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Author(s): Anne McDaniel

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Cross-National Gender Gaps in Educational Expectations: The Influence of National-Level Gender Ideology and Educational Systems

ANNE MCDANIEL

Introduction

In recent decades, a dramatic shift has occurred in higher education throughout much of the industrialized world. For the first time in history, women are completing more education than men. Through the 1970s, women lagged behind men in the number of tertiary degrees completed in most nations. Since the 1980s, women have begun to reach parity with men and, in many cases, surpassed men in terms of their educational attainment. Today, out of the 30 member nations of the Organization for Economic Cooperation and Development (OECD), women comprise 53 percent of tertiary students, surpassing men in all but five countries: Germany, Japan, Korea, Switzerland, and Turkey (UNESCO 2005; see fig. 1). Most striking about these changes is that they are occurring across a large number of countries. This increasingly upward shift in women's educational status will no doubt cause further transformations in these societies and have large implications for gender stratification worldwide.

Research has begun to focus on women's advantage in tertiary education in the United States (Buchmann and DiPrete 2006; DiPrete and Buchmann 2006), but it is important to remember that women's growing share of tertiary completion does not indicate complete gender equality within education or in other arenas. College majors remain highly sex segregated, with women enrolled in fields of study that earn less money than men (Jacobs 1999; Charles and Grusky 2004). Women still lag behind men in terms of financial returns to education, labor market participation, and representation in politics (Paxton and Kunovich 2003; Pettit and Hook 2005; Bobbitt-Zeher 2007). Given the many arenas in which men continue to experience an advantage, it is especially important to study education, the one area in which women have reached parity with—and in many countries surpassed—men. Women's increasing success in tertiary completion could influence future gender in-

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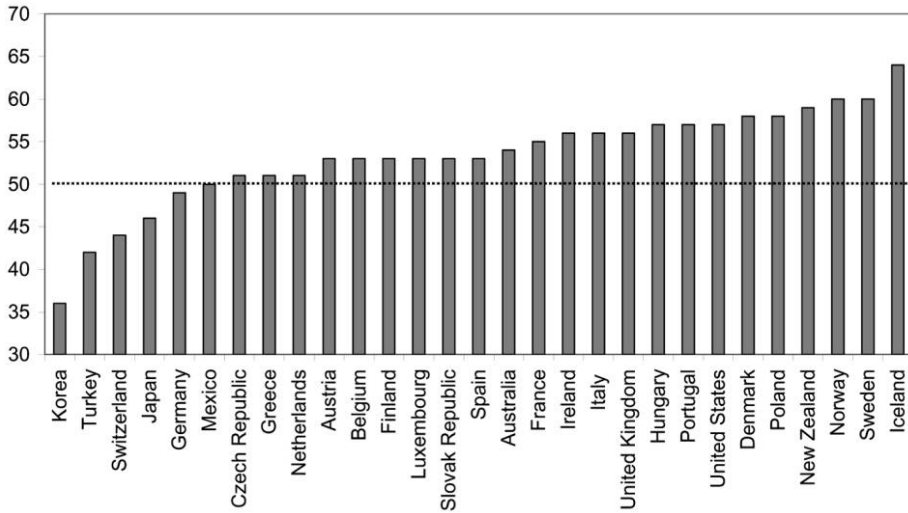


FIG. 1.—Women's enrollments as percentages of all tertiary enrollments (type A and B), 2003

equalities within education or in other domains, such as the labor market or politics. The educational expectations of adolescents are a useful way to gauge young men's and women's perceptions about their future educational achievement, and gender differences in educational expectations can shed light on women's shifting educational status.

With a few exceptions (Marini and Greenberger 1978; Hanson 1994), prior research on youths' expectations largely ignores gender differences in educational expectations. Almost nothing is known about how boys' and girls' expectations vary cross nationally or what influences this variation. One plausible explanation for gender differences in expectations is variations in gender ideologies across countries. Gender-egalitarian attitudes in a country have been found to be associated with more equitable opportunities for women in terms of work, family arrangements, and political representation (Inglehart and Norris 2003; Paxton and Kunovich 2003; Fuwa 2004) and could influence young men and women early in the life course when they are contemplating and making decisions about their futures. Another plausible explanation is that the structure of a country's educational system affects gender differences in expectations. Research finds that the degree of differentiation, or stratification, in secondary schools affects young boys' and girls' educational expectations (Buchmann and Dalton 2002), and more rapidly expanding tertiary systems have a positive influence on the number of women completing tertiary degrees in a country (Shavit et al. 2007). Researchers have yet to examine how the education system or gender ideology of a country influences youths' educational expectations.

In this article, I attempt to rectify shortcomings of previous research by

CROSS-NATIONAL GENDER GAPS IN EDUCATIONAL EXPECTATIONS

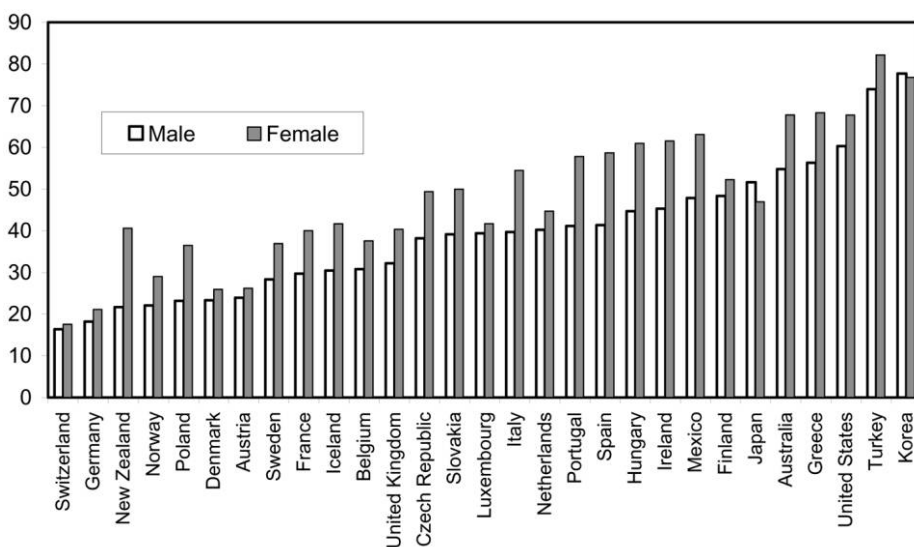


FIG. 2.—Percentages of 15-year-olds expecting to complete academic tertiary education, by country and gender.

documenting cross-national patterns in gender differences in adolescents' educational expectations across a range of developed countries and by examining how national-level features of education systems and attitudes toward gender equality influence gender differences in educational expectations. Using data from the 2003 Program for International Student Assessment (PISA 2005), I find that girls have higher educational expectations than boys in a majority of the 29 countries studied (see fig. 2).¹ Specifically, I find that girls' expectations surpass those of boys in all countries studied except Japan and Korea, but the size of the female-favorable gender gap varies across countries. The widespread nature of the female-favorable gap in expectations is striking but begs the following question: Why are girls' educational expectations higher than those of boys in a relatively diverse set of countries?

