

The Determinants of Student Achievement at the Academy for Academic Excellence

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Introduction

In its ongoing collaboration with the Lewis Center for Educational Research (LCER), the School Improvement Research Group (SIRG) has produced several technical reports based upon the data obtained from the Annual Family Survey. Most recently, *The Academy for Academic Excellence 2000 Annual Family Survey: Report on the Findings* was completed. The current effort extends the previous report on the findings by employing the family survey items to predict student achievement at the AAE.

Five different categories of variables from the Family Survey are tested for their effects on student achievement. These include: (1) student demographics, (2) parent demographics, (3) instructional factors, (4) enrollment motivations, and (5) social movement motivations. A total of 29 predictor variables are included in the analyses.

Determinants of Student Achievement

Three student demographic variables – gender, ethnicity, and home schooling experience – are tested for their effect on California’s STAR test scores (the Stanford Achievement Test, version 9). Gender and race are routinely employed in analyses of student achievement because these student characteristics are typically related to substantial differences in measured achievement. Gender analysis will allow us to determine whether male or female AAE students perform better. Because the sample is relatively small, a “minority student” variable was constructed that grouped all students of color together. Also, those students who have always been homeschooled are compared to those who have not.

Eight variables regarding parent demographics are included in the statistical analyses of student achievement. Parent age, household income, parent education, and marital status are rather straightforward. We also explore whether the number of school-age children in the household and whether or not the primary parent/teacher is employed has any impact on student achievement. The parent’s years of homeschooling experience and whether they have ever taught in a public school are considered as well.

Six instruction-related variables are examined. These instructional factors concern what actually occurs in the home during the learning process. First, the average daily hours of home instruction is considered. Next, whether or not the spouse participates and if some other person assists the primary parent/teacher with the home instruction is examined.

The scores of those students whose parents are currently employing standards in their instruction are compared to those who are not. Similarly, the parent's perceived success with standards is tested. Last, the impact of incorporating religion into home instruction is considered.

As in the first round of the survey, parental enrollment motivations were exhaustively assessed in the 2000 Annual Family Survey. Why parents chose to enroll their children at the AAE may have important effects upon student achievement. Four different enrollment motivation scales were constructed from the individual survey items. As shown in Table 1, the scales summarize the extent to which survey respondents are: 1) motivated by criticism of the public schools, 2) attracted to the AAE because of its own special characteristics, 3) attracted to the AAE because of its alignment with important religious or political ideas, and 4) motivated to join the AAE to meet unique child or family needs. Table 1 lists the specific survey items comprising each of the enrollment motivation measures.

Table 1: Description of Four Enrollment Motivations Scales
<p><u><i>Critical of Public Schools</i></u> Concerned about the quality of teaching at other schools Concerned about the curriculum at other schools The testing programs at other schools are inappropriate I do not trust the government's ability to provide an adequate education</p>
<p><u><i>Attracted to AAE</i></u> The AAE offers resources and support for home schoolers The AAE's educational program is of superior quality The AAE's strength and focus on science education It provides me with the opportunity to use diverse and innovative curriculum The AAE is an important part of the charter school reform movement</p>
<p><u><i>Ideological Reasons</i></u> It provides me with the opportunity to give my child(ren) religious instruction At home during the day regularly and want to provide guidance to child(ren) It is not the government's responsibility to provide public education I have always believed in the philosophy of home schooling</p>
<p><u><i>Family/Children Needs</i></u> The scheduling of other schools is too inflexible for my family's situation My child(ren) have special learning needs that cannot be met in other schools My child(ren) have unique abilities that would not be fostered in other schools My child had a difficult experience at his/her previous school</p>

Finally, a set of “social movement” motivations is examined. While all AAE participants are making tremendous sacrifices to educate their children, some feel much more intensely than others that they are doing so because they are engaged in a larger school reform movement. The degree of this involvement may spillover into their instructional practices, influencing their children’s educational attainment. Whether or not the parents feel that they are involved in a “homeschooling movement” (rather than just schooling their children at home as part of the overall AAE instructional program) was assessed by looking at whether they were engaged in homeschooling their child(ren) prior to joining the AAE. A broader measure of self-identified social movement participation was constructed from answers to two survey items asking about whether participation in the AAE is seen as part of an explicit school reform activity. The two survey items were combined to construct this scale measuring the extent to which parents perceive their involvement with the AAE in social movement terms.

