

January 2013

JOHN W. GARDNER CENTER for Youth and Their Communities

Academic Demands and Student Achievement: A View From Middle School Classrooms in Redwood City, CA

Graciela N. Borsato and Karen Strobel

Each spring since 2009, the John W. Gardner Center for Youth and their Communities (Gardner Center) surveys middle school students in the Redwood City School District (RCSD). These students complete our Youth Development Survey about their motivational beliefs and their classroom experiences. Results consistently show that students' motivational beliefs are critical precursors to their academic achievement. Moreover, our analyses have identified classroom practices associated with increases in students' motivation to learn. Specifically, caring classroom practices and practices that encourage effort and understanding are connected with more positive motivational beliefs, which in turn predict higher achievement.

In this brief, we report results from the 2012 survey focusing on two kinds of classroom practices that place different (albeit not mutually exclusive) academic demands on students: practices with an **emphasis on getting good grades and high test scores** (where the focus is on performance outcomes) on the one hand, and practices that **press students to embrace academic challenge** (where the focus is on deep learning and understanding) on the other. How are these practices related to student achievement in math¹?

In this brief, we highlight four main findings:

1. Practices that **put emphasis on grades/test scores** are not significantly related to math achievement.
2. Practices that **press students to embrace academic challenge** are associated with high math achievement.
3. When the two kinds of practices are considered together, the combination of high **press for academic challenge** and low **emphasis on grades/test scores** is associated with high math achievement.
4. Practices that **press students for academic challenge** are more prevalent in higher-achieving than in lower-achieving classrooms.

¹ Even though our survey focused on math classrooms, previous research in the field of academic motivation strongly suggests that results apply to all school subjects.

Guiding Framework

These analyses are grounded in theory and research that highlight the importance of the kind of *learning goals* communicated in the classroom (see Meece, Anderman & Anderman, 2006 for a review). Teachers' everyday practices convey the purpose of learning as well as expectations for individual students' performance and capacity to improve (Ames, 1992).

In *classrooms that stress goals for demonstrating competence and outperforming others*, students are more likely to take short cuts and feel motivated to perform, but not necessarily learn and comprehend. Indeed, students who are overly focused on getting high grades are more likely to use surface-level learning strategies such as memorizing and rehearsing which can help them answer questions on a test in the short term, but will not help them truly understand the material in the long term (Elliot & Harackiewicz, 1996).

In contrast to the pressure to earn high grades, *practices that press students to embrace academic challenge* communicate that the goal of learning is to work hard to pursue new knowledge and to master new ideas and skills. Perceptions of press to embrace challenge in the classroom are usually associated with student use of effective learning strategies and enhanced academic motivation and long-term success (Middleton & Midgley, 2002).

The Study

RCSD serves approximately 2,500 students in grades 6 through 8 each year. Approximately 70% of the district population is of Latino background, 20% is White, and 9% represents other races or ethnicities. In the set of analyses reported in this document, we focused on the 1,907 Latino and White students who took the survey in 2012 and who had complete survey and school records. Seventy-four percent of the students in the sample were Latino and 63% participated in the Free and Reduced Price Lunch (FRPL) program. Students represented all eight schools that serve middle school students in a total of 93 classrooms.

The survey includes items that ask students to rate different aspects of their math classrooms on a scale from 1 to 6 where 1 is *very untrue* and 6 is *very true*.²

² Our survey relies heavily on the work of Carol Midgley and her colleagues (2000) who designed and validated the scales that we use.

To measure **emphasis on grades and test scores**, we averaged students' responses to the following three items:

- In this class, getting good grades is the main goal.
- In this class, getting right answers is very important.
- In this class, it's important to get high scores on tests.

To measure **press for academic challenge**, we averaged students' responses to the following four items:

- When I've figured out how to do a problem, my teacher gives me more challenging problems to think about.
- In this class, my teacher asks me to explain how I get my answers.
- In this class, my teacher does not let me do just easy work.
- In this class, my teacher makes sure that the work I do really makes me think.

We measured achievement using the California Standards Test (CST) for math. We linked students' survey responses to their school records using the Gardner Center's Youth Data Archive.³ Analyses included math CST scores from both 2011 and 2012. Starting in seventh grade students take different math courses (e.g., general math, algebra, etc.), each with its own end-of-course examination. Since CST scale scores are not directly comparable across different course-specific tests, we converted scale scores from each CST to a standardized score with a mean of zero and a standard deviation of one prior to performing the statistical analyses.