Theoretical Framework

Beginning with the Wisconsin model of status attainment in the 1960s, a large body of literature developed in the United States demonstrates that individuals' expectations play an important role in determining subsequent achievement and attainment (Sewell et al. 1969; Woelfel and Haller 1971). Given the importance of expectations for social mobility, research examines how adolescents' expectations are shaped through individual (e.g., Marini

¹ This study includes all OECD countries except Canada, which is not included due to missing data.

and Greenberger 1978; Spenner and Featherman 1978) and institutional factors (e.g., Kerckhoff 1977; Buchmann and Dalton 2002).

Individual Factors' Influence on Expectations

Family background plays a pivotal role in the formation of adolescents' expectations. Evidence shows that the largest predictor of educational expectations is socioeconomic status.² Families with higher levels of education and higher occupational status have children who are more likely to expect to attain high levels of education. Socioeconomic status matters more for the development of educational expectations than any other factor, including academic ability (Sewell et al. 1969). Significant others' opinions and attitudes toward an adolescent's future are also important in shaping youths' expectations (Woelfel and Haller 1971). Research on the status attainment model was originally based on samples of white males from the state of Wisconsin in the United States and therefore is not highly representative or generalizable (e.g., Sewell et al. 1969). Recent studies find, however, that the model holds for males and females in the U.S. population (Hanson 1994; Morgan 1998; Fan and Marini 2000) and that the basic relationships of the status attainment model are supported in other countries such as Australia (Marjoribanks 2003) and Canada (Williams 1972; see also the discussion in the section "Structure of Education Systems").

While we have a good understanding of how adolescents develop expectations, less is known about gender differences in educational expectations or their formation. Some research suggests that gender differences in expectations exist and that males and females take different approaches in developing their expectations. From the 1950s to the beginning of the 1980s, boys had higher educational expectations than girls in the United States (Marini and Greenberger 1978; Hanson 1994). Margaret Mooney Marini and Ellen Greenberger (1978) found that academic ability and socioeconomic status had a greater effect on boys' expectations than on those of girls. Girls adjusted their expectations downward over their life course, as they entered their marriage and childbearing years (Marini 1984). Since the 1980s, however, evidence indicates that in the United States (Reynolds and Burge 2008) and some other industrialized countries (Buchmann and Dalton 2002), girls report higher educational expectations than boys. For instance, John R. Reynolds and Stephanie Woodham Burge (2008) find that girls' expectations in the United States have increased over the previous 3 decades due, in part, to increasing opportunities for girls to take challenging high school classes and increasing support from parents for daughters interested in pursuing higher education.

Status attainment models clearly state that higher levels of academic abil-

² See, e.g., Marini and Greenberger (1978), Hanson (1994), Morgan (1998), and Fan and Marini (2000).

ity increase an individual's expectations (Sewell et al. 1969), so it is possible that gender differences in expectations could be due, in part, to gender differences in academic ability. On standardized achievement tests, boys consistently score higher on math and science tests, while girls score higher on reading tests, but the female advantage in reading is larger than the male advantage in math and science in the United States (Hedges and Nowell 1995; Downey and Vogt Yuan 2005). Gary N. Marks (2008) finds these patterns hold across 31 countries. Given these differences, one might expect girls to have higher expectations toward fields of study that require verbal and written skills, while boys might have higher expectations toward fields of study that require math and science skills.

Standardized tests scores may not, however, represent girls' true ability or performance in the classroom. U.S.-based research found that girls received higher grades and had higher class standings than boys in all subjects, even when taking courses of similar difficulty, as early as the 1950s and 1960s, when data first became available (Alexander and Eckland 1974; Alexander and McDill 1976; Thomas et al. 1979). Douglas Downey and Anastasia Vogt Yuan (2005) found a similar female advantage in the classroom using more recent data from the 1988 National Educational Longitudinal Study. In light of the mismatch between gender differences in classroom performance and standardized tests, it is unclear whether standardized tests underestimate the academic ability of girls or if they truly represent the ability of boys. If girls' classroom performance (i.e., the grades they receive from teachers) truly represents their ability, then this could explain their high educational expectations.

Nevertheless, even though the status attainment model posits that students' ability predicts their expectations, a clear causal ordering is difficult to disentangle. It is just as likely that academic performance influences students' expectations about their future as it is that students' expectations about their future influence their academic performance. Thus, it may be more appropriate to view expectations and performance as mutually causal.

National-Level Influences on Expectations

National-level contextual and structural factors can shape expectations through a variety of mechanisms, but little research examines how national contexts influence expectations. The research that does exist examines how differences in education systems influence educational expectations (Kerckhoff 1977; Buchmann and Dalton 2002).

Structure of education systems.—Based on Ralph Turner's (1960) theory that education systems affect students in different ways, Alan Kerckhoff (1977) found that differences between the U.S. and English educational systems led English boys to have more realistic educational aspirations than U.S. boys. Claudia Buchmann and Benjamin W. Dalton (2002) conducted a comparative

study of aspiration formation in 12 countries and found the level of differentiation in a country's education system affects the impact of significant others on both boys' and girls' educational aspirations. In highly differentiated systems that have clearly demarcated educational trajectories at the secondary level, the influence of significant others is diminished, since students' futures are largely decided by their educational track. Furthermore, Buchmann and Hyunjoon Park (forthcoming) found that male and female students in highly differentiated systems have more realistic expectations than those in undifferentiated systems.