Another pair of survey items measured social movement orientations along a third dimension. This scale contrasts parents who interpret their participation at the AAE in an individualistic fashion to those who see it as collectivist or community activity. Those who see it in a collective fashion may develop a deeper sense of identity with the AAE educational program, which may, in turn, give their children a deeper sense of engagement in the educational process. In a similar way, where AAE families have friends who are also participating in the AAE program we may find that children are more deeply engaged and may achieve better.

A typology of the parent’s civic engagement was constructed using several survey items (see our earlier *Report on Findings*, Mitchell & Collum, 2001, p. 20, Table 19). This scale identifies four different groups who have engaged in different forms of political participation: conventional, moderate, assertive, and activist. Social movement theory implies that the children of those parents who are more engaged may perform better than those who are less engaged. Additionally, if parents stress the importance of social activism for the children as they are growing up the children may become more deeply engaged in education and more successful in school.

Parents’ political identification may also be an important source of their children’s educational motivation. Theory suggests that parents who consider themselves “extremely liberal” or “extremely conservative” are more likely to be dissatisfied with the status quo. Since they have chosen to homeschool, AAE parents are already likely to be dissatisfied with the status quo and it will be interesting to see whether political identification has any educational effects. Finally, religious identification is considered. This is potentially important given homeschooling’s historical association with faith-based movements. Those AAE parents who identified themselves as “very religious” will be compared to those who did not.

Data and Methods

The 2000 Annual Family Survey was merged with the 2000 STAR test database (using the Normal Curve Equivalent student scores for the Total Reading, Total Mathematics and Total Language sub-tests). 235 AAE parents completed the Annual Family Survey in late 2000. Several months earlier, in April, 308 AAE students took the STAR examination. Not all of the individuals in the two groups could be matched. Some of the students had graduated or otherwise left AAE, and some of the parents who completed the survey were new to AAE, which meant that their children had no STAR test scores to analyze. As a result, when the files were merged, we had matched Family Survey and STAR data for 175 AAE students.

In order to determine which factors most strongly influence student achievement, we employ a statistical technique known as path analysis. This is a “multivariate” technique that simultaneously considers the explanatory effects of multiple factors. Path analysis is unique in allowing not only independent (cause) and dependent (effect) variables, but also intervening or mediating variables. Intervening variables simultaneously measure the effects of some variables and the causes of others. In short, path analysis enables the construction of complex models that more accurately reflect social reality.

Figure 1 (on the next page) illustrates the type of model used to analyze the data presented in the body of this report. The simplified model depicted here maps one possible set of relationships among four variables: two independent variables, one intervening, and one dependent outcome variable (the STAR achievement test scores). Household income and parent education are the independent variables – which means that influence other variables, but are themselves influenced by any of the other variables measured in this study. Thus, the arrows indicating how the various variables influence each other only point *away* from these two variables. Both variables have arrows pointing *toward* the intervening variable, an attitudinal measure indicating that parents were motivated to enroll their children at the AAE as a way of meeting specific child/family needs. These arrows depict plausible causal relations. That is, they indicate that parental reasons for enrolling their children in AAE may be significantly influenced by household income and parent education levels. Since family income and education levels might also influence their children’s performance on the STAR test, the system of arrows eventually point to the STAR test results variable.

Figure 1: Path Analysis Example

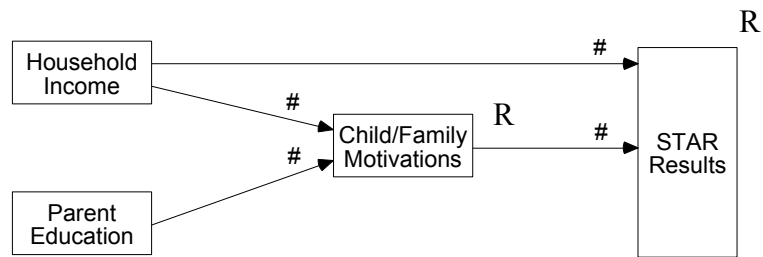


Figure 1 depicts the model that would result if household income had a direct effect on student achievement but parent education only influences STAR test results indirectly through its effect on child/family motivation to enroll in AAE. The arrow pointing from household income to STAR results indicates the direct effect on achievement. Since both income and education influence motivation in this model, there are two arrows pointing to the enrollment motivation variable. The arrow pointing from the motivation variable to the STAR test results box indicates a direct effect of parental motivation on STAR test results. Since “child/family motivation” is influenced by previous factors (income and education) they are said to have “indirect effects” upon student achievement by way of their effect on the enrollment motivation. So, while parental education does not have a direct effect upon student achievement, it does have an indirect effect through its influence on “child/family motivations.”

