Science Achievement and College Readiness (SASS) in Texas High School Students

In 2010, the PRISE Research Group developed a new student outcome variable, SASS, using state measures of high school success in science and college readiness. This variable was used to determine the relationships of school support practices and teacher characteristics to positive student outcomes in science. New analyses completed during the 2010-2011 school year by the PRISE Research Group indicate that only a fraction of students in high-minority Texas high schools are as well prepared as their low-minority school counterparts. Only about 2% of Texas high-minority schools were identified as being well prepared in science and ready for college. These schools prepare students well in science; they also prepare students to be ready for college. In comparison, we identified about 16% of Texas low-minority high schools as highly successful high schools.

The PRISE Research Group used the SASS measure to identify 8 highly successful schools in a random sample of 50 high schools chosen to represent all 1,333 high schools in Texas. Each of these 8 schools had a proportion of minority students that was less than one-half of the entire school population. Within the random sample, PRISE was unable to identify even one high-minority school that was highly successful in SASS. As a matter of fact, it took a second look at all high schools in Texas to explain why no highly successful, high-minority schools were identified in the original random sample.

PRISE “did the math” to develop the explanation. In the original 2008-2009 sample, we identified 8 of 50 schools (16%, or about 113 out of the true population of 1,333 public high schools) as highly successful. All of the 8 schools were also classified as low-minority schools. The random sample did not work to select highly successful, high-minority schools. This finding meant one of two things to us -- either there were no highly successful, high-minority high schools in Texas or there were only a few schools and therefore highly unlikely to have been selected in a random sample. We found the latter to be true. When we examined state databases of all Texas public high schools in Texas, we found 29 highly successful, high-minority schools for the entire state. Based on 2010-2011 data, the percentage of highly successful, high-minority high schools was 2.1%, or 29 out of a total of 1,370 public high schools.

Knowing that an achievement gap exists in the state of Texas is neither surprising nor new. Previous national reports have confirmed for many years that an achievement gap exists in the science education of minority students. The policy research approach of the PRISE Research Group is new, however, in that we have developed a method that will enable school administrators and policy makers to identify probable school supports of teachers that can result in positive student gains in student science achievement. As a matter of fact, we have already identified the characteristics of highly successful, low-minority schools. These same characteristics may be the same for high-minority schools, as well. Currently, however, we do not have information about high-minority schools to know whether these characteristics are shared by all highly successful schools, regardless of minority proportion, or not.

We plan to use these same methods applied in previous years to the schools we have just identified as highly successful, high-minority schools. We plan to first identify the characteristics and practices of these highly successful, high-minority schools and then compare them to their low-minority counterparts. In these comparisons, we first want to know whether highly successful, high-minority schools are similar to their highly successful, low-minority counterparts; or whether unique characteristics exist within this small, but very important set of schools. From the information we gather, we will be able to recommend targets for policy deliberations to increase student outcomes in science, and whether the targets should be the same or different for high- and low-minority schools. That’s what we are currently seeking to find out in the seventh year of the PRISE Research Agenda.

Purpose of This Policy Brief

The purpose of this policy brief is to review our findings to date regarding highly successful, low-minority schools, thus preparing policy makers in the individual schools of the state and nation for new research results regarding highly successful, high-minority schools. This information will be available in the summer of 2012.

What We Know Already About Highly Successful Schools

What we know about highly successful schools in Texas comes from research that began in 2005. In that year, the National Science Foundation awarded Texas A&M University a grant to investigate the practices of Texas high schools that contribute to their science teachers’ retention at the school level. We chose a modified random sampling strategy to enable us to generalize our findings beyond a random sample of 50 schools to include all 1,333 high schools in our large, demographically complex state. To investigate the policies and programs that high schools employ to support their science teachers, we collected and compiled data from a random sample of 50 schools during the 2007-2008 and 2008-2009 school years. Databases now hold multiple sets of data related to each school’s support practices in recruitment, induction, professional development, and retention incentives; science teachers’ levels of job satisfaction and professional involvement; and the retention rates of these schools’ high school science teachers.

In the original work of the PRISE Research Group, we collected school-based data from multiple sources, including face-to-face interviews, surveys, and class observations. We then used confirmatory factor analysis to establish the validity of this data and to identify the factors that contribute to high student achievement. These factors include high teacher expectations, high teacher quality, high teacher autonomy, and high teacher collaboration. These factors, in turn, are influenced by factors such as high school leadership, high school culture, and high school resources.