The current study contributes to this research in two important ways. First, no study has empirically tested how the level of differentiation in a country's education system affects students' expectations. This study is the first to use hierarchical modeling to examine how the structure of a country's education system influences youths' expectations. Second, research has yet to examine how an education system's level of differentiation may affect boys and girls differently. Boys and girls may not experience or react to educational differentiation in the same way. For example, in more open, undifferentiated educational systems, students have higher expectations. Girls may benefit from this environment more than boys because, viewing their country's education system to be meritocratic, they may see more opportunities to translate their advantages in the classroom into higher education.

In addition to aspects of secondary schools, features of tertiary education may affect students' expectations. As education systems expand, previously disadvantaged groups, including women, gain greater access to higher education (Schofer and Meyer 2005; Shavit et al. 2007). But in tertiary systems where growth is constrained, men continue to benefit. U.S.-based research shows that women excel once they gain access to higher education, surpassing men in terms of grades, evaluations, and degree completion (Jacobs 1996; Buchmann et al. 2008). Therefore, the rate of growth of higher education should play a role in determining whether more men or women gain higher levels of education. In countries with more rapidly growing tertiary systems, young girls may foresee greater future opportunities for entering higher education and, in turn, raise their expectations more than in countries with stagnant or slower growing tertiary systems.

Besides the possibility of future opportunities for tertiary enrollment, women's actual opportunities for higher education should positively influence young girls' expectations. As mentioned, women comprise 53 percent of tertiary students in OECD countries, but this number varies widely from a high of 64 percent in Iceland to a low of 36 percent in Korea (see fig. 1). Young girls and boys may look to higher education and see relatively greater opportunities or obstacles that could affect their educational expectations. In countries where more women than men enroll in higher education, young girls should perceive greater opportunity and thus be more likely to expect

to enter into higher education than is the case for young boys. Therefore, in addition to the rate of tertiary growth in a country, women's share of tertiary enrollment may play an important role in shaping the expectations of the next generation.

Gender egalitarianism.—Beyond a country's education systems, its national norms and attitudes can affect students' educational expectations. Research on cross-national gender stratification often examines how the gender ideology of a country determines women's status within that society (Charles and Bradley 2002; Paxton and Kunovich 2003), but this research only focuses on women in adulthood. Attitudes and expectations about appropriate gender roles vary across societies and determine microlevel beliefs and interactions as well as macrolevel organizational and structural features of institutions (Martin 2004; Risman 2004). In countries where more egalitarian gender ideologies prevail, the division of household labor is more equitable among men and women (Geist 2003; Fuwa 2004), and women are more likely to participate in the labor market and politics (Paxton and Kunovich 2003; Pettit and Hook 2005). Some evidence suggests that the spread of more egalitarian gender ideologies across countries is a driving force behind women's increasing tertiary attainment (Bradley and Ramirez 1996). Given that a country's gender-egalitarian ideology affects women's status and actions later in the life course, it is likely that adolescents would also be affected by these ideologies. Therefore, national-level gender ideologies should prove important in shaping educational expectations of adolescents, especially those of young girls.

Research to date fails to explore how gender-egalitarian ideologies influence individuals at early stages in the life course. It is plausible, however, that young girls and boys experience the influence of a country's aggregate gender ideology as adults do and actively shape their future expectations not only according to their personal experiences, family backgrounds, or school systems but also in the context of national gender ideologies. As young girls look to their futures and make decisions about whether they expect to attend higher education, they likely consider what their lives will be like as an adult. Will they have access to higher education? Will they be expected to stay home and raise children? Will they need or be able to use a tertiary degree? The answers to these questions are shaped by the gender ideology of a country, and in countries with highly gender-egalitarian attitudes, young girls' perceptions of their opportunities and expectations about the future may be higher than in less egalitarian countries where girls may perceive fewer opportunities to pursue higher education.

Data and Methods

This study uses the PISA 2003 data set on the educational achievement and attitudes of 15-year-old students who are nearing the end of compulsory

education in 41 industrialized and developing countries. The student population selected for PISA is representative of the full population of 15-year-olds attending both public and private schools in each participating country. For each country, a minimum of 150 schools and 4,500 students was required. First, schools were systematically sampled based on the grade span of the school, school type, region of country, type of location relative to population of area, and minority status. Within each school, 35 students were randomly selected between the ages of 15 years, 3 months and 16 years, 2 months. (If a school had fewer than 25 students between these ages, all students were included in the sample.) PISA is a unique and useful data set that improves over previous international education data sets because of the breadth of information and diversity of countries included. I limit the countries in the analysis to 29 countries—all members of the OECD, except Canada, which is not included due to missing data on country-level indicators. The 29 countries in the analysis are all industrialized countries that were chosen to test hypotheses across countries with more similar economies and educational and occupational opportunities for individuals. My final sample includes 181,207 individuals.

Dependent Variable

“Educational expectations” is the dependent variable in this study.³ Students in all countries were asked about the highest level of education they expected to complete. Responses were coded according to the International Standard Classification of Education (ISCED), an instrument designed to be used for reporting education statistics, which includes the following distinctions: ISCED 1 for primary education, ISCED 2 for lower secondary education, ISCED 3B or 3C for vocational upper secondary education, ISCED 3A or 4 for academic upper secondary education, ISCED 5B for vocational tertiary education, and ISCED 5A or 6 for academic tertiary education or higher. There is an important distinction between vocational and academic tertiary education (ISCED 5B vs. 5A or 6). Vocational tertiary education represents technical training aimed toward blue-collar occupations, while academic tertiary education, known as college or university, is focused on preparing students for professional white-collar occupations. Girls are more likely to expect to complete academic tertiary education (52 percent of girls vs. 43 percent of boys), while boys and girls expect to complete roughly the same amount of vocational tertiary education (13.11 percent of girls and 12.94 percent of boys). Since academic tertiary education leads to higher prestige occupations and has higher status, I recode educational expectations into a dummy variable to represent whether or not a student expects to complete college or

³ Research on status attainment and educational aspirations and expectations notes the difference between expectations (what a student expects to achieve) and aspirations (what a student hopes to achieve) (Kerckhoff 1976; Hanson 1994). Due to the wording in the questionnaires, it is more appropriate for this study to measure and discuss educational expectations.

