

Gender Variation in Developmental Trajectories of Educational and Occupational Expectations and Attainment From Adolescence to Adulthood

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Adolescents' future expectations are a potentially important precursor of adult attainment and may illuminate how males and females vary in schooling and work. Thus, this longitudinal study examined gender variation in developmental trajectories of educational and occupational expectations from adolescence to adulthood and in connection to corresponding adult attainment. National data (NELS:88) including individuals aged 14 to 26 and hierarchical linear modeling analyses yielded several findings: Males and females had similar developmental trajectories of educational expectations from adolescence to adulthood with the sample average expecting to attend college. Probabilities of expecting a professional occupation were lower for males than females. Adolescent educational and occupational expectations predicted corresponding attainment in adulthood, although the relationship varied by gender. Males who reported high occupational expectations in adolescence had higher occupational attainment in adulthood compared to males with low occupational expectations, whereas females' adult occupational attainment did not vary by their adolescent occupational expectations. Gender variation in expectations and attainment is discussed in light of historical changes, and future directions of research are proposed.

Keywords: adolescence, educational and occupational expectations and attainment, gender

Adolescents' educational and occupational expectations are a potentially important precursor of corresponding attainment in adulthood. Investigating how expectations develop through adolescence and into adulthood by gender may elucidate the process by which males and females vary in education and occupation. *Educational and occupational expectations* refer to the anticipation of attainment in school and work. Researchers offering perspectives on expectations and gender variation have discussed how gendered stereotypes (Eccles & Wigfield, 2002) and perceptions of barriers (Lent, Hackett, & Brown, 2000) may influence the anticipation of completed schooling and work for males and females. Studies with individuals across the life span provide support for these assertions including how parental gendered attitudes shape expectations of children and adolescents (Eccles & Wigfield,

2002; Jacobs & Eccles, 1992) and how females report more barriers than males, among college students (e.g., McWhirter, 1997). However, extant research has yet to examine longitudinal data on gender variation in expectations from adolescence to adulthood. Further, with few exceptions (Schoon, 2001), there has been limited research linking expectations in adolescence to actual attainment in adulthood. Thus, this study sought to extend researchers' knowledge of this topic by generating developmental trajectories of males' and females' educational and occupational expectations from ages 14 to 26 and by connecting such expectations in adolescence with corresponding attainment in adulthood.

Perspectives on Educational and Occupational Expectations and Gender

Perspectives on expectations and gender have discussed how gender stereotypes from parents, significant adults, and social/cultural milieu contribute to gender variation in expectations. Eccles and colleagues (Eccles & Wigfield, 2002; Eccles, Wigfield, & Schiefele, 1998) have presented a theoretical model of achievement that denotes how expectations in educational and occupational domains are gendered, in part, due to an interaction among parental gender-specific stereotypes and individual characteristics such as gender and ability. Research supports this perspective and has documented the association between adolescents' expectations and parental gender-specific stereotypes. For example, in a study of 11th graders, Jacobs (1991) showed how parental gendered stereotypes were related to their adolescent children's own perceptions of their ability and, in turn, to their academic achievement.

An alternate perspective suggests that males and females may vary in educational and occupational expectations because of perception of barriers to schooling and work (Gottfredson, 1981,

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1996; Gottfredson & Lapan, 1997; Lent, Hackett, & Brown, 2000; McWhirter, 1997). Individuals who perceive, anticipate, or experience barriers may compromise or reduce their expectations (Gottfredson, 1981, 1996). Females have been shown to perceive more barriers to schooling and work than males. In a study of adolescents, females were more likely to anticipate gender discrimination and to question the utility of college than males (McWhirter, 1997), and in studies of college students, females reported more barriers to achieving career goals (Luzzo & McWhirter, 2001). In a study of male and female children, only females were more likely to view females as subjects of discrimination in a scenario presented to participants (Brown & Bigler, 2004).

Gender variation in expectations has implications for how gender may be associated with the development of educational and occupational expectations over time. As individuals mature, knowledge about gender variation in opportunities and barriers in schooling and work increases (Jacob & Ganzel, 1993; Jacobs & Klaczynski, 2002). Such knowledge may be reflected in a reduction of expectations, with age. Gottfredson and Lapan (1997) have proposed a developmental model that posits gender begins to contribute toward compromising occupational interests in early adolescence and then continues to adulthood. Prior research supports this model. In a study of 6th- and 7th-grade students, age-related changes in self-concept were shown to vary across males and females (Eccles et al., 1989). More recently, self-perceptions of competencies and values generally declined from Grades 1 through 12, with the gap between females and males somewhat declining or remaining stable based on domains such as math, literature, or sports (Jacobs, Lanza, Osgood, Eccles, & Wigfield, 2002).

Research on Educational and Occupational Expectations and Gender

To date, research on gender variation in educational and occupational expectations has been limited to restricted age ranges or has included mixed findings. Most recent studies show that females have higher expectations than males (Mau & Bikos, 2000; Rigsby, Stull, & Morse-Kelley, 1997). In analyses of national data (i.e., NELS:88), females reported higher educational expectations than males in 8th grade (Kao & Tienda, 1998) and in 10th grade (Rigsby et al., 1997), and they reported higher educational and occupational expectations than males in 12th grade and through to 2 years post-high school (Mau & Bikos, 2000). Research with variables similar to expectations has also shown gender differences. In a study of 7th- and 10th-grade students, females reported more positive attitudes about school than males, and more females expected to graduate high school and go onto college than males (Lupert, Cannon, & Telfer, 2004). Most recently, females reported less negative thoughts about the future than their male counterparts among high academically achieving adolescents (Mello & Worrell, 2006).

In contrast, males reported higher occupational expectations than females in past research (Arbona & Novy, 1991; Herzog, 1982). In a study of German youth, adolescent males were more concerned about a future career than females (Trommsdorff & Lamm, 1975), and males thought farther into the future regarding a career than females (Trommsdorff, Lamm, & Schmidt, 1979). In

a more recent study of college freshmen, a larger proportion of male students expected to work in higher status occupations than their female counterparts (Arbona & Novy, 1991).

