# THE SECRET BEHIND COLLEGE COMPLETION

## GIRLS, BOYS, AND THE POWER OF EIGHTH GRADE GRADES

By Thomas A. DiPrete and Claudia Buchmann

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## WHAT'S NEXT?

To see into the future, one needs only to look at eighth grade. If an eighth grader gets As and Bs in school, that student will likely earn a college degree. If that same eighth grader gets only Bs and Cs, college completion is unlikely. That is one of the stunning conclusions from authors Thomas A. DiPrete and Claudia Buchmann in their report on gender, mobility, and college attainment for Third Way's NEXT initiative.

To see into the future, one needs only to look at eighth grade.

In *The Secret Behind College Completion*, Columbia University Professor Thomas A. DiPrete and Ohio State University Professor Claudia Buchmann grapple with one of the central problems affecting upward mobility today—why so many college students fail to graduate. In the course of trying to better understand why, in recent years, women have outpaced men in the completion of college degrees, they uncover a profound correlation: girls do better than boys do in school by eighth grade and "eighth grade grades are a better predictor of completing college than are standardized test scores."

DiPrete and Buchmann explain that the reason eighth grade grades are such strong predictors of college completion is that they are indicators of behavioral patterns, which, learned early in life, tend to persist into high school and college. Children that do more homework, skip fewer days of school, remember to bring their pencils or books to class, and generally stay out of trouble, tend to have higher middle school grades, higher high school grades, and a higher chance of finishing college. Behavioral differences critical to later success in college show up dramatically in the differences between boys and girls. These factors are so powerful that, as DiPrete and Buchmann find, "the social and behavioral skills gap between boys and girls is considerably larger than the gap between children from poor families and middle class families or the gap between black and white children."

This paper, a piece of their longer, important book, *The Rise of Women*, published in 2013, points to the importance of social and behavioral skills in academic success. DiPrete and Buchmann point out that the gap in these skills between girls and boys is evident in kindergarten and widens through fifth grade. They argue that understanding these factors and incorporating them into education policy is both a major challenge and a potential breakthrough for policymakers in the future.

*The Secret Behind College Completion* is the 7th in a series of ahead-of-the-curve, groundbreaking pieces published through Third Way's NEXT initiative. NEXT made up of in-depth, commissioned academic research papers that look at trends that will shape policy over the coming decades. In particular, we are aiming to unpack the

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central domestic policy challenge of the 21st century: how to ensure American middle class prosperity and individual success in an era of ever-intensifying globalization and technological upheaval. It's the defining question of our time, and one that as a country we're far from answering.

Each paper dives into one aspect of middle class prosperity—such as education, retirement, achievement, and the safety net. Our aim is to challenge, and ultimately change, some of the prevailing assumptions that routinely define, and often constrain, Democratic and progressive economic and social policy debates. And by doing that, we'll be able to help push the conversation towards a new, more modern understanding of America's middle class challenges—and spur fresh ideas for a new era.

**Jonathan Cowan**
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# THE SECRET BEHIND COLLEGE COMPLETION

## GIRLS, BOYS, AND THE POWER OF EIGHT GRADE GRADES

We are constantly told that higher education is critical to success in today's economy and yet a very large number of students who start college fail to graduate. Understanding the causal factors behind failure to graduate is critical to crafting policies which will help produce the sophisticated workforce America needs.

One intriguing glimpse into the reasons behind the failure to graduate comes from studies we have done comparing women and men. These studies point to the importance of middle school and the importance of behavioral characteristics in eventual college success.

Women have made substantial gains in all realms of education in recent decades and now generally outperform men on several key benchmarks. In 1970, 58% of college students were men, but by the 1980s, the gender gap in college enrollment favored women, and in 2010 57% of all college students were women. Women are also more likely than men to persist in college, obtain degrees, and enroll in graduate school. The growing female advantage in higher education has attracted the attention of college administrators, policymakers, and the media, and researchers are trying to make sense of this reversal from a male advantage to a female advantage in educational attainment as it has unfolded not only in the United States but also in most industrialized societies.