TABLE 1
DESCRIPTIVE STATISTICS: ALL VARIABLES

| | Combined | | Females | | Males | |
|---|----------|---------|---------|--------|--------|--------|
| | Mean | SE | Mean | SE | Mean | SE |
| Dependent variable: | | | | | | |
| Expecting to complete academic tertiary education | .47 | . . . | .52 | . . . | .43 | . . . |
| Individual-level indicators: | | | | | | |
| Female | .51 | . . . | . . . | . . . | . . . | . . . |
| Parent's education | 12.53 | 3.62 | 12.40 | 3.65 | 12.66 | 3.57 |
| Parent's occupation | 48.06 | 16.93 | 47.75 | 16.94 | 48.38 | 16.93 |
| Achievement test scores | 988.81 | 180.50 | 996.00 | 174.97 | 981.41 | 185.72 |
| Attitudes toward school | .09 | 1.01 | .18 | .99 | .00 | 1.03 |
| Individual-level <i>N</i> | 181,207 | 181,207 | 91,852 | 91,852 | 89,355 | 89,355 |
| National-level indicators: | | | | | | |
| GDP (logged) | 4.38 | .19 | . . . | . . . | . . . | . . . |
| Gender egalitarianism | 74.26 | 14.95 | . . . | . . . | . . . | . . . |
| Differentiation | 2.62 | 1.37 | . . . | . . . | . . . | . . . |
| Change in tertiary enrollment | 1.18 | .14 | . . . | . . . | . . . | . . . |
| Female tertiary enrollment | 53.28 | 5.85 | . . . | . . . | . . . | . . . |
| Country-level <i>N</i> | 29 | 29 | . . . | . . . | . . . | . . . |

university (1 = expects to complete college), to assess whether girls are more likely than boys to have high educational expectations. Descriptive statistics for the dependent variable and all other variables are presented in table 1.

Individual-Level Variables

Independent variables include gender (1 = female), parent's education, parent's occupation, academic ability, and attitudes toward school. Parent's education is measured as the highest year of schooling completed by either parent. Parent's occupation is measured as the highest score of either parent on the International Socioeconomic Index of Occupational Status (ISEI), which measures the socioeconomic status and prestige of occupations (Ganzeboom et al. 1992). Academic ability is measured by scores on standardized math and reading achievement tests, which are measured at the same time as expectations.⁴ Since, on average across countries, girls score higher on reading tests, and boys score higher on math tests (Marks 2008), I seek to reduce biases by using only one test. I combine each student's scores on math and reading tests to create a measure of academic ability.⁵ Students' attitudes toward the importance of schooling are measured as a scale, derived

⁴ Since an individual's academic ability may precede and influence expectation, it would be preferable to measure academic ability at a point prior to when expectations are assessed, but these data do not include such measures. Thus, I use achievement test scores as proxies for prior ability.

⁵ Math and reading ability have similar relationships with educational expectations. Math ability and educational expectations are correlated at .30; reading ability and educational expectations are correlated at .35. Math and reading are correlated at .84.

from four statements about the importance of and feelings toward school: school has done little to prepare me for adult life when I leave school, school has been a waste of time, school helped give me confidence to make decisions, and school has taught me things that could be useful in a job. A four-point scale for each question, coded as 0 = strongly agree, 1 = agree, 2 = disagree, and 4 = strongly disagree, is used. PISA used item-response theory to create an index out of the questions (PISA 2005).⁶ More positive values on the scale represent students' positive attitudes toward school. Student-level weights were added to inflate each country's sample to the total student population within each country.

National-Level Variables

To measure the structure of a country's education system, three measures are used: level of differentiation, change in tertiary enrollment, and female tertiary enrollment. All country variables are measured in the year 2003. Level of differentiation at the secondary level is a measure constructed by the OECD (see OECD 2005), which identifies the number of school types or distinct educational programs available to 15-year-olds in a country. The minimum is one, and the maximum is five. Higher numbers represent more differentiated, or more highly stratified, education systems. Change in tertiary enrollment is measured as the ratio increase in all tertiary enrollments between 1999 and 2003 (UNESCO 2005). Female tertiary enrollment is measured as the percentage of women enrolled in all tertiary education as a percent of all students (UNESCO 2005).

Gender egalitarianism is measured by the percentage of individuals in each country who either agree or strongly agree with the statement that "a husband and wife should both contribute to household income." Higher scores represent more egalitarian attitudes, as this statement encompasses whether traditional gender roles are relevant within a country as well as the naturalness of women working outside the home. This question is used because it was asked in the exact same way in both the 2002 International Social Survey Program (ISSP) and the 2004 World Values Survey (WVS)—nationally representative surveys that include attitudes and opinions of each country's adult population.⁷ Using both the ISSP and WVS provides information on gender egalitarianism in all countries in the study. The ISSP was used for 21

⁶ The index was scaled using a weighted maximum likelihood estimate, using a one-parameter item response model. The scale was estimated in three stages. First, the question parameters were estimated from subsamples of equal size in each country. Second, estimates were computed for all students and schools by anchoring the question parameters from the preceding step. Finally, the index was standardized so that the mean is zero and the standard deviation is one across all countries.

⁷ A similar measure was used by Charles and Bradley (2002) when assessing how gender roles affect sex segregation in higher education and found to be a good representation of a country's gender ideology.

countries while the WVS was used for the additional eight countries.⁸ Finally, a measure of gross domestic product per capita (GDPC), measured as per person purchasing power (in U.S. dollars), is used as a control for level of development across countries. This variable is logged due to the high degree of variability across countries (from a low of \$6,928 in Turkey to a high of \$53,317 in Luxembourg). Descriptive statistics for both individual-level and country-level variables are presented for each country in appendix table A1, available in the online version of *Comparative Education Review*.

