# Idaho Parents' STEM Education Experiences

Micron STEM Education Research Initiative

Micron Foundation

University of Idaho

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# Introduction

Research surrounding parental involvement in their child's education consistently finds that higher academic achievement is linked to parents' expectations and presence in student learning (Jeynes, 2005). To identify the multiple factors that help explain Idaho's STEM educational outcomes, a Micron funded five-year research project explores community and statewide factors. This report summarizes key findings from surveys collected in spring 2013 from the parents of the 4th-, 7th-, and 10th-grade students who had been surveyed in the fall of 2012. These surveys were collected from adults residing in twelve different communities across Idaho.

# Executive Summary

1. The response rate from Idaho 4th, 7th, and 10th graders' parents was very good, with over 60% of students' parents participating. This demonstrates a high level of parents' interest in their children's learning experiences and future aspirations.
2. Parents' own experiences with math and science appear similar to students' experiences. When asked to recollect if they liked math and science, and about their friends' views of the subjects, a large number of parents indicated they liked these subjects, though they perceived that their friends were less positive about the topics.
3. A substantial number of parents in our sample (25-40%) earned incomes below poverty level and Idaho's median income level of $46,890. When we examine the distribution of incomes above and below poverty level, the largest percentage of families in poverty are Hispanic in this sample. Parents with college degrees comprised the smallest percentage of families living below poverty level, with the lowest percent being those families with a male adult who has a four-year or graduate/professional degree.
4. Poverty negatively affects families' opportunities to support their children's learning as they felt there were time constraints that hampered parental involvement in their child's education. Results also indicate families experiencing poverty report they are less knowledgeable about how to help their children with college preparation.
5. Over 50% of parents, male and female, have earned a high school diploma or less. White parents in our sample have the highest number of college degrees compared to the two other racial-ethnic groups considered in this report. For example, 64% of Hispanic men in the sample had not earned a high school diploma.
6. No matter the level of a particular parent's educational attainment, the vast majority of all parents (89% or more) would like to see their children earn a four-year degree or a graduate/professional degree.
7. The educational attainment of students' parents also impacts students' learning experiences and aspirations. For instance, 36% of students whose female parents had a four-year, graduate, or professional degree said they wanted to be a scientist. Further, parents who had not attended college indicated they wished they had more time to be involved in their child's education.

8. According to parents, the cost of college, their child's high school grades, and their child's college admission exam scores factor importantly in their considerations of their child going to college. Even though college admission exams are known to be important, 35% of 10th graders' parents report having conversations about these exams rarely or never.
9. When asked how their child's college expenses will be covered, most parents indicate scholarships, student loans, and child's income during college would be utilized. Over 30% of 10th graders' parents, however, say they are not sure how to help their child apply for financial aid. When responses between parents and their students were compared, almost 70% of students whose parents say they know how to apply report that they, themselves, do not know how to apply for financial aid.
10. Fifty-eight percent of 7th and 10th graders' parents said their own math and science knowledge interfered with their abilities to help their child with math and science homework. In addition, almost all parents felt it was essential that students have basic math and science skills; however, there was less consensus that physics and calculus were considered essential or even important.
11. Parents' performance in the science literacy test (the Scientific Fact Index) was slightly stronger than it was among the 10th graders sampled in this project. People who reported feeling very informed about matters of science performed better than those who felt they were not as informed. However, when tested on understanding about evolution, all parents were less informed on this topic than on topics covered by other questions.
12. When parents' beliefs and trust in science is examined, we find over 1/3 reporting that science can come into conflict with their religious beliefs and that their trust in scientific findings is uncertain (53%). However, the majority of parents say that evolution should be taught in schools and that Idaho needs more scientists to help improve things in the state.

# Demographics and Parent Experiences

In this section we summarize the parent sample demographics and briefly illustrate the experiences fourth, seventh, and tenth graders' parents have had with mathematics and science learning. The response rate from these Idaho parents was very good, with over 60% of students' parents participating. A response rate of 60% demonstrates a high level of parental interest in children's learning experiences and future aspirations. Parents' own experiences with math and science appear similar to students' experiences. When asked to recollect if they liked math and science, and about their friends' views of the subjects, over half of parents recalled that they had liked these subjects and their friends did not like them as much.

# Parent Sample Demographics: Gender, Ethnicity, and Geographic Residence

| Demographic Groups | 4th Grade Parents (n=258) | 7th Grade Parents (n=634) | 10th Grade Parents (n=701) |
|---|---|---|---|
| **Gender** | | | |
| Women | 80% | 82% | 76% |
| Men | 20% | 18% | 24% |
| **Ethnicity*** | | | |
| White | 85% | 81% | 83% |
| Hispanic | 10% | 13% | 10% |
| American Indian or Alaskan Native | 3% | 3% | 2% |
| Black or African American, Asian American, or Other | 2% | 2% | 3% |
| **Geographic Residence** | | | |
| Rural | 30% | 15% | 14% |
| Urban | 70% | 85% | 86% |

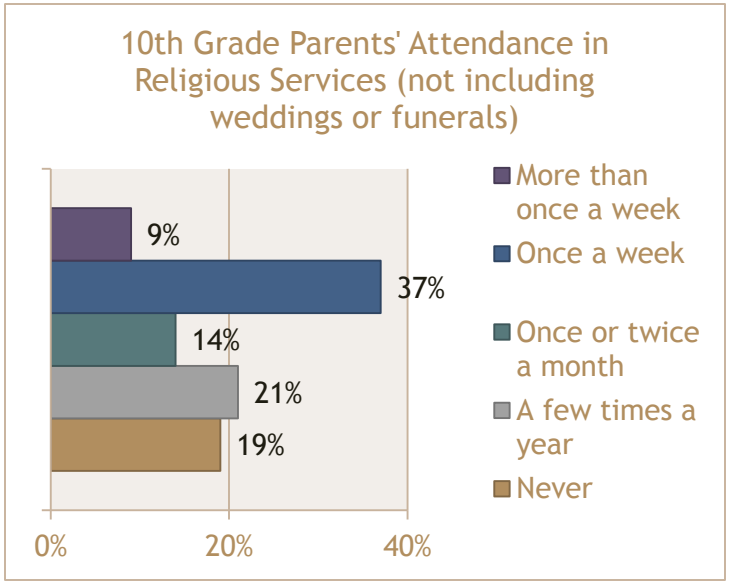
Of the 4th-grade students who participated in the survey fall 2012, 61% of their parents participated. Of 7th-grade students, 64% of their parents participated and 60% of 10th-grade students' parents participated.

The ethnic distribution of the parent sample is not as diverse as the student sample. Although 17% of the student sample reported being Hispanic, only 10% of the parents identified as Hispanic.

*Respondents could identify with more than one ethnicity, thus percentages do not total 100.

# Parent Sample Demographics: Political Perspective and Religious Affiliation

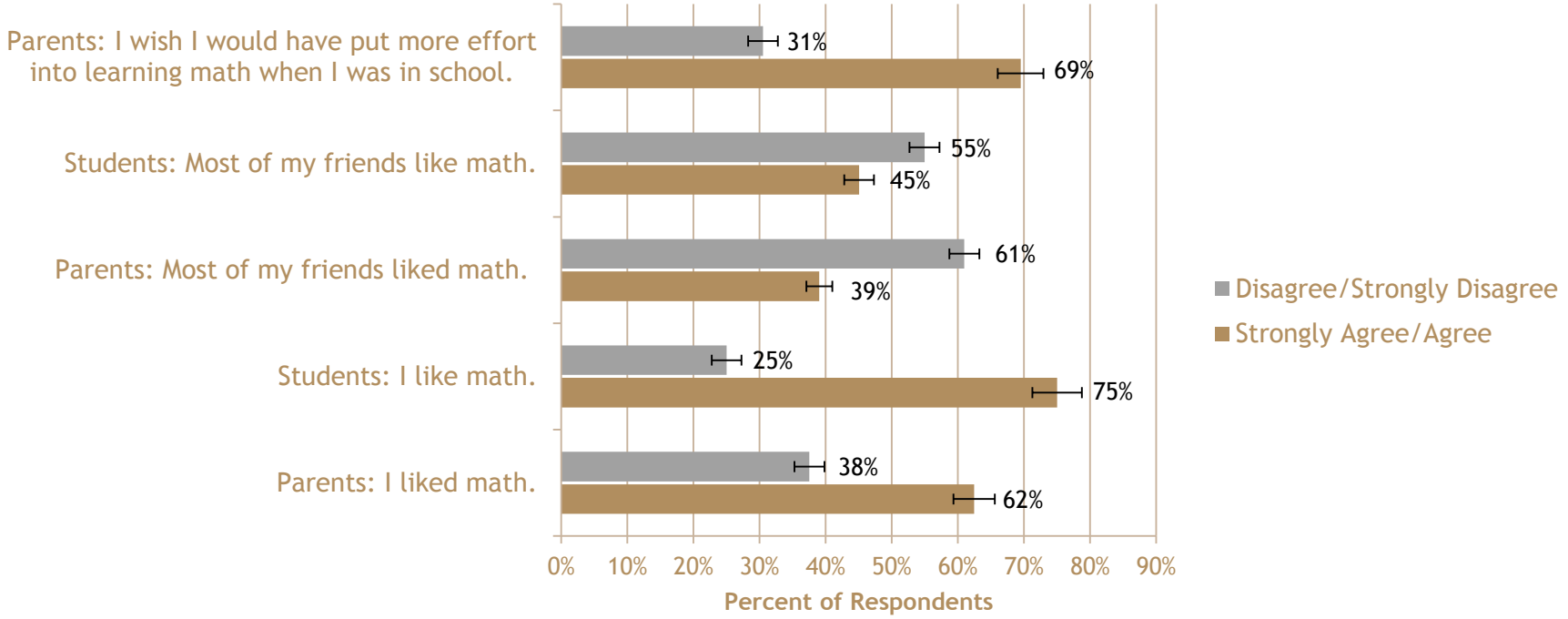
| Demographic Groups | 4th Grade Parents | 7th Grade Parents | 10th Grade Parents |
|---|---|---|---|
| **Political Perspective** | | | |
| Strongly Conservative | 9% | 8% | 10% |
| Conservative | 33% | 30% | 34% |
| Slightly Conservative | 11% | 13% | 12% |
| Middle of the Road | 25% | 27% | 25% |
| Slightly Liberal | 13% | 8% | 8% |
| Liberal | 8% | 11% | 8% |
| Strongly Liberal | 1% | 3% | 3% |
| **Religious Affiliation** | | | |
| Protestant | 28% | 30% | 32% |
| Catholic | 15% | 17% | 14% |
| Church of Jesus Christ of Latter-day Saints | 25% | 23% | 25% |
| Atheist/Agnostic/None | 21% | 17% | 16% |
| Other | 9% | 8% | 8% |
| Refuse to Answer | 2% | 5% | 5% |



# Parents' Math Experiences

Over two-thirds of parents said they wished they had put more effort into learning math when they were in school. Parents and students both perceived they liked math more than their friends. Just over 60% of parents perceived that their school friends had not liked math. However, over 60% of parents reported they themselves had liked math in school. There was a small but significant correlation between how much children reported liking math and how much their parents reported liking math ($r$=.11, $p$<.001). Perceptions of peers may be more influential than parents in this regard as children who believed their friends liked math were more likely to report that they too liked math ($r$=.29, $p$<.001).