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From more than a decade of research culminating in our new book *The Rise of Women*,[1] it is clear that earning a college degree has less to do with performance on standardized tests than with grades earned in high school. Students who earn good grades in academically rigorous high school courses are much more likely to obtain a college degree than are poorly performing students. While there is diversity in the academic performance of male and female student populations, on average girls get higher grades than do boys. In the past, girls did not take educational advantage of their superior academic performance by going to college

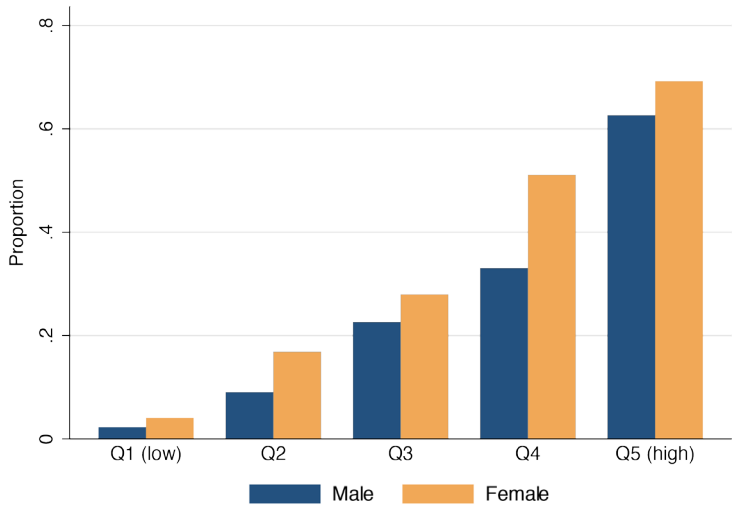
in large numbers, as most Americans believed that the point of an education was simply to make women better wives and mothers. But with declining gender discrimination and rising labor market opportunities for women, their numbers in rigorous high school classes and the ranks of colleges students increased rapidly. Today, girls take more advanced courses in high school and on average perform better than boys in these courses do. Women's superior academic preparation is a major reason behind why they now earn more college degrees than men.

## SUCCESS IN MIDDLE SCHOOL STRONGLY PREDICTS COLLEGE COMPLETION

Some commentators want to address the problem of relatively low male college completion rates by policies that focus on high school and college experiences. This approach ignores two facts well established by our research: (1) girls' academic performance advantage over boys is already well established by eighth grade, and (2) success in middle school is highly predictive of college completion. In fact, eighth grade grades are a better predictor of completing college than are standardized test scores. Figure 1 shows the relationship between scores on the Armed Services Vocational Aptitude Battery (ASVAB), a general test of aptitude, and the chance of completing college by age 25 for a nationally representative sample of adults surveyed in 2009.[2]

Eighth grade grades are a better predictor of completing college than are standardized test scores.

**Figure 1: Probability of Completing BA, by ASVAB Score[3]**




Certainly test scores matter—individuals who score higher on the ASVAB are more likely to get a college degree than those who get lower scores. More than 60% of those in the top score quintile complete a

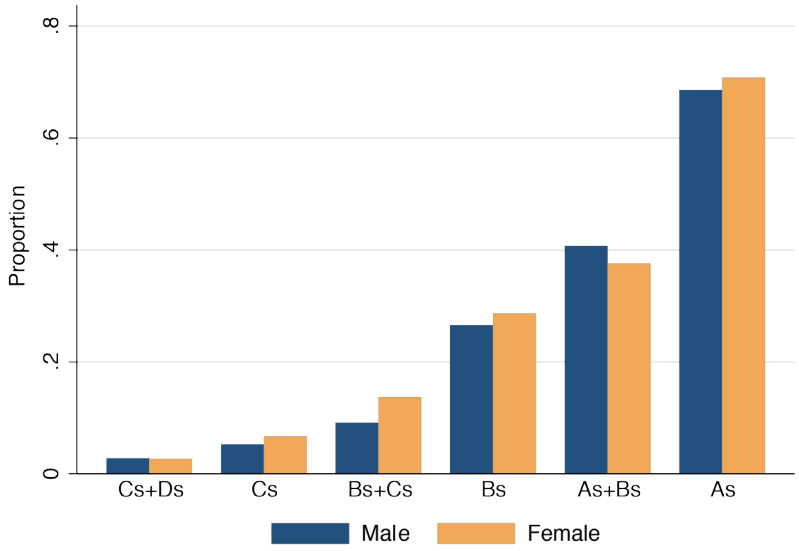
bachelor's degree by age 25, compared to less than 30% of those who score in the middle quintile. But just as striking is the fact that females are more likely to complete college than males at every quintile of this test score distribution. Fifty percent of girls in the second test score quintile completed a college degree compared to only 35% of boys in this quintile. In fact, the fraction of boys in the second test score quintile who complete college is not much higher than the overall fraction of girls who complete college, even though these boys score in the 60th percentile or higher on this aptitude test.