Analytic Strategy

I begin by estimating baseline models for each country to examine the gender differences in educational expectations using logistic regression and controlling for individual-level variables. Logistic regression is used because educational expectations are measured as a binary variable (whether or not a student expects to complete academic tertiary education). Next, to test the effects of individual- and national-level factors across countries, I use hierarchical modeling with Bernoulli logistic regression. Hierarchical modeling is used to allow for the estimation of a model that contains differing levels of analysis, recognizing that students are nested within countries. Using only logistic regression when including a second level of analysis could produce biased slopes and standard errors (Raudenbush and Bryk 2002). Since logistic regression is used, the following link function is used to transform the outcome in each model: $\eta_{ij} = \log(\varphi_{ij}/1-\varphi_{ij})$. Female is entered into the model uncentered, to properly estimate the effects of the binary variable. All other variables, at the individual and country level, are entered grand-mean centered. The basic, unconditional model is as follows:

$$\text{Level 1: } \eta_{ij} = \ln\left(\frac{\varphi_{ij}}{1-\varphi_{ij}}\right) = \beta_{0j}$$

$$\text{Level 2: } \beta_{0j} = \gamma_{00} + u_{0j}$$

Results

Figure 3 presents the difference between the percent of females expecting to complete academic tertiary education and the percent of males expecting to complete academic tertiary education in 29 countries in 2003. As can be seen in figure 1, despite girls' higher expectations overall, the size of the female-favorable gap varies across countries. For example, in Spain, 17 per-

⁸ There was overlap between 15 countries with data from both the WVS and ISSP. The correlation of the gender-egalitarian measure across both data sets is .92, which shows the measures are extremely similar across each data set.

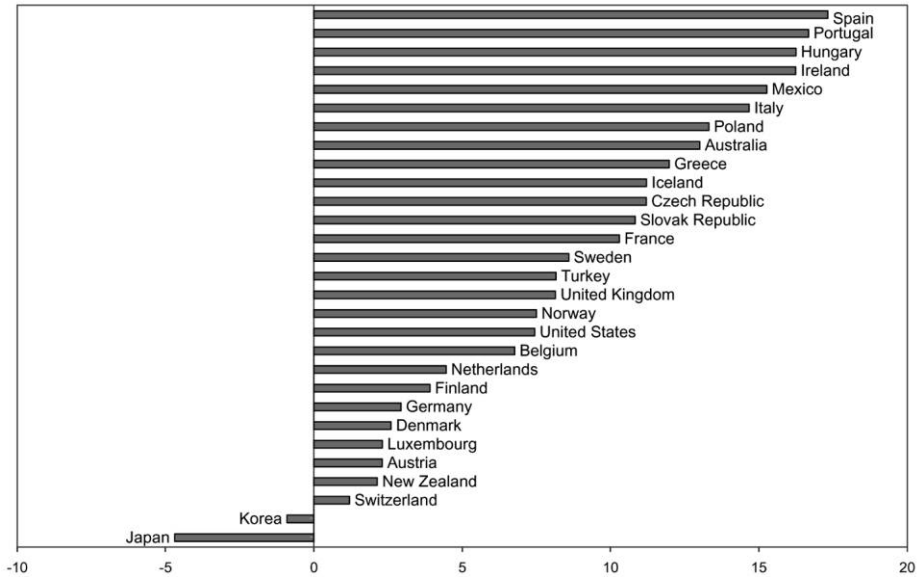


FIG. 3.—Gender gaps (percent females minus percent males) in expectations of completing academic tertiary education.

cent more girls than boys expect to complete academic tertiary education, but, in Switzerland, only 1 percent more girls than boys expect to complete academic tertiary education. Moreover, only in Japan and Korea are boys more likely than girls to expect to complete academic tertiary education.

The descriptive results of the gender differences in educational expectations are striking but do not inform whether the gaps between boys' and girls' expectations are significantly different across countries. To test this question, I conduct logistic regressions predicting educational expectations for each country. Table 2 presents the coefficient for female from the logistic regression of educational expectations, controlling for parent's education, parent's occupation, student academic ability, and student attitudes toward schools for each country.

All control variables are in the expected direction. In almost all countries, higher levels of parent's education and occupation increase the likelihood of a student's expecting to complete academic tertiary education. Academic ability, as measured through a combination of math and reading achievement scores, is strongly associated with high educational expectations, as are more positive attitudes toward the importance of schooling (for full regression models for each country, see appendix table A2, available in the online version of *Comparative Education Review*). These results are consistent with status attainment models and support the idea that similar processes of developing high educational expectations occur in a diverse set of countries.

In 19 of the 29 countries, girls are significantly more likely than boys to

CROSS-NATIONAL GENDER GAPS IN EDUCATIONAL EXPECTATIONS

TABLE 2
UNSTANDARDIZED FEMALE COEFFICIENTS FOR THE LOGISTIC REGRESSION
OF EXPECTING TO COMPLETE ACADEMIC TERTIARY EDUCATION, 2003

| | <i>b</i> | SE | <i>N</i> | Odds Ratio |
|-----------------|----------|-------|----------|------------|
| Australia | .535** | (.05) | 11,638 | 1.707 |
| Austria | .016 | (.08) | 4,363 | 1.015 |
| Belgium | .279** | (.06) | 7,802 | 1.321 |
| Czech Republic | .545** | (.08) | 5,924 | 1.725 |
| Denmark | .104 | (.08) | 3,939 | 1.110 |
| Finland | .001 | (.06) | 5,661 | 1.001 |
| France | .368** | (.08) | 3,659 | 1.445 |
| Germany | .107 | (.09) | 4,009 | 1.113 |
| Greece | .699** | (.09) | 4,334 | 2.013 |
| Hungary | .920** | (.09) | 4,468 | 2.509 |
| Iceland | .268* | (.08) | 3,234 | 1.308 |
| Ireland | .755** | (.08) | 3,680 | 2.128 |
| Italy | .762** | (.06) | 11,326 | 2.143 |
| Japan | -.426** | (.08) | 4,169 | .655 |
| Korea | -.089 | (.08) | 5,248 | .915 |
| Luxembourg | .052 | (.08) | 3,295 | 1.053 |
| Mexico | .654** | (.07) | 28,279 | 1.923 |
| Netherlands | .135 | (.09) | 3,572 | 1.145 |
| New Zealand | .120 | (.08) | 3,335 | 1.128 |
| Norway | .305** | (.08) | 3,744 | 1.357 |
| Poland | .716** | (.08) | 4,266 | 2.047 |
| Portugal | .824** | (.09) | 4,393 | 2.278 |
| Slovak Republic | .603** | (.08) | 7,007 | 1.828 |
| Spain | .701** | (.07) | 9,916 | 2.015 |
| Sweden | .338** | (.07) | 4,284 | 1.402 |
| Switzerland | .082 | (.09) | 7,917 | 1.085 |
| Turkey | .349** | (.10) | 4,214 | 1.418 |
| United Kingdom | .374** | (.08) | 8,494 | 1.453 |
| United States | .198* | (.07) | 5,037 | 1.219 |

NOTE.—Controlling for parent's occupation, parent's education, attitudes toward school, and academic ability.

