

A Middle School Drop: Consistent Gender Differences in Students' Self-Efficacy

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Academic self-efficacy is a student's belief in their ability to perform within a school environment. Prior research shows that students experience a drop in academic self-efficacy during middle school that is particularly steep for female students and results in lower self-efficacy for girls than boys throughout middle and high school. In this brief, we probe whether this pattern is consistent across student groups defined by demographics, achievement level, and school of attendance. We find unusual consistency: while non-white, low-achieving, and poor students show somewhat lower self-efficacy than other students, the differential drop in middle school is essentially universal across student groups. Similarly, while schools vary meaningfully in their students' level of self-efficacy, they also do not differ much in this trend.

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Introduction

Academic self-efficacy refers to confidence in one's ability to do well on academic tasks. Efficacious individuals take on a challenge, such as earning an A in their classes, with sustained effort; they understand how to achieve their goals and believe they can overcome obstacles. Individuals with low self-efficacy may not commit as fully to completing challenges, making them susceptible to setbacks or to simply avoiding the challenge. Empirical evidence supports the hypothesis that academic self-efficacy contributes to learning. Positive academic self-beliefs predict positive academic outcomes.¹ Teachers and families are often encouraged to use various strategies to increase students' sense of academic confidence.²

Disparities across groups in academic self-efficacy are, therefore, worth identifying and addressing. Prior research points particularly to gender differences in self-efficacy. Most research in this area has found gender differences in student confidence in specific subjects, such as math, where gender-stereotypical beliefs that boys are better at the subject than girls are common.³ Very few studies have analyzed gender differences in broader academic attitudes, such as the belief that one has the ability to succeed in school overall. One exception is an early study using data from the California CORE districts that examined trends in students' social-emotional skills across grade levels.⁴ This study⁵ showed that female students report significantly higher self-efficacy in elementary school than do males. However, in middle school, students' self-efficacy declines for both genders; with a substantially greater drop for females, leading to significantly lower levels of reported self-efficacy for females than males from middle school onward.

The middle school drop in self-efficacy and lower self-efficacy for females throughout high school may have negative consequences for both female experiences in school and their later life outcomes. By better understanding which female students are experiencing these drops and whether the changes are concentrated in some subgroups or contexts, we can better understand how to address low self-efficacy. Without identifying whether these trends are similar across student demographic groups (such as race/ethnicity or socioeconomic status), programmatic efforts that attempt to foster such beliefs may target a population for which these trends do not hold and miss the populations most in need. Similarly, without identifying which school contexts exacerbate and which mitigate the drops in self-efficacy, we may have difficulty identifying productive approaches.

This brief addresses the question of whether gender disparities in self-efficacy vary among student populations and school environments. Our analyses use data from five of the California CORE districts⁶ which received a waiver granting exemption from constraints placed by the federal No Child Left Behind Act in order to build an accountability system that incorporates measures of social-emotional learning (SEL). Their collaboration resulted in the implementation of a novel student survey that systematically measures students' self-efficacy, self-management, growth mindset, and social awareness. We use SEL survey responses from 2014-15 onward and link them to student and school characteristics. These data include student demographics such as race, gender, and socioeconomic status, as well as responses to school culture and climate surveys by students.

We demonstrate a gender gap in self-efficacy across grades and describe its relationship to various student characteristics. We use data for nearly 800,000 third through 12th grade students in 813 schools to describe gender differences in general academic self-efficacy, how they vary among demographic subgroups (income and race/ethnicity), and how they change as students matriculate from third to 12th grade. We further explore whether gender disparities in self-efficacy are related to school culture and climate and whether this measure of self-efficacy is associated with academic success.

Measuring Self Efficacy

Academic self-efficacy is measured using students' survey responses to the following items:⁷

How confident are you about the following at school?