The differences between the test score distributions of boys and girls are relatively small and do not explain the gender gap in college completion. So why is there such a consistent gender gap in completing college after accounting for standardized test scores? The answer to this question is found largely in gender differences in coursework and grades.

Even as early as middle school, course grades have a very strong relationship to four-year college completion. Figure 2 shows that students who get mostly A's in middle school have a nearly 70% chance of completing college by age 25.[4] But those who get mostly B's have only a 30% chance of completing college and less than one in 10 students who get mostly C's in middle school will complete a bachelor's degree by age 25. Some weaker students will complete college at older ages, and this is especially true of boys, who are more likely to delay completing their education. Clearly, however, poor academic performance in middle school heavily disadvantages students who aspire to get a college degree.

Even as early as middle school, course grades have a very strong relationship to four-year college completion.

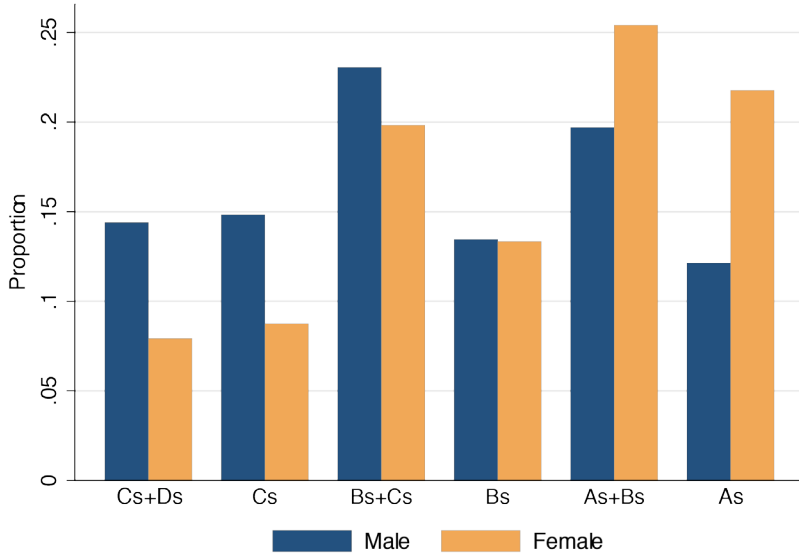
**Figure 2: Proportion who Complete College, by Grades in 8th Grade[5]**



Girls have a big advantage over boys in educational attainment, and this is largely because girls earn higher grades than boys.

Girls have a big advantage over boys in educational attainment, and this is largely because girls earn higher grades than boys. A much higher fraction of girls earned "mostly A's" or "half A's and half B's" than did boys in eighth grade (see Figure 3). In the middle of the performance distribution, the number of boys and girls is comparable, but boys predominate among those who get "mostly C's" or lower. The pattern for middle school grades is also evident for high school grades. This substantial academic performance advantage of girls translates directly into their much higher rates of college completion and educational attainment more generally.