* $p < .01$.

** $p < .001$ (two-tailed tests).

expect to complete academic tertiary education. For example, in Hungary, the country with the largest unstandardized female coefficient ($b = .920$), girls are 150 percent more likely than boys to expect to complete academic tertiary education, while in United States, which has the smallest significant unstandardized female coefficient ($b = .198$), girls are only 21 percent more likely than boys to expect to complete academic tertiary education. Furthermore, in several countries (Austria, Denmark, Finland, Germany, Luxembourg, the Netherlands, New Zealand, and Switzerland), the female coefficient is positive but does not attain significance. In only one country, Japan, boys are significantly more likely than girls to expect to complete academic tertiary education. In Korea, the female coefficient is negative but not significant.

The findings presented in table 2, however, do not explain the variations in gender gaps in expectations. Table 3 presents the hierarchical Bernoulli logistic model of expecting to complete academic tertiary education and tests

TABLE 3
HIERARCHICAL BERNOULLI LOGIT MODELS OF EXPECTING TO COMPLETE ACADEMIC TERTIARY EDUCATION

| | Model 1 | Model 2 | Model 3 | Model 4 | Model 5 | Model 6 | Model 7 |
|--------------------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|
| Individual-level variables: | | | | | | | |
| Female | .273*** (.070) | .322*** (.079) | .255** (.082) | .223** (.081) | .080 (.433) | .248** (.086) | .253*** (.034) |
| Parent's education | . . . | .117*** (.022) | .081** (.029) | .083** (.028) | .094** (.033) | .101*** (.026) | .102*** (.025) |
| Parent's occupation | . . . | .022*** (.002) | .011*** (.002) | .011*** (.002) | .012*** (.002) | .012*** (.002) | .012*** (.002) |
| Achievement test scores | . . . | . . . | .004*** (.000) | .004*** (.000) | .005*** (.001) | .005*** (.001) | .005*** (.001) |
| Attitudes toward school | . . . | . . . | . . . | .195*** (.051) | .159** (.064) | .211*** (.053) | .210*** (.052) |
| Individual-level interactions: | | | | | | | |
| Female × parent's education | . . . | . . . | . . . | . . . | -.021 (.022) | . . . | . . . |
| Female × parent's occupation | . . . | . . . | . . . | . . . | -.001 (.002) | . . . | . . . |
| Female × achievement | . . . | . . . | . . . | . . . | .000 (.000) | . . . | . . . |
| Female × attitudes | . . . | . . . | . . . | . . . | .072** (.032) | . . . | . . . |

| | | | | | | | |
|--|-----------------|-----------------|-----------------|-----------------|-----------------|-------------------|--------------------|
| National-level variables: | | | | | | | |
| GDP (logged) | ... | ... | ... | ... | ... | -1.136 (1.560) | -.419 (1.225) |
| Gender egalitarianism | ... | ... | ... | ... | ... | .002 (.014) | -.002 (.010) |
| Differentiation | ... | ... | ... | ... | ... | -.602** (.167) | -.601*** (.145) |
| Change in tertiary enrollment | ... | ... | ... | ... | ... | 3.435 (1.753) | 3.798** (1.629) |
| Female tertiary enrollment | ... | ... | ... | ... | ... | -.093** (.031) | -.118*** (.026) |
| Cross-level interactions: | | | | | | | |
| Female × gender egalitarianism | ... | ... | ... | ... | ... | ... | .012** (.005) |
| Female × differentiation | ... | ... | ... | ... | ... | ... | .055 (.041) |
| Female × change in tertiary enrollment | ... | ... | ... | ... | ... | ... | .305 (.348) |
| Female × female tertiary enrollment | ... | ... | ... | ... | ... | ... | .026*** (.006) |
| Intercept | -.111 (.243) | -.211 (.239) | -.191 (.310) | -.157 (.310) | -.451 (.411) | -.396 (.221) | -.402* (.194) |
| Female odds ratio | 1.314 | 1.380 | 1.286 | 1.250 | 2.235 | 1.281 | 1.288 |

NOTE.—Standard errors in parentheses. Country-level $N = 29$; individual-level $N = 181,207$; population-average models with robust standard errors.

* $p < .05$.

** $p < .01$.

*** $p < .001$ (two-tailed tests).

the effects on expectations of individual-level factors and of a country's education systems and gender-egalitarian attitudes across all 29 countries. Initially, the unconditional model was run, which does not include any independent variables, and it illustrated that the expectation to complete academic tertiary education does not significantly vary across the 29 countries included in the analysis.

Models 1–4 introduce the individual-level variables separately in order to establish their effect on the female coefficient. Model 1 shows that across countries, girls have significantly higher educational expectations than boys. The female odds ratio is 1.314, indicating that girls are 31.4 percent more likely than boys to expect to complete academic tertiary education. Model 2 introduces parent's education and occupation into the model. As expected, higher levels of parent's education and occupation increase the likelihood of expecting to complete academic tertiary education. After controlling for these factors, the female coefficient increases in size ($b = .322$), and girls are 38 percent more likely than boys to expect to complete academic tertiary education. That is, holding family background constant, girls are even more likely than boys to expect to complete academic tertiary education. Model 3 introduces achievement scores, which significantly increase expectations. Including achievement scores reduces girls' advantage over boys (from 38 to 27 percent) in terms of expecting to complete academic tertiary education. Taking academic ability into account, boys' expectations are slightly closer to those of girls, but girls still maintain their advantage in expecting to complete academic tertiary education. Model 4 introduces students' attitudes toward school, which increase expectations. Including attitudes toward school decreases the size of the effect of being female (from 38 to 25 percent) on likelihood of expecting to complete academic tertiary education. The results of models 1–4 show that even after controlling for these individual-level factors, girls are significantly more likely than boys to expect to complete academic tertiary education.