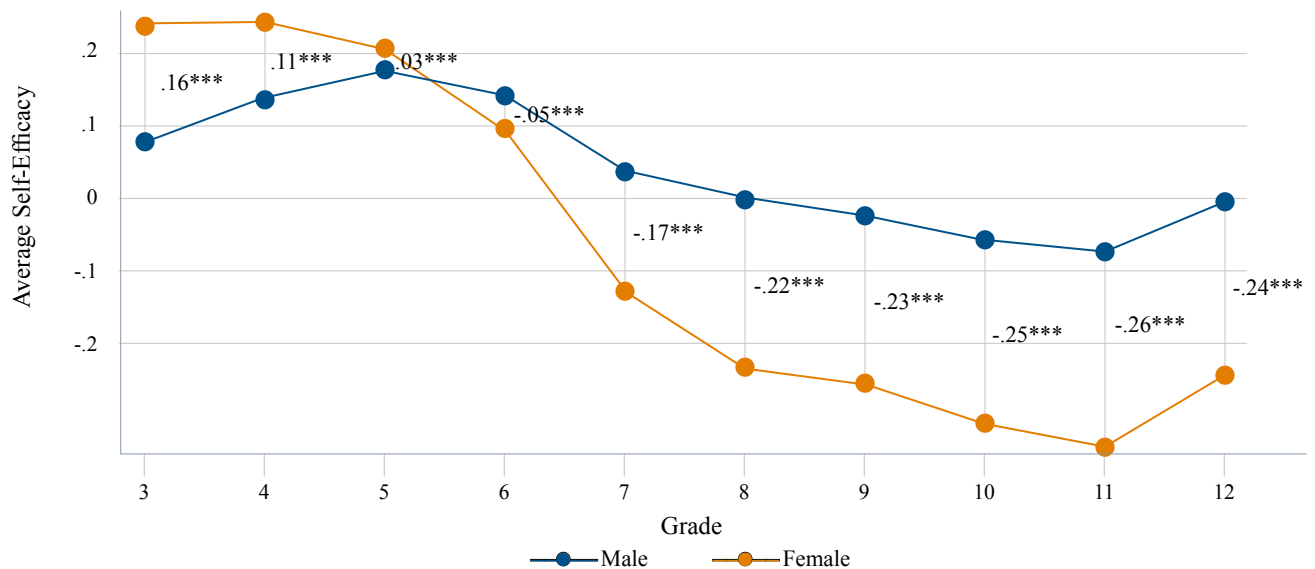
1. I can earn an A in my classes.
2. I can do well on all my tests, even when they're difficult.
3. I can master the hardest topics in my classes.
4. I can meet all the learning goals my teachers set.

(Not At All Confident, A Little Confident, Somewhat Confident, Mostly Confident, Completely Confident)

Decline in Female Students' Self-Efficacy Consistent Regardless of Background

Self-efficacy is at its highest in elementary school, drops rapidly in middle school, and levels off in high school (Figure 1). Up until fifth grade, female students report higher average self-efficacy than male students, although all students report higher than average self-efficacy. Starting in sixth grade, this gap reverses: male students report higher average self-efficacy than female students. This female-male efficacy gap then widens rapidly throughout middle school and levels off in high school. Male students report about .25 standard deviations (SD) higher self-efficacy than females, although both male and female students report lower average self-efficacy than they did in elementary school. A 1 SD difference is approximately the difference between each response category or confidence level, (e.g., the difference between being somewhat confident and mostly confident).

Figure 1. Changes in Female-Male Self-Efficacy Gaps Over Grades



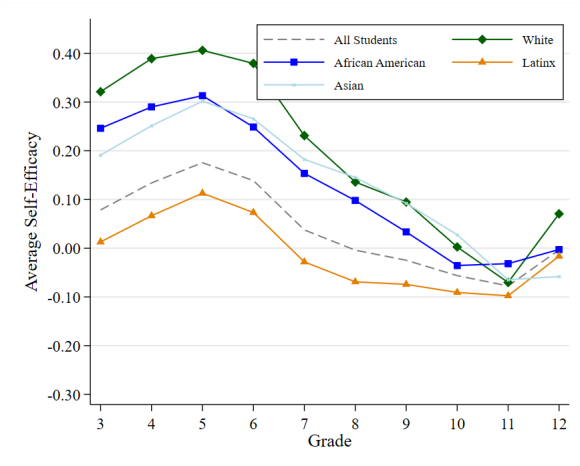
Note: The vertical lines and values on the graph show the female-male differences in self-efficacy; the corresponding asterisks represent the statistical significance of the differences: * $p < .05$, ** $p < .01$, *** $p < .001$.