**Figure 3: Distribution of Girls and Boys, by Self-Reported Grades in 8th Grade[6]**

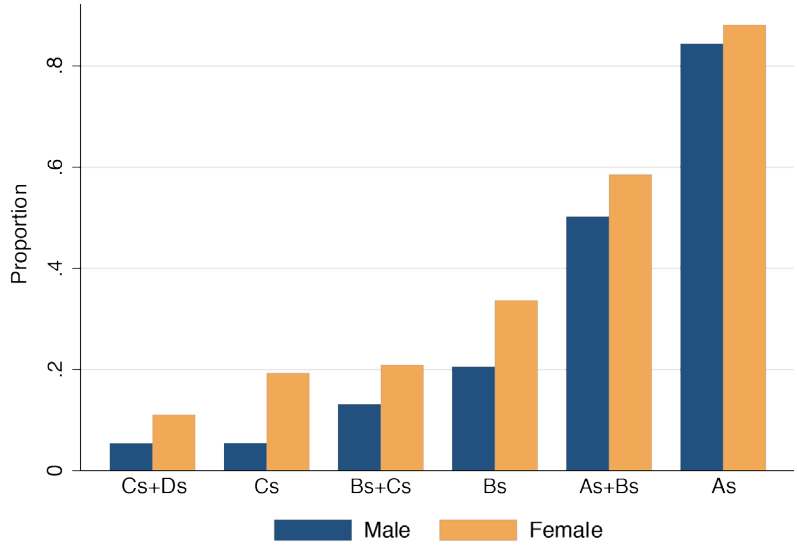



## WHY IS EARLY ACADEMIC PERFORMANCE IMPORTANT?

Why do eighth grade grades so strongly predict college completion? The answer is simple. Later behavior patterns and academic performance build on what is learned earlier in life. Middle school grades predict college success because, not surprisingly, middle school grades predict high school grades. Figure 4 shows the proportion of male and female students who earned "A's and B's" in high school according to their grades in middle school. There is a strong continuity in academic performance. Almost all students who earned A's in middle school earned A's and B's in high school. A smaller fraction of students earning A's and B's in middle school earned A's and B's in high school, and even fewer students who earned B's or lower in middle school manage to reach this threshold. Also evident in Figure 4 is the continued slippage

of boys' performance relative to girls. Not only are boys less likely than girls to earn top grades in middle school, they are also less likely to earn A's and B's in high school than girls are at each level of academic performance in middle school.

**Figure 4: Proportion of Males and Females who earned "A's and B's" in High School, by Grades in 8th Grade[7]**




Of course, grades are not perfect measures of capacity and preparation for college because schools vary in the courses they offer and students vary in the courses they take. High grades in academically demanding courses are better indicators of college readiness than are high grades in less demanding courses. However, even when we account for grades and courses taken in high school, women typically earn higher grades than men in college courses. In short, female students generally outperform male students and this advantage persists over time, even net of earlier performance advantages.[8]

Students who earned higher grades in middle school went on to earn higher grades and attain a better class rank in high school in part because they exhibited behaviors that align with school success and were less likely to engage in behaviors that align with failure.[9] High performing middle school students generally did more homework when they were high school sophomores and seniors. They were more likely to have taken Advanced Placement classes and less likely to have taken remedial high school courses in math or English. As high school students, they were more likely to expect they would get a bachelor's degree and, indeed, they were more likely to enroll in and graduate from college. High performing middle school students were also more likely to avoid problem behaviors that correlate with academic failure.

Later behavior patterns and academic performance build on what is learned earlier in life.

They were less likely to report that they missed school, were late to school, skipped classes, or often forget to bring pencils or books to class. They were also less likely to get in trouble or to be suspended. All of these intermediate behaviors, both positive and negative, are themselves predictive of completing college. And girls typically exhibit more of these better behaviors and have higher academic outcomes than do boys. Their better academic performance in eighth grade is a central reason for all of these better outcomes.

To put it another way, when we do a thought experiment (via statistical simulation) of giving eighth grade boys the grade distribution of eighth grade girls and then follow them through the post-high school years, we find that this substitution closes part of the gender gap on these outcomes, and, ultimately, raises boys' level of college completion closer to that observed for girls by age 25.

## THE GENDER GAP BEGINS BEFORE MIDDLE SCHOOL

The gender gap in academic performance has its origins earlier than middle school. The female advantage in reading tests is about .15 standard deviations at the beginning of kindergarten and declines only slightly through the end of fifth grade.[10] In contrast, kindergarten boys have a slight lead over girls on tests of mathematics at the start of kindergarten, and this gap grows to about .25 standard deviations by the end of third grade, and remains at that size as of fifth grade.

The social and behavioral skills gap between boys and girls is considerably larger than the gap between children from poor families and middle class families or the gap between black and white children.

Importantly, however, elementary school girls lead boys in social and behavioral skills, which include attentiveness, task persistence, eagerness to learn, flexibility, organization, expressing feelings, ideas, and opinions in positive ways, and showing sensitivity to the feelings of others. The gender gap in social and behavioral skills is nearly 0.4 standard deviations at the start of kindergarten. From kindergarten to the end of fifth grade, boys fall further behind girls, lagging by 0.53 standard deviations by the end of fifth grade. In fact, the social and behavioral skills gap between boys and girls is considerably larger than the gap between children from poor families and middle class families or the gap between black and white children. Social and behavioral skills are important because they have a direct impact on academic performance. DiPrete and Jennings[11] estimated that the female advantage in social development at the end of kindergarten accounts for 34% of the female advantage in reading at the end of fifth grade,

and that the male favorable math gap would be 21% larger but for the female advantage in social and behavioral skills.