Next, I assess whether family background, academic ability, or attitudes toward the importance of schooling affect girls' and boys' expectations differently. If the individual-level predictors of expectations affect boys and girls in different ways, this result could explain part of girls' advantage in expecting to complete academic tertiary education. Model 5 includes interaction effects for each individual-level variable multiplied by female, to test whether the effects of the individual-level variables vary by gender. The interaction between female and attitudes toward school is significant and positive. For boys, more positive attitudes toward the importance of schooling increases the likelihood of expecting to complete academic tertiary education by .1591 (in terms of odds ratios, a one-unit increase in positive attitudes toward the importance of schooling increases boys' likelihood of expecting to complete academic tertiary education by 17 percent). For girls, the effect is even larger

(attitudes [.1591] + female \times attitudes [.0723] = $b = .2314$). In terms of odds ratios, this result means that a one-unit increase in positive attitudes toward the importance of schooling for girls increases their likelihood of expecting to complete academic tertiary education by almost 25 percent, which is significantly higher than the effect for boys.

Why is this effect the case? Buchmann et al. (2008) summarize U.S.-based research that shows that girls earn better grades in school, are less likely to repeat a grade, and are less likely than boys to drop out of school. In addition, boys demonstrate more antisocial behavior in school, are more likely to be diagnosed with a learning disability, and have more discipline problems than girls. All these factors are likely associated with boys' more negative attitudes toward the importance of schooling, which decreases their expectations to complete academic tertiary education. Furthermore, it is possible that, for girls, education may be the most visible and accessible path to a successful future, whereas boys may perceive more varied options where education may not be necessary. A gender wage gap favoring men exists across industrialized countries (Blau and Kahn 2003), and men dominate the best, most prestigious, and highest-earning manual and nonmanual occupations (Charles and Grusky 2004). This gap suggests that, for boys, more opportunities may exist than for girls, and girls may need to value schooling more and have more positive attitudes toward school than boys. My results shed light on some of the individual factors that matter for girls' and boys' educational expectations across countries and show that one reason for girls' higher expectations is their more positive attitudes toward the importance of schooling.

Although the findings from models 1–5 are informative, they do not explain differences in youth's expectations or the gender gap in expectations across countries. To assess national features of educational systems and aggregate gender-egalitarian attitudes' effect on expectations, I introduce country-level variables into the model (presented in model 6). The individual-level variables remain significant in the expected directions, and girls are 28 percent more likely than boys to expect to complete academic tertiary education. Turning to the country-level variables, GDPC is not significant, which is not surprising given that all of the countries in the analysis are industrialized nations with fairly advanced education systems. Gender egalitarianism does not significantly affect students' educational expectations, which makes sense, as I predict that gender egalitarianism will affect girls' expectations more than those of boys—but not necessarily all students' expectations.

Looking at variables related to the structure of the education system, the results show that the level of differentiation in a country's secondary system significantly decreases the expectation of completing academic tertiary education ($b = -.0602$). The odds ratio for differentiation is .547, which means that each additional level of differentiation in a country's secondary schools decreases students' expectations of completing academic tertiary education

by 45.3 percent. These findings correspond with previous research that suggests that higher levels of differentiation or stratification within a country's schools lowers students' expectations, since stratified systems place students in more rigid tracks that directly predict their educational future, compared to open systems in which all students have the possibility of going to college or university (Kerckhoff 1977; Buchmann and Dalton 2002). This finding is important, as this study is the first to test empirically the effect of differentiation on individuals' educational expectations across countries, and it lends support to previous theories. The coefficient for change in tertiary enrollment size is not significant, suggesting that increases (or decreases) in tertiary size over the previous 8 years do not affect whether students expect to complete academic tertiary education. Higher levels of female tertiary enrollment, however, significantly decrease students' expectations.

In the final model, I use cross-level interactions between female and the country-level variables to test whether gender egalitarianism and the structure of education systems have different effects for boys and girls. The interactions between female and level of differentiation and change in tertiary enrollment are not significant, suggesting that these factors affect boys and girls in the same way. The interaction between female and females' share of tertiary enrollment is significant and positive, but the main effect of females' tertiary enrollment is negative. For boys, an increase in females' share of tertiary enrollment decreases the likelihood that they will expect to complete academic tertiary education by 11.1 percent ($b = -.1177$). For girls, an increase in females' tertiary enrollment decreases the likelihood that they will expect to complete academic tertiary education by 9.4 percent ($b = -.0914$), a smaller amount than for boys. While higher levels of female tertiary enrollment decrease expectations overall, the negative effect is less for girls. The interaction between female and gender egalitarianism is positive and significant. The effect of gender egalitarianism for boys is negative ($b = -.0015$), while the effect of gender egalitarianism for girls is positive ($b = -.0015$ [egalitarianism] + $.0122$ [female \times egalitarianism] = $.0107$). The odds ratio for boys is .998, meaning a one-unit increase in gender egalitarianism decreases boys' likelihood of expecting to complete academic tertiary education by .2 percent. For girls, a one-unit increase in gender egalitarianism increases girls' likelihood of expecting to complete academic tertiary education by 1 percent (odds ratio = 1.010). While a small effect, it is important that in more egalitarian countries, girls' educational expectations increase at a greater rate than boys' expectations.

Discussion

In this article, I find a female-favorable gap in adolescents' educational expectations in all but two of the 29 countries studied. Family background, academic ability, and attitudes toward school are found to be important pre-

dictors of youths' expectations in general, and, for girls, their more positive attitudes toward the importance of schooling increase their expectations even more than for boys. The findings also indicate that the structure of the education system within a country is an important predictor of youths' expectations. Previous research argues that the more differentiated a country's education system is, the lower students' expectations will be, and this study provides empirical support for this claim across countries—for both boys and girls. Furthermore, I find that national gender-egalitarian attitudes shape young girls' and boys' expectations differently—increasing girls' expectations while slightly decreasing boys' expectations. While I do not find that features of educational systems affect boys' and girls' expectations differently, the finding that gender egalitarianism matters for gender differences in the likelihood of expecting to complete academic tertiary education is important. Gender-egalitarian attitudes have been shown to influence women's opportunities and status later in the life course (Paxton and Kunovich 2003; Pettit and Hook 2005), but this study is the first to examine how egalitarianism in a country affects young girls' attitudes early in the life course—shaping whether or not 15-year-old females expect to complete academic tertiary education. Given that more egalitarian gender ideologies in a country cause women later in life to participate more in the labor market and in politics, it is logical that these ideologies would affect young girls. As adolescent girls think about their futures and make decisions about their expectations to pursue higher education, the prevailing gender ideology in their country—in addition to other individual- and country-level characteristics—influences whether they expect to complete an academic tertiary degree.