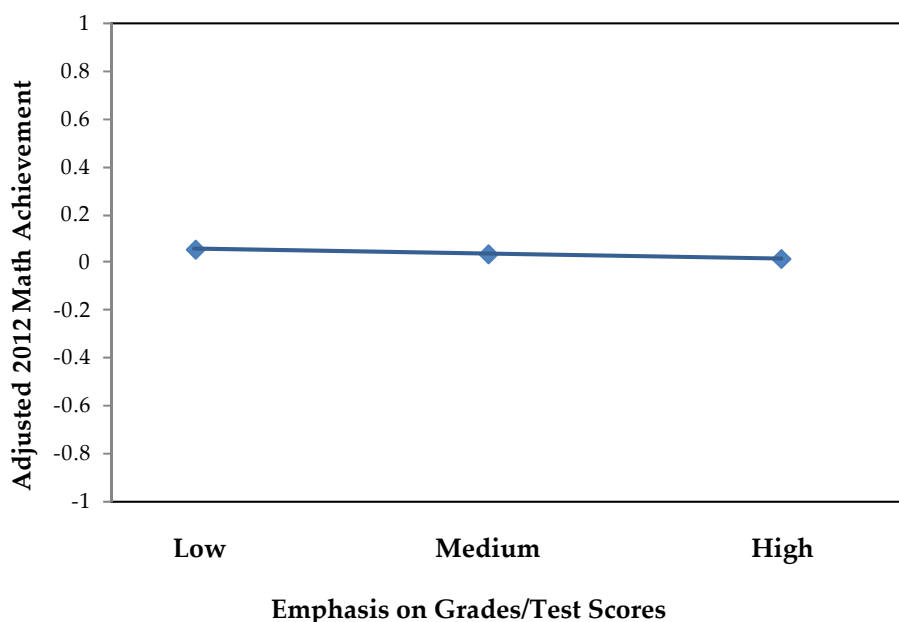
Analyses took into account students' gender, race/ethnicity, grade level, and participation in the FRPL program as well as prior achievement and prior motivation to learn. Past research has indicated that each of these factors is related to student achievement on standardized tests. By statistically controlling for all of them, we are able to identify the unique contribution of the target classroom practices to the prediction of CST scores. We used hierarchical linear modeling (HLM) to conduct the analyses. HLM is a statistical approach that takes into account the nested nature of the data (information about both individual students and the math classrooms they attend).

³ The Youth Data Archive (YDA) links data across schools, public agencies, and community based organizations to answer key questions about youth. Participating agencies collectively identify shared questions that no single agency can answer alone.

Findings

Emphasis on grades/test scores is not significantly related to 2012 math CST scores, after taking into account demographic characteristics and prior motivation and achievement. The nearly straight line in Figure 1 reflects the absence of a significant relationship between classroom practices that emphasize performance and student achievement in the context of Redwood City middle school classrooms.

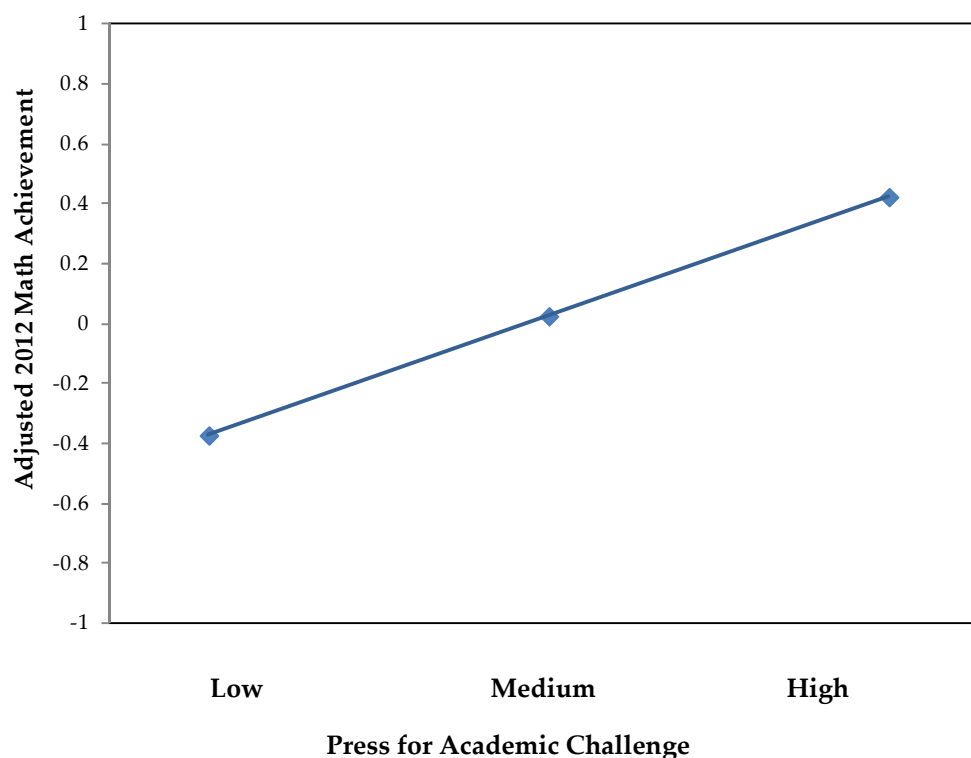
**Figure 1. Student achievement in the 2012 math CST test
based on perceived classroom emphasis on grades/test scores**



