is whether individual differences in relative perceived value of a variety of occupations mediate individual differences in occupational choice. Eccles and Barber have been studying this question for the last 10 years. Because of their interest in understanding career choice, they extended MSALT to include a series of measures of more general life and occupational values. When the participants were seniors, they were asked to rate how important each of a series of job-related and life-related values and a series of job characteristics were to them (see appendices for sample items). The results are summarized in Table 1. As was true for the job-related skills, they found evidence of both gender-role stereotypic differences and of gender-role transcendence. In keeping with traditional stereotypes, the female students rated family and friends as more important to them than did the male students; the female students also were more likely than the male students to want jobs that were people oriented. In contrast but also consistent with both traditional stereotypes and the

work of Spence and Helmreich (1978, 1983), the male students placed a higher value on high-risk and competitive activities and wealth than did the female students; they also were more interested in jobs that allowed for work with machinery, math, or computers. However, counter to traditional stereotypes, there were no gender differences in careerism; the female and male students were equally likely to want jobs that allowed for flexibility to meet family obligations, that entailed prestige and responsibility, and that allowed for creative and intellectual work. As seen in the next section, these values are significant predictors of occupational aspirations.

Evidence from other investigators also provides good support for a key role of perceived task value in achievement-related decisions. For example, using a longitudinal, correlational design, Dunteman, Wisenbaker, and Taylor (1978) studied the link between personal values and selection of one's college major. They identified two sets of values that both predicted students' subsequent choice of major and differentiated the sexes: The first set (labeled *thing orientation*) reflected an interest in manipulating objects and understanding the physical world; the second set (labeled *person orientation*) reflected an interest in understanding human social interaction and a concern for helping people. Students who were high on thing orientation and low on person orientation were more likely than the other students to select a math or science major. Not surprisingly, female students in their study were more likely than male students to be person oriented and to major in something other than math or science; in contrast, the male students were more likely than the female students both to be thing oriented and to major in math and science.

Predicting Achievement-Related Choices Using the Eccles et al. Expectancy-Value Model

The MSALT study has been used to predict achievement-related choices in several domains. The evidence supporting the power of expectancies and values as both direct effects and as mediators of gender differences in behavioral choices is quite strong. In this section, we summarize this evidence in three domains: athletics, course enrollment, and career as-

pirations. In each set of analyses, Eccles and Wigfield (1995) used their measure of self concept of ability as the expectation-related measure because factor analyses indicate that both ratings of one's current competence and expectations for current and future success load on a single factor, with high internal reliability. We used perceived utility value and interest-enjoyment as two indicators of perceived task value because factor analyses indicate that these two components of perceived task value are independent, although highly related, constructs, each with high internal consistency reliability (Eccles & Wigfield, 1995).

Athletics

Both Eccles and Harold's (1991) data and national statistics indicate that females participate less than do males in competitive athletics at all ages. Figure 2 illustrates the path analyses they did to assess whether gender differences in expectation-related and value-related self beliefs

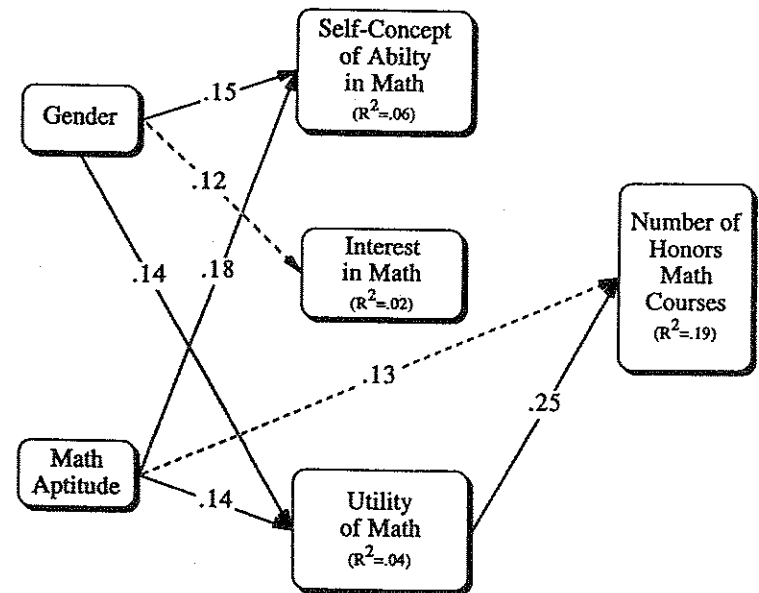


Figure 2

Predicting number of honors math classes.