Even still, other researchers have reported no gender differences in educational and occupational expectations (Patton, Bartrum, & Creed, 2004; Simpkins, Davis-Kean, & Eccles, 2006). In an interview study among college students, females and males expressed similar ages and detail regarding the anticipation of a future career (Greene & Wheatley, 1992). In a study of 5th through 10th graders, females and males reported similar values toward math and science (Simpkins et al., 2006), and in an Australian study of high school students, females and males reported similar career expectations and planning (Patton et al., 2004).

Educational and Occupational Expectations, Attainment, and Gender

Perspectives on educational and occupational expectations propose that the anticipation of future schooling and work attainment will influence behavior through cognitive/motivational processes (e.g., Eccles & Wigfield, 2002). Research provides some support for this perspective. The relationship between vocational choice and field of job entry were examined in a national sample of individuals in 11th grade and 2 years out of high school (Noeth & Jepson, 1981). Results indicated that less than half (i.e., 38%) expressed a vocational choice that they later attained. Many of the discrepancies between occupational choice and attainment were in science and art fields. For example, 13.3% of the sample indicated a science occupation, and only 2.5% actually attained such an occupation. In another study of adolescents, Trice and McClellan (1993) examined the association between occupational expectations and attainment of gifted children aged 6 to 17 and 15 years later. Results indicated that about a third (i.e., 26% to 46%) matched their specific occupational expectation with attainment, although the percentage increased when considering occupations organized into themes such as social and/or artistic (i.e., 71% and 64%, respectively).

More recent research also shows that adolescent educational and occupational expectations predict corresponding adult attainment. Adolescents' occupational expectations predicted occupational attainment 17 years later, in a study of United Kingdom youth (Schoon, 2001). Data indicated that the extent to which expectations predicted attainment depended on the level of expectations. In particular, 50% of adolescents who had expectations of becoming a health professional were in such professions as adults. In contrast, only 20% of engineers actually obtained such a position in adulthood. In another analysis of the data, Schoon and Parsons (2002) reported that adolescents' with high occupational expectations were more likely than their counterparts with lower expectations to enter a professional or managerial career. Similarly, adolescents' occupational expectations were examined in relation to their educational attainment 11 years later (Powers & Wojtkiewicz, 2004). Data indicated that high occupational expectations in adolescence were associated with an increased likelihood of high school and college completion.

There is a dearth of studies examining gender differences in the connection between expectations and attainment, with one exception. Powers and Wojtkiewicz (2004) studied gender differences in the relationship between occupational expectations of adolescents

aged 14 to 17 and their educational attainment 11 years later. Participants were surveyed between 1961 and 1990. The authors reported a similar positive association between adolescent expectations and college completion for both males and females. However, females were more likely than males to graduate high school if they held high expectations in adolescence.

Present Study

The present study sought to extend extant literature on gender variation in schooling and work by generating female and male developmental trajectories of educational and occupational expectations from adolescence and into adulthood and to examine how such expectations in adolescence predict corresponding attainment in adulthood. This study was guided by several research questions. First, how do average levels of developmental trajectories of educational and occupational expectations from adolescence to adulthood vary by gender? Similar to past research (Kao & Tienda, 1998), it was expected that males would have lower average expectations than females. Second, how does the shape of such developmental trajectories of educational and occupational expectations from adolescence to adulthood vary by gender? Drawing from perspectives proposed by Eccles and Gottfredson (Eccles & Wigfield, 2002; Gottfredson & Lapan, 1997), it was expected that with age, females' developmental trajectories of expectations would decline more rapidly than males. Third, how do female and males' educational and occupational expectations in adolescence predict corresponding attainment in adulthood? Given limited prior research showing that adolescents' expectations are somewhat linked to adult attainment (e.g., Schoon, 2001), it was expected that adolescent expectations would moderately predict attainment in respective educational and occupational domains. Fourth, how does the relationship between expectations and attainment vary across gender? Drawing from one study (i.e., Powers & Wojtkiewicz, 2004), the relationship between expectations and attainment was anticipated to vary across gender, with females reporting a stronger association than males.

Method

Participants

Data for the present study came from the National Education Longitudinal Study (NELS; NELS:88/2000 public use data files; National Center for Education Statistics [NCES], 2002a) and included five waves of data collection beginning when participants

were aged 14 and spanning 12 years, to age 26 (see Table 1 for details on age, year, and wave). NELS employed a two-stage sampling design including schools and then students. About 26 students were randomly selected from each school with 24 regularly sampled students plus oversampling for Hispanic and Asian/Pacific Islanders. Participants for the present study included 12,144 individuals who were invited to participate at all five waves (see NCES, 2002a, for details on the longitudinal data sampling). Individuals who were not included in the longitudinal sample ($n = 1,317$) or who had missing values for academic achievement, gender, or racial/ethnic group ($n = 463$) were excluded, resulting in a final sample of 10,364.

Analyses were conducted to determine whether individuals in the final sample varied in gender and across key study variables such as educational and occupational expectations (see NCES, 2003, for details on attrition). Among participants who were nonrespondents and reported their gender ($n = 557$; 760 cases with missing values for gender), more males ($n = 293$; 53%) were nonrespondents than females ($n = 264$, 47%), $\chi^2(4, N = 11,384) = 7.42, p < .01$. A series of t tests indicated that nonrespondents reported lower average educational and occupational expectations than participants included in the study (values not shown).

The final sample of 10,364 (53% female) included several racial/ethnic groups: African American ($n = 919$; 9%), American Indian/Alaska Native ($n = 103$; 1%), Asian American/Pacific Islander ($n = 693$; 7%), European American ($n = 7,287$; 71%), and Hispanic ($n = 1,280$; 12%). The Asian American/Pacific Islander subgroups included Chinese, Filipino, Japanese, Korean, Southeast Asian, Pacific Islander, South Asian, West Asian, and Middle Eastern, and the Hispanic subgroups included Mexican, Mexican American, Chicano, Cuban, and Puerto Rican.