**Consider your experiences with math in school. Please indicate how much you agree or disagree with each of the following statements.**

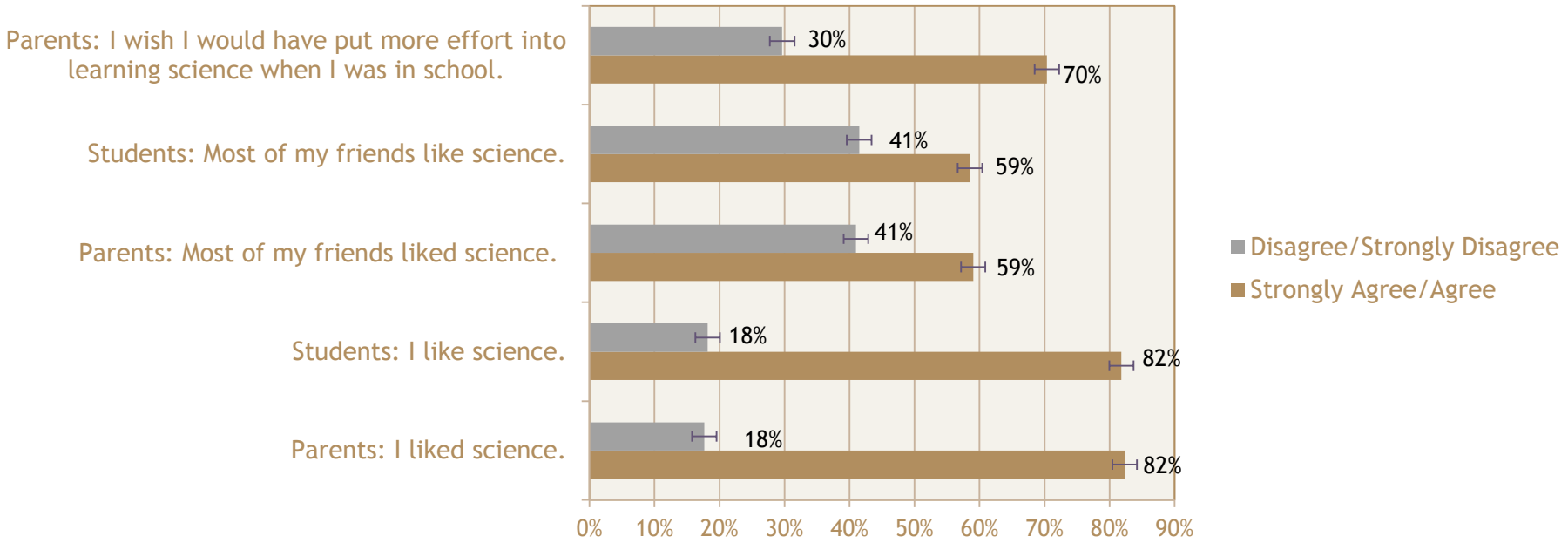



Error bars indicate the upper and lower limits of 95% confidence intervals for each percentage.
Differences for each item are significantly different all $\chi^2$ (1,1595) > 15.64, $p$ <.001.

# Parents' Science Experiences

Parents also were more likely to agree they wished they had exerted more effort in their science courses. Parents reported more liking for science (compared to math) for both themselves, $F(1, 1578) = 114.32$, $p<.001$, and their friends, $F(1, 1580)=50.79$, $p<.001$. Students showed an identical pattern to their parents with regard to their own and perceptions of their friends' liking for science.

**Consider your experiences with science in school. Please indicate how much you agree or disagree with each of the following statements.**

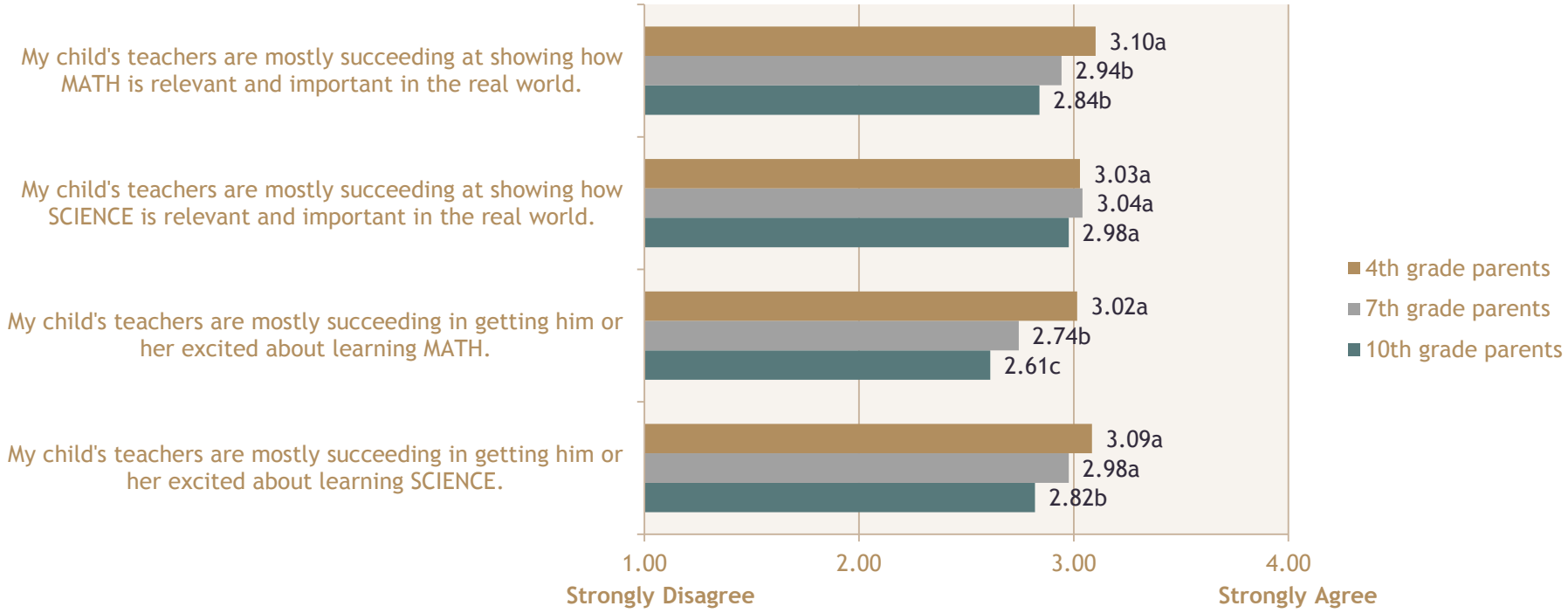



Error bars indicate the upper and lower limits of 95% confidence intervals for each percentage.
Differences for each item are significantly different all $\chi^2$ (1,1595) > 46.3559, $p$ <.001.

# Parents' Perceptions of Their Child's STEM Learning Experiences in Schools and Communities

As grade levels advance parents increasingly perceive that teachers are less successful in getting students excited about math or science. Parents of 4th graders feel the teachers are more successful in creating excitement about math and science than parents of 10th graders. However, teachers in every grade level are perceived as succeeding in demonstrating real world applications in science coursework. Parents perceive teachers of 10th graders have less success at demonstrating real world applications for math than parents of 4th and 7th graders.

## Degree of Parent Agreement with Each Item




Higher numbers indicate more agreement with item. Bars with differing subscripts are significantly different from one another within each item, $p < .05$.

# Poverty and Family Education Experiences

In this section, we examine how poverty and different education experiences and aspirations are related. A substantial number of parents in our sample (25-40%) earned incomes below poverty level and Idaho's median income level of $46,890. When we examine the distribution of incomes above and below poverty level, the largest percentage of families in poverty are Hispanic in this sample. Parents with college degrees comprised the smallest percentage of families living below poverty level, with the lowest percent being those families with a male adult who has a four-year or graduate/professional degree.

# Parent Sample Demographics: Income

The number of households living on incomes below Idaho's median income and below poverty was greater for the sample of 4th-grade parents than for the other two parent samples.

Distribution of parents in sample earning above and below Idaho's median income of $46,890.

| | 10th-grade Parents | 7th-grade Parents | 4th-grade Parents |
|---|---|---|---|
| Above Median | 58% | 54% | 44% |
| Below Median | 42% | 46% | 56% |

Poverty distribution of parents in sample.

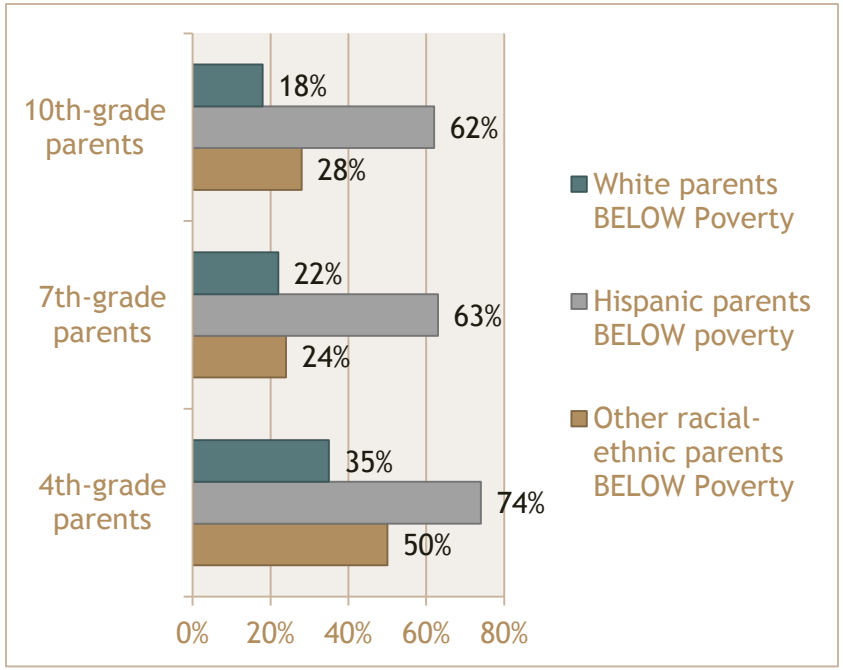
| | 10th-grade Parents | 7th-grade Parents | 4th-grade Parents |
|---|---|---|---|
| Above Poverty | 75% | 71% | 60% |
| Below Poverty | 25% | 29% | 40% |

Note: Median income for Idaho is a 2007-2011 figure (US Census Bureau Idaho Quickfacts). We used Federal Poverty Guidelines (FPG) to determine household poverty status (refer to http://aspe.hhs.gov/poverty/13poverty.cfm ). Poverty guidelines depend on household income and the number of people in a household. On the survey, we asked both number of people in the household and for the range in which the household income would fall. In SAS, we took these two variables and created a dummy variable to categorize households (this was matched as closely as possible, given the categories for income in the survey do not exactly match the FPG) as being either above or below poverty. So if 2 people live in a household and household income is between $10,000 and $14,999 the household would be categorized as living below the poverty level.