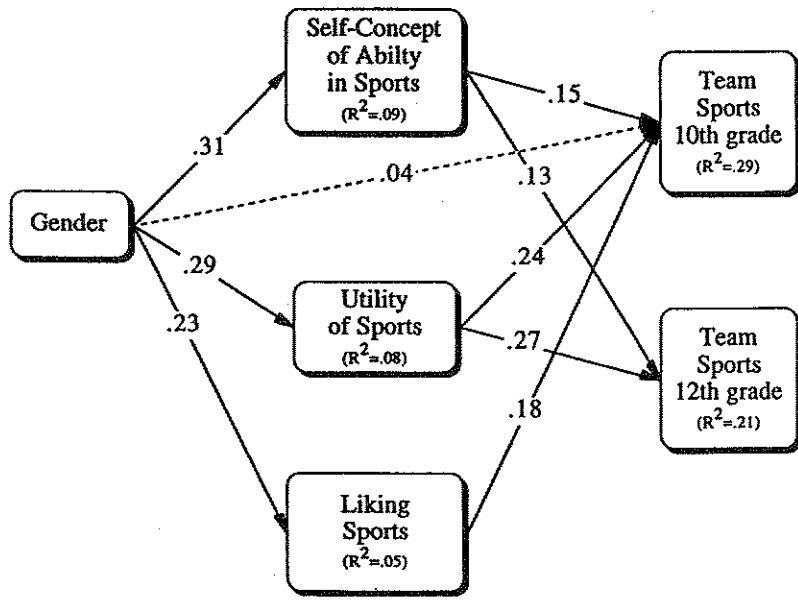


Figure 3

Predicting sport team involvement.

explain this gender difference in participation at both 10th and 12th grades. They entered all three psychological predictors at the same time in these analyses. There was a significant gender difference in participation (assessed in terms of number of competitive sports participated in during the last 12 months) at both grades: Male students were more likely to have participated than were female students (see Figure 3). These differences, however, are totally mediated by the three psychological predictors gathered at 10th grade. The strongest predictor when all three psychological variables were entered into the same model was perceived importance/utility.

Honors Track Math

Figure 4 illustrates the path analyses for the total number of honor's track math courses taken during their high school career by those adolescents who began high school in the honors math track (Updegraff,

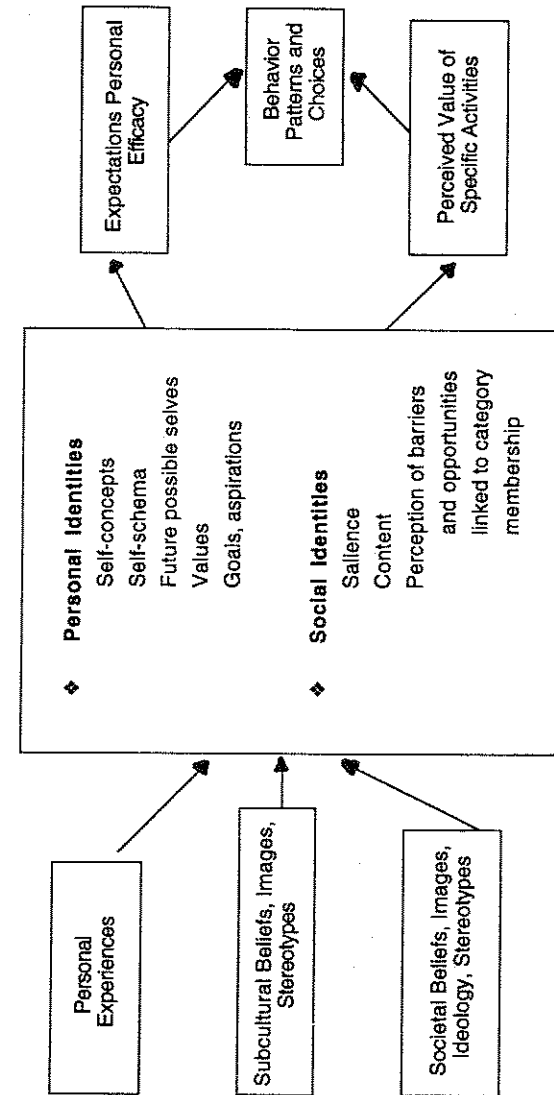


Figure 4

Model of identity influence on behavior.