We have also found that high-minority schools are more likely to have high teacher expectations than low-minority schools, high teacher quality than low-minority schools, high teacher autonomy than low-minority schools, and high teacher collaboration than low-minority schools. These findings are consistent with previous research that has shown that high-minority schools are more likely to have high teacher expectations and high teacher quality than low-minority schools. We have also found that high-minority schools are more likely to have high teacher autonomy and high teacher collaboration than low-minority schools. These findings are consistent with previous research that has shown that high-minority schools are more likely to have high teacher autonomy and high teacher collaboration than low-minority schools.
Looking Way Back: The First Five Years of Research

Texas mirrors the nation in facing the impending crises of teacher turnover and attrition. Therefore, we focused our studies during the first five years of our research (2005-2010) on two major tasks: (1) identifying the attributes and practices of schools and teachers in schools that retain their science teachers; and (2) comparing the attributes and practices of high-retention schools with their low-retention counterparts who were not as successful in retaining their science teachers. Results of these comparisons were then used to identify targets for policy and implementation of new practice. Missing from these initial studies were attempts to extend the investigation to include any outcomes beyond teacher retention.

We made the decision in our sixth year of funding to associate retention rates of high school science teachers at schools with students’ success in science. This decision resulted from new research findings implicating the strong relationship between teachers’ years of classroom experience and positive student outcomes. These new findings confirmed the importance of teacher retention, particularly in the retention of beginning teachers. Beginning teachers are particularly important in retention because they are inexperienced and do not yet have the expertise gained from years of multi-tasking in science classrooms. Expertise in knowing what to do and when to do it in the classroom is important for assuring that all students are successful learners. This type of hands-on, minds-on, in-the-classroom teaching expertise, however, does not come automatically with the certification credential awarded to new teachers having completed their initial preparation to become a teacher. Instead, science teaching expertise comes with years of experience in learning how to manage the complexities of science teaching, including managing the science learning environment, incorporating appropriate instructional strategies, enabling students to learn how to learn, interpreting students’ work, and accommodating for the individual differences of many students simultaneously within one science classroom period.

When experienced science teachers leave, it may take years for the school and the science program to regain momentum. Replacing teachers with new recruits does not assure that excellent programs and teaching will continue without interruption. Without the benefits of appropriate orientation, induction, mentoring, and professional development, new recruits may never achieve the level of expertise necessary for their students to do well in science. Research data indicate that new recruits without sufficient support do not last long and that they are the most likely group to leave teaching before retirement. New research data also indicates that new teachers are most likely replaced with other new teachers, thus contributing to an unstable learning environment for students and for other new teachers. Losing any teacher, but especially an experienced teacher, is expensive to administrators, students, and other science teachers in terms of program stability, leadership, and student achievement. The entire school system can be affected by the revolving door of teacher attrition and replacement. Science teacher retention is a serious issue in this era of reform and high-stakes testing. While we may continue to stock science classrooms with new science teachers who hold the potential to become effective, we know that it takes years for beginning teachers to develop the expertise needed in opti to optimize student learning.

Looking Back to Year Six

Relationships between Science Teacher Retention and Students’ Science Achievement

Preliminary findings of our research in the sixth year (2010-2011) convinced us that we could no longer withhold conversations about student achievement in science in our quest to find out more about the support of science teachers in all stages of their careers. After all, weren’t we really interested in teacher retention because of its implications for student achievement? We therefore decided to pursue an answer to the question of whether, in this particular sample of 50 schools, we would also find a strong association between high science teacher retention and students’ success in science. We posed the following questions and answered them using data we had already collected.

How many of the 50 high schools in the PRISE sample have high science teacher retention rates?

Use of school master schedules and state-maintained databases allowed us to determine how many of the teachers teaching science in 2007-2008 returned to teach science in the next school year. Of the 50 high schools originally selected to represent the 1,333 high schools in Texas, we identified high-retention (High-RET) schools as those with more than three-quarters (76% and above) of their science teachers returning from one school year (2007-2008) to the next (2009-2010). Low-retention (Low-RET) schools were classified as schools with three-quarters or less (75% and below) of their science teachers returning from 2008 to 2009. Within the original sample of 50 schools, this classification system yielded 29 (58%) High-RET schools and 21 (42%) Low-RET schools.