Educational expectations. In Waves 1–3, educational expectations were ascertained by the question “As things stand now, how far in school do you think you will get?” In Wave 4, the question was “What is the highest level of education you ever expect to complete?” and in Wave 5, the question was “When you are age 30, what level of education do you plan to hold?” Items were recoded to a 6-point scale to establish comparability across waves and were divided as follows: 1 = *less than high school*, 2 = *high school completion/GED/certificate*, 3 = *trade school*, 4 = *some college/associate's degree*, 5 = *college completion*, 6 = *graduate school including MA, PhD, MD*. However, in the fourth wave a response option of “no further education planned/no higher degree anticipated” was included. If participants endorsed this

Table 1
Summary Statistics for Educational and Occupational Expectations by Gender and Wave

Expectation	Wave 1: 1988 (age 14)		Wave 2: 1990 (age 16)		Wave 3: 1992 (age 18)		Wave 4: 1994 (age 20)		Wave 5: 2000 (age 26)	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Educational										
Females	4.69	1.25	4.63	1.34	4.91	1.15	4.91	1.24	4.66	1.28
Males	4.57	1.27	4.45	1.35	4.76	1.20	4.82	1.28	4.47	1.37
Occupational										
Females	0.66	0.47	0.76	0.43	0.80	0.40	0.73	0.44	0.70	0.46
Males	0.52	0.50	0.62	0.49	0.67	0.47	0.65	0.48	0.59	0.49

response option, their highest educational attainment at that time (age 20) was used as their educational expectation.

Educational attainment. Educational attainment was the highest level of education attained by age 26 in year 2000 (i.e., Wave 5) and included the following categories: 1 = *less than high school*, 2 = *high school completed*, 3 = *trade school*, 4 = *some college including attaining an associate's degree*, 5 = *college completion*, 6 = *graduate school*.

Occupational expectations. In Wave 1, occupational expectations were ascertained by the question "What kind of work do you expect to be doing when you are 30 years old?" In Wave 2, the question was "Which of the categories below comes closest to describing the job or occupation that you expect or plan to have when you are 30 years old?" In Wave 3, the question was "What job or occupation do you expect or plan to have when you are 30 years old?" In Wave 4, the question was "What job or occupation do you plan to have when you are age 30?" For Waves 3 and 4, verbatim responses reported by the participant were matched to occupational categories with a computer program used by the interviewer (see NCES, 2003, for details).

It is important to note that when I examined the developmental trajectory of occupational expectations the items were recoded into dichotomous variables indicating the participant's expectation of attaining a professional occupation (1) or nonprofessional occupation (0). Dichotomous coding was necessary due to changes in occupational categories across waves (see Table 2 for a detailed description of occupational categories by wave). The dichotomous coding of occupational expectations is similar to prior research with these data (Schneider, 1994).

However, when I examined the association between occupational expectations in adolescence (age 14) and occupational attainment in adulthood (age 26), occupational expectations at age 14 were recoded using the Hollingshead Occupational Status Scale (Hollingshead, 1975) to generate more variation in the occupational expectation variable, as suggested by Bornstein, Chun-Shin, Suwalsky, and Haynes (2003). Thus, a 7-point occupation expectation variable was generated; two categories were omitted due to the absence of those particular occupations (see Table 2).

Occupational attainment. Occupational attainment was determined by the participants' response to a series of questions about their current occupation, duties, and type at age 26 (Wave 5). Occupation codes were then selected from a preexisting list, generated by NCES (2003). Participants reported 42 different occupations (see Table 2). For this study, occupations were coded into nine categories based on the Hollingshead Occupational Status Scale (Hollingshead, 1975). Consistent with recommendations by Bornstein et al. (2003), for purposes of maximizing variability, the occupational attainment variable was treated as a continuous variable.

Control variables. Academic achievement control variables were included to address the association between academic achievement and expectations (Eccles & Wigfield, 2002) and included standardized academic tests, grade point average (GPA), and drop-out status (ascertained in Wave 1; age 14). The standardized academic test included a measure of reading and math ($M = 51.84$, $SD = 10.11$). GPA was self-reported grades for English, mathematics, science, and social studies and was generated by converting the response categories to a 5-point scale (4 = mostly

Table 2
Distribution of Occupational Attainment by Category and Gender

Hollingshead status ^a	Occupational expectations (age 14)	Occupational attainment (age 26)	Female	Male
Laborer	Laborer, farmer, housewife	Farmers, foresters, farm laborers/laborers/ unemployed homemaker	27	73
Unskilled worker	Service worker	Personal services, customer service	79	21
Semi-skilled worker	—	Mechanic, repairer, service technicians/ skilled operatives/transport operatives	21	79
Craftsperson	Craftsperson, military, police, security	Craftsmen/protective services, criminal justice/military	15	85
Clerical/sales worker/small business owner	Sales, clerical	Secretaries, receptionists/cashiers, tellers, sales clerks/clerks, data entry/clerical other/sales/purchasing	71	29
Technician/semi-professional	Technical	Cooks, chefs, bakers, cake decorators/ legal support/research assistants, lab technicians/technical workers/computer equipment operators/health, recreation services	51	49
Manager/minor professional/small business owner	Business, manager, business owner	Business/financial support services/financial services/medical services/computer systems/computer programmers/performers/artists/midlevel manager/supervisor	55	45
Administrator/semi-professional	—	Medical licensed professional/K-12 educators/human services/editors, writers, reporters	71	29
High executive/major professional	Science, engineering	Legal/medical practice/educators other than K-12/engineers, architect, software engineers/scientist	54	46

Note. Values shown are percentages. Dashes indicate occupational categories not included in the assessment.

^a Hollingshead Index of Occupational Status Scale (Hollingshead, 1975).

As, 3 = Bs, 2 = Cs, 1 = Ds, .5 = mostly below D; $M = 2.99$, $SD = 0.73$). Drop-out status was a dichotomous variable indicating if the participant had ever dropped out of high school ($n = 1,158$; 11%).

Results

Analytic Strategy

Hierarchical linear modeling (Raudenbush & Bryk, 2002) was used to generate developmental trajectories of educational and occupational expectations from age 14 to 26. A series of three-level growth curve models were produced. Level 1 included repeated observations of expectations, from age 14 to age 26. Repeated observations included five waves of data that corresponded to ages 14, 16, 18, 20, and 26, respectively. Level 2 included gender, racial/ethnic group, and academic achievement control variables. Level 3 included participants' schools to account for the sampling of participants within schools. Linear multilevel modeling was used with analyses on educational expectations, and logistic multilevel modeling was used with occupational expectations, given that it was a dichotomous variable. Population-average

estimates were reported. Gender was coded 0 = male and 1 = female. Academic achievement and GPA were grand mean centered; they were centered on the sample average.