Eccles, Barber, & O'Brien, 1996). The researchers entered all three psychological predictors at the same time in these analyses. They also entered the students' Differential Aptitude Test (DAT)-quantitative score as a control for ability differences. There was a significant zero-order relation of both gender and DAT to the number of honors track math courses taken in this set of students—the male students took slightly more courses than did the female students and those with higher DAT scores took slightly more courses than did those with lower DAT scores. The gender effect was totally mediated by one of the three psychological predictors: perceived importance/utility. The DAT relationships were also substantially mediated by perceived importance/utility. Neither 10th-grade enjoyment/interest nor self concept of ability predicted the number of courses taken.

So here again we find good support for the Eccles et al. model. Most important is the power of the two subjective value belief constructs in explaining both individual and gender differences in honors students' high school math course enrollment patterns. We are particularly struck by the strength of the importance/utility construct. Recall the example we gave about the two young women deciding whether to take the college math course. We stressed that there was a perceived importance of the course for the young women's future plans. These data support this emphasis. At this point in the students' lives, they must begin to choose between elective courses. These finding suggest that they weigh the utility of the course for their future educational and vocational goals heavily in making these choices.

Career Aspirations

Four sets of values and beliefs were assessed using a 7-item, Likert-scale format. These sets include (a) values regarding work, future success, relationships, and leadership (lifestyle values); (b) specific job characteristics adolescents might desire in their future occupational settings (valued job characteristics); (c) estimates of future success in different categories of occupations (expected efficacy in jobs); and (d) self-ratings of job-relevant skills (self-perception of skills). Each of the four sets of items was factor analyzed. Factors obtained from the analyses were further broken down based on theoretical and conceptual grounds. Scale items, alphas, means,

and standard deviations are presented in the Appendices. We already reported on the gender differences in these beliefs (see Table 1).

Occupational aspirations were assessed using the following open-ended probe: "If you could have any job you wanted, what job would you like to have when you are 30?" Standard U.S. Occupational Classification Codes were used, and each code was categorized into one of nine general occupational categories. Nonparametric statistical procedures (chi-square analyses) revealed fairly stereotypic gender differences: The young men aspired to science/math-related occupations, male-typed skilled labor occupations, and protective service jobs more than did the young women. Conversely, these young women aspired to human service jobs, health professions, and female-typed skilled labor more than did their male peers. However, the majority of both the male and female students aspired to business and law occupations (31% and 30%, respectively).

We used discriminant analyses, run separately for male and female participants, to determine which values, job characteristics, skills, and efficacy expectations best discriminated between adolescents who aspired to each of the nine occupational categories. The results of discriminant analyses for the women's and the men's aspirations for both science- and math-related professions and health professions are presented in Table 2. In each of these analyses, the discriminate function generated indicators of the extent to which various expectancy and value-related characteristics distinguished between the female (or male) students who aspired to the targeted occupation and the female (or male) students who did not aspire to this occupation.

We first focus on health careers. Both female and male students who aspired to these careers expected to do well in health-related occupations, and they valued people/society-oriented job characteristics in comparison with those who did not aspire to health careers. For female students, those who chose health-related careers also expected to do well in science-related occupations. For male students, those who chose health-related careers rated their machinery skills low and their working with others skills high in comparison with male students who did not aspire to these careers.