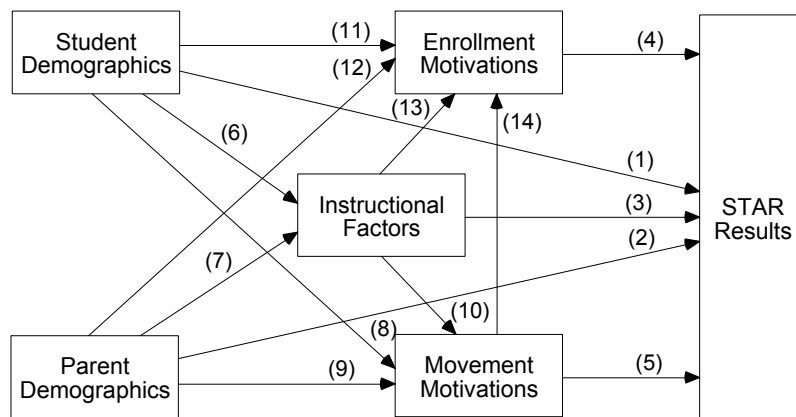
In the actual analyses presented below, the number signs (#) shown on the arrows are replaced by numbers ranging between -1.0 and $+1.0$. These numbers are called “path coefficients” and they indicate the strength and direction of influence between each of the pairs of variables in the model. Positive values (between 0 and $+1.0$) indicate a positive relationship between the variables, meaning when scores for the variable at the tail-end of the arrow go up in value those for the variable at the head-end of the arrow also tend to go up. Values near $+1.0$ would indicate a near perfect correlation between the two variables with the head end variable moving up in lock step with increases in the tail-end variable. Negative path coefficients (ranging from 0 to -1.0) indicate that the head-end variable *decreases* in value as the tail-end variable increases. Again, path coefficients near -1.0 indicate a near perfect negative correlation, meaning that the head-end variable decreases just as fast as the tail-end variable increases in value. Values at or near 0 indicate that there is little or no relationship between the two variables (near 0 value relationships are typically not shown on path diagrams to make it easier to see relationships that are more substantial). In social science research, it is quite rare to find path coefficients that are very close to $+1.0$ or -1.0 as this would imply that knowing one of the variables enables us to perfectly predict the value of the other variable for all individuals in the study. We typically need to include several independent variables in order to explain a substantial amount of variation in the dependent variable.

In addition to the arrows with their path coefficients, each of the variables being predicted by other variables (that is each variable with at least one arrow pointing toward it) has a “coefficient of determination” – a number indicating how completely that variable is explained by all of the variables with arrows pointing toward it. In Figure 1, a letter “R” indicates the location of each coefficient of determination. These coefficients indicate the proportion of the total variation of the dependent variable that is determined by its relationship to all of the independent variables. They range from 0 to 1.0 and can be interpreted as percentages (from 0% - 100%) of success in predicting the dependent variables.

Following the approach illustrated in Figure 1, best fitting path models were developed for each of the three STAR sub-tests (Reading, Mathematics, and Language). We began with exploratory analyses to determine which factors directly influence student achievement. Once these significant relationships were found, other variables were added to the models to show how factors directly influencing achievement were, in turn affected by variables with important indirect impact on achievement test scores.

Figure 2 provides an overall theoretical model indicating how we expected the various factors to be related to one another. Student achievement is the ultimate dependent variable. Student and parent demographics are independent variables while the instructional factors, enrollment motivations, and movement motivations are all intervening variables.

Figure 2: Theoretical Model of Relations between Factors



Student demographics, parent demographics, instructional factors, enrollment motivations, and movement motivations are all expected to directly affect student achievement (arrows 1 – 5). If any of the enrollment motivations are significant

determinants, we work backwards to see if those are in turn determined by student demographics (11), parent demographics (12), instructional factors (13), or movement motivations (14). If any of the movement motivations determine student achievement, we test to see if they are affected by student (8) or parent (9) demographics or by instructional factors (10). Finally, we test to see whether the significant instructional factors are determined by student (6) and parent (7) demographics. Relationships between variables within the same category are also explored where it is theoretically appropriate.