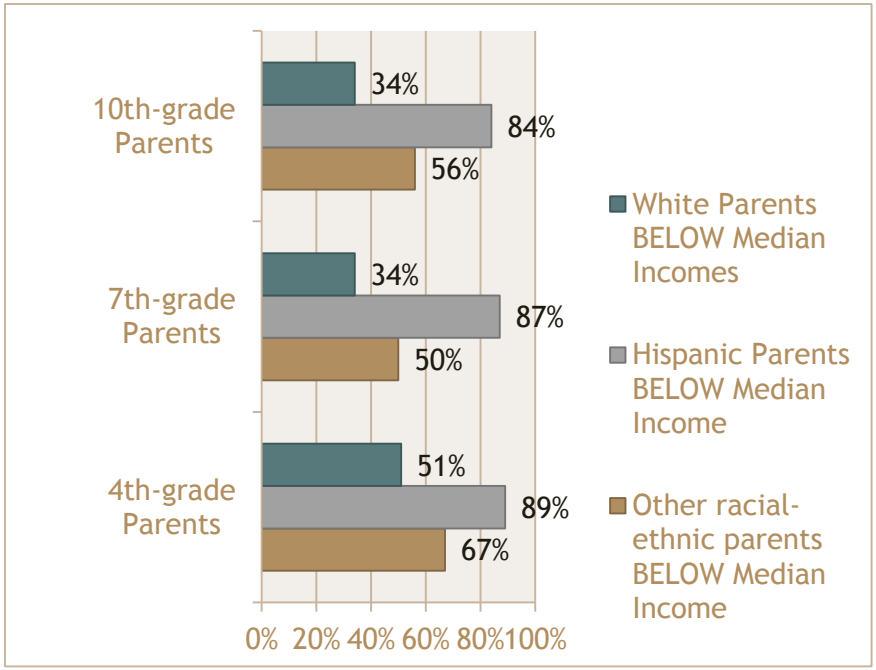
# Poverty and Median Income levels by Racial-Ethnic Groups in the Parent Sample

Nearly two-thirds of Hispanic 7th- and 10th-grade parents live on incomes below poverty level and nearly three-quarters of Hispanic 4th-grade parents do. This level of poverty is higher for Hispanic parents compared to non-Hispanic parents.

Percent of Households Earning Below-Poverty Incomes

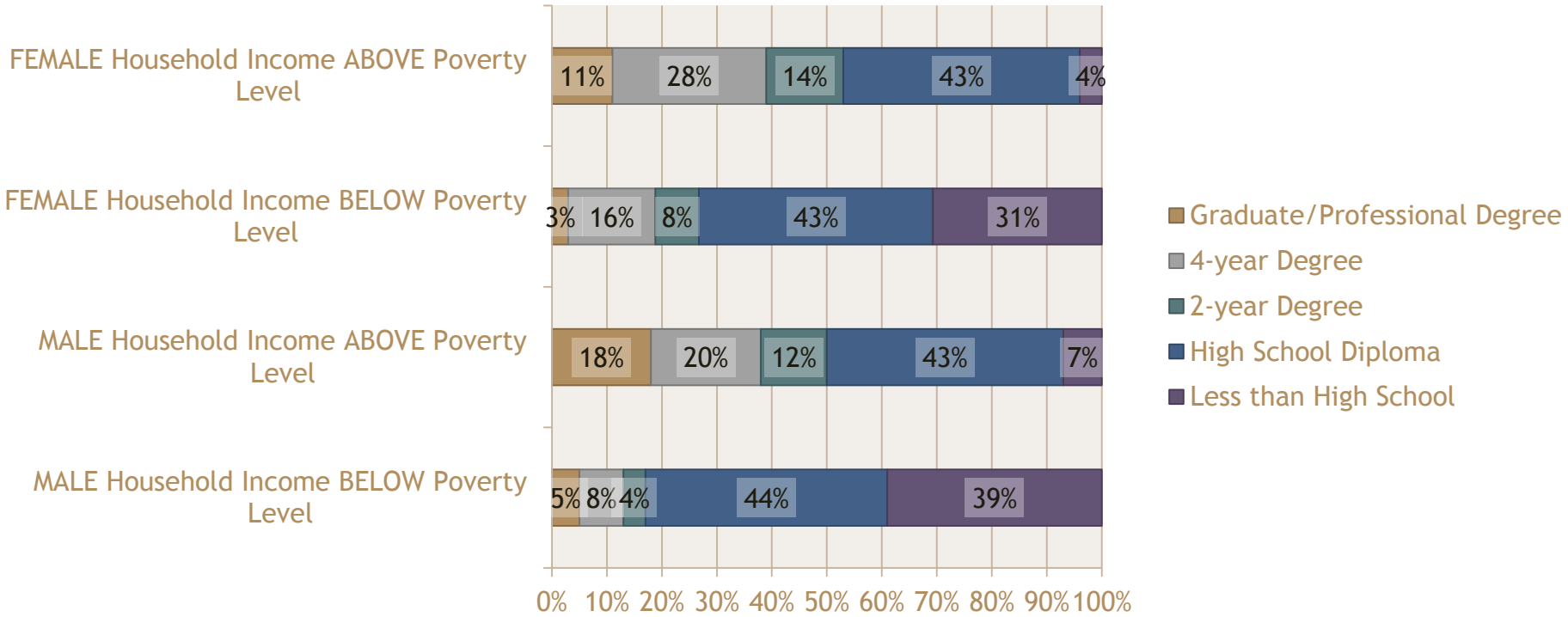



Percent of Households Earning Below Idaho's Median Income by Racial-Ethnic Group



# Household Incomes (Above or Below Poverty) and Educational Attainment of Female and Male Adults in 10th-grade Students' Households

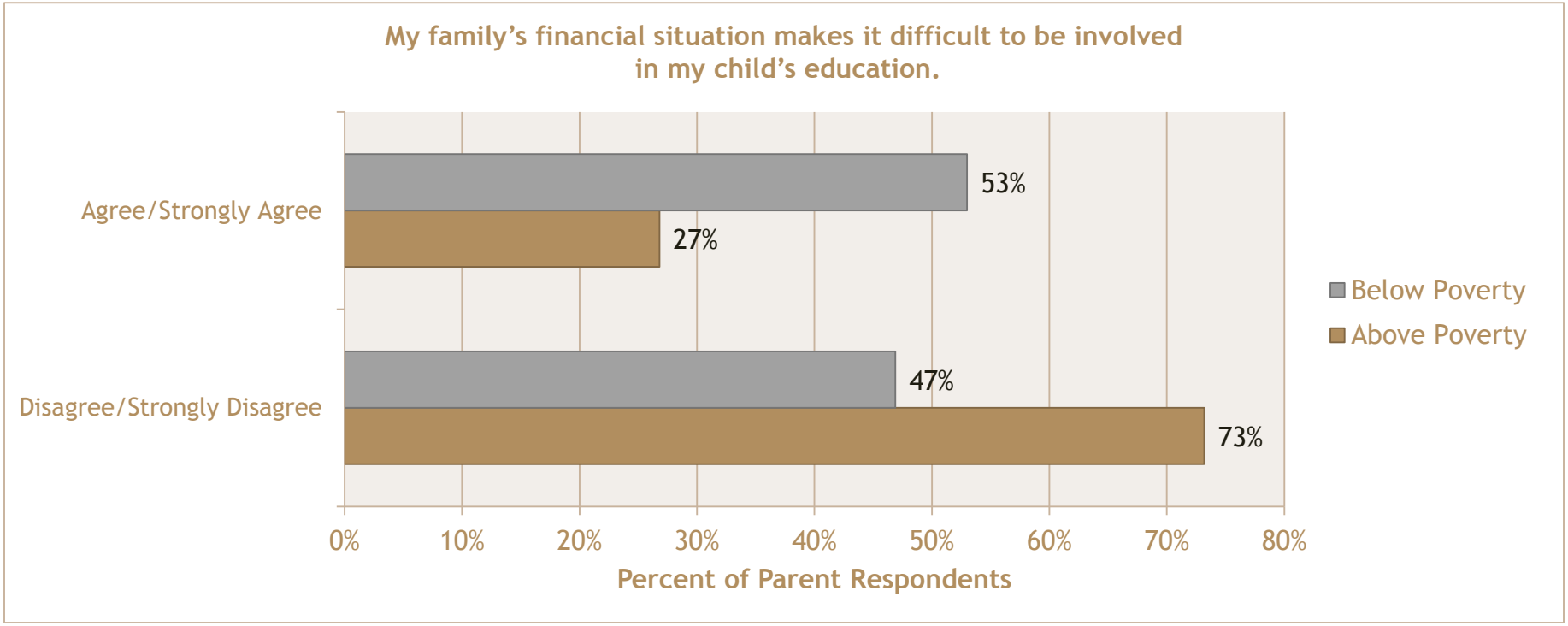
Less than 30% of below poverty households included adults with college degrees, only 17% of them have a male adult present with a college degree and 27% had a female adult present with a college degree. In contrast, 50% or more of above poverty households include males (50%) and females (53%) who hold college degrees.




Note: The survey asked for the education attainment level for the female and male adults living in the household. These percent distributions reflect the poverty levels of each household by the education levels of the female adults and of the male adults and does not indicate individual incomes of men and women respondents.
The cross-tabulation tested significant $p < .0001$.

# Family Poverty and Parent Involvement in Student Education

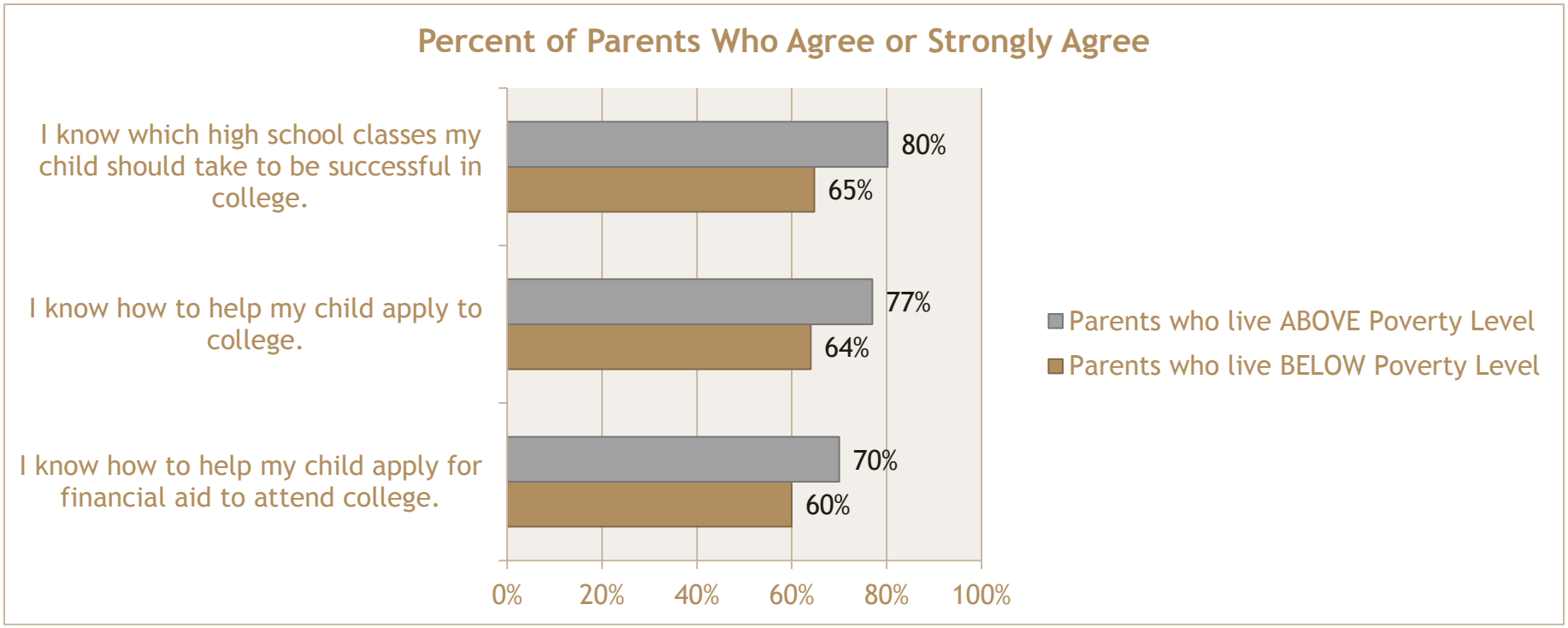
We tested whether parents experiencing poverty reported more difficulty being involved in their child's education. Parents experiencing poverty were significantly more likely to feel their financial situation constrained their involvement in their child's education than parents not experiencing poverty. Approximately half of parents considered to be above poverty also reported that being involved in student education was difficult due to their financial situation.