Table 2
Discriminations Between Those Who Do and Those Who Do Not Aspire to Certain Professions

Occupation	Males		Females	
	Discriminating variable	Structure coefficient	Discriminating variable	Structure coefficient
Science related (<i>N</i> = 90 aspiring/331 not aspiring)	Efficacy—science related	.51	(<i>N</i> = 45 aspiring/536 not aspiring)	
	Job value—math/composition	.51	Efficacy—science related	.61
	Skills—computers	.32	Job value—people/society	-.40
	Skills—machinery	.31	Efficacy—male typed	.27
	Efficacy—business/law	-.28	Job value—math/composition	.27
Health related (<i>N</i> = 20 aspiring/401 not aspiring)	Efficacy—health related	.65	(<i>N</i> = 56 aspiring/525 not aspiring)	
	Skills—machinery	-.28	Efficacy—health related	.81
	Skills—working with others	.26	Efficacy—science related	.56
	Job value—people/society	.25	Job value—people/society	.29

Note. Only coefficients correlating with the function at .25 or above are reported here.

With regard to science–math careers, male and female students who aspired to these careers expected to do well in science-related fields and valued math and computer job tasks when compared with other students. Male students who aspired to science-related careers also had high ratings of computer and machinery skills and low expectancies of doing well in business–law occupations. Female students who chose science-related careers did not value people/society-oriented job characteristics, and they anticipated doing well in skilled labor (male-typed) careers when compared with all other female students.

These results are interesting for several reasons. First, they support the Eccles et al. model of achievement-related choices: For both male and female students, occupational aspirations are mediated by expectatancy beliefs and values. In addition, both approach- (i.e., “I expect to do well in science, therefore I will choose a science career”) and avoidance- (i.e., “I do not value people/society-oriented job tasks, therefore I will aspire to something else”) related beliefs predict the occupational choices for both male and female students. The importance of considering all of these factors in explaining occupational choice has been stressed by Eccles and her colleagues (e.g., Eccles, 1987; Eccles [Parsons] et al., 1983).

Second, there are intriguing gender and occupational category differences in the discriminating characteristics. For instance, expecting to do well in science-related occupations discriminates against female students who chose science-related or health careers from those who do not aspire to such careers. This is not true of male students, where only science-related expectancies discriminate between those male students who choose science careers and those who do not. In regard to the female students who chose science-related or health careers, it is important to point out that the value of people–society job characteristics also discriminates between those female students who aspire to health or science–math careers and those who do not. However, it discriminates in opposite directions for these two career options. That is, female students who aspire to health careers place high value on people/society-oriented job characteristics; in contrast, female students who aspire to science-related careers place unusually low value on the people/

society-oriented aspects of jobs. Considering that they both expect to do well in science-related careers, it follows that one of the critical components influencing female students' decisions to go into a science-versus health-related field is not a science-related efficacy but the value these students place on having a job associated with people and humanistic concerns. Thus, increased emphasis on the humanistic and people-oriented aspects of science-related careers, not increased emphasis on ability perceptions alone, is important in encouraging more female students to consider science-related occupations.

GENDER ROLES AND GENDER DIFFERENCES IN OCCUPATIONAL CHOICE

This analysis has a number of important implications for understanding how gender can lead to differences in the educational and vocational choices. Because socialization shapes individuals' self-perceptions, identity formation, goals and values, men and women should acquire different self concepts, different patterns of expectations for success across various activities, and different values and goals through the processes associated with gendered socialization. Through the potential impact of the socialization practices linked to various gender roles on both expectations for success and subjective task value, these socialization experiences can affect educational vocational choices in several ways. (Like Spence, 1993, we explicitly use the term *gender roles* instead of gender role because there are many gender roles linked to various aspects of life.)

For one, because gendered socialization experiences influence identity formation, such experiences could lead male and female students to have different hierarchies of core personal values (e.g., their terminal and instrumental values; Rokeach, 1973). Several studies document such differences. For example, among the high school seniors in a longitudinal study of adolescent life transitions (MSALT), female students placed more value than did male students on the importance of making occupational sacrifices for one's family and of having a job that allows

one to help others and do something worthwhile for society. In contrast, the male students placed more value on becoming famous, making lots of money, seeking out challenging tasks, and doing work that involves the use of math and computers (Jozefowicz et al., 1993). These women and men did not differ in the value they attached to doing one's best at whatever job one takes on and to doing creative stimulating work, intellectually stimulating work, or both.