Average levels of self-efficacy vary dramatically among racial/ethnic and economic subgroups (Figure 2). White students report the highest average levels of self-efficacy, followed by African American and Asian students. Latinx students report markedly lower self-efficacy than all other racial/ethnic groups. Higher-income students (those ineligible to receive free/reduced lunch) also have higher self-efficacy than lower-income students (those eligible to receive free/reduced lunch). These findings align with prior research showing that students who have had fewer educational opportunities—and therefore fewer chances to succeed in school—have lower self-efficacy and self-esteem.⁸

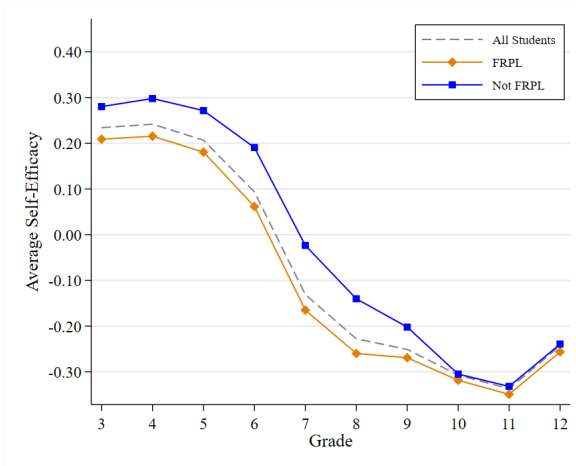
Despite the large differences between groups in average self-efficacy, within all groups female self-efficacy drops relative to males at a similar rate, suggesting that this effect is consistent for girls of all backgrounds (Figure 2, Panels E and F). Among all subgroups, the gap is female-favoring in early grades indicating female students have higher academic self-efficacy, quickly changes to favor male students by sixth grade, and levels off in high school with male students reporting self-efficacy that is .2 to .3 SDs (or levels of confidence) higher than females. Low-income and Latinx young women are disproportionately disadvantaged by this pattern; of all groups studied, these two report the lowest self-efficacy.

Figure 2. Changes in Average Male Self-Efficacy and Female-Male Self-Efficacy Gaps Over Grades by Demographic Subgroup