On the other hand, we found a *significant and positive relationship between perceived press for academic challenge and 2012 math CST scores*, even after taking into account demographic characteristics and prior motivation and achievement. Figure 2 depicts a graphic representation of this relationship.

To illustrate, take the case of a 7th grade student who attended a math class rated by students in that class as 4.12 (on a scale from 1 to 6) with regard to press for academic challenge and who scored 335 on the CST 7th-grade math test. This score approximately placed the student in the district's 33rd percentile with a proficiency level of "Basic." If that same student had been in a math class rated as 5.13 with regard to press for academic challenge, the student would have scored in the 43rd percentile instead, moving her up to the "Proficient" category. Even though not all percentile increases will result in a change in proficiency level, this example illustrates how practices that press for academic challenge can potentially shape student achievement.

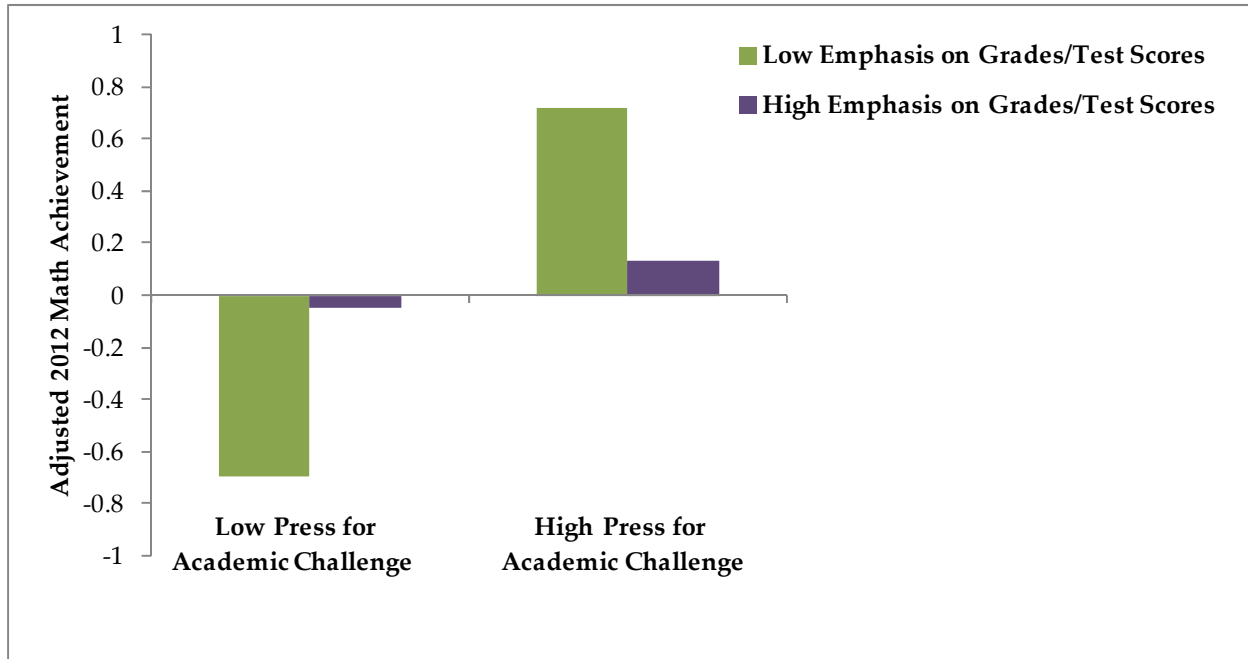
Figure 2. Student achievement in the 2012 math CST test
based on perceived press for academic challenge