A somewhat similar pattern of results emerges in studies of gifted children. Gifted girls typically scored higher than did gifted boys on scales tapping social and aesthetic values; in contrast, gifted boys typically scored higher than did the girls on scales tapping theoretical, economic, and political values (George & Denham, 1976; McGinn, 1976). Gifted boys and girls, however, typically scored equally high on investigative interests (Fox et al., 1976; George & Denham, 1976; McGinn, 1976). To the extent that these differences exist, tasks embodying various characteristics should have different subjective values for women and men. For example, both boys and girls stereotype mathematicians and scientists as loners who have little time for their families or friends because they work long hours in a laboratory on abstract problems that typically have limited immediate social implications (Boswell, 1979). If the analysis developed in the previous section is correct, such a profession should hold little appeal to someone who rates social values high and thinks it is very important to devote time and energy to one's family.

Gender-role socialization could also lead male and female students to place different values on various long-range goals and adult activities. The essence of gender roles (and of social roles in general) is that they define the activities central to those roles. In other words, they define what one should do with one's life to be successful in those roles one considers central to one's identity. If success in various gender-related roles is a central component of one's identity, then activities that fulfill these roles would have high subjective task value and activities that hamper efforts at successfully fulfilling one's internalized gender roles would have lower subjective task value. Gender roles mandate different primary activities for women and men. Traditionally in the gendered

roles of wives and mothers, women are supposed to support their husbands' careers and raise their children; men are supposed to compete successfully in the occupational world to confirm their worth as human beings and support their families. To the extent that a woman has internalized this culture's traditional definition of the female roles, she should rank order the importance of the associated adult activities differently than would her male peers. In particular, she should rate the parenting and the spouse-support roles as more important than a professional career role and be more likely than her male peers to resolve life's decisions in favor of these family roles.

Evidence of these gender differences is found in MSALT. As noted earlier, the women in this study indicated they would be more likely to make sacrifices in their professional life for the needs of their family than did the men (Jozefowicz et al., 1993). They were also more likely to mention both family and career concerns in qualitative descriptions of what they thought a day in their lives would be like when they were age 25. Clearly, their future family roles were much more salient to them than to their male peers. Most interesting, occupational concerns were also quite salient in their day-in-the-life descriptions. Many of these young women were anticipating a life filled with both heavy work and family responsibilities. They were not yet fully aware of the difficulties such a life would entail. Both Sears (1979) and Kerr (1985) provided compelling examples of how such a life influenced the career-related decisions of gifted women—many of whom ended up choosing to limit their career development after they had had their families to fulfill their image of their role as wife and mother. Whether the MSALT generation of young women will make the same choices as they move through adulthood remains to be seen. Certainly, on the one hand, more women today are continuing their careers after they have children. On the other hand, women today are still more likely than men to work part time and to modify their career behavior to accommodate their spouses' career needs (Crosby, 1991).

In contrast, men should find integrating family and career roles easier. In fact, because they can fulfill their family role by having a successful career, men should expect these two sets of gendered roles

to be compatible. Consequently, aspiring after a high status, time-consuming career should not pose as much of a conflict for men and such careers should have high subjective value, not only because of the rewards inherent in these occupations but also because they fulfill the male gender-role mandate.

Similarly, gender roles can influence the definition one has of a successful performance of those activities considered central to one's identity. For example, women and men may differ in their conceptualization of the requirements for successful task participation and completion. If so, then men and women would approach and structure their task involvement differently, even when they appear on the surface to be selecting a similar task. The parenting role provides an excellent example of this process. If men define success in the parenting role as an extension of their occupational role, then they would respond to parenthood with increased commitment to their career goals and with an emphasis on encouraging a competitive drive in their children. In contrast, if women define success in the parenting role as high levels of involvement in their children's lives, they would respond to parenthood with decreased commitment to their career goals. Furthermore, if staying home with her children and being psychologically available to them most of the time are central components of a woman's gender-role schema, then involvement in a demanding, high-level career would have reduced subjective value precisely because it conflicts with a more central component of her identity.