Parents experiencing poverty are significantly more likely than parents who are not to indicate their financial situation makes it difficult to be involved in their child's education, $p < .05$.

# Family Poverty and College Preparation

Sixty percent of parents felt they knew how to support their child's efforts in college preparation. However, parents experiencing poverty were less likely to report understanding different aspects of college preparation. Most noteworthy in these results is that 40% of parents living below poverty level reported they did not know how to help their child apply for financial aid.




All three questions indicated that parents experiencing poverty were less likely than parents living above poverty levels to agree with each item, $p<.05$.

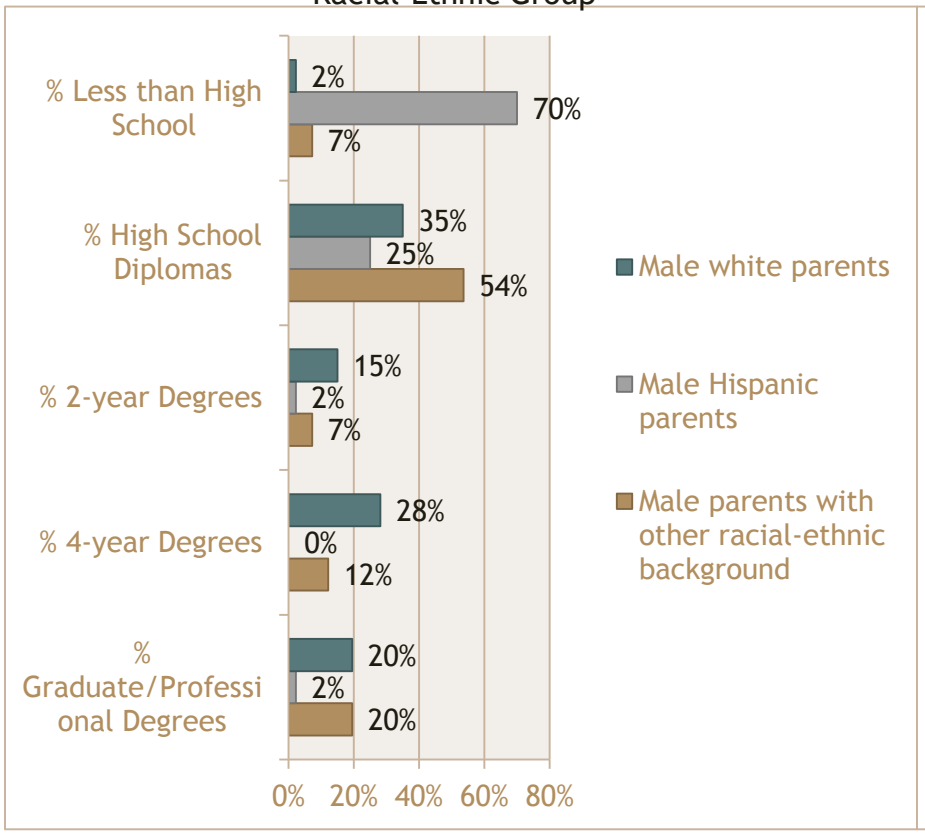
# Parents' Educational Attainment and Student Learning and Aspirations

In this section we explore how parents' educational attainment levels are related to different learning experiences of fourth, seventh, and tenth graders. Over 50% of parents, male and female, have earned a high school diploma or less. White parents in our sample have the highest number of college degrees compared to the two other racial-ethnic groups considered in this report. For example, 70% of Hispanic men in the sample had not earned a high school diploma. Regardless of a particular parent's educational attainment, the vast majority of all parents (89% or more) would like to see their child earn a four-year degree, or even a graduate professional degree. We also consider the degree to which educational aspirations and college preparation are affected by these factors.

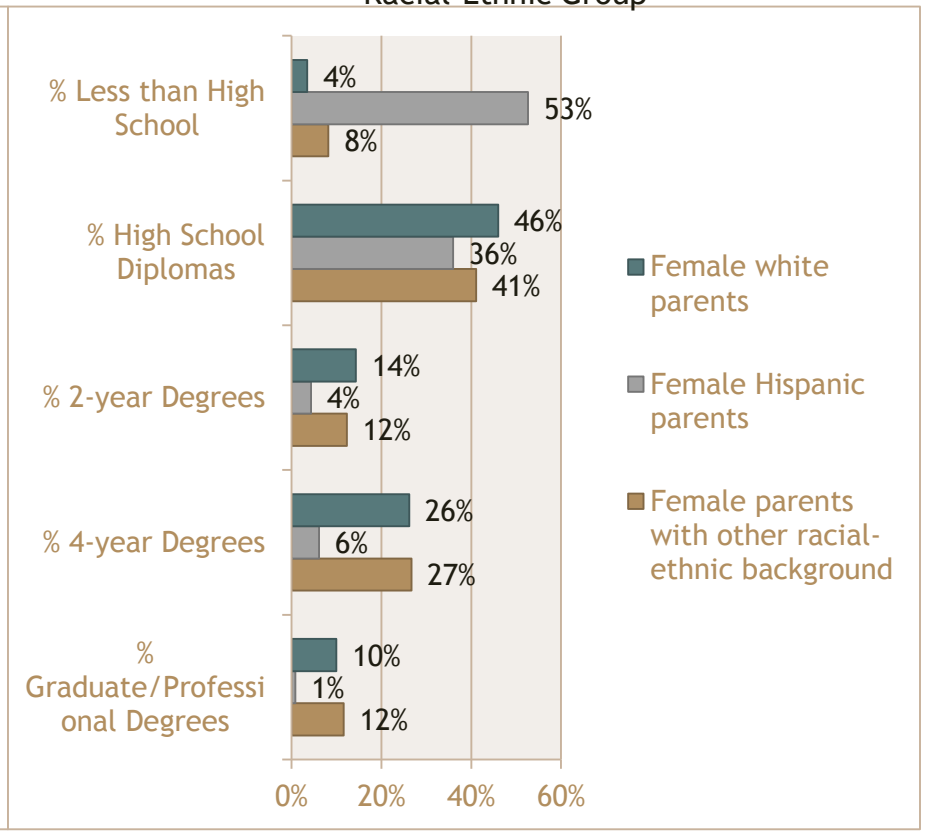
# Families' Educational Attainment and Racial-Ethnic Composition

For both male and female parents, the level of educational attainment among Hispanic parents was significantly lower than the other two racial-ethnic groups considered in this report. White parents, male and female, had significantly higher levels of education generally, except more women of other racial-ethnic groups than white women had graduate or professional degrees (12%).

Male Parents' Educational Attainment by Racial-Ethnic Group



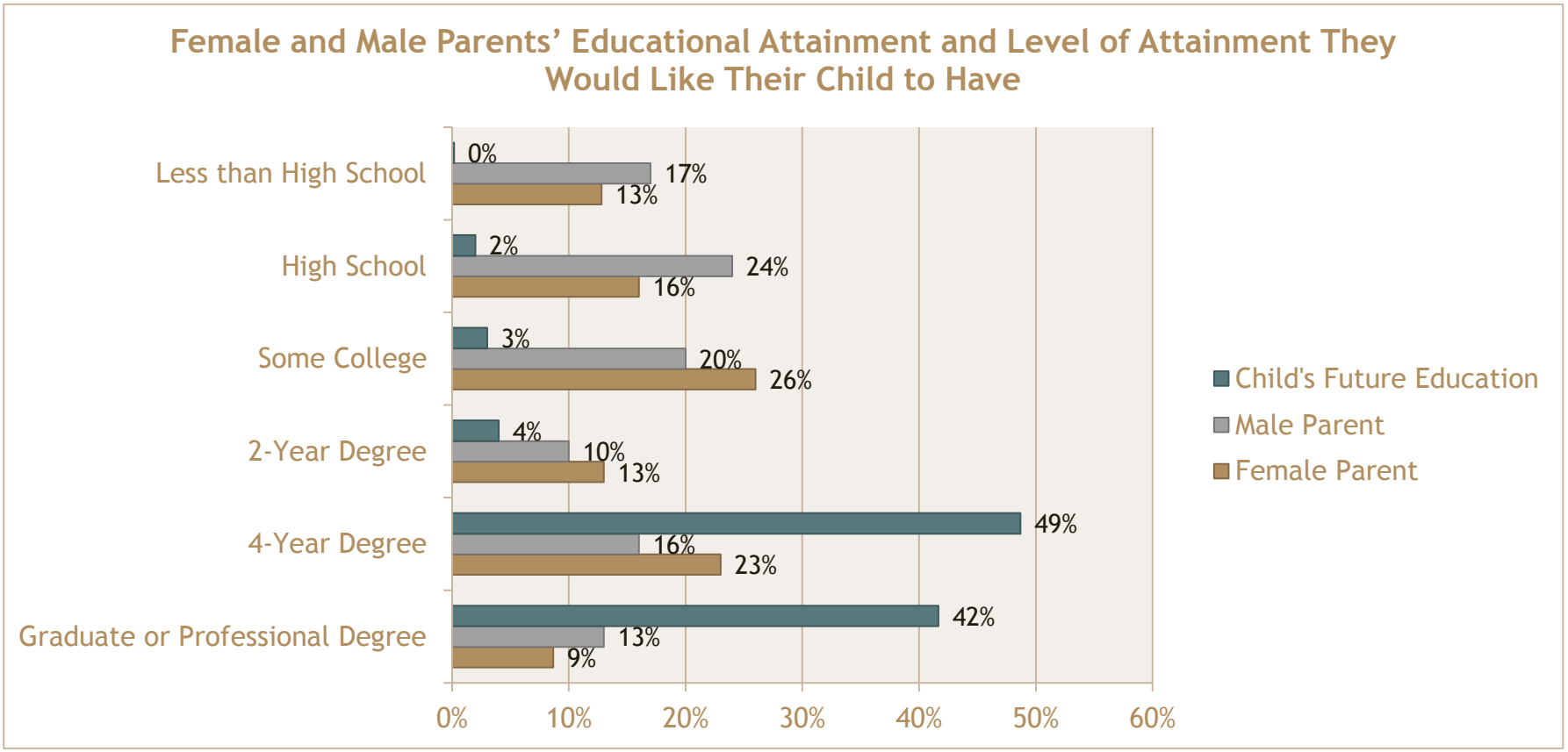

Female Parents' Educational Attainment by Racial-Ethnic Group




For female parents, there was a significant difference in amount of education such that Hispanic female parents had less education than all other female parents, $p < .05$. For male parents, white fathers were more educated than fathers of other racial-ethnic backgrounds, and Hispanic fathers had the lowest levels of education, $p<.05$.