The shape of the developmental trajectories of educational and occupational expectations was determined by examining the significance and fit indices of a series of models including linear, quadratic, and cubic growth terms. Incorporating higher power growth terms enables the developmental trajectory to accelerate or decelerate (Singer & Willett, 2003) and is useful for examining gendered variation in developmental trajectories of educational and occupational expectations from adolescence to adulthood.

Analyses

Educational expectations. Table 3 (Model 1) shows that the average developmental trajectory of educational expectations included a slight decline ($b = -0.12$, $p < .001$), increase ($b = 0.04$, $p < .001$), and another very slight decline ($b = -0.003$, $p < .001$). The shape of the developmental trajectory was determined in a prior study through the examination of the deviance statistic and the size and significance of linear, quadratic, and cubic growth terms in a series of increasingly complex polynomial change

Table 3

Developmental Trajectories of Educational Expectations From Adolescence to Adulthood by Gender (N = 10,374)

Fixed effect	Model 1		Model 2		Model 3	
	Coefficient	SE	Coefficient	SE	Coefficient	SE
Intercept						
Intercept	4.66***	0.02	4.58***	0.02	4.68***	0.02
Gender			0.14***	0.02	0.07***	0.02
Academic (GPA)					0.49***	0.02
Academic (SND)					0.03***	0.00
School dropout					-0.45***	0.05
Linear change						
Intercept	-0.12***	0.01	-0.14***	0.01	-0.12***	0.01
Gender			0.05**	0.02	0.05***	0.02
Academic (GPA)					0.01	0.02
Academic (SND)					0.00***	0.00
School dropout					-0.32***	0.04
Quadratic change						
Intercept	0.04***	0.00	0.05***	0.00	0.04***	0.00
Gender			-0.02***	0.00	-0.01***	0.00
Academic (GPA)					-0.01	0.00
Academic (SND)					0.00*	0.00
School dropout					0.06***	0.01
Cubic change						
Intercept	-0.003***	0.00	-0.003***	0.00	-0.003***	0.00
Gender			0.001***	0.00	0.001***	0.00
Academic (GPA)					0.0004	0.00
Academic (SND)					0.00004**	0.00
School dropout					-0.003***	0.00
Variance component	Variance	SD	Variance	SD	Variance	SD
Intercept	0.89	0.94	0.89	0.94	0.59	0.77
Linear change	0.20	0.44	0.19	0.44	0.19	0.43
Quadratic change	0.01	0.10	0.01	0.10	0.01	0.10
Cubic change	0.00003	0.01	0.00	0.01	0.00	0.01
Within individual	0.50	0.71	0.50	0.71	0.50	0.71

Note. Gender was coded as female = 1, male = 0. GPA = grade point average; SND = standardized academic achievement; School dropout = Participant was a high school dropout.

* $p < .05$. ** $p < .01$. *** $p < .001$.

models (see Mello, in press). Gender differences were observed in the level and shape of the developmental trajectory of educational expectations (see Table 3, Model 2) and were maintained after including academic achievement control variables (see Table 3, Model 3). The multivariate hypothesis test indicated that gender significantly contributed to the overall model, $\chi^2(4) = 73.65, p < .001$, and that the shape of the developmental trajectories significantly varied by gender, $\chi^2(3) = 20.03, p < .001$.

As shown in Figure 1, females' educational expectations at age 14 were, on average, 0.07 points higher than males. Significant gender differences in growth rates indicated that the developmental trajectory of females' educational expectations included a shallower decline compared to males ($\pi_{1jk} = -.12, p < .001, b = 0.05, p < .001$). However, the size of the growth term coefficients and the estimated developmental trajectory (see Figure 1) indicated that the magnitude of gender differences in developmental trajectories of educational expectations from adolescence to adulthood was quite small. Academic achievement had a significant influence on gender differences in developmental trajectories of educational expectations. Comparing Models 2 and 3 (see Table 3) shows that academic achievement accounted for a 50% reduction ($b = 0.14$ to

$b = 0.07$) in the effect of gender on educational expectations at age 14.

Occupational expectations. Similar to analyses of educational expectations, the shape of the average developmental trajectory of occupational expectations was determined in a prior study (Mello, in press). For clarity, estimates are shown in Model 1 (see Table 4). Coefficients indicate that the developmental trajectory of expecting a professional occupation in adulthood includes an increase ($b = 0.34, p < .001$) and a shallow decline ($b = -0.06, p < .001$). Gender differences in the level and rate of change in developmental trajectories of occupational expectations were observed (see Table 4, Model 2), even after including academic achievement control variables (see Table 4, Model 3). The multivariate hypothesis test indicated that gender significantly contributed to the overall model, $\chi^2(4) = 359.77, p < .001$, and that the shape of the developmental trajectories of occupational expectations significantly varied by gender, $\chi^2(3) = 29.16, p < .001$.

As shown in Figure 2, females had higher predicted probabilities of expecting a professional occupation in adolescence and into adulthood compared to males, after I controlled for academic achievement control variables. Model 3 in Table 4 shows that the