Women and men may also differ in the density of their goals and values. Some evidence suggests that men are more likely than women to exhibit a single-minded devotion to one particular goal, especially their occupational goal. In contrast, women seem more likely than men to be involved in, and to value, competence in several activities simultaneously (Maines, 1983). Similar results emerge from studies of gifted children and adults (e.g., McGinn, 1976; Terman & Oden, 1947). For example, in one study the gifted boys evidenced a more unidimensional set of interests than did gifted girls on the Strong Vocational Interest Blank. That is, the boys scored quite high on investigative interests and low on most other interests; in contrast, the girls scored higher than

average on several interest clusters (McGinn, 1976). A similar discrepancy emerged when these gifted boys and girls were asked to rate several occupations on the Semantic Differential scales. The boys gave positive ratings only to traditional male scientific and mathematical professions; all of the female professions and the homemaker role were rated negatively. In contrast, the gifted girls gave both male- and female-typed professions, as well as the homemaker role, very positive ratings. A similar pattern emerges from a recent wave of data collection from the Terman (1926) sample (Sears, 1979). These gifted women and men were asked to rate how important each of six goals was to them in making their life plans during early adulthood. The men rated only one area (occupation) as having had higher importance than did the women; in contrast, the women rated four areas as having had higher importance than did the men (family, friends, richness of one's cultural life, and joy in living). These data suggest that these gifted women had desired a more varied, or multi-faceted, type of life than the men had desired at precisely the time in one's life when people make major decisions about their life plans.

One other pattern characterized the responses of these gifted women and men: The men rated family and occupation as of equal importance, whereas the women rated family as more important than occupation, which is consistent with our hypothesis and our findings. Several researchers have suggested that the perceived conflict of traditional female values and roles with the demands of male-typed achievement activities is very salient to women (e.g., Barnett & Baruch, 1978; Baruch, Barnett, & Rivers, 1983; Eccles, 1987; Farmer, 1985). How this conflict affects women's lives is a complex issue. Some studies emphasize its negative consequence. For example, recent interviews with the Terman (1926) sample women suggest that they now have regrets about the sacrifices they made in their professional development for their family's needs (Sears, 1979).

Similar studies with children and adolescents suggest that girls and young women feel caught between their need to be "nice" and their need to achieve. This conflict in gifted girls' lives is well illustrated by a recent ethnographic study of a group of gifted elementary school girls

by Lee Anne Bell (1989). She interviewed a multiethnic group of third to sixth grade gifted girls in an urban elementary school, regarding the barriers they perceived to their achievement in school. Five gender-role related themes emerged with great regularity: (a) concern about hurting someone else's feeling by winning in achievement contests, (b) concern about seeming to be a braggart if one expressed pride in one's accomplishments, (c) overreaction to unsuccessful experiences (apparently not being the very best is very painful to these girls), (d) concern over their physical appearance and what it takes to be beautiful, and (e) concern with being overly aggressive in terms of getting the teacher's attention. In each case, the gifted girls felt caught between doing their best and either appearing feminine or doing the "caring" thing.

Similarly, in his study of the worries of doctoral students in mathematics, Maines (1983) found that men were most concerned about their professional status and about their mentors' estimates of their professional potential. In contrast, women were most concerned about the impact of their graduate training on their families and their other interests; they felt that graduate training was taking too much time and energy away from other activities that they valued just as much. Thus, the women appeared to place high attainment value on several goals and activities; in contrast, the men appeared more likely to focus on one main goal: their professional development. If this were true, then the psychological cost of engaging in their primary goal in terms of time and energy lost for other important goals would certainly be less for these men than for their female colleagues.

Several investigators have pointed out that this conflict results, in part, from the fact that women have multiple roles and multiple goals (e.g., Barnett & Baruch, 1978; Crosby, 1991; Eccles, 1994). These multiple roles, however, provide richness to women's lives as well as stress. There is growing evidence that women with multiple roles are healthier both mentally and physically than are women with fewer roles and than men in general (Barnett & Baruch, 1978; Crosby, 1991).