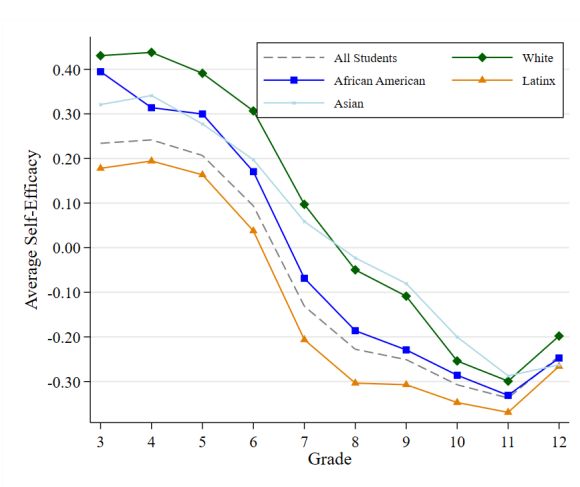
A. Average Male Self-Efficacy by Race



B. Average Male Self-Efficacy by FRPL Status



C. Average Female Self-Efficacy by Race



D. Average Female Self-Efficacy by FRPL Status

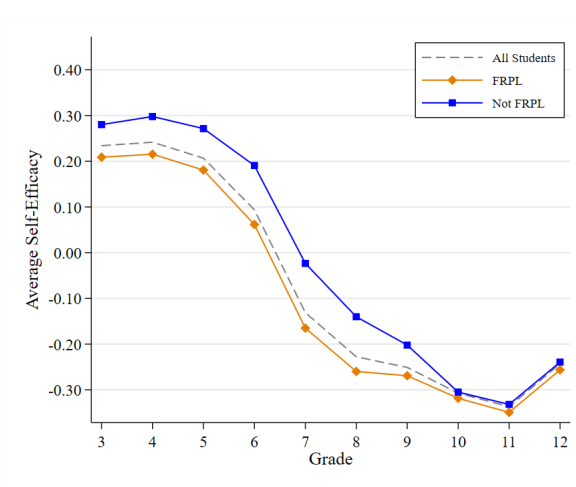
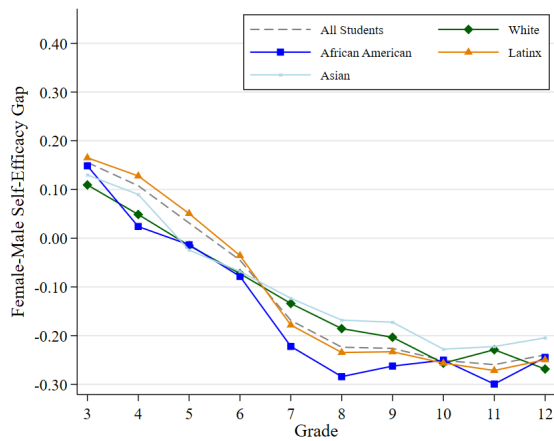
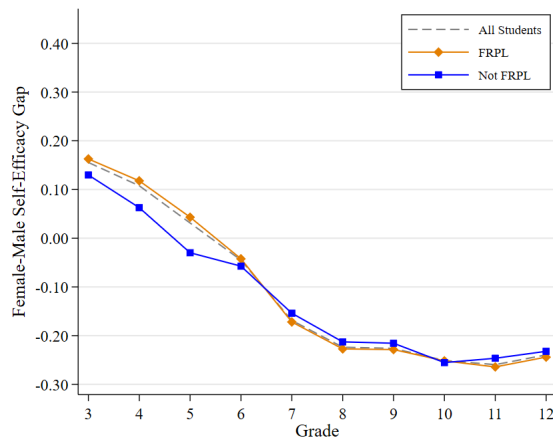


Figure 2. Changes in Average Male Self-Efficacy and Female-Male Self-Efficacy Gaps Over Grades by Demographic Subgroup, continued

E. Average Female-Male Self-Efficacy Gap by Race



F. Average Female-Male Self-Efficacy Gap by FPL Status



Rapid Declines in Female Self-Efficacy Persist Across School Contexts

We find that students' average self-efficacy differs among schools, suggesting that school-level factors may contribute to students' average self-efficacy. We find average self-efficacy is higher in schools with more supportive academic learning climates, in schools where students report a higher sense of belonging, and in schools where students perceive discipline is fair. The associations of self-efficacy with supportive learning climates and perceptions of fair discipline are slightly more pronounced for female students relative to male students; however, these factors explain only a very little of the variance in average self-efficacy among schools. School demographics are more strongly related to the average levels of self-efficacy reported by students, suggesting that racial/ethnic and economic student sorting between schools can partially explain the variability in school average self-efficacy and trends.

While self-efficacy varies substantially across schools, the drop during middle school, especially for girls, does not. This pattern is evident across most schools and suggests that the forces causing this drop are pervasive across contexts. This finding does not, however, imply that school practices could not reduce the gap. Research has suggested a series of school-level practices that may support social-emotional learning, including fostering a positive school climate and student-school relationships, supporting positive behavior, and integrating SEL activities into curricula.⁹ Targeting these practices toward female students may be a fruitful step in reducing gaps.

Higher Achieving Students Feel More Efficacious

Prior mastery experience is important in students' development of academic self-efficacy.¹⁰ We see this relationship reflected when looking at the trends in average self-efficacy by prior achievement (high scoring, mid-scoring, and low scoring).

High-scoring students have the highest average self-efficacy, followed by mid-scoring students, and then low-scoring students. However, there (again) are striking similarities in the trend in female-male efficacy gaps over grades with females initially reporting higher self-efficacy in Grades 4 and 5, but lower self-efficacy starting in sixth grade. The rate of decline of female self-efficacy is similar across all three prior achievement groups.

We further show that students who experience a positive change in test scores also experience a positive change in self-efficacy during the same time period. This association is stronger in later grades and similar for both male and female students. Even though our research does not show that changes in achievement *cause* changes in self-efficacy, this correlation implies self-efficacy and academic performance are tied together and may function to reinforce one another, particularly in later grades.