# Parents' Educational Attainment and Expectations for Their Children's Education

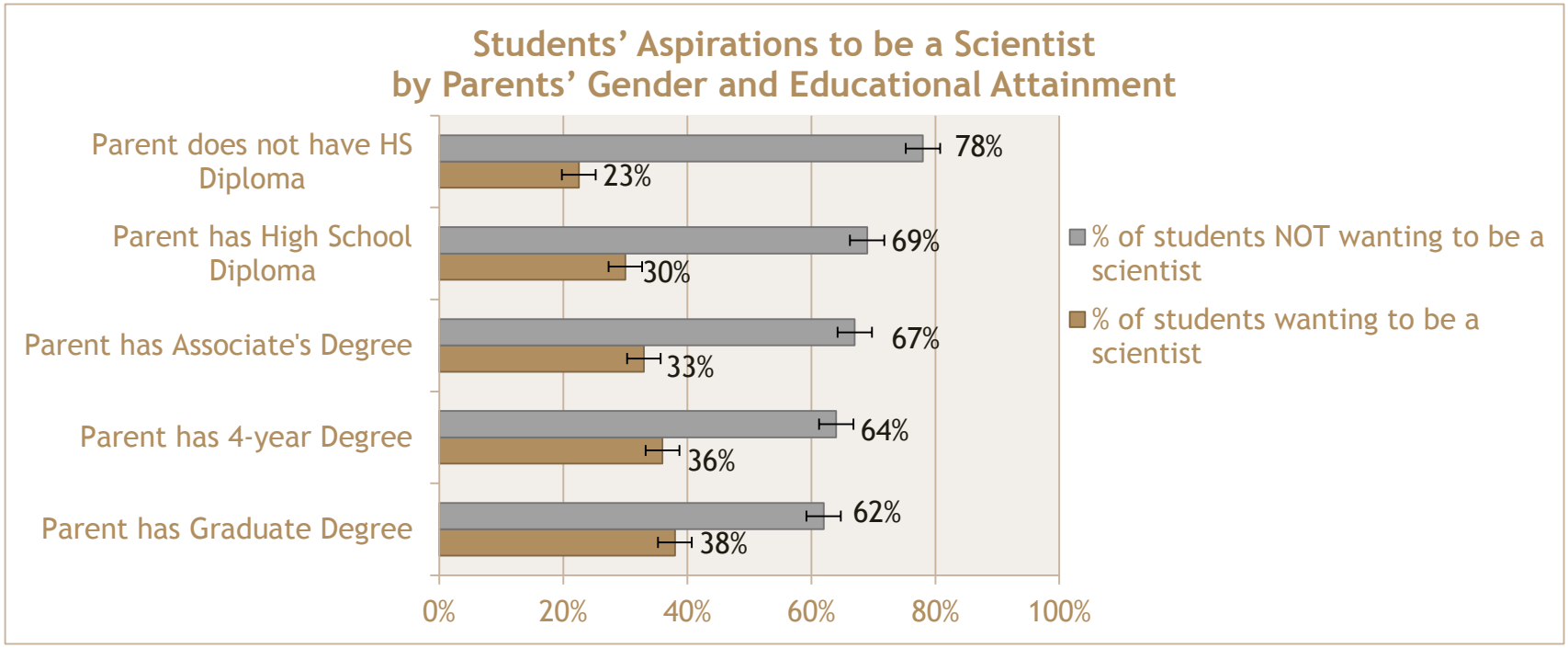
Over 50% of parents, both male and female, reported having a high school education or less. While less than half of parents reported having a four-year degree or higher, 91% of parents said they would like their child to earn at least a four-year degree.




**Note:** Just over 3% of parents expected their child to complete vocational/technological college or pursue a two-year degree. There is a small but significant correlation ($r$=.20, $p$<.001) between parents' years of education and educational aspirations for their child.

# Parents' Educational Attainment and Children's STEM Learning and Aspirations

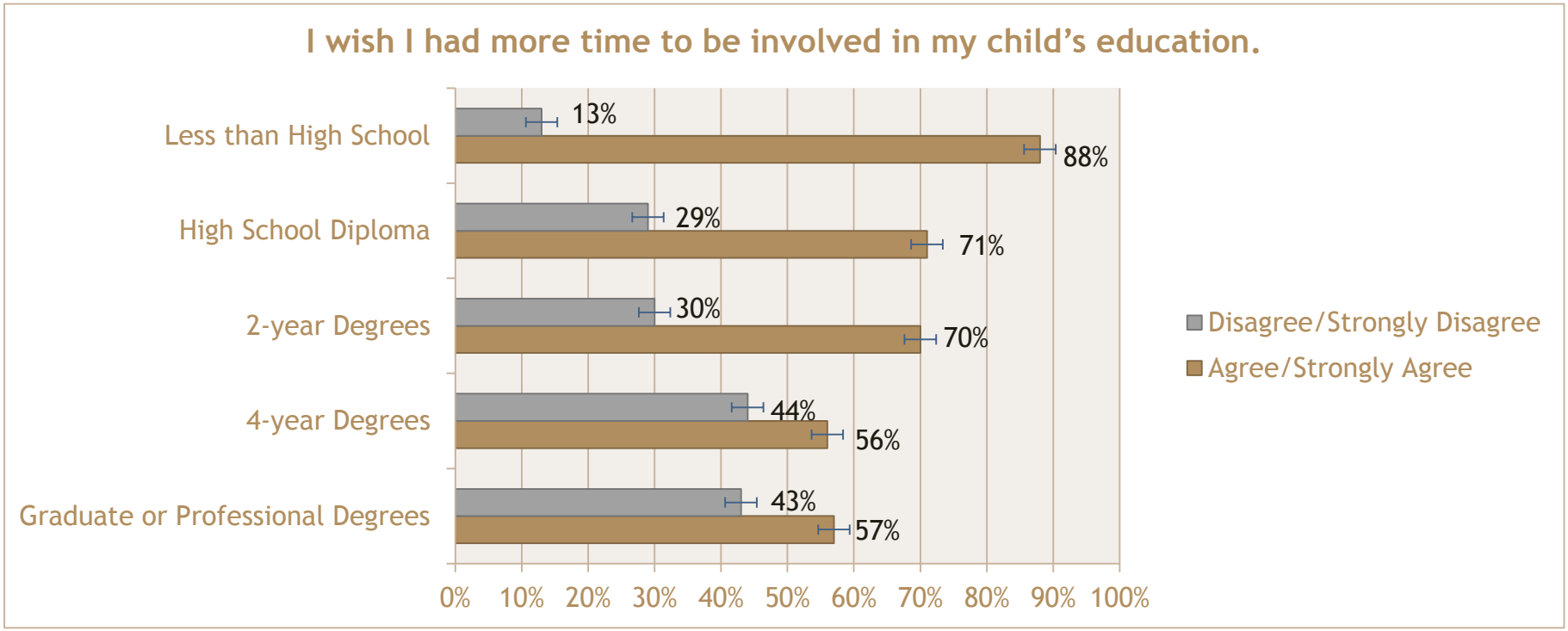
Overall, about 33% of students indicated they would like to be a scientist. However, the largest portion of students who indicate they do not want to be scientists come from homes where the parent has less than a high school diploma. Regression analysis indicates that a female parent's educational attainment and grade in school are significant predictors of a child's agreement with the statement, "I want to be a Scientist." Such results support the view that advancing women's, as well as men's, educational attainment positively affects student's STEM aspirations.



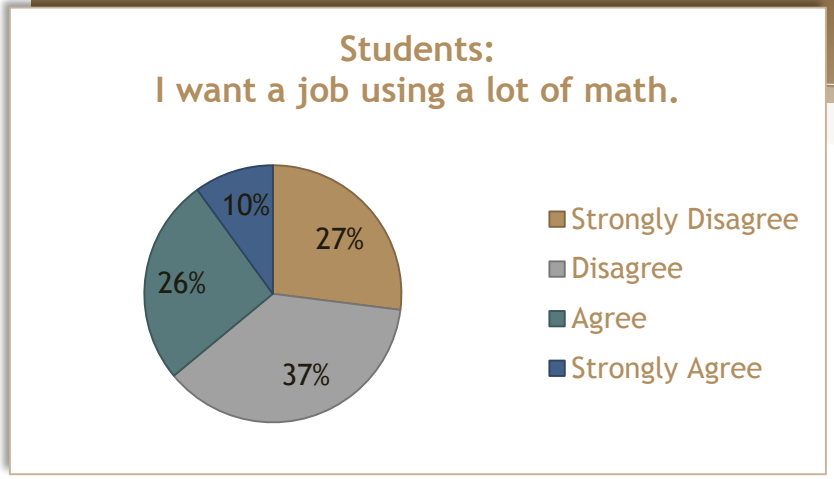

Analysis indicates there is a main effect of female parent's educational attainment, $F(1, 1484)=10.20$, $p < .01$. There is also a main effect of grade in school, $F(2,1484)=14.24$, $p<.0001$, as students progress through school they are less likely to want to be scientists. Male parent's educational attainment did not predict student's ratings of the item.

# Parents' Educational Attainment and Involvement in Children's Education

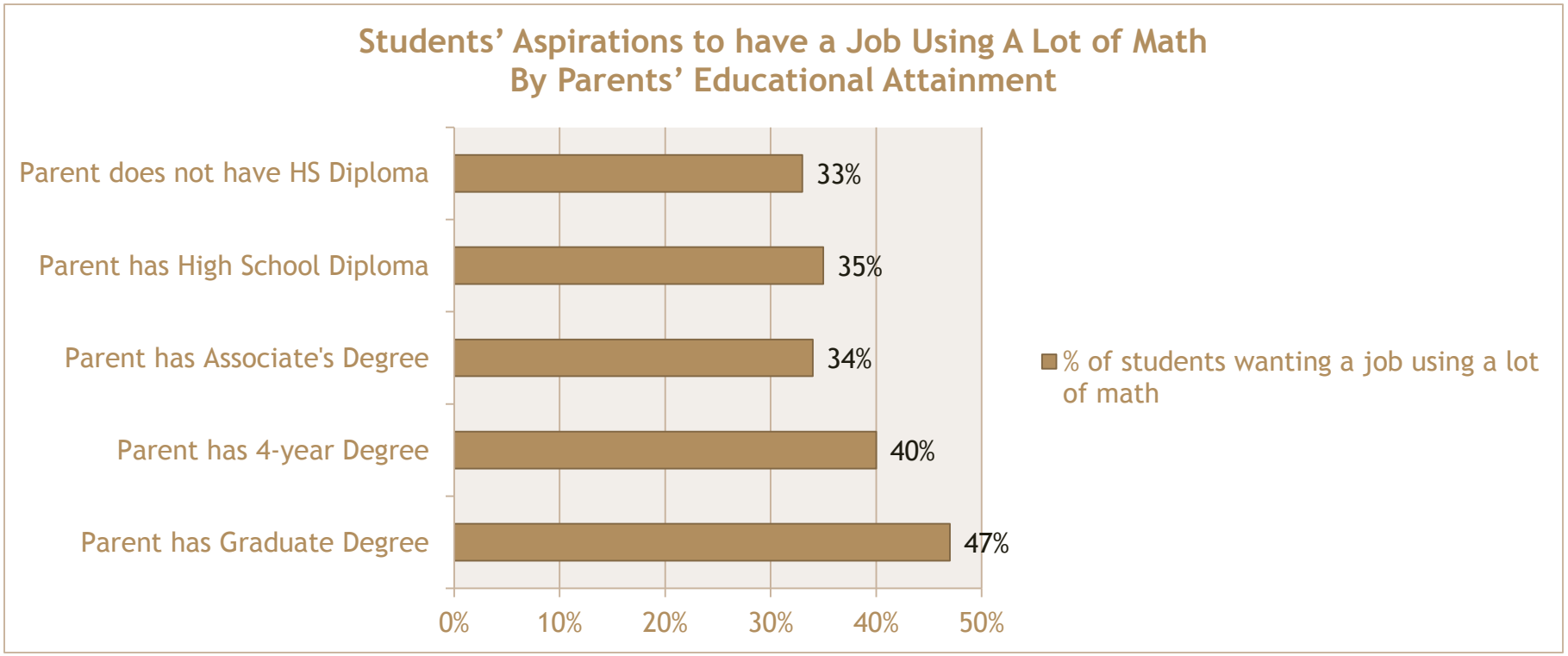
Parents with less than a high school education wish they had more time to be involved in their child's education compared to other parents, $p<.001$. Parents with four-year degrees and post-baccalaureate degrees have the highest rate of disagreement with the item. Overall, parents were more likely to agree than disagree with this statement, $p<.001$.




Statistically significant differences at $p<.05$ are demonstrated by error bars for each level of education.