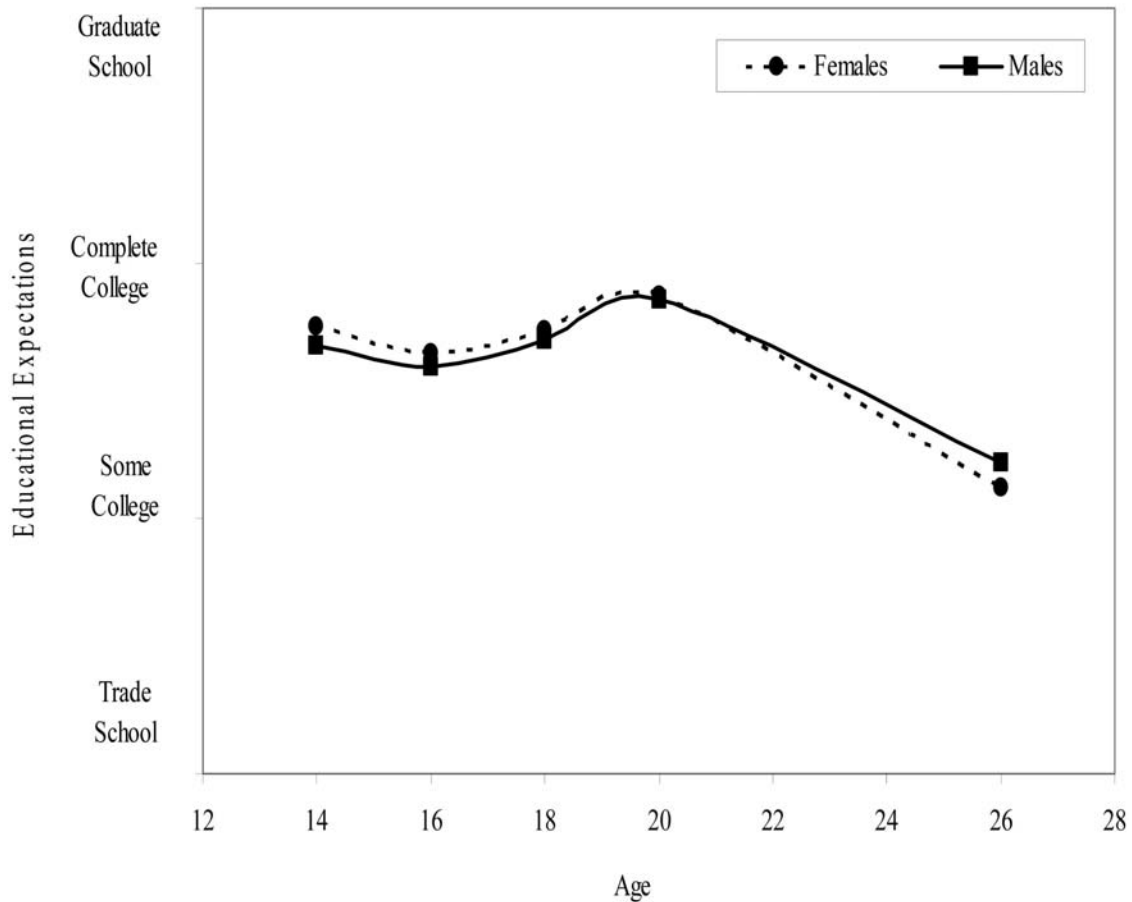


Figure 1. Developmental trajectories of educational expectations from age 14 to age 26 by gender, controlling for academic achievement ($n = 10,374$). Scale excludes values for less than and completed high school. Shown are estimated developmental trajectories for individuals with average academic achievement and individuals who did not drop out of high school.

Table 4
Developmental Trajectories of Occupational Expectations From Adolescence to Adulthood by Gender (N = 10,374)

Fixed effect	Model 1		Model 2		Model 3	
	Coefficient	SE	Coefficient	SE	Coefficient	SE
Intercept						
Intercept	0.36***	0.03	0.07	0.04	0.13**	0.04
Gender			0.55***	0.05	0.54***	0.05
Academic (GPA)					0.49***	0.04
Academic (SND)					0.04***	0.00
School dropout					-0.21**	0.08
Linear change						
Intercept	0.34***	0.02	0.27***	0.03	0.31***	0.03
Gender			0.15**	0.04	0.16**	0.05
Academic (GPA)					-0.04	0.04
Academic (SND)					0.01*	0.00
School dropout					-0.29**	0.08
Quadratic change						
Intercept	-0.06***	0.00	-0.04***	0.01	-0.05***	0.01
Gender			-0.04***	0.01	-0.05***	0.01
Academic (GPA)					0.01	0.01
Academic (SND)					0.00	0.00
School dropout					0.06**	0.02
Cubic change						
Intercept	0.00***	0.00	0.00***	0.00	0.00***	0.00
Gender			0.00***		0.00***	0.00
Academic (GPA)					0.00	0.00
Academic (SND)					0.00	0.00
School dropout					0.00**	0.00
Variance component	Variance	SD	Variance	SD	Variance	SD
Intercept	0.92		0.94	0.97	0.71	0.84

Note. Gender was coded as female = 1, male = 0. GPA = grade point average; SND = standardized academic achievement; school dropout = Participant was a high school dropout.

* $p < .05$. ** $p < .01$. *** $p < .001$.

estimated odds of expecting a professional occupation for females was 1.80 times greater than males ($b = 0.54$, $p < .001$). Further, females had a developmental trajectory that included a steeper increase in predicted probabilities of expecting a professional occupation than males ($\pi_{1jk} = 0.31$, $p < .001$; $b = 0.16$, $p < .01$). Quadratic and cubic growth terms were significant but were small in magnitude. Academic achievement did not account for a difference in the effect of gender on developmental trajectories of occupational expectations ($b = 0.55$ to $b = 0.54$, Models 2 and 3 in Table 4, respectively).

It is worth noting that racial/ethnic group membership variation in females' and males' developmental trajectories of educational and occupational expectations was examined. The multivariate hypotheses test was used to determine whether the interaction between gender and each racial/ethnic group significantly contributed to the level or rate of change in the developmental trajectories of educational and occupational expectations (values not shown). The interaction term was generated by the product of the gender variable (1 = female, 0 = male) and the racial/ethnic group variables including African American, American Indian/Alaskan Native, Asian American, Hispanic, and European American. The multivariate hypotheses test indicated that the interaction between gender and racial/ethnic group did not significantly contribute to the educational or occupational models. In other words, gender differences in developmental trajectories of educational and occu-

pational expectations were similar (did not vary) across racial/ethnic groups.

Educational and occupational attainment. The next set of analyses sought to determine the extent females' and males' educational and occupational expectations at age 14 predicted corresponding educational and occupational attainment at age 26. Given that these particular analyses did not include nested data, ordinary least squares regression provided appropriate estimates and was therefore employed. Interaction terms were generated that included the product of gender (1 = female, 0 = male) and educational and occupational expectations, respectively. Coefficients are shown in Table 5. For the population, both educational and occupational expectations in adolescence, at age 14, positively predicted corresponding attainment in adulthood, at age 26 (see Model 2, $b = 0.28$, $p < .001$, and Model 4, $b = 0.26$, $p < .001$, respectively). In fact, standardized coefficients indicate that expectations in adolescence had a similar effect on corresponding attainment in adulthood when compared to academic achievement tests (see Models 2 and 4).