Finally, when running a statistical model that included *both* **emphasis on grades/test scores** and **press for academic challenge** as classroom-level predictors of 2012 math achievement, we found that students scored lowest on the CST test when both kinds of academic demands were rated as low. On the other hand, the combination of high **press for academic challenge** and low **emphasis on grades and test scores** was associated with highest achievement on the test.

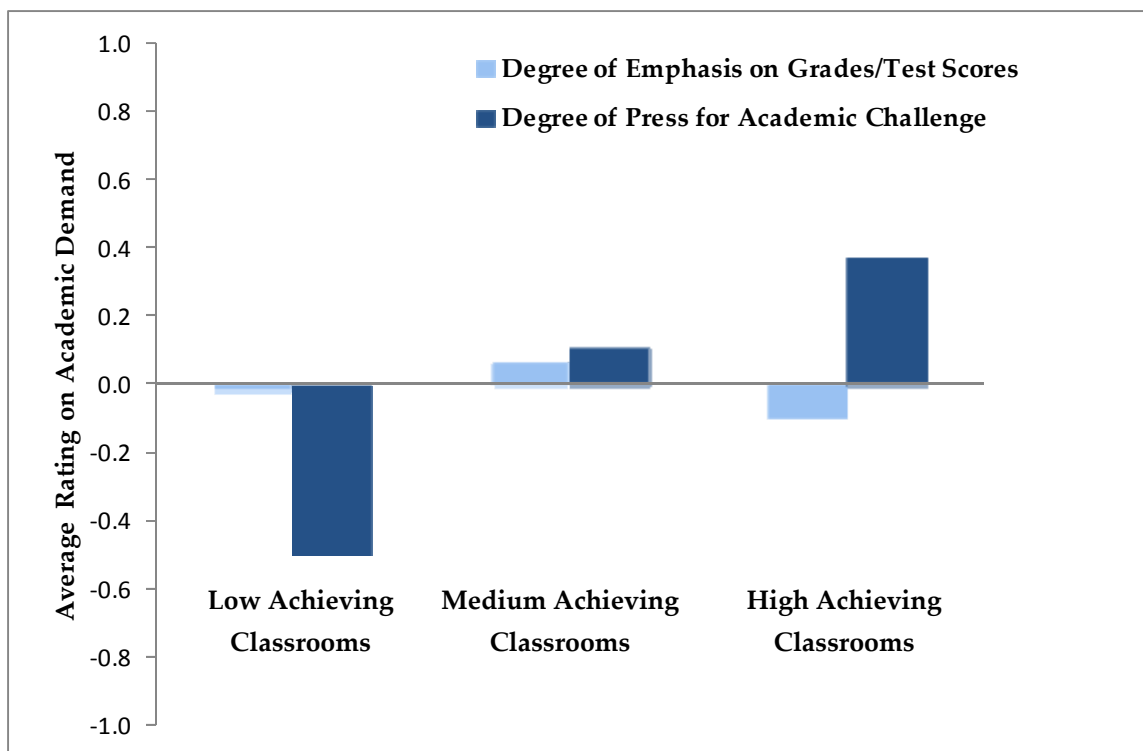
As illustrated in Figure 3, students achieved less if they experienced low press for academic challenge (two left bars) regardless of the amount of emphasis placed on grades and test scores. Achievement was lowest, however, when both types of demands were low. It may be the case that the absence of any kind of academic demand conveys to students that they are not capable of doing well in the class or that the teacher does not care about them. In contrast, students achieved more when press for academic challenge was high (two right bars). In particular, students showed the highest math achievement when press for academic challenge was high and emphasis on grades/test scores was low.

Figure 3. Student achievement in the 2012 math CST test based on perceived press for academic challenge AND perceived extent of emphasis on grades/test scores.