Finally, as predicted in the model of Figure 1, gender roles could affect the subjective value of various educational and vocational options indirectly through their influence on the behaviors and attitudes of the

people to whom individuals are exposed as they grow up. If, for example, parents, friends, teachers, and counselors provide boys and girls with different feedback on their performance in various school subjects, different advice regarding the importance of various school subjects, different information regarding the importance of preparing to support oneself and one's family, different information regarding the occupational opportunities that the student should be considering, and different opportunities to develop various skills, then it is likely that girls and boys will develop different self-perceptions, different patterns of expectations for success, and different estimates of the value of various educational and vocational options. Similarly, if the female and male individuals around the children engage in different educational and vocational activities, then girls and boys should develop different ideas regarding those activities for which they are best suited. Finally, if one's peers reinforce traditional gender-role behaviors and values, female and male individuals will likely engage in different activities as they grow up and thus are likely to acquire different competencies, different patterns of expectations or success, and different values and long-term goals.

CONCLUSION

In this chapter, we suggested that gender roles have their largest impact on life trajectories through their affect on both personal and social identities. As girls and boys grow up, some learn to value those aspects of life and personality that are consistent with their various gender-related roles. They learn to see themselves in terms of these gender roles. Such a socialization process affects their expectations and values, which in turn affect their life choices (see Figure 4). Exactly why some women and men place great importance on such roles and others do not is the subject of extensive theorizing and empirical work. Developmental psychologists have linked it to gendered socialization pressures from parents, peers, and the larger social context and to the child's early need to form stable social categories and personal identities and then to become competent members of the groups they have identified

with (e.g., Eccles, 1990; Eccles & Bryan, 1994; Huston, 1983). To the extent that the child grows up in a gendered world with strong pressures toward conformity to that world, the child will attach great importance to behaving in accord with the norms of this gendered world. In contrast, to the extent that the child grows up in a world that both encourages and reinforces independence, flexibility, and individual choice and provides extensive models of gender-role transcendence, she or he is likely to place much less importance to conformity to gender-role stereotypic behavior norms (Eccles & Bryan, 1994). Similarly, social psychologists have pointed to a deep-seated need for self-confirmation, prediction, and control (e.g., W. B. Swann, Jr., personal communication, July 10, 1997). Elaborating these various theories further is beyond the scope of this chapter. But critical for this chapter is our belief that gender roles affect behavioral choices largely through their influence on identity formation, which in turn shapes expectations for success and values.

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APPENDIX A

Lifestyle Values

Scale item	α	M	SD
High status/competitive	.76	4.6	1.4
I'd like to accomplish something in life that will be well known.			
I feel that winning is very important.			
I'd like to be famous.			
I would rather be president of a club than just a member.			
When a group I belong to plans an activity, I would rather organize it myself than have someone else organize it and just help out.			
It is important for me to perform better than others on a task.			
Risk taking	.64	4.9	1.1
I more often attempt difficult tasks that I am not sure I can do than easier tasks I believe I can do.			
I like to try things I've never done before.			
I would rather do something at which I feel confident and relaxed than something that is challenging and difficult. (reverse coded)			
I really enjoy working in situations involving skill and competition.			
Careerism	.60	5.6	1.0
Doing my best at the tasks I take on is very important to me.			
I want to do my best in my job even if this sometimes means working overtime.			
I expect my work to be a very central part of my life.			
Family and friends before job	.52	4.3	1.1

Scale item	α	M	SD
I would turn down a promotion in my career if it meant moving away from close supportive friendships.			
If a choice had to be made, I would put my spouse's career before mine.			
I would readjust my work schedule or work part-time to meet the needs of my children.			
If I had a career opportunity in another location, I would expect my spouse and family to move. (reverse coded)			
Material wealth	.50	4.9	1.2
I would give up a secure job for a chance to make big money.			
I would like a lot of expensive possessions.			

Note. 1 = strongly disagree to 7 = strongly agree.

APPENDIX B

Valued Job Characteristics

Scale item	α	M	SD
Flexibility to meet family needs	.79	5.5	1.1
Has a flexible working schedule you can adjust to meet the needs of your family.			
Leaves a lot of time for other things in your life.			
Does not require you to be away from your family.			
Allows you to be at home when children are out of school (like teaching).			
You have more than 2 weeks vacation.			
Makes it easy to take a lot of time off for family responsibilities.			
People/society oriented	.77	5.4	1.1
Gives you an opportunity to be directly helpful to others.			
Gives you contact with a lot of people.			
Involves working with children.			
Gives you a chance to make friends.			
Is worthwhile to society.			
Prestige/responsibility	.73	5.4	1.0
Has high status and prestige.			
You get a chance to participate in decision making.			
You get a chance to work on difficult and challenging problems.			
You are your own boss most of the time.			
Creative/educational	.70	5.8	1.1
You have the chance to be creative.			
You can learn new things and new skills.			
Machinery/manual work	.60	3.4	1.5
Involves a lot of work with your hands.			
Involves operating heavy machinery.			