Findings

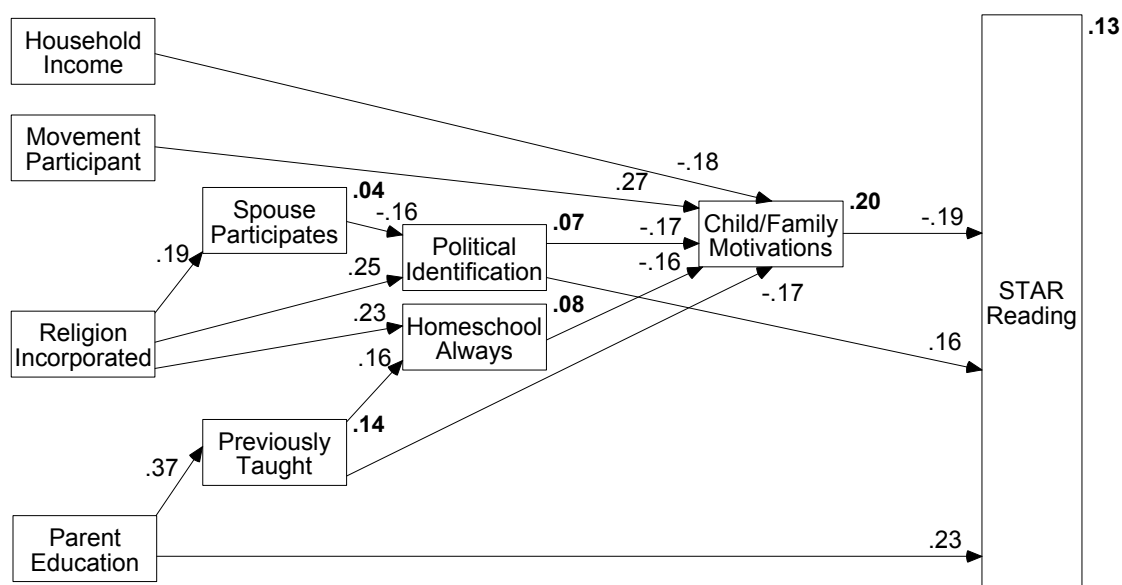
Reading Achievement

The best-fitting path model for determinants of AAE student achievement in reading is shown in Figure 3 (next page). The high goodness-of-fit index (GFI), low Chi-square, and relatively high probability value (reported along the bottom of the figure) all indicate that the model “fits” the data very well. The model explains a modest but statistically significant 13% of the variance in students’ STAR reading scores. While 13% is modest, keep in mind that our analysis does not take into consideration variations in student ability, their prior academic experiences or the curriculum materials and teaching techniques used in their current schooling. That is, we find that a moderate and reliable part of student reading achievement is dependent on family characteristics and motivations, independent of individual student ability or school program design.

There are four independent variables (on the far left in the diagram) and five intervening variables that are simultaneously influenced by the four independent variables and predictive of reading achievement. The child/family motivations variable is the best predicted in the model with 20% of its variance explained.

Household income has a significant negative relationship with child/family motivations. Those who have higher incomes are less likely to join the AAE because of particular family and child needs. The positive relationship between movement participant signifies that those who identify themselves as members of a larger social movement are more likely to join the AAE for child/family reasons. These parents apparently see their participation as not only alleviating their own particular needs, but as contributing to something larger as well.

Figure 3: STAR Reading Scores Path Model



GFI = .97; Chi-square = 26.53; Prob. = .70; df = 31; N = 175

The model also demonstrates that in those families where religion is incorporated into the home instruction, the spouse of the primary parent/teacher is more likely to participate in home educating their children. This is interesting as it appears that those who do not teach faith-based values at home are also more likely to be families where the mother performs all of the home instruction. At the same time, those who incorporate religion into their instruction are more likely to identify themselves as politically conservative. However, homes where both parents/guardians participate in instruction are more likely to identify themselves as politically liberal.

Political identification affects two other variables in the model. First, those who identify as conservatives are less likely to join the AAE because of child and family needs (while liberals are more likely to join for these reasons). Also, children of the self-identified conservatives have higher STAR reading scores according to the model. Perhaps homeschooling liberals are less likely to be concerned with standardized tests and do fewer test preparations.

As the model indicates, parents who incorporate religion in their home instruction are more likely to have always homeschooled their children and less likely to be at the AAE because of identifiable child and family needs. The AAE continues to serve a faith-based community of families whose commitment to home schooling is high and whose children are not seen as presenting specific needs motivating the selection of AAE. Moreover, children whose parents enrolled them because of specific child and family needs perform

lower on the STAR reading examination. This is sensible because a significant proportion of these special needs make academic preparation more challenging.