The same general pattern is found for the ECLS-K* academic rating scales (ARS), which are teachers' ratings of the students' progress in language and literacy, general knowledge in science and social studies, and mathematical thinking. These ratings are designed to measure the products of learning but also "the strategies used to read, solve math problems, or investigate a scientific phenomenon"[12] and to "reflect a broader sampling of the most recent national curriculum standards and guidelines" and a broader curriculum content.[13] In contrast to reading scores, the gender gap in reading ARS scores continues to grow between kindergarten and fifth grade (from 0.22 to 0.32 standard deviations). As with math test scores, the math ARS trend favors boys, though it only brings them from a deficit of 0.15 standard deviations in kindergarten to parity in fifth grade. In other words, as of fifth grade, the gender gap in the academic rating scales for both reading and math is larger than the corresponding gender gap in test scores, and in both instances the larger gap is to the advantage of girls. By the time boys and girls reach middle school, girls have achieved a clear advantage in overall course grades, as described above.

By the time boys and girls reach middle school, girls have achieved a clear advantage in overall course grades.

The reasons behind the gender gap in academic performance are complex, and important research questions remain. The average male deficit in social and behavioral skills is certainly one factor, but other there are other factors. As we show in our book, boys are more negatively affected than girls by growing up in families with absent or less-educated fathers. Boys are also more negatively affected than girls by classrooms that lack a strong learning-oriented environment. Too many adolescent boys underinvest in education due to out-of-date masculine stereotypes that depict academic excellence, attachment to school, and interest in art, music and drama as unmasculine. These stereotypes, in turn, are fueled by boys' failure to understand (or the systems failure effectively to communicate) the strong connection between effort in school and later success in the labor market. While the causes are complex, our results contain a straightforward conclusion: because boys' academic deficit is well established by middle school, reforms targeting the early and middle school years offer the greatest potential for closing the gender gap in college completion.

* Early Child Longitudinal Study - Kindergarten Class of 1998-99

## ABOUT THE AUTHORS

**Thomas A. DiPrete** is Giddings Professor of Sociology, co-director of the Center for the Study of Wealth and Inequality at Columbia University, and a faculty member of the Columbia Population Research Center. DiPrete holds a B.S. degree from the Massachusetts Institute of Technology, and a Ph.D. from Columbia University. He has been on the faculty of the University of Chicago, Duke University, and the University of Wisconsin–Madison as well as Columbia. DiPrete's research interests include social stratification, demography, education, economic sociology, and quantitative methodology.

A specialist in comparative research, DiPrete has held research appointments at the Max Planck Institute for Human Development in Berlin, the Social Science Research Center – Berlin, the German Institute for Economic Research in Berlin, the VU University Amsterdam, the Netherlands Institute for Advanced Study in the Humanities and Social Sciences, and the University of Amsterdam. In addition to his research on gender and education, his recent and ongoing projects include an investigation into the extent of segregation in Americans' social networks along dimensions of class, race, religion, and political ideology, a study of the causes of rising pay for corporate executives, and a comparative study of how educational expansion and the structure of linkages between education and the labor market contribute to earnings inequality in several industrialized countries.

**Claudia Buchmann** is professor and director of Graduate Studies in the Department of Sociology at the Ohio State University. She holds a B.A. from the University of Wisconsin, and a Ph.D. from Indiana University. She and Thomas A. DiPrete recently coauthored of *The Rise of Women: The Growing Gender Gap in Education and What it Means for American Schools* (2013, Russell Sage Foundation). Her research on gender, race and class inequalities in higher education has been published in many journals and books.

In addition researching gender inequalities in education, she has investigated race and class inequalities in access to SAT test preparation and their impact on subsequent college admission and achievement gaps between immigrant and native-born students in industrialized countries. Buchmann has served as deputy editor of the *American Sociological Review* and as chair of the Sociology of Education Section of the American Sociological Association. She earned her M.A and Ph.D. degrees from Indiana University. She taught at Duke University before moving to the Ohio State University in 2004.