We also explored the question of whether teachers place differential academic demands on students depending on the overall achievement level of their math class. To do so, we compared **emphasis on grades/test scores** and **press for academic challenge** across low-, medium-, and high-achieving classrooms, based on students' 2011 math CST scores. Not surprisingly, when looking at the composition of these three achievement groups, we found that remedial classes (e.g., 7th graders taking Math Intervention) tended to fall into the "Low Achieving Classrooms" category, while advanced classes (e.g., 7th graders taking Algebra) tended to fall into the "High Achieving Classrooms" category. The pattern that emerged (Figure 4) suggests that **practices that emphasize grades and test scores** were more prevalent in the lower track classrooms, whereas **practices that press students for academic challenge** were more prevalent in the higher track classrooms.

Figure 4. Average perceived emphasis on grades/test scores and press for academic challenge in low-achieving, medium-achieving, and high-achieving classrooms.



Summary

The results from the 2012 RCSD middle school survey are consistent with findings from the broader field of academic motivation indicating that students' perceptions of classroom practices are associated with their academic beliefs and outcomes. In summary, findings show:

1. **Emphasizing grades and tests scores did not predict achievement.** A focus on *proving* one's ability rather than on *improving* one's ability did not lead to improved math achievement.
2. **Pressing students to embrace academic challenge positively predicted achievement.** Students' perceptions that they were required to engage in higher order thinking skills and to demonstrate their understanding were associated with higher math scores.
3. **The combination of high press for academic challenge and low emphasis on grades and test scores was associated with higher achievement.** Students in classrooms where they felt encouraged to embrace academic challenge and, at the same time, perceived little pressure to get good grades or high test scores were the ones most likely to perform better on the CST.

4. **Practices that press students for academic challenge were more prevalent in high-achieving classrooms compared to low-achieving classrooms.** These results, based on Redwood City data, suggest that students who took advanced math courses were more likely to experience practices that press for academic challenge than students in remedial math courses.

Implications

These findings have important implications for both practice and policy:

1. **Pressing students to embrace academic challenge aligns with the Common Core State Standards Initiative.** The Common Core Standards represent a move toward greater emphasis on higher order cognitive demand (Porter, McMaken, Hwang, and Yang, 2011), including an emphasis on higher-order thinking skills and understanding concepts and a de-emphasis on memorization and performing procedures. Assessments under Common Core will measure students' ability to problem solve and think analytically, which means that simply getting the right answer is no longer sufficient. Explaining the logic of an argument and articulating a problem solving process will become more important and classroom practices must prepare students for this.
2. **All students benefit from press for academic challenge.** In this study, however, a pattern emerged where students in the lower achieving classrooms were exposed to lower levels of press for academic challenge. These are students who may benefit greatly from instructional practices that challenge them to stretch themselves academically and that convey the expectation that all students can and should strive for deep learning and understanding.
3. **District and school policies play a critical role in supporting teachers to press students for academic challenge and put less emphasis on grades and test scores.** Students can only embrace academic challenge when the teacher provides the necessary instructional scaffolds so that students can be successful when taking academic risks. Teachers need to be encouraged to prioritize those instructional scaffolds and supported in acquiring the necessary knowledge, tools, and skills to address the academic needs of all their students.

A compelling body of research shows that the classroom context can powerfully influence students' motivation to learn and ultimately their achievement (see review by Farrington et al., 2012).

Nonetheless, there is more to learn about the specific strategies that teachers can implement in their everyday instruction to promote in students the drive to learn. In the next phase of our research, we hope to engage with RCSD's teachers and administrators in a research-to-practice effort to inform future professional development efforts around the promotion of student academic motivation and school success.

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The John W. Gardner Center for Youth and Their Communities (JGC) would like to thank the [insert foundations here] for making this research possible. The authors would also like to thank their partners in RCSD and their colleagues at the JGC for their feedback on earlier drafts of this brief: John Baker, Jan Christensen, Kara Dukakis, Amy Gerstein, and Rebecca London.

For more information about the study on “Academic Demands and Achievement,” please contact Graciela Borsato at gborsato@stanford.edu.

*John W. Gardner Center for Youth and Their Communities
Stanford University School of Education
505 Lasuen Mall
Stanford, CA 94305-3083*

Tel: (650)-723-1137

Fax: (650) 736-7160

Email: gardnercenter@lists.stanford.edu

Web: <http://gardnercenter.stanford.edu>