Scale item	α	M	SD
Math/computer work	.50	4.0	1.5
Uses a lot of math.			
Involves the use of a computer.			

Note. Different people look for different things in their work. Participants were asked to indicate how much they would like a job with each characteristic (1 = not at all to 7 = a lot).

APPENDIX C

Expect Efficacy in Jobs

Scale item	α	M	SD
Health related	.87	4.0	1.8
Health paraprofessional (like paramedic, dental hygienist, medical technician, vet's assistant).			
Health professional (like registered nurse, physical therapist, pharmacist).			
Health (like physician, dentist, psychiatrist, veterinarian).			
Skilled labor/protective services (male typed)	.80	3.2	1.4
Transportation (like taxicab, bus, or truck driver).			
Factory (like assembly line worker, welder).			
Protective or military service (like police officer, fire fighter, military duty).			
Skilled worker in electronics or computer repair.			
Other skilled worker (like carpenter or mechanic).			
Professional athlete.			
Science related	.73	3.7	1.9
Science- or math-related field (like engineer, architect, science teacher).			
Science (like scientist or a PhD).			
Business and law	.70	4.7	1.4
Owner of small business (like restaurant owner, shop owner).			
Business manager or administrator, stock broker.			
Lawyer.			
Skilled labor/human services (female typed)	.69	4.0	1.3
Full-time homemaker.			
Child care/day care.			
Personal service (like cosmetologist, masseuse, tailor, chef).			

Clerical or office worker (like typist, receptionist, secretary).

Scale item	α	M	SD
Human services (like librarian, social worker, counselor, teacher).			
Professional and performing artist	.60	3.4	1.8
Professional artist (like designer, interior decorator).			
Performing artist (like musician, actress, dancer, model).			

Note. Participants were asked to rate how well they thought they would do in each of the following types of jobs (1 = *I would not do well at all*, 4 = *I would do average*, 7 = *I would do well*).

APPENDIX D

Self-Perception Skills

Scale item	α	M	SD
Working with others	.77	5.2	1.0
Taking care of children			
Listening to and understanding others			
Teaching and explaining to others			
Helping others solve their problems			
Patience			
Leadership	.75	5.0	1.2
Supervising others			
Being a leader			
Independence	.75	5.3	1.1
Independence			
Self-confidence			
Decisiveness			
Intellectual	.73	5.1	1.2
Logical, analytical thinking			
Intelligence			
Mechanical	na	3.2	1.8
Repairing mechanical equipment			
Computers	na	4.1	1.7
Computer skills			

Note. Participants were given a list of skills and abilities and were asked the following: Compared with others, how good are you at each of the following (7-point Likert scale: a lot worse than others to a lot better than others).

Sexism and Other “Isms”: Interdependence, Status, and the Ambivalent Content of Stereotypes

Peter Glick and Susan T. Fiske

The questions we address in this chapter can be traced through 2½ decades of work by Janet Taylor Spence and her colleagues. More than any other single researcher, Spence has sought to establish the content of beliefs about women, to determine whether these beliefs are merely descriptions of women or prescriptions for how women ought to be, and to document what has changed and what has remained the same in attitudes toward women across decades of social turmoil in male–female relations. Twenty-five years ago, Spence and Helmreich (1972b) asked, “Who Likes Competent Women?” in an effort to determine whether women who violate gender stereotypes are disliked. This article addresses the issue of whether gender stereotypes are purely descriptive expectations or prescriptions that are enforced through punishment when they are violated. Implicit in the question is the notion that “feminine” women are seen as very likable but as less competent than men. At the same time, Spence and her colleagues developed the first psychometrically sound and, subsequently, most widely used instruments to measure attitudes toward and stereotypes about women: the Attitudes Toward Women Scale (Spence & Helmreich, 1972a) and the Personal Attributes Questionnaire (PAQ; Spence, Helmreich, &