## ENDNOTES

1 Claudia Buchmann and Thomas A. DiPrete, "The Growing Female Advantage in College Completion: The Role of Family Background and Academic Achievement," *American Sociological Review*, 2006, Vol. 71, pp. 515–541. Available at: http://asr.sagepub.com/content/71/4/515.abstract; See also Thomas A. DiPrete and Claudia Buchmann, "Gender Specific Trends in the Value of Education and the Emerging Gender Gap in College Completion," *Demography*, 2006, Vol. Vol. 43, pp.1-24. Available at: http://www.columbia.edu/~tad61/demog100205.pdf; See also Claudia Buchmann, Thomas A. DiPrete, and Anne McDaniel, "Gender Inequalities in Education," *Annual Review of Sociology*, 2008, Vol. 34, pp. 319-37. Available at: http://www.annualreviews.org/doi/abs/10.1146/annurev.soc.34.040507.134719; See also Anne McDaniel, Thomas A. DiPrete, Claudia Buchmann, and Uri Shwed, "The Black Gender Gap in Educational Attainment: Historical Trends and Racial Comparisons," *Demography 2011*, 2012, Vol. 48, pp. 889-914. Available at: http://www.columbia.edu/~tad61/Race%20Paper%2009232009.pdf; See also Joscha Legewie and Thomas A. DiPrete. "School Context and the Gender Gap in Educational Achievement," *American Sociological Review*, 2012, Vol. 77, pp. 463–485 Available at: http://asr.sagepub.com/content/early/2012/04/03/0003122412440802.abstract; See also Thomas A. DiPrete and Jennifer Jennings, "Social/Behavioral Skills and the Gender Gap in Early Educational Achievement," Social Science Research, 2013, Vol. 41, pp. 1-15. Available at: http://www.columbia.edu/~tad61/gender_social02232009.pdf; See also Allison Mann and Thomas A. DiPrete, "Trends in Gender Segregation in the Choice of Science and Engineering Majors," Social Science Research, Vol. 42, pp.1519-1541. Available at: http://www.sciencedirect.com/science/article/pii/S0049089X13001051; See also Thomas A. DiPrete and Claudia Buchmann, *The Rise of Women: The Growing Gender Gap in Education and What it Means for American Schools*, Russell Sage Foundation, 2013, Print.; See also Joscha Legewie and Thomas A. DiPrete, "Pathways to Science and Engineering Bachelor Degrees for Men and Women," Sociological Science, 2014, Vol. 1, pp. 41-48. Available at: http://www.sociologicalscience.com/pathways-science-engineering-bachelors-degrees-men-women/.

2 All members of the NLSY97 cohort were given the armed services vocational aptitude battery of tests (ASVAB) in the 1997 survey, when they were 12 to 17 years old. The ASVAB is a military enlistment test battery that has been used as a general test of aptitude or cognitive ability in many studies.

3 Figure 1 is based on data from the National Longitudinal Survey of Youth, 1997. Available at: http://www.bls.gov/nls/nlsy97.htm.

4 Based on self-reported grades, which closely approximate grades on transcripts. In the Add Health study for example, self-reported grades correlated around 0.7 with transcript grades. See Sean Kelly, "What Types of Students' Effort Are Rewarded with High Marks?" *Sociology of Education*, 2008, Vol. 81, pp. 32-52. Available at: http://soe.sagepub.com/content/81/1/32.short.

5 Figure 2 is based on data from the National Longitudinal Survey of Youth, 1997.

6 Figure 3 is based on data from the National Longitudinal Survey of Youth, 1997.

7 Figure 4 is based on data from the National Longitudinal Survey of Youth, 1997.

8 See Buchmann and DiPrete, "The Growing Female Advantage in College Completion"; See also William G. Bowen, Matthew M. Chingos, and Michael S. McPherson, *Crossing the Finish Line: Completing College at America's Public Universities*, Princeton University Press, 2009, Print, found the same gender pattern in their analysis of student performance at "flagship" state universities. See Stephen Machin and Sandra McNally, "Gender and student achievement in English schools" *Oxford Review of Economic Policy*, 2005, Vol. 21, pp. 357. Available at: http://oxrep.oxfordjournals.org/content/21/3/357.short, found a similar pattern in the UK. The gender gap in secondary school performance widens and cannot be fully explained by the gender gap at age 11. It is important to remember that we are speaking about averages and that academic performance for both males and females varies widely. High performing boys do as well as high performing girls in school. On average, however, the performance gap between girls and boys continues to grow over the educational life course.

9 The results reported in the remainder of this section are drawn from the authors' analysis of the National Education Longitudinal Study of 1988. Available at: https://nces.ed.gov/surveys/nels88/.

10 The results reported in this section are drawn from analysis of the Early Child Longitudinal Survey – Kindergarten Class of 1998-99. Available at: http://nces.ed.gov/ecls/kindergarten.asp.

11 "Social/Behavioral Skills and the Gender Gap in Early Educational Achievement."

12 United States, Department of Education, "ECLS-K Base Year Data Files and Electronic Codebook," Westat and Educational Testing Service, 1998. Available at: http://users.nber.org/~kling/surveys/Userguide.pdf.

13 Ibid, p. 3-15.