Figure 3. Changes in Average Male Self-Efficacy and Female-Male Self-Efficacy Gaps Over Grades by Prior Achievement

A. Average Male Self-Efficacy by Prior Scores

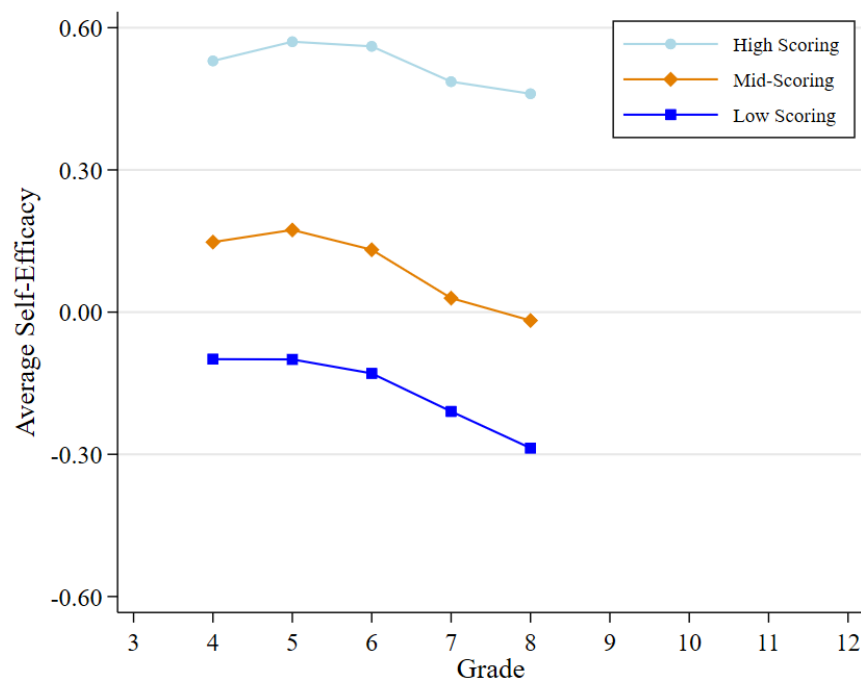
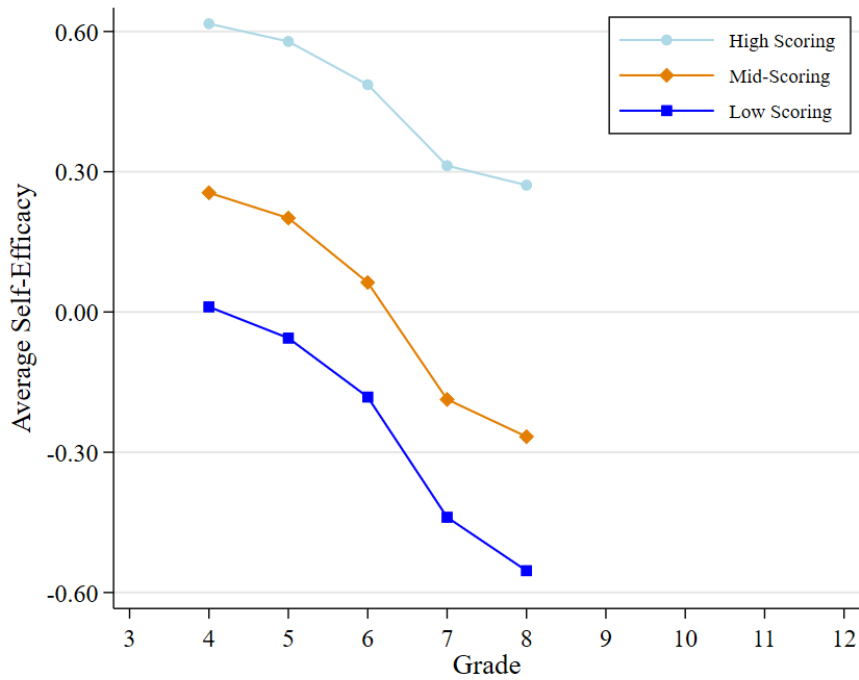
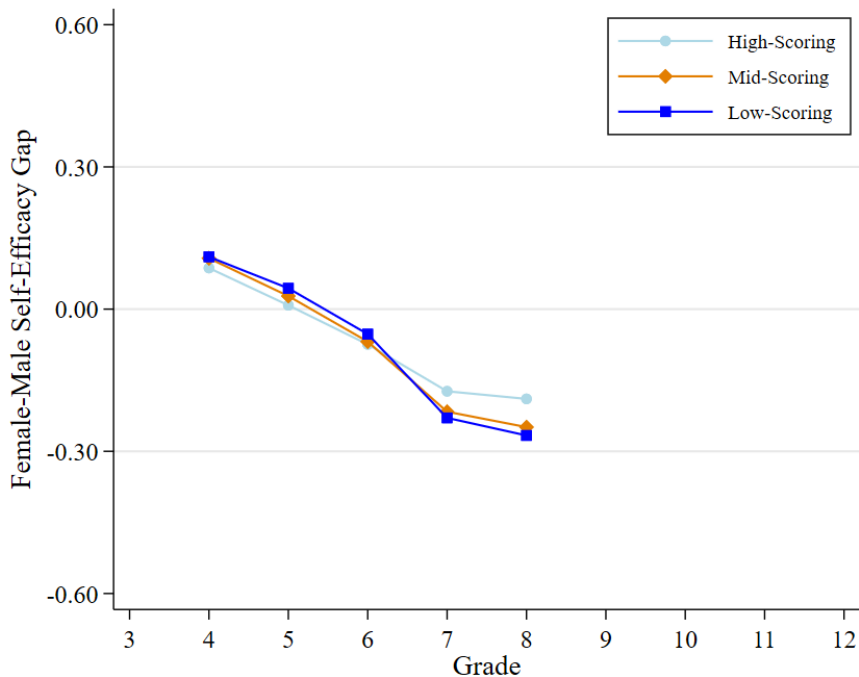