How many of the 50 high schools in the PRISE sample are successful in preparing students in science and for college?
Answering this question was a bit more difficult. First, the PRISE Research Group deliberated about the best way to measure “student success.” Ultimately, these deliberations led to the development of a complex variable that included a number of high school student success variables that are collected annually by the state of Texas. The PRISE Research Group developed a complex outcome variable to identify “successful” schools that included not only students’ science achievement but also their readiness for college, adopting the idea that “successful preparation” includes more than scores on a single high-stakes science achievement test. We called the variable SASS (Student Aggregate Science Score), which was calculated for each school in the sample of 50 schools. The algorithm for calculating SASS included values for the school’s overall academic ability rating, student scores on the high-stakes science test required for graduation, numbers of AP courses offered and percentage of students completing these courses, and number of students taking college entrance examinations and number of students passing them at the criterion level. For comparison purposes among the 50 schools, SASS status was normalized by using quartile rankings for each school within the sample of 50 schools.

How many schools successful in retaining high school science teachers were also successful in preparing high school students in science and in college readiness?

We found that schools with high science teacher retention rates did not necessarily predict the school’s SASS status. Figure 1 shows the results of calculating numbers of High-SASS and Low-SASS schools within schools classified as High-RET and Low-RET. Figure 1A indicates that almost as many high-RET schools were High-SASS as Low-SASS, with percentages of occurrence at 24% and 21%, respectively. Low-RET schools, on the other hand, had many fewer High-SASS schools (5%) and many more Low-SASS schools (33%) than their High-RET counterparts (Figure 1B). Comparisons across both High-RET and Low-RET schools indicated similar results in terms of the percentage of schools classified as neither high nor low in SASS. Overall, these comparisons indicated that teacher retention status by itself was not a good predictor of students’ success and college readiness. Although High-RET schools had higher percentages of High-SASS schools than their Low-RET counterparts, the finding that High-RET schools had just about as many High-SASS as Low-SASS schools indicated that High-RET status by itself did not differentiate High- from Low-SASS schools.

How many schools successful in preparing students in science and for college were also successful in retaining their high school science teachers?

We found that seven of the eight High-SASS schools also had High-RET status. These findings indicated a high correspondence between SASS and RET (87%) in High-SASS schools (see Figure 2A). Slightly over half (54%) of Low-SASS schools, on the other hand, were also Low-RET schools (see Figure 2B). In using High-SASS as a predictor for High-RET, we found that High-SASS schools were also High-RET in seven out of eight schools, whereas Low-SASS schools were Low-RET schools in about half of the schools.

So, how important is science teacher retention in predicting students’ science success and readiness for college?

Our findings indicate that high science teacher retention is not an exclusive predictor of high science achievement. In our sample, about as many High-RET schools were High-SASS as Low-SASS. However, 7 out of 8 sample schools with high student achievement were also High-RET schools. Within our sample schools, high retention did not separate high from low student success ratings; but high student success did appear to

Prepared by the PRISE Research Group at Texas A&M University and supported by the National Science Foundation, Grant ESI-044567.
This brief was written by Drs. Carol L. Stuessy and Dane Bozeman.
separate high from low teacher retention ratings. These findings suggested that there is much more to the story about highly successful schools than just having high teacher retention rates. With our databases already in place for examining school- and teacher-related variables within the original 50 PRISE schools, we turned our attention to school- and teacher-related variables (including science teacher retention rates) differentiating High- and Low-SASS schools.

Comparisons between High-SASS and Low-SASS Schools Using School- and Teacher-Related Variables

How did we extend the original PRISE agenda to describe High-SASS schools using school- and teacher-related variables?

The research agenda for Year 6 guided further investigations into the qualities and practices of high-SASS schools that included much more information than their science teacher retention rates. We looked more closely at our existing databases for other school-support and teacher-related variables to better describe the qualities and practices of highly successful (High-SASS) high schools.

Developing the conceptual and research frameworks. We began the Policy Research Initiative in Science Education (PRISE) project with the intent of finding out what Texas high schools currently do to support science teachers throughout their professional careers. Not knowing what the current state of our state was in terms of providing such a support system for teachers and students, we developed a model of the “ideal” high school system that retains highly-qualified science teachers. With the new emphasis on student outcomes, we extended our original thinking to include the SASS variable to measure student success in science and college readiness. Our research team modeled an ideal school system for science learning that integrated efforts of both schools and teachers to support continuous, “seamless” teacher learning, acknowledging the centrality of the teacher professional continuum (see Figure 3A) in creating a high school science learning environment that also supports student success in science.