Overall, 36% of students said they wanted a job using a lot of math. However, the number of students who want such a job declines at a statistically significant rate as they advance in school from 47% of 4th graders to 39% of 7th graders and only 28% of 10th graders. Parents' educational attainment significantly correlates with students' career aspirations, with the desire to use a lot of math increasing as parents' education level increases ($r$=.07, $p$=.01). Parents with graduate/professional degrees have the highest percentage of children who wish to have jobs that use a lot of math.

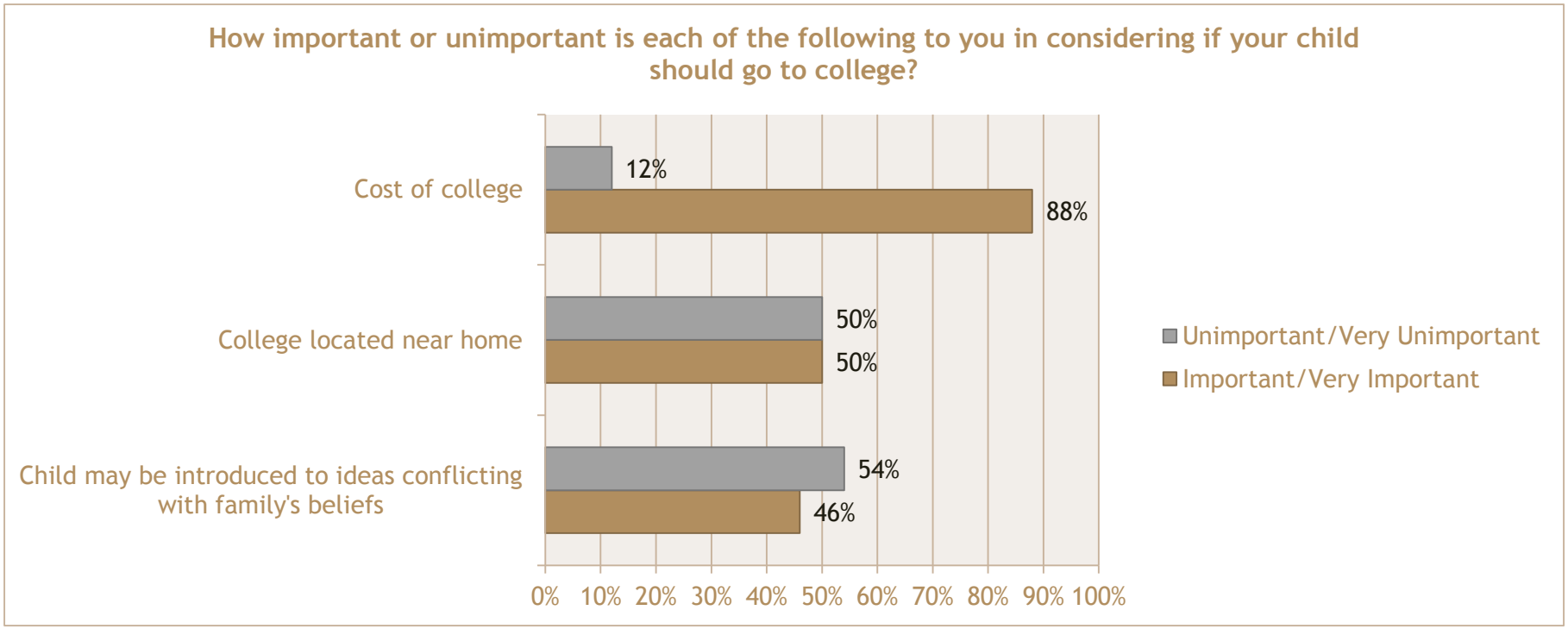


# Parents' and Students' College Preparedness

In this section we examine the extent to which parents feel prepared to help their child get ready for college admission. We explore different factors that may create differences in college preparation skills for different households and test some parent responses against their child's responses from the student survey conducted fall 2012. According to parents, the cost of college, their child's high school grades and college admission exam scores factor importantly in their considerations of their child going to college. A third of 10th-grade parents and even fewer 7th-grade parents, report rarely or never having conversations with their child about college admission exams and our results suggest they do not have concrete plans for covering their child's college costs.

# Parents' and Students' College Aspirations and Preparedness

Parents were asked how important the cost of college was in considering whether their child should attend college. Parents were significantly more likely to indicate that cost was important than not important. However, parents were evenly split on the importance of the location of college or their child being introduced to ideas conflicting with their family's beliefs. Almost all parents reported that their child's grades (99%) and exam scores (95%) were very important factors when considering whether their child should attend college. In addition, 92% of parents indicated that having a college education was necessary for their child's future.

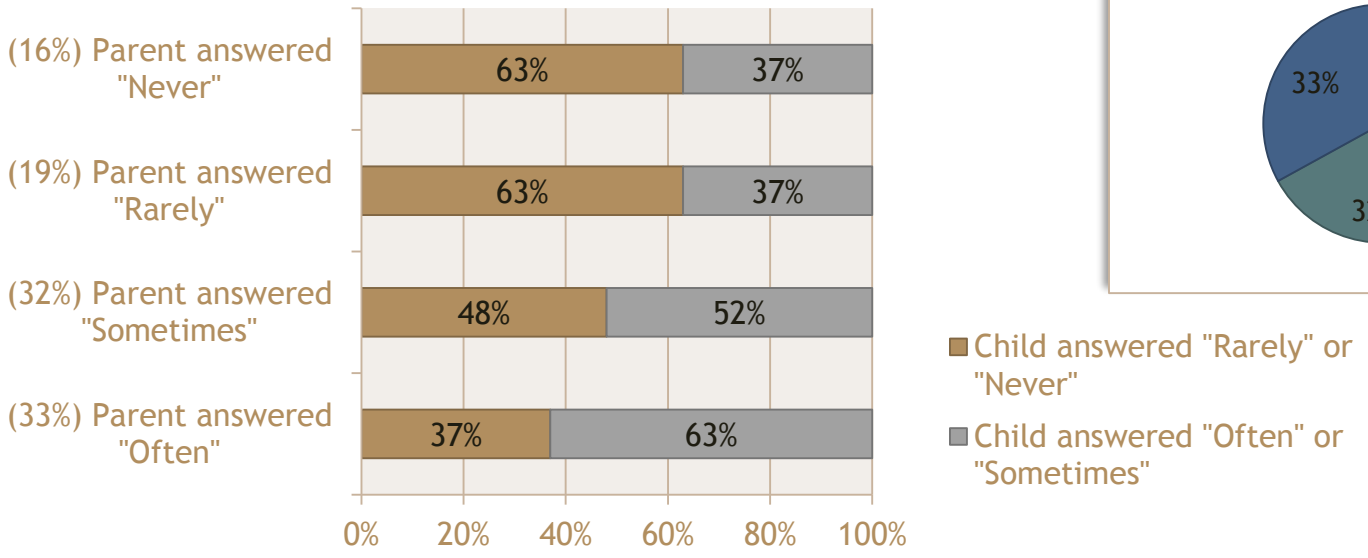



Percentages indicate the number of respondents who reported these factors were very important/important or very unimportant/unimportant.

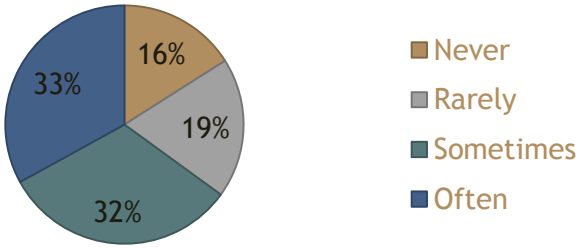
# Parents' and Students' College Aspirations and Preparedness: Parents' Knowledge and Conversations about College Admissions Exams

Parents of 7th and 10th graders were asked how often they discussed college admissions exams with their child. Thirty-five percent of parents said they rarely or never discussed college admission exam preparation with their child. When parents indicate they hold conversations often or sometimes, students were more likely to report talking about this topic often or sometimes. Yet, over a third of students thought these conversations were held rarely or never, which suggests a difference between parents' and children's perceptions.

**Children: How often do you discuss plans to prepare for college admission exams (ACT or SAT) with your family?**




**Parents: How often have you and/or your spouse discussed plans to prepare for college admission exams (ACT or SAT) with your 10th grader?**

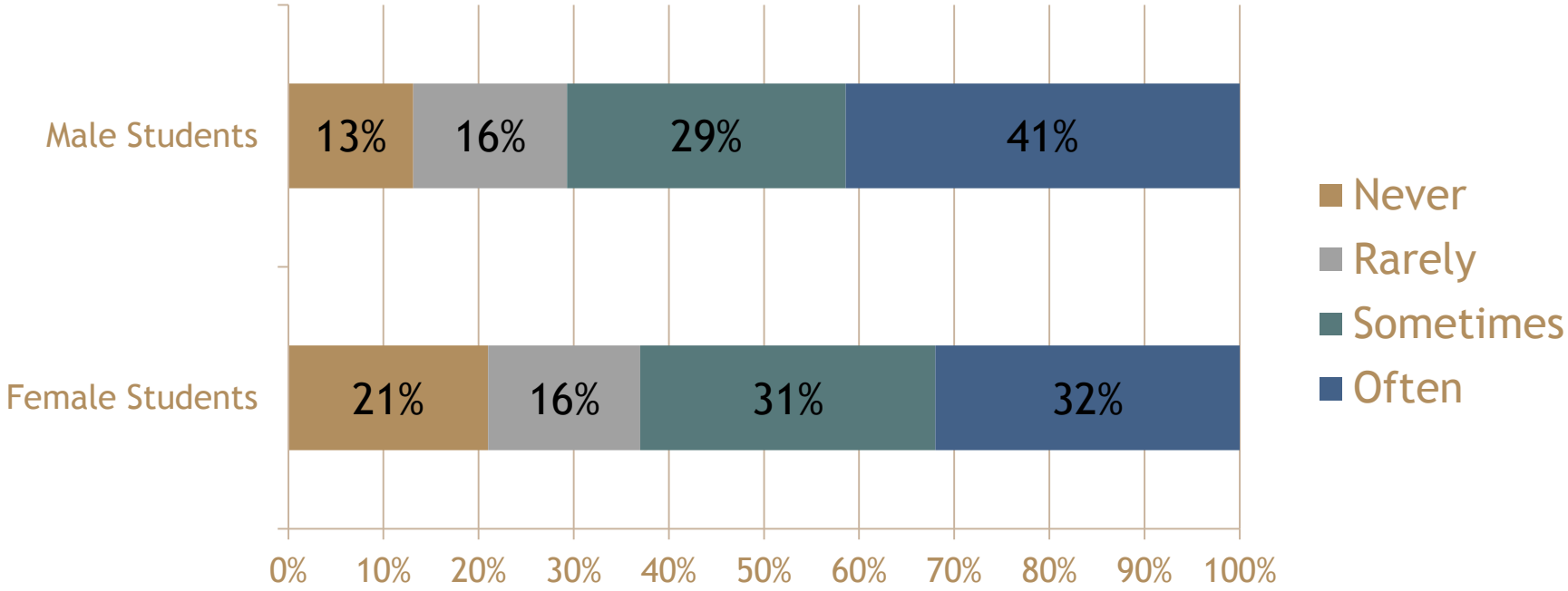



The parent-student cross-tabulation tested significant $p < .0001$. Parents of 4th graders were not asked about the ACT/SAT directly. Parents of 7th graders as compared to parents of 10th graders were less likely to have had conversations about plans for college, $F(1, 1320)=122.99$, $p<.001$.