As seen at the lower left corner of Figure 3, better educated primary parent/teachers are more likely to have previously taught in the public school system. Interestingly, those who have previously taught are more likely to have always homeschooled their own children. In addition to their sense of competence, these parents may have found that first-hand experience with the problems in public schools was enough to make them decide to teach their own children at home. Those who have previously taught are also less likely to be at the AAE because of their child and family needs.

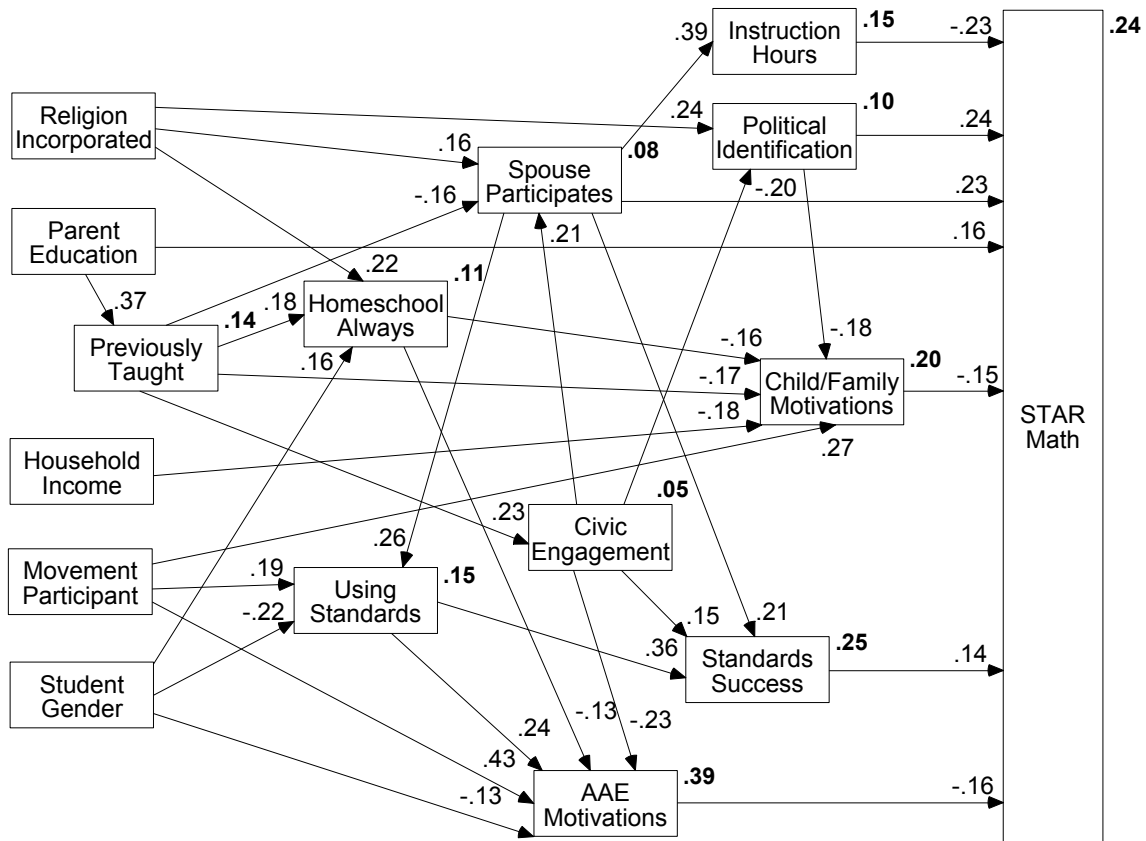
Finally, parent education has a direct positive connection with reading scores. The more educated the primary parent/teacher the better their children perform on the STAR reading examination. Overall, it is interesting that none of the instructional factors have direct effects upon reading scores. The three significant direct relationships are all parent-related measures. This underscores the importance of contextual factors in shaping student learning. It is likely that the salience of parent-level factors reflects the fact that parents are the primary teachers at the AAE.

Math Achievement

The best-fitting path model for math achievement was estimated next and is shown in Figure 4. As indicated along the left side of this figure, there are five independent variables in this model – a) religion incorporated into home teaching, b) parent education levels, c) household income, d) participation in social movements, and 3) student gender. As seen toward the middle of the figure there are a total of ten intervening variables mediating the impact of these five independent variables and further influencing mathematics achievement scores. Taken together, the variables in this model explain nearly one-quarter (24%) of the variance in AAE student's math scores. This is certainly a more powerful model than we saw in the case of reading achievement.