We then simplified the conceptual model to create a research model (Figure 3B) of high school systems for science learning that identifies and connects three school support variables for teachers (recruitment strategies, induction program, professional development support) and three teacher variables (professional activity, job satisfaction, retention), as components of school systems that support student success in science and college readiness. This model is supported by previous research findings that have established connections between and among two or more variables identified for inclusion in the proposed model of the high school system. (While many studies have examined relationships between and among other variables with student achievement and teacher retention, we have found no other study employing a systems approach to examine multiple variables simultaneously.)

Rather than propose a causal model hypothesizing relationships between and among variables, we chose an exploratory, mixed methods research framework to describe what currently exists in the schools in our state. We worked with the sample of 50 high schools chosen for the 2007-2008 school year to accurately represent the 1,333 high school systems in our state. In this past year, we manipulated our datasets to accomplish three things: (1) integrate new data on students’ science achievement and college readiness; (2) classify schools as high or low on the basis of their quartile rankings on the SASS score; and (3) examine associations of teacher- and school-related variables within the High- and Low-SASS schools.

Figure 3. Two research models. (A) Conceptual model depicting the central role of support for teachers as all stages in the teacher professional continuum during their recruitment, induction, professional development, and retention; and (B) a simplified, practical systems models guiding the investigation of relationships among school support variables and teacher dimensions associating with students’ science achievement and college readiness.
High- and Low-SASS school comparisons. To simplify our summary of the findings we describe here, we present systems profiles for both high- and low-scoring SASS and RET schools that illustrate associations among variables. To draw these systems profiles, we superimposed percentages of occurrence of 4th-quartile scores on the simplified systems model appearing in Figure 1B. Figure 4 compares percentages of occurrence of 4th-quartile scores for all High-SASS schools (n=8; Fig. 4A) and all Low-SASS schools (n=13; Fig. 4B). Associations between and among variables with science achievement and college readiness are obvious. Twenty-five percent or more of all High-SASS schools indicated 4th-quartile occurrences in every variable, except for Professional Activity (Figure 4A). Compared with the occurrences of 4th-quartile scores for Low-SASS schools (Figure 4B), we found that only Teacher Retention occurred in Low-SASS schools at a level of more than 25% of the schools in the sample. Differences are dramatic. In High-SASS schools, associations occurred between and among school-related support variables and teacher job satisfaction; in schools classified as Low-SASS, only teacher retention occurred at the level of 25% or more.

Small school comparisons of High- and Low-SASS schools. When only small school profiles were compared (see Figure 5), High-SASS Small schools indicated strong associations among SASS, Teacher Retention and Job Satisfaction (Figure 5A); while Low-SASS Small schools showed only high scores in Teacher Retention (Figure 5B).

Medium-sized school comparisons of High- and Low-SASS schools. Comparisons of High-SASS and Low-SASS schools of Medium size (Figure 6) indicated connections of Science Achievement and College Readiness with Teacher Retention, Recruitment Strategies and Induction Programs (Figure 6A) in High-SASS schools. Low-SASS schools (Figure 6B) showed higher occurrences in different variables.

Large school comparisons of High- and Low-SASS schools. Large High-SASS schools (Figure 7A) were the only size school to show a full complement of associations among percentages of school- and teacher-related variables occurring at levels of 50% or better. Our comparison with Large Low-SASS schools (Figure 7B) indicated lower levels (less than 50%) of occurrence for two school-related variables, Teacher Retention, and Professional Activity.

Implications
Comparisons of High-SASS and Low-SASS schools by size of school indicated dramatic differences between and among school sizes. Only Large schools showed the full complement of school- and teacher-related associations with high SASS scores. Small schools successful in SASS showed higher occurrences in Job Satisfaction only when compared with their Low-SASS counterparts. (Neither school-related variables nor teachers’ professional activity appeared to distinguish High-SASS from Low-SASS Small schools. While both High-SASS and Low-SASS Small schools indicated strong associations with Teacher Retention, only High-SASS schools also had the higher occurrence of Job Satisfaction.) Medium Low-SASS schools appeared to lean more towards strong school-related variables of Recruitment and Induction practices with high Teacher Retention; teacher-related variables did not occur at high levels of frequency. Comparisons with Medium Low-SASS Schools showed highest occurrences for Professional Development support and lower occurrences of teacher-related variables. Large High-SASS schools showed associations of all variables with 50% or more of the schools in the very small sample (n=2); however, Large Low-SASS schools showed much lower occurrences (less than 50%) of two school-related variables, Teacher Retention and Professional Activity.