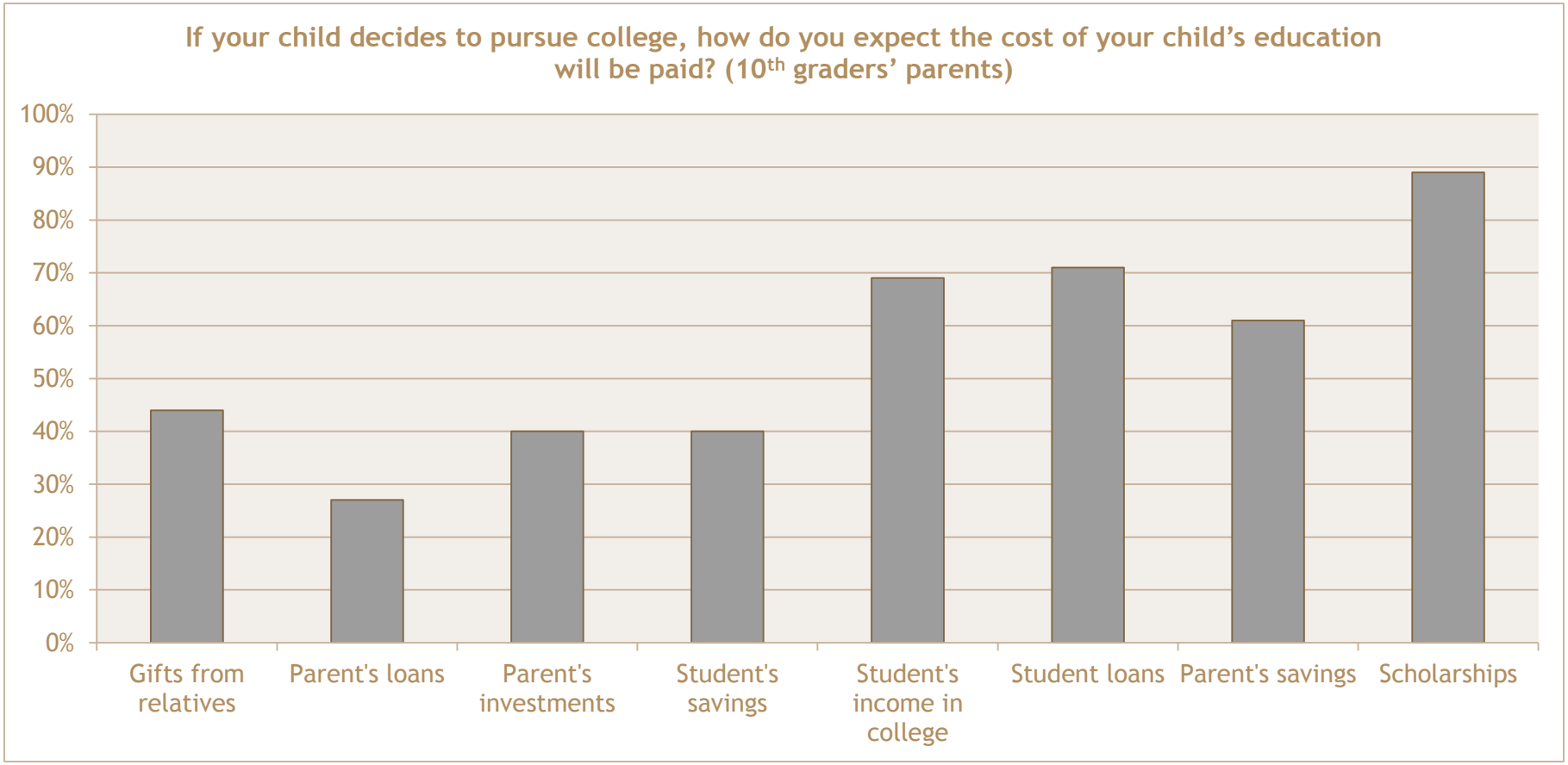
# Parents' and Students' College Aspirations and Preparedness: Parents' Conversations about STEM Fields

Parents of 7th and 10th graders were asked how often they discussed the advantages of pursuing a STEM field in college with their child. Analyses indicate that parents were more likely to have discussed STEM fields with sons than with daughters, $F(1, 1{,}252)=9.70$, $p<.002$. In addition, parents were more likely to discuss STEM fields with 10th graders as compared to 7th graders, $F(1, 1252)=5.93$, $p=.015$. Thus, the gender gap that persists in STEM fields, may have some beginning in these early conversations with parents.

## Parents: In the last 12 months, how often have you discussed the advantages of pursuing a field in college related to STEM with your child?

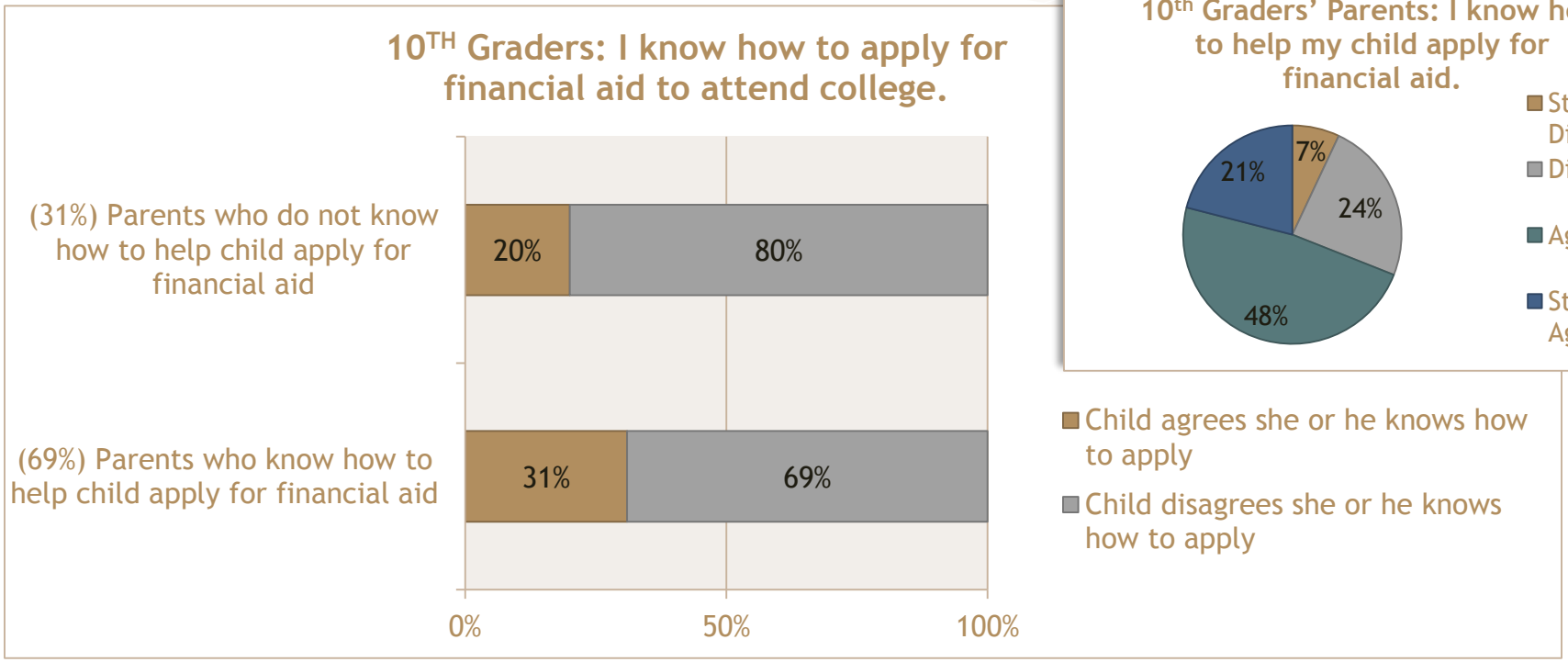


Parents were asked about the various ways they planned to cover the costs of their 10th grader's college education. Scholarships, student loans, and student's income in college were referred to most frequently. However, most parents understand that the costs will likely be covered by more than one source and the parents on average indicated they would use four of these methods to cover the cost of college.




Respondents were not asked to rank which of these methods for covering cost was most important. The most popular response was scholarships, but 95% of parents selected more than one financial resource.

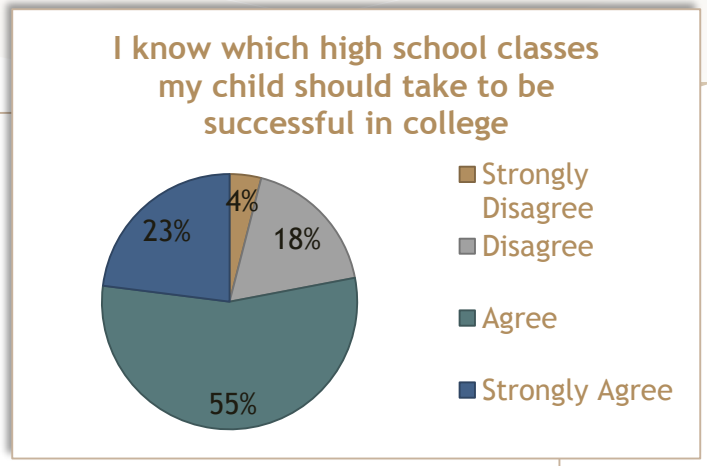
Almost 70% of 10th-graders' parents said they know how to help their child apply for financial aid to attend college. However, the children of these parents in the know, 69% of their children indicated they do not know how to apply. The implication is that parents are not transmitting information to their children about this topic. Unsurprisingly, 80% of students whose parents who said they did not know how to indicated they, too, did not know how. This indicates that little information about financial aid is being communicated to students from parents and that a large number of parents themselves are not equipped to support their child in this way, even though this is the primary way parents perceive paying for their child's college education.

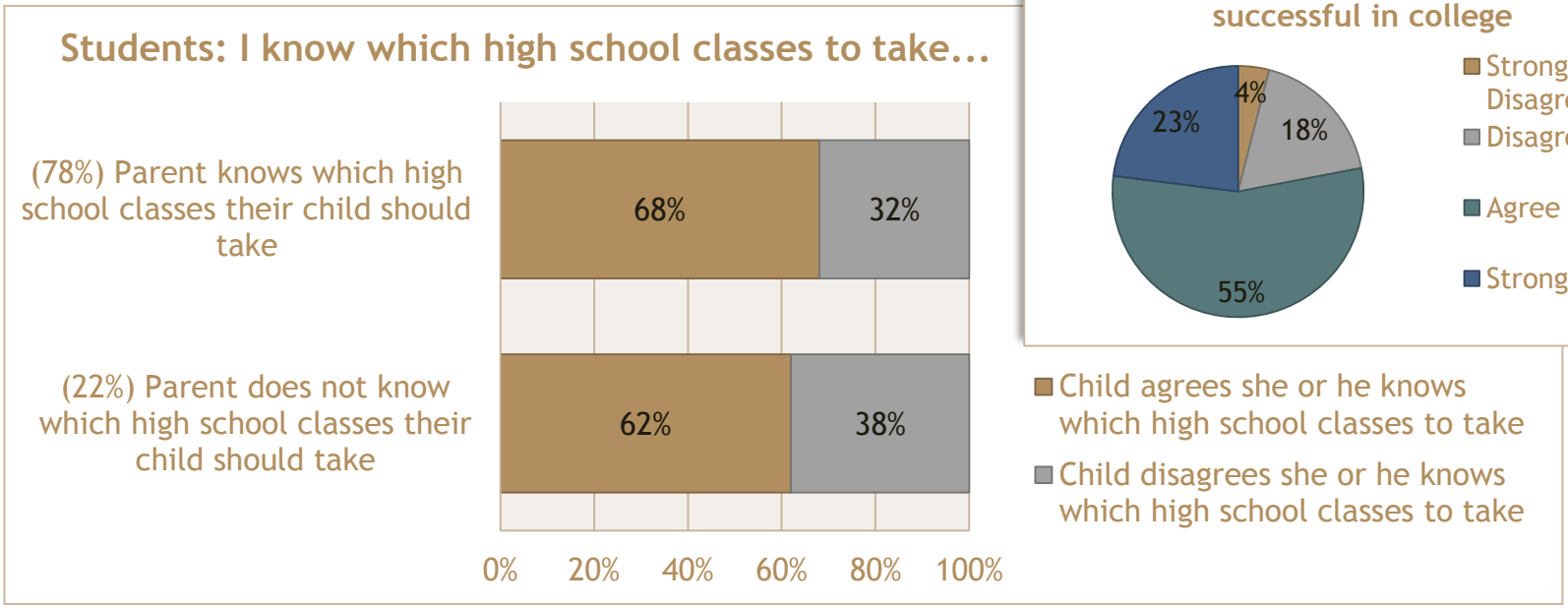



Parent-child cross-tabulation tested significant $p < .01$. All parents were asked about financial aid, but only 10th-grade students were asked whether they knew how to apply allowing for the comparison above. Parents' responses have the same pattern across all grade levels (effect of Grade, $p>.01$).