Figure 3. Changes in Average Male Self-Efficacy and Female-Male Self-Efficacy Gaps Over Grades by Prior Achievement, continued

B. Average Female Self-Efficacy by Prior Scores



C. Average Female-Male Self-Efficacy Gap by Prior Scores



Conclusion and Implications

Self-efficacy has both the potential to shield students from setbacks and to bolster them to tackle hard challenges. We find consistent evidence that self-efficacy declines rapidly during middle school for everyone, but particularly for female students. This dynamic leads to a male-favoring self-efficacy gap in middle school and high school. While we observe that historically marginalized students (minority, low-income, and low achieving students) report lower levels of average self-efficacy, the self-efficacy gap between male and female secondary school students is universal across subgroups and school contexts. The stability of this gender disparity pattern suggests that there exist driving forces that are pervasive across diverse student populations and school settings.

Closing gaps in access to educational opportunities may help to close the large self-efficacy gaps between racial/ethnic and economic subgroups by providing these students the resources and support needed to succeed in school and build their academic confidence. However, male and female students, on average, have similar access to educational resources, indicating that differences in access to educational resources likely is not a driving force of the consistent self-efficacy gap we observe. Instead, we need to consider gender differences *within* students' academic experiences that persist across different contexts and for students of different backgrounds.

Research provides evidence both that female and male students are treated differently in classrooms¹¹ and that they tend to evaluate themselves differently given feedback.¹² These findings suggest that teachers and schools may benefit from thinking critically about the experiences that students have within classrooms. For example, qualitative research shows that feedback and encouragement from family members and teachers may play an important role in building female students' self-efficacy; in particular, female students were responsive to how others perceived and described their abilities.¹³ Ensuring that female students receive positive messaging about their abilities and are provided positive, constructive feedback in classroom environments may be a first step to closing these persistent gaps.

As policymakers consider the use of self-efficacy or other social-emotional learning measures for school accountability, it is important to take these results into consideration. Self-efficacy does vary across school contexts; however, student background explains more of that variation than the school factors explored in this work. Without a better understanding of the steps that schools can take to build their students' academic confidence, it would be premature to hold them responsible for their students' self-efficacy.

Author Biographies

Erin M. Fahle, PhD, is an Assistant Professor in the School of Education at St. John's University. Her research highlights and explains systemic gender, racial, and economic inequalities in educational opportunity using applied statistical methods.