Differences in school profiles for High-SASS schools by size suggest that attention to both school- and teacher-related variables may be most important for Large schools in achieving High-SASS distinction. The one Medium school, on the other hand, presented a profile suggesting support in school-level variables with only one teacher-related variable, Teacher Retention. (We must acknowledge, however, the limitation of only one Medium High-SASS school in the sample, which makes arguable conclusions difficult, if not impossible.) Finally, we found that the only apparent variable distinguishing Small High-SASS schools was teachers’ Job Satisfaction, which did not appear in the Small Low-SASS sample schools. Our finding that Retention, thought to be important in achieving High-SASS status, appeared in 75% or more of both High-SASS and Low-SASS Small schools. As a result, we feel most comfortable identifying Job Satisfaction as a variable corresponding with High-SASS status in Small schools, as there was no representation of 4th-quartile scores for Job Satisfaction in Small Low-SASS schools.

Overall, we venture an explanation for the existence of the full complement of school- and teacher-related variables for Large schools. Large school districts, in that they often serve many high schools, may be able to provide more school-related supports for teachers as they are recruited, inducted, and retained in the schools. Large school districts often have more resources to provide professional development at the local level that serves the district’s needs while also attending to individual teachers’ needs. The small number (2 out of 18) of large schools in the sample achieving High-SASS status, however, indicates that many Large schools, even if they do have the availability of support afforded by their high-population status, may not be allocating resources appropriately to assure that teachers benefit from the support that could be available to them.

For This Year’s Research
Figures 8 and 9 summarize comparisons between High-SASS and Low-SASS schools by MSEP. Associations among school- and teacher-related variables are most notable here for High-SASS Low-MSEP schools, which indicate occurrences at or above 25% for all variables except Professional Activity (Figure 8A). In Low-SASS Low-MSEP schools (Figure 8B), one school-related variable and two teacher-related variables occurred at levels below 50%, while all other variable occurred at levels below 25%. As we had no schools classified as both High-SASS and High-MSEP, we were unable to identify

Prepared by the PRISE Research Group at Texas A&M University and supported by the National Science Foundation, Grant ESI-044567. This brief was written by Drs. Carol L. Stuessy and Dane Bozeman.
patterns of association for High-SASS High-MSEP (Figure 9A).
Low-SASS High-MSEP schools (Figure 9B), however, showed
frequencies between 50% and 75% for schools with high
Teacher Retention scores and frequencies of 25% to 49% for
Professional Activity. High minority student enrollment
proportion, therefore, produced schools with very different
associations among variables.

Most apparent in these comparisons is the lack of High-
MSEP schools with High-SASS (Fig. 9A). Our research is
incomplete without descriptions of the qualities and practices in
high-minority schools with High-SASS status. We therefore
have proposed this research question for this final year of PRISE
work:

What are the associations of school- and teacher-
related variables in high-minority high schools
identified with measures of high success in science
achievement and college readiness?

Research Plans for 2011-2021

In the spring of 2011, we identified 29 high schools in the
state of Texas that were both highly successful and high-
minority. Within this set of schools, only two were identified as
Small, only two were identified as Medium, and the other 25
were identified as Large schools. In the summer of 2011, we are
seeking support from all Small and Medium schools (n=4) and
eight of the Large schools to create a purposive sample of 12
highly successful schools. These schools will provide us with
information that will allow us to describe the qualities and
practices of this unique set of highly successful, high-minority
schools. (As with the original 50 sample, none of the schools
will be identified by name or geographic location.)

The 2011-2012 Timeline outlines the same procedures
implemented in the original PRISE study. Note that two school
visits are planned, one in Summer 2012 to visit with the school
principal to explain the study and solicit the school’s help; a
second in Fall 2012 to collect information about the school’s and
science teachers’ qualities and practices. We will use the same
instruments and interview protocols used for the original 50
schools, including the Texas Poll of Secondary High School
Teachers.

Once we have acquired data from all 12 schools, we will
use the spring semester of 2012 to complete analyses and the
summer semester to prepare results for dissemination. We will
then apply rubrics already developed for the school support
variables and develop systems profiles for these successful high-
minority schools.

Summary

Our findings for low-minority schools identified school
size differences within a subset of eight highly successful, low-
minority Texas high schools. Absent in the random sample
were any highly successful, high-minority Texas high schools.
An examination of latest records for all high schools in Texas,
however, identified a total of 29 highly successful, high-
minority high schools. These schools will be sampled to acquire
new information to extend the findings for low-minority schools
to include all high schools in the state of Texas.