This model becomes much more sensible when we realize that many of the relationships between the independent and intervening variables are the same as in the reading model. For example, the determinants of “child/family motivations” discussed as sources of reading achievement are similar in direction and magnitude for math. In other areas, there are some important differences between reading and mathematics influences, however. For example, whether or not the primary parent/teacher has previously taught in public schools affects whether or not their spouses participate in the home instruction of their children. The spouses of those who have previously taught are less likely to participate. Perhaps these households feel that instruction should be left to the “expert.”

Figure 4: STAR Math Scores Path Model



GFI = .95; Chi-square = 83.67; Prob. = .55; df = 86; N = 175

Households in which the spouse participates in the home instruction of their children are more likely to be using standards according to the model. Also, spouse participation leads to having success with standards-based instruction. Furthermore, the more that standards are used, the more success parents have with them. Spouse participation also increases the average daily hours of home instruction that the AAE student receives.

There is also a relationship between student gender and the network of variables influencing math achievement. Female AAE students are more likely to have always been homeschooled than their male counterparts. Gender has two other important effects as well. Those AAE parents with male children are more likely to use standards in their home instruction than parents with female children. Moreover, those with male children are more likely to have joined the AAE because of their attraction to the school itself. So, while female students are more likely to have always been homeschooled, the AAE and the use of standards is more appealing to parents of male students. Perhaps parents

of male children have different aspirations for their boys and see the AAE as contributing better to these goals.

In addition increasing parental focus on the needs of their children as a motivation for joining AAE (i.e., child/family motivations), the social movement participation variable significantly influences two other survey responses. Self-identified social movement participants are more likely to have been motivated by the AAE itself and are more likely to be using standards in their home instruction. These parents see their participation in a larger light and are better integrated with the AAE's goals and mission.

Parents who have always homeschooled their children are less likely to have been attracted to the AAE itself. This implies that this segment of the population joined the AAE because of the *kind of school* it is, not because of its current staff or programs. Those parents who currently use standards are more likely to have joined because of the qualities they see in the AAE itself. This is sensible as standards-based instruction is clearly a large part of the AAE strategy.

Civic engagement plays an important role in this model. Parents who have previously taught in public schools are more likely to have engaged in deeper forms of political participation than those who have not. Professional experience inside public schools (when it becomes a source of negative feelings and dissatisfaction with the public schools) apparently leads one to become more politically active. Also, those primary parent/teachers who are more politically engaged are more likely to have their spouses assisting them with home instruction. Such engagement is likely to be a "family affair" and these spouses are thus more likely to participate.

The more politically engaged parents are also more likely to identify themselves as liberals and are less likely to have been attracted to the AAE itself. More politically active families may come to the AAE primarily because of their dissatisfaction with the public schools. Finally, those who are more politically engaged are more likely to have success with standards in their home instruction. These parents may simply be more motivated and are not likely to quit when things do not go as planned.

There are seven direct significant determinants of STAR math scores. As in the reading model, the children of self-identified conservatives and those whose parents are more well-educated are more likely to have higher scores. Also, where the motivation for joining the AAE focus on family and child needs, we are likely to see lower math scores.

The model indicates that those students who receive more average daily hours of home instruction perform less well than those who receive fewer hours. It is likely that those students who receive more hours of home instruction are having some learning difficulties. This negative relationship probably reflects something particular about the student and not home instruction hours per se. Increasing the amount of home instruction

almost certainly reflects a redoubling of efforts to raise flagging performance, not a cause of reduced achievement.

The students whose parents both participate in the home instruction tend to perform better on the math portion of the STAR examination than those who do not. Perhaps the spouses of the primary parent/teachers (almost always the husbands) are better able to convey mathematical concepts.

The model also demonstrates that the children of those parents who successfully employ standards are more likely to have higher math scores. It is interesting to note that the using standards variable has no direct relationship to math achievement. It is only where it is perceived that standards are being used successfully that there is any effect upon student performance. This implies that parents' perception of standards "success" tends to be rather accurate.

Finally, this model indicates that the children of those parents who are attracted to the AAE itself tend to perform less well on the math portion of the STAR exam. Those who chose to enroll their children because of the qualities of the AAE may be relying too much on the school.