In regards to educational expectations, Model 1 shows that females attained more schooling than males in adulthood, at age 26 ($b = 0.10$, $p < .001$), although the effect was not significant after I included academic achievement ($b = 0.08$, $p = ns$, Model 2). When I controlled for academic achievement, females and males both attained the same level of schooling in adulthood, about some

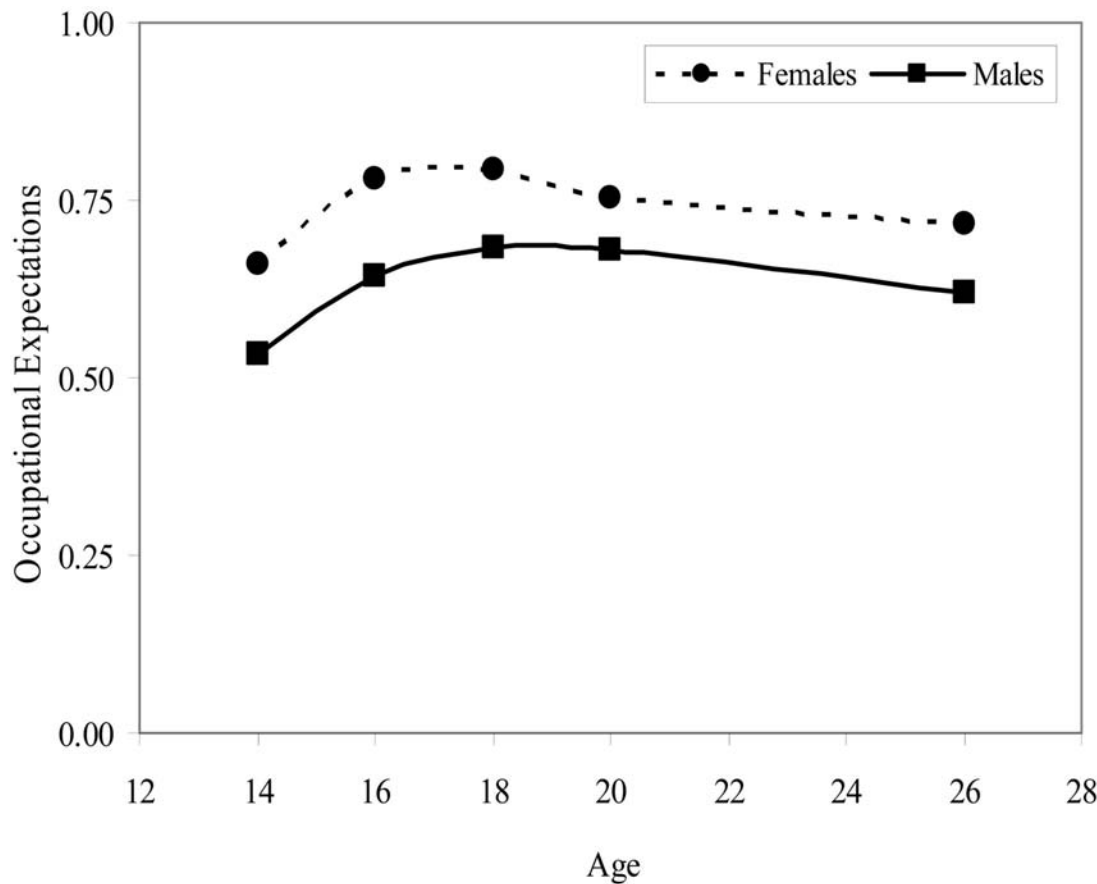


Figure 2. Developmental trajectories of occupational expectations from age 14 to age 26 by gender, controlling for academic achievement ($n = 10,374$). Shown are estimated developmental trajectories of individuals with average academic achievement and individuals who did not drop out of high school. Values were generated by transforming logistic multilevel model coefficients to predicted probabilities (see Table 4).

college. The interaction between gender and educational expectations did not significantly predict educational attainment ($b = -0.01, p = ns$). Thus, the relationship between adolescents' educational expectations and educational attainment in adulthood did not vary by gender.

Analyses with occupational expectations indicated that females attained a higher level of occupation in adulthood compared to males ($b = 0.80, p > .001$; see Model 3), between craftsperson and small business owner. The gender difference persisted and increased in magnitude, after I controlled for academic achievement ($b = 1.63, p > .001$; see Model 4). In contrast to educational expectations, results indicated that an interaction between gender and occupational expectations at age 14 predicted occupational attainment at age 26, after I controlled for academic achievement ($b = -0.19, p < .001$). As Figure 3 shows, the connection between occupational expectations in adolescence and occupational attainment in adulthood varies by gender. Adolescent males who reported high occupational expectations in adolescence actually held higher level occupations in adulthood than their counterparts with lower occupational expectations, after I included academic achievement control variables. In comparison, females' occupational attainment at age 26 did not vary by occupational expectations at age 14.

Discussion

This longitudinal study sought to contribute to researchers' understanding of gender variation in educational and occupational attainment by examining male and females' developmental trajectories of educational and occupational expectations from adolescence to adulthood and in relation to corresponding attainment. HLM analyses with NELS:88 data yielded several findings: Educational expectations were very similar for males and females, occupational expectations varied with males reporting lower expectations of attaining a professional occupation than females, gendered patterns of educational and occupational expectations remained generally stable from adolescence to adulthood, and expectations in adolescence predicted corresponding attainment in adulthood, although the pattern varied by gender. Males with high occupational expectations in adolescence attained more professional occupations in adulthood compared to their counterparts with low occupational expectations, whereas, for females, the relationship between occupational expectations in adolescence and occupational attainment in adulthood did not vary across levels of expectations. Results are discussed in light of recent trends in educational and occupational attainment and gender.