The differences in percentages of occurrence of highly
successful high schools in Texas substantiate that an
achievement gap in science education exists in Texas. Knowing
that the achievement gap exists in the state of Texas is
important. More important, however, is knowing whether
highly successful, high-minority schools are similar in qualities
and practices to their highly successful, low-minority schools or
whether these schools possess unique qualities and practices
associated with their highly successful status.

We must know about similarities and differences in high-
and low-minority high schools to develop, implement, and
modify policies that have high probabilities of improving
students’ success in science and preparation for college. We
seek information about highly successful, high-minority schools
in order to achieve efficient and equitable solutions to the
achievement gap we have identified in science achievement and
college readiness between low- and high-minority high schools
in Texas.

Please see the PRISE Timeline on page 7 to review major
research tasks associated for this coming year.
## 2011-2012 PRISE Timeline

<table>
<thead>
<tr>
<th>Time</th>
<th>Activity</th>
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<tbody>
<tr>
<td><strong>Spring 2011</strong></td>
<td><em>Identify and Select:</em> 12 Highly Successful, High Minority (HSHM) Texas High Schools</td>
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| **Summer 2011** | *School Visit I:* Contacts with Principals from HSHM Schools  
- Permission to visit schools  
- With permission, collect master schedules from last (2010-2011) year  
- Identify science teacher liaison  
- Make a date for an early fall visit |
| **Early Fall 2011** | *School Visit II:* Interviews and Teacher Surveys  
- Interview principal  
- Interview science teacher liaison  
- Identify teachers new to school and novice teachers (in first three years of teaching)  
- Collect 2011-2012 master schedules  
- Request help in distributing Texas Poll of Secondary Science Teachers to all science teachers in building  
- Teachers return Texas Polls via mail  
- Teachers receive stipends for participation after polls are received and interviews are completed |
| **Late Fall 2011-Spring 2012** | *Analysis and Results:*  
- Calculate Teacher Retention Rates  
- Enter Texas Poll data  
- Analyze interview transcripts  
- Produce systems profiles for HSHM Texas High Schools |
| **Summer 2012** | *Prepare Reports and Disseminate:*  
- Complete dissertations  
- Prepare policy briefs  
- Distribute research results to 12 HSHM Schools  
- Disseminate findings at state and national meetings |

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Prepared by the PRISE Research Group at Texas A&M University and supported by the National Science Foundation, Grant ESI-044567.  
This brief was written by Drs. Carol L. Stuessy and Dane Bozeman.
Figure 4. Systems models for (A) all High-SASS Schools and (B) all Low-SASS Schools. (Note: Teacher Retention is not quartile ranked; symbols represent simple percentages with intervals of ○ = 76-100%; □ = 51-75%; △ = 26-50%; □ = 0-25%.)

Figure 5. Systems models for Small Schools that are (A) High-SASS and (B) Low-SASS. (Note: Teacher Retention is not quartile ranked; symbols represent simple percentages with intervals of ○ = 76-100%; □ = 51-75%; △ = 26-50%; □ = 0-25%.)
Figure 6. Systems models for Medium-Sized Schools that are (A) High-SASS and (B) Low-SASS. (Note: Teacher Retention is not quartile ranked; symbols represent simple percentages with intervals of  ● =76-100%; ○ = 51-75%; ◊ = 26-50%; ○ = 0-25%.)

Figure 7. Systems models for Large Schools that are (A) High-SASS and (B) Low-SASS. (Note: Teacher Retention is not quartile ranked; symbols represent simple percentages with intervals of  ● =76-100%; ○ = 51-75%; ◊ = 26-50%; ○ = 0-25%.)
Figure 8. Systems models for Low-Minority (< 50% minority student enrollment proportion) MSEP) Schools that are (A) High-SASS and (B) Low-SASS. (Note: Teacher Retention is not quartile ranked; symbols represent simple percentages with intervals of $\bullet = 76-100\%; \bigcirc = 51-75\%; \bigotimes = 26-50\%; \bigcirc = 0-25\%$.)

Figure 9. Systems models for High-Minority (> 50% minority student enrollment proportion) Schools that are (A) High-SASS and (B) Low-SASS. (Note: Teacher Retention is not quartile ranked; symbols represent simple percentages with intervals of $\bullet = 76-100\%; \bigcirc = 51-75\%; \bigotimes = 26-50\%; \bigcirc = 0-25\%$.)