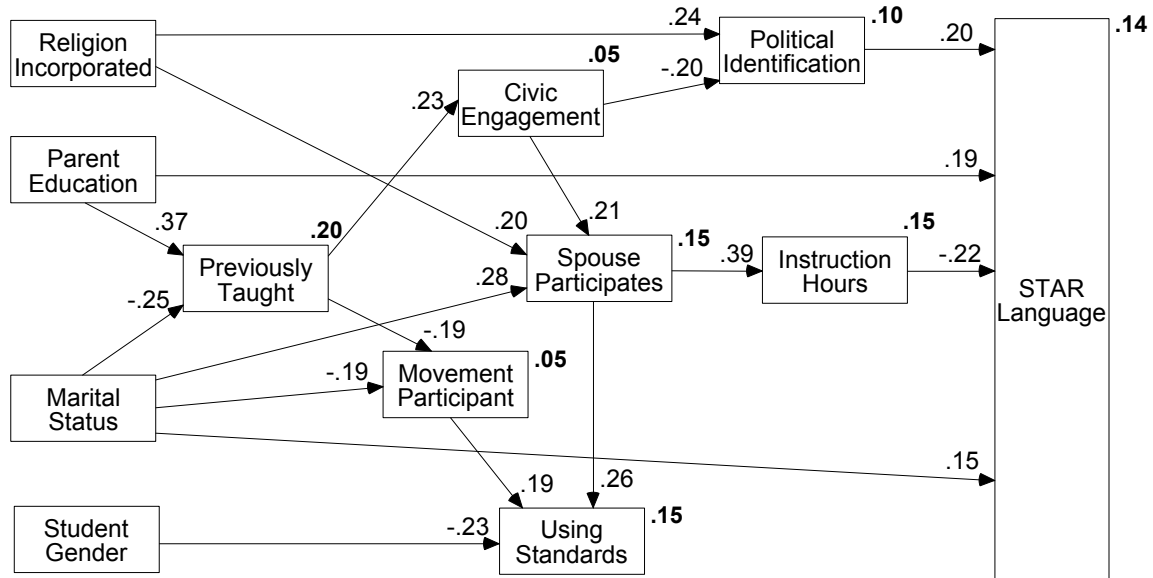
Language Achievement

The last model that we will consider is language achievement. This model differs from the previous ones in two ways. First, none of the enrollment motivations significantly determine student achievement (hence they do not appear in the model shown in Figure 5). Second, marital status has a significant effect for the first time.

This model indicates that currently unmarried parents are more likely to have previously taught in the public schools. This is probably a reflection of the fact that being single nearly forces one into paid employment. Thus, the single AAE parents are more likely to have taught in the public schools.

Another obvious finding in this model is that those who are married are more likely to have spouses who participate in the home instruction. Less obvious is the fact that being married makes one less likely to feel like they are participating in a broad social movement. Homeschooling is particularly difficult for single parents. These parents who take on this responsibility solely are more likely to feel like they are part of a larger movement. It is likely that these single parents are very committed to homeschooling and to bettering education as a whole.

Figure 5: STAR Language Scores Path Model



GFI = .96; Chi-square = 42.53; Prob. = .70; df = 48; N = 175

Another new finding in this model is that those parents who have previously taught are less likely to feel that they are participating in a larger social movement. Such experience in the public schools may make these teachers feel that a one-on-one environment is most conducive for learning. These pedagogical concerns may cause these homeschoolers to interpret their participation at the AAE in a more individualistic fashion.

In regard to STAR language scores, marital status has a direct, positive relationship. Children of married parents tend to perform better. This is so despite the fact that spousal participation has no direct effect. Therefore, it is something about the environment (and not about having two parents participating in the home instruction) of being in a married couple household that increases language scores. Perhaps daily conversational interaction with two parents increases these students' language achievement. The political identification, parent education, and instructional hour effects are the same as in the previous model.

Discussion

Overall, of the five different categories of variables, only student demographics have no significant effect upon student achievement. In particular, student race, student gender, and whether or not the student has always been homeschooled do not determine STAR performance at the AAE. The lack of findings attributable to student racial status is

particularly noteworthy. Traditionally, students of color have performed less well on standardized tests. Indeed, student race has no significant effects in any of the models. It thus appears that the AAE has succeeded in providing a “level playing surface” for all types of students.

The fact that no student-level measures are significant suggests that contextual factors at the AAE are quite important. Indicators of enrollment motivations, movement motivations, parent demographics, and instructional factors each have some effect upon student achievement. No one category of variables stands out as overwhelmingly important, however.

The mathematics achievement model is the most powerful of the three tested. There are many different determinants of math performance at the AAE. Unique to the math model is the positive influence of spouse participation and standards success. It may be that the husbands are more effective at teaching math than they are at teaching reading and language. Alternatively, perhaps the spouses of the primary parent/teachers tend to instruct in only particular subject areas (such as math). This is certainly an arena where further inquiry is needed.