Table 5
Predicting Educational and Occupational Attainment at Age 26 With Educational and Occupational Expectations at Age 14 by Gender

Attainment	Model 1			Model 2			Model 3			Model 4		
	Coefficient	SE	β	Coefficient	SE	β	Coefficient	SE	β	Coefficient	SE	β
Educational												
Intercept	3.85***	0.02		2.59***	0.06							
Gender	0.10***	0.02	0.04	0.08	0.07	0.03						
Academic (GPA)				0.25***	0.01	0.21						
Academic (SND)				0.34***	0.01	0.28						
Educational expectations				0.28***	0.01	0.28						
Gender \times Educational Expectations				-0.01	0.02	-0.03						
<i>F</i>	18.45***			1231.47***								
Adjusted <i>R</i> ²	0.00			0.38								
Occupational												
Intercept							5.23***	0.03		4.02***	0.12	
Gender							0.80***	0.05	0.17	1.63***	0.16	0.35
Academic (GPA)										0.41***	0.03	0.18
Academic (SND)										0.41***	0.03	0.18
Occupational expectations										0.26***	0.02	0.19
Gender \times Occupational Expectations										-0.19***	0.03	-0.23
<i>F</i>							310.26***			288.79***		
Adjusted <i>R</i> ²							0.03			0.17		

Note. Gender was coded as female = 1, male = 0. GPA = grade point average; SND = standardized achievement.

*** $p < .001$.

Gender Variation in Developmental Trajectories of Educational and Occupational Expectations

Females reported higher educational and occupational expectations than males from ages 14 to 26, after I controlled for academic achievement. The findings of this study extend those reported by prior research with limited age ranges (Mau & Bikos, 2000; Rigsby et al., 1997) to show gender differences in educational and occupational expectations from adolescence and into adulthood. Variation in educational expectations was quite small with both females and males expecting to attend or complete college in adulthood, on average. In contrast, females were much more likely than males to expect to attain a professional occupation in adulthood. These results show that males and females anticipate adulthood to include relatively similar levels of education, whereas with regard to occupations, females are more likely to expect to obtain a professional occupation compared to males.

Gender differences in expectations are consistent with actual trends in educational attainment. In the 2003–2004 academic year, more females attained associate's, bachelor's, and master's degrees than males, and projections suggest that females will attain more doctorate's than males by the year 2015 (National Center for Educational Statistics, [NCES], 2006). The increase in the number of females who pursue and complete higher education may act as a model fostering females to hold high educational and occupational expectations. Researchers have noted an upward pattern in the expectations reported by females. In the 1960s and 1970s, females' expectations began to rise, mirroring those of males (Schneider & Stevenson, 1999; Shu & Marini, 1998). In 1980, males and females had similar educational expectations, and by 1995, more females planned on college completion than males (NCES, 2002b).

The results of this study support the perspective that information about gender from adults and the social cultural milieu is associ-

ated with how adolescents view their own futures (e.g., Eccles & Wigfield, 2002). Eccles and Wigfield (2002) have discussed how gendered stereotypes influence educational and occupational expectations between females and males. In a study of college students, Correll (2004) showed that gendered beliefs evoked gendered evaluations of competence that, in turn, influenced career aspirations. In an experimental condition, female and male participants were led to believe that males were better at a particular task. Males then rated their ability and career aspirations higher than females, even though both male and female participants received the same scores. Findings from this study may be used by educators and researchers to offset gendered beliefs by showing how females actually report relatively higher expectations than their male counterparts.

Another perspective has addressed how facing or anticipating barriers may adversely influence future expectations for completed schooling and work (Gottfredson, 1981, 1986). In fact, past research has shown that females report more barriers to future school and work than males (Brown & Bigler, 2004; Luzzo & McWhirter, 2001; McWhirter, 1997). However, this study showed that females reported relatively higher expectations than males. It is possible that perceptions of barriers may actually raise expectations. Researchers have discussed how some individuals may respond positively when faced with barriers (Lent et al., 2000). Indeed, in a recent study, African Americans, thought to experience barriers to school and work, actually reported higher occupational expectations than their counterparts (Mello, in press). Future studies may contribute to this area by systemically examining the relationship between expectations and perceptions of barriers for future school and work.

Gender differences in educational and occupational expectations were generally stable from adolescence and into adulthood, in contrast to predictions. It was hypothesized that, with age, knowledge about barriers would increase and would, in turn, be mani-

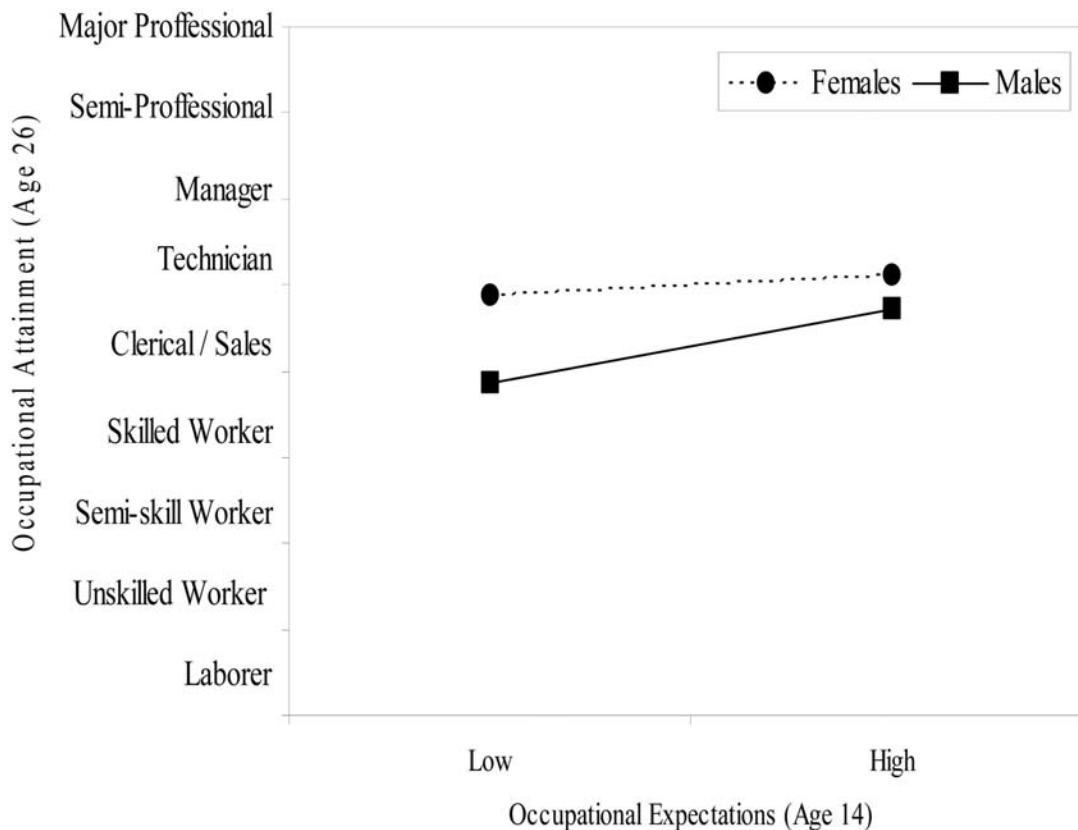


Figure 3. Predicting occupational attainment at age 26 with occupational expectations at age 14 by gender ($n = 10,374$). Shown are estimates for individuals with average academic achievement.