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Endnotes

- ¹ Multon, K. D., Brown, S. D., & Lent, R. W. (1991). Relation of self-efficacy beliefs to academic outcomes: A meta-analytic investigation. *Journal of Counseling Psychology*, 38(1), 30–38. <http://dx.doi.org/10.1037/0022-0167.38.1.30>
- ² Usable Knowledge. (Sept. 2018). *Building a culture of self-efficacy*. Posted September 21, 2018. Retrieved from Harvard University Graduate School of Education website: <https://www.gse.harvard.edu/news/uk/18/09/building-culture-self-efficacy>.
- ³ Pajares, F. (2005). Gender differences in mathematics: Self-efficacy beliefs. In A. M. Gallagher & J. C. Kaufman (Eds.), *Gender differences in mathematics: An integrative psychological approach* (pp. 294–315). New York, NY: Cambridge University Press. doi.org/10.1017/CBO9780511614446.015
- ⁴ West, M. R., Pier, L., Fricke, H., Hough, H., Loeb, S., Meyer, R. H., & Rice, A. B. (2018). *Trends in student learning: evidence from the CORE districts*. Working Paper. Policy Analysis for California Education. Stanford, CA. Available at <https://edpolicyinca.org/publications/sel-trends>
- ⁵ This brief is based on a PACE working paper, which can be found here: <https://edpolicyinca.org/publications/gender-differences-students-self-efficacy>
- ⁶ The CORE districts include Fresno, Long Beach, Los Angeles, San Francisco, and Santa Ana Unified School Districts.
- ⁷ CORE Districts. (nd) *Improvement measures: student social-emotional learning*. Retrieved from <https://coredistricts.org/our-data-research/improvement-measures/>
- ⁸ Pajares, F., & Kranzler, J. (1995). Self-efficacy beliefs and general mental ability in mathematics. *Contemporary Educational Psychology*, 20(4), 426–443. doi.org/10.1006/ceps.1995.1029;
Bolger, K. E., Patterson, C. J., Thompson, W. W., & Kupersmidt, J. B. (1995). Psychosocial adjustment among children experiencing persistent and intermittent family economic hardship. *Child Development* 66(4), 1107-1129. <https://doi.org/10.1111/j.1467-8624.1995.tb00926.x>
- ⁹ Allbright, T. N., Marsh, J. A., Kennedy, K. E., Hough, H. J., & McKibben, S. (2019). Social-emotional learning practices: insights from outlier schools. *Journal of Research in Innovative Teaching & Learning*, 12(1), 35- 52. doi.org/10.1108/JRIT-02-2019-0020
- ¹⁰ Bandura, A. (1977). Self-efficacy: Toward a unifying theory of behavioral change. *Psychological Review*, 84(2), 191–215. <https://doi.org/10.1037/0033-295X.84.2.191>
- ¹¹ Jones, S. M., & Dindia, K. (2004). A meta-analytic perspective on sex equity in the classroom. *Review of Educational Research*, 74(4), 443–471. <https://doi.org/10.3102/00346543074004443>
- ¹² Pomerantz, E. M., Altermatt, E. R., & Saxon, J. L. (2002). Making the grade but feeling distressed: Gender differences in academic performance and internal distress. *Journal of Educational Psychology*, 94(2), 396-404. <http://dx.doi.org/10.1037/0022-0663.94.2.396>.
- ¹³ Zeldin, A. L. & Pajares, F. (2000). Against the odds: Self-efficacy beliefs of women in mathematics, scientific, and technological careers. *American Educational Research Journal*, 37(1), 215-246. [doi: 10.2307/1163477](https://doi.org/10.2307/1163477)

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Related Publications

Robert Meyer, Libby Pier, Jordan Mader, Michal Christian, Andrew Rice, Susanna Loeb, Hans Fricke, Heather Hough. *Can We Measure Classroom Supports for Social-Emotional Learning?* October 2019.

Hunter Gehlbach, Heather Hough. *Measuring Social Emotional Learning Through Student Surveys in the CORE Districts: A Pragmatic Approach to Validity and Reliability*. Policy Analysis for California Education. May 2019.

Martin R. West, Libby Pier, Hans Fricke, Heather Hough, Susanna Loeb, Robert H. Meyer, Andrew B. Rice. *Trends in Student Social Emotional Learning: Evidence from the CORE Districts*. Policy Analysis for California Education. April 2018.

Julie A. Marsh, Susan McKibben, Heather Hough, Michelle Hall, Taylor N. Allbright, Ananya M. Matewos, Caetano Siqueira. *Enacting Social-Emotional Learning: Practices and Supports Employed in CORE Districts and Schools*. Policy Analysis for California Education. April 2018.



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