Although prior research on expectations has shown that expectations play an important role in students' educational achievement and attainment (Sewell et al. 1969), it has largely ignored gender differences in educational expectations. The fact that girls' expectations now surpass those of boys in a majority of countries could have important implications for the future of gender stratification. If expectations to some degree predict later outcomes, the pattern of girls' rising expectations could lead to changes in women's participation in higher education and their positions within the economies and politics of their countries.

We should not, however, assume a perfect correlation—or a direct causal link—between expectations and outcomes, especially for women. Many factors, such as entering marriage and experiencing childbirth, sex segregation in education and the labor market, and outright discrimination, restrict women's access to more desirable and lucrative positions.⁹ Therefore, while the findings from this study are important and striking, future research needs to monitor how women's shifting advantage in educational expectations in-

⁹ See, e.g., Jacobs (1996), Budig and England (2001), Charles and Bradley (2002), Charles and Grusky (2004), and Bobbitt-Zeher (2007).

fluences subsequent tertiary completion and achievement in other arenas. It will be especially important to pay attention to younger cohorts of women if, as their expectations suggest, gender roles and stratification are changing.

This research is not without limitations, which future research should attempt to address. The sample of countries used in this study is limited to industrialized OECD member states and therefore is not representative of all countries, especially less developed countries. Given that women's shifting advantage in tertiary education is largely occurring in industrialized countries (UNESCO 2005), however, it is of critical importance to understand changes in these countries. The current study sheds light on how features of industrialized countries—advanced educational systems and gender-egalitarian ideologies—affect the gender gap in youths' expectations. Future research should examine whether the results of the current study are applicable in industrializing or less developed countries, which are traditionally not included in cross-national quantitative studies of education.

Another limitation of this study is that it provides only a snapshot of educational expectations and does not examine historical trends in boys' and girls' expectations. This limitation is potentially important because we do not know if boys' expectations have declined or stagnated over time, allowing girls to surpass them, or if girls' and boys' expectations have both risen over time, although at a faster rate for girls. To investigate these possibilities, I examined descriptive information on educational expectations and gender from three earlier studies with data sets similar to PISA: the First and Second International Science Studies (FISS and SISS) and the Third International Math and Science Study (TIMSS). These studies were conducted in 1970, 1983, and 1995, respectively (results presented in table A2, available in the online version of *Comparative Education Review*).

Data were available on students' expectation to complete academic tertiary education in each of the four studies (FISS, SISS, TIMSS, and PISA) for only six countries: Australia, Hungary, Japan, the Netherlands, Sweden, and the United States. Boys increased their expectations over time in all countries except the United States—where 70 percent of boys expected to complete academic tertiary education in 1970, compared to 60 percent in 2003. Girls, however, increased their expectations in all countries over time and at higher rates than boys. This pattern can be observed even in Japan, the only country where boys enjoy higher expectations to complete academic tertiary education than girls. Japanese girls' expectations to complete academic tertiary education increased from 18 percent to 47 percent from 1970 to 2003 (an increase of 29 percent), while Japanese boys' expectations rose from 31 percent to 52 percent (an increase of 21 percent). The gap between girls' and boys' expectations thus shrunk significantly over time in Japan, from almost 17 percent in 1983 to approximately 5 percent in 2003.

These brief insights suggest that, if only in a few countries, girls' rising

expectations are not coming at the expense of boys' lowering expectations (except in the United States). Rather, girls' expectations are rising at a more rapid rate than those of boys. While this trend is interesting and informative, it is beyond the scope of this article to elaborate on causal factors that may have contributed to the faster rate of girls' rising expectations. Future research, however, should investigate this trend in further depth—perhaps examining how changes in parents' attitudes toward sons and daughters and school curricula affect girls' expectations, as Reynolds and Burge (2008) find in the United States. In addition, future research should look at how changes in a country's gender-egalitarian ideologies over time may influence girls' rising expectations.

One final direction for future research to strengthen our understanding of gender gaps in education expectations is to explore additional microlevel factors not addressed here but that the status attainment model outlines as predictors of expectations, such as the impact of significant others, role models, and school performance. For example, parents' and teachers' attitudes could affect gender differences in expectations. Parents serve as critical role models to their children, and the roles of girls' mothers could be extremely influential toward girls' expectations. Teachers could also be very influential, as research shows that they often favor girls in classrooms and think of girls as better in-class citizens and students (Mickelson 1989; Downey and Vogt Yuan 2005). Students may recognize teacher preferences and assume, based on their gender, that they are better or worse students. This perception could influence their achievement expectations. Role models influence students' perceived opportunities and in turn could influence their expectations (Mickelson 1989). Successful female role models, seen in a student's community, country, or media, could also prove important in shaping girls' expectations—if those role models were not previously visible, or if boys do not perceive similar male role models.

Finally, school performance, measured through grades, could also explain females' higher expectations. Because of data limitations, this study controls for current measures of academic ability through standardized test scores, but ideally one would include measures of prior academic ability, such as prior standardized test scores or grades. Regarding standardized test scores, research shows boys have advantages in math and science, while girls have advantages in reading tests in at least 31 industrialized countries (Hedges and Nowell 1995; Marks 2008). In terms of grades, girls outperform boys in all subjects in the United States (Alexander and Eckland 1974; Hedges and Nowell 1995; Downey and Vogt Yuan 2005). Research shows that increasing the opportunities for girls to take the same rigorous courses as boys increases girls' expectations over time. While less is known about gender differences in grades and standardized test scores cross nationally, it is possible that girls'

superior classroom performance is partly responsible for driving up their expectations.

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