festated in a decline of expectations for future schooling and work, a decline that would be especially pronounced among females. However, data did not indicate such a pattern; rather, variation in expectations between females and males was mostly maintained between ages 14 and 26. These data indicate that once established, gender differences do not vary across this time period. This finding departs from the seminal study conducted by Hanson (1994) that showed how males were more likely than females to reduce educational expectations between their high school senior year and 6 years later. The historical period may underlie these discrepancies, and, in fact, recent research has reported results similar to the present study showing that the gap between male and female self-perceptions were generally stable across Grades 1–12 (Jacobs et al., 2002).

Results of this study were inconsistent with one prior study (i.e., Yowell, 2000). Yowell (2000) showed that early adolescent males gave greater priority to their future occupation than females in research with in-depth interviews. Variation in the results may stem from differences in the methods employed. Yowell's study used interviews compared to self-reported surveys in the current study. It is possible that further probing of occupational expectations may have yielded varying results. Future research may investigate this issue by utilizing multimethods when examining gender and perceptions of future accomplishments in schooling and work domains.

Connecting Adolescents' Expectations With Corresponding Adult Attainment and Gender

Findings provide longitudinal evidence for the association between the anticipation of occupational attainment in adolescence and actual attainment in adulthood or 12 years later. Results support theoretical perspectives on the cognitive/motivational qualities of expectations that suggest the expectations of future events meaningfully contribute toward attainment (e.g., Eccles & Wigfield, 2002). Findings are consistent with some past research (Powers & Wojtkiewicz, 2004; Schoon, 2001), showing that expectations reported by individuals at age 14 were positively associated with corresponding attainment at age 26 in both educational and occupational domains, even after I controlled for academic achievement. In fact, expectations had a similar magnitude of association with attainment as did academic achievement.

Importantly, this study further extends researchers' understanding of the relationship between expectations in adolescence and corresponding attainment in adulthood by incorporating gender. Males and females varied in the relationship between adolescent occupational expectations and adult occupational attainment. For females, the relationship between occupational expectations and attainment did not vary by the level of expectation, whereas males with high occupational expectations in adolescence actually had more professional occupations in adulthood compared to their

counterparts with lower occupational expectations in adolescence. This result contrasts with Powers and Wojtkiewicz (2004), who showed that occupational expectations in adolescence were of greater importance for females than males. The discrepancy may be due to variation in how occupations were measured or to the historical periods under examination, given that the current study was conducted between 1988 and 2000 and Powers and Wojtkiewicz surveyed participants' expectations between 1961 and 1990.

Gender variation in the association between expectations and attainment may be better understood by incorporating the considerable role of adults such as parents, teachers, and career counselors in guiding female and male students' educational and occupational pursuits. Indeed, Eccles and colleagues have shown how parents and teachers' expectations are gendered, which, in turn, shape the expectations of female and male children and students (Eccles & Wigfield, 2002). Future research may further examine how such gendered attitudes shape the connection between expectations in adolescence and corresponding attainment in adulthood.

Implications

This study has important implications for educators and researchers concerned with the expectations and attainment of both males and females. The results of this study support recent attention to the relative decline in educational attainment among males. The relatively high educational and occupational expectations reported by females may have implications with other domains of life such as the family. Some prior research has shown how adolescent females' expectations are connected to the timing of mothering with females who report higher expectations becoming mothers at an older age than their counterparts with lower expectations (Stewart, 2003).

It is important to be reminded that although national reports have shown females are exceeding males in educational completion (e.g., NCES, 2000), there are still large gender gaps in the types of occupations that are pursued and/or obtained between females and males, especially among those careers requiring math and science (NCES; Simpkins et al., 2006). Past research has shown that although females and males have similar values regarding math and science, females tend to report lower math self-concept (Simpkins et al., 2006). Educators and researchers must continue to promote the pursuit of math and science among females.

Limitations and Future Directions

The limitations of this study center on challenges to the investigation of occupational expectations and to the historical period under investigation. A significant limitation concerns the occupational expectation variables. The extent to which this study could capture age-related change in occupational expectations was limited due to the dichotomous coding of occupational expectations. Dichotomous coding was necessary, given changes in the definition of occupational categories across time and was consistent with prior research analyzing the NELS:88 data set (Mau & Bikos, 2000; Schneider, 1994). However, it is likely that a more continuous-type coding of occupations such as the Hollingshead Index (Hollingshead, 1975) would reflect more variation in the

development of occupational expectations over time. Although challenging to longitudinal research designs, it is imperative that research include more nuanced occupational measures. Including binary variables of professional and nonprofessional occupations greatly restricts researchers' knowledge of these important topics.

Further, another limitation concerns the use of survey data and the extent a greater understanding of educational and occupational expectations among males and females may be captured from interview methodology. A final limitation for consideration is the timeframe under study. Specifically, this study was conducted from 1988 to 2000. It is possible that the observed gendered patterns in educational and occupational expectations may have shifted since this period. More contemporary research is needed to examine historical shifts in the educational and occupational expectations reported by females and males.

Future directions may address these limitations and expand on the findings of the current study by including interviews, adults, and more nuanced measures of occupations. Interviewing adolescent males and females about how they come to report such educational and occupational expectations may prove fruitful in uncovering the gendered meaning underlying ideas about completed schooling and work. It is also important that participants in adolescence and in adulthood be included, given that individuals continue to explore schooling and work options into adulthood. Such studies may illuminate possible age-related variation in the relationship between educational and occupational expectations and corresponding attainment.

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