Having success with standards is also an important determinant of math performance. This is a substantial finding given the AAE’s focus on standards-based education. Moreover, since the variable concerns perceptions of standards success, it suggests that parents truly understand when standards are effective tools. The connection with math performance is not entirely clear. Parents may be more likely to employ standards in mathematical instruction than they are elsewhere. Alternatively, standards may simply be more effective in math than in other subjects. Many mathematical concepts certainly translate rather easily into educational standards.

One other variable had a unique relationship to mathematics achievement. The children of those parents who chose to come to the AAE because of the school’s own characteristics are performing less well on the math portion of the STAR exam. As stated earlier, those parents who were attracted to the AAE itself may be relying too much on the school. It may also be that those attracted specifically to the AAE have children who were achieving slightly below average before their AAE experience and thus started out a bit behind. Regardless, it is not clear why this is the case only for mathematics. While we could speculate more, it is best to accept this as an interesting relationship that should be pursued in future research.

The amount of home instruction received by the student is negatively related to both math and language achievement. Again, we suspect that the students who receive more daily hours of home instruction are likely to have some learning difficulties. In other words, those students who get more home instruction are likely to be getting more instruction to help overcome lower performance.

Marital status was found to have a unique positive relationship on language achievement. Again, this may have something to do with these students having daily interactions with both parents. It seems likely that children's language skills will improve with more regular interaction with more adults. This is certainly a finding which deserves to be studied further.

The children of those parents who chose to come to the AAE because of their family/children needs have lower reading and math scores on average. This is reasonable since this is the special needs population. Yet it is interesting that this effect does not also hold for language achievement. Indeed, none of the parental enrollment motivations significantly affect student language scores.

There are two variables that are significant determinants in all three of the models. Children of the parents who identify themselves as politically conservative have higher test scores. As previously mentioned, this may reflect the fact that liberals tend to be less concerned with standardized tests. These liberal parents may do fewer test preparations for their children given their negative feelings toward the test instruments. It may also be that liberals, overall, are less strict with their children. Regardless, the correlation is consistently significant, demanding further study.

Lastly, the educational attainment of the primary parent/teacher is also positively associated with test scores. It is likely that the more educated parents tend to be better teachers and may be better prepared to teach their children how to perform well on standardized achievement tests. This educational "spillover" is not uncommon as the children of the well-educated tend to grow up in environments which are more conducive to learning.

Several of the relationships between the independent and intervening variables are also noteworthy. It was found that those parents who were motivated to join the AAE because of specific family and child needs are more likely to feel as if they are participating in a larger social movement. These parents are likely to see education as more of a collective enterprise. Also, self-identified liberals are more likely to have joined the AAE to meet family/child needs. This suggests that conservatives are primarily at the AAE for reasons other than their family and child needs.

The AAE primary parent/teachers who have previously taught in public schools are more likely to have always homeschooled their children and are less likely to have spouses who participate in the home instruction. These teachers clearly want to educate their children themselves. Those who have previously taught are also less likely to feel as if they are participating in a larger social movement. This experience in other schools apparently instills a very individualistic outlook among these parents.

The mathematics achievement model also highlights the importance of student gender. Parents of female children are more likely to have always homeschooled their children

and those with male children are more likely to use standards. Also, those with male children are more likely to have enrolled them at the AAE because of their attraction to the school itself. It does appear that parents are tending to have different aspirations and goals for their boys and girls.

Conclusion

The models presented in this report have identified several significant determinants of student achievement. Of these intriguing results, some of the relationships are intuitively sensible and may be useful in helping to increase student achievement overall at the AAE. On the other hand, some of the findings are not at all obvious. Indeed, good educational research often stirs up many more unanswered questions, laying the groundwork for a future research agenda.

The findings in this report suggest that there are several research questions that would be important to consider: Are there certain subject-areas in which spouses primarily tend to participate in the home instruction? In which subjects are standards most likely to be used and where are they most likely to be successful? Are those who chose the AAE because of the school itself more likely to depend upon the AAE for their students' math instruction? Are those children who receive more home instruction more likely to have special learning needs? Do two-parent households foster better language development? In what ways are self-identified liberal parents approaching home instruction differently than those who identify themselves as conservatives? And, above all, how has AAE managed to succeed in eliminating the usually powerful impact of student ethnicity and poverty on achievement? We hope to explore these and other important questions in our ongoing data collection and analysis. The findings from this report and the answers to these future research questions are likely to make an important contribution to educational research and to assist in improving education everywhere.