# Parents' and Students' College Aspirations and Preparedness: 7th and 10th-Grade Parents' Ability to Prepare Their Child for College

Seventy-eight percent of 7th and 10th graders' parents said they knew which high school classes their child should take to be successful in college. Students whose parents indicated they did not know which classes to take were just as likely to indicate they knew which classes to take as students whose parents did now. However, about one-third of students are unsure and for 22% of students parents may not be able to assist. The following section of the report, though, suggests some ambiguity among parents surrounding which classes will best prepare students in math and science.



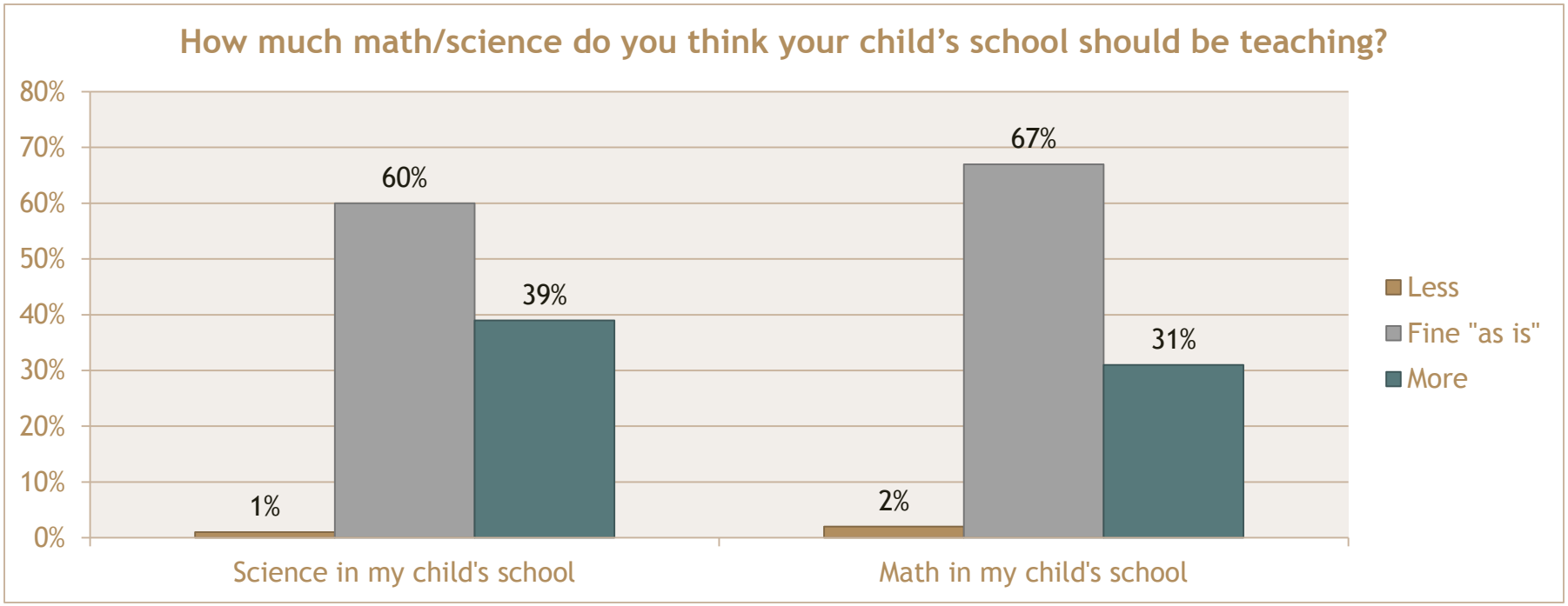

10th grade parent-child cross-tabulation tested significant $p < .001$. All parents were asked about which high school classes students should take, but only 7th- and 10th-grade students were asked whether they knew which classes to take, allowing for the comparison above. A one-way ANOVA of grade level indicates that parents' agreement with the item about which classes will best prepare students is higher for parents of 10th graders than parents of 4th and 7th graders, $F(2, 1566) = 8.19$, $p < .001$).

# Parents' Understanding and Performance in Mathematics and Science

In this section we examine parents perceptions of necessary mathematics and science preparation. We also look at the extent to which parents feel informed about science and at their science performance using the Scientific Fact Index. Parents' performance on the science literacy test (the Scientific Fact Index) was slightly stronger than it was among the 10th graders sampled in this project. People who felt very informed in matters of science performed better than those who felt they were not as informed. However, when tested on understanding about evolution, all parents performed poorer than they did on other questions. Seventy-five percent of parents said their own math and science skills interfered with their ability to help their child with math and science homework.

# Parents' Understanding and Performance in Mathematics and Science: Amount of Math and Science Education In Schools

Although 60% or more of parents reported the math and science courses taught in their schools were fine "as is", 31% of parents still felt more math should be taught. A higher percentage of parents (39%) said more science should be taught in their schools.

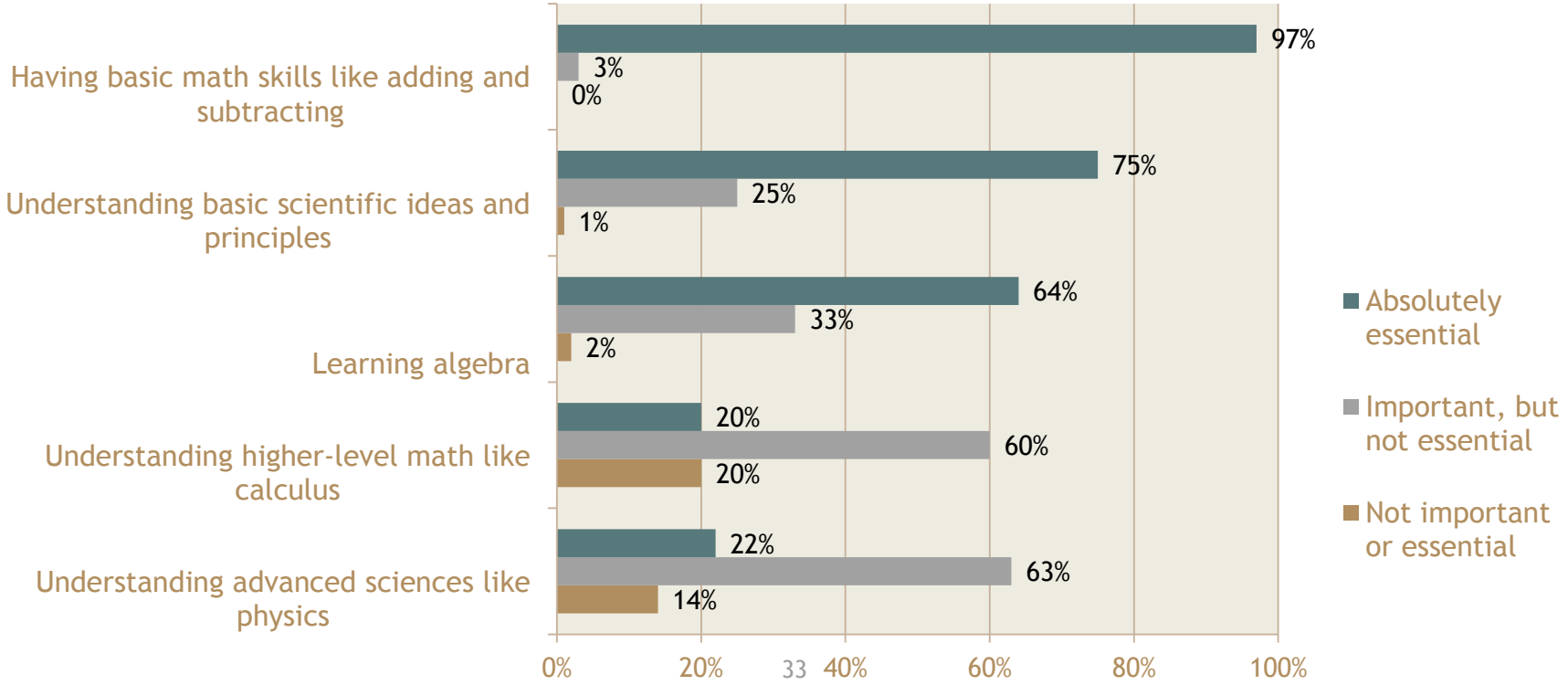



Percentages refer to the percent of parents responding for each item. The cross-tabulation tested significant $p < .001$. There were no significant effects of child's grade in school or student gender for the math question. However, parents of 4th (48%) and 7th graders (41%) were more likely to indicate they wanted more science than parents of 10th graders (35%), $p$=.003.

# Parents' Understanding and Performance in Mathematics and Science: Parents' Desired STEM Learning Outcomes for Their Children

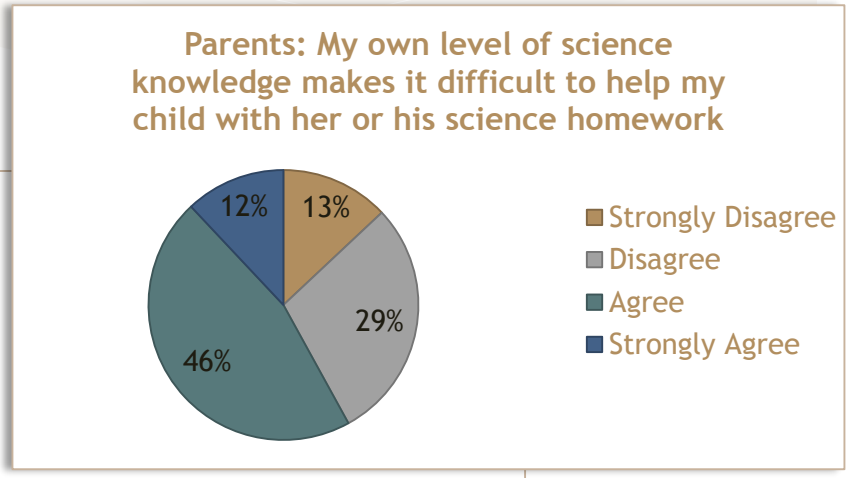
The chart below shows the percent of parents who considered different skills in math and science as absolutely essential, important but not essential, and not important/essential. Over 75% of parents generally agree that basic math and science skills are absolutely essential. However, more advanced topics are less likely to be viewed as essential: 20-22% of parents said understanding physics and calculus were absolutely essential. Although physics is a prerequisite for many STEM fields and careers, only one-third of U.S. high school students take physics courses. Many countries require physics in secondary education (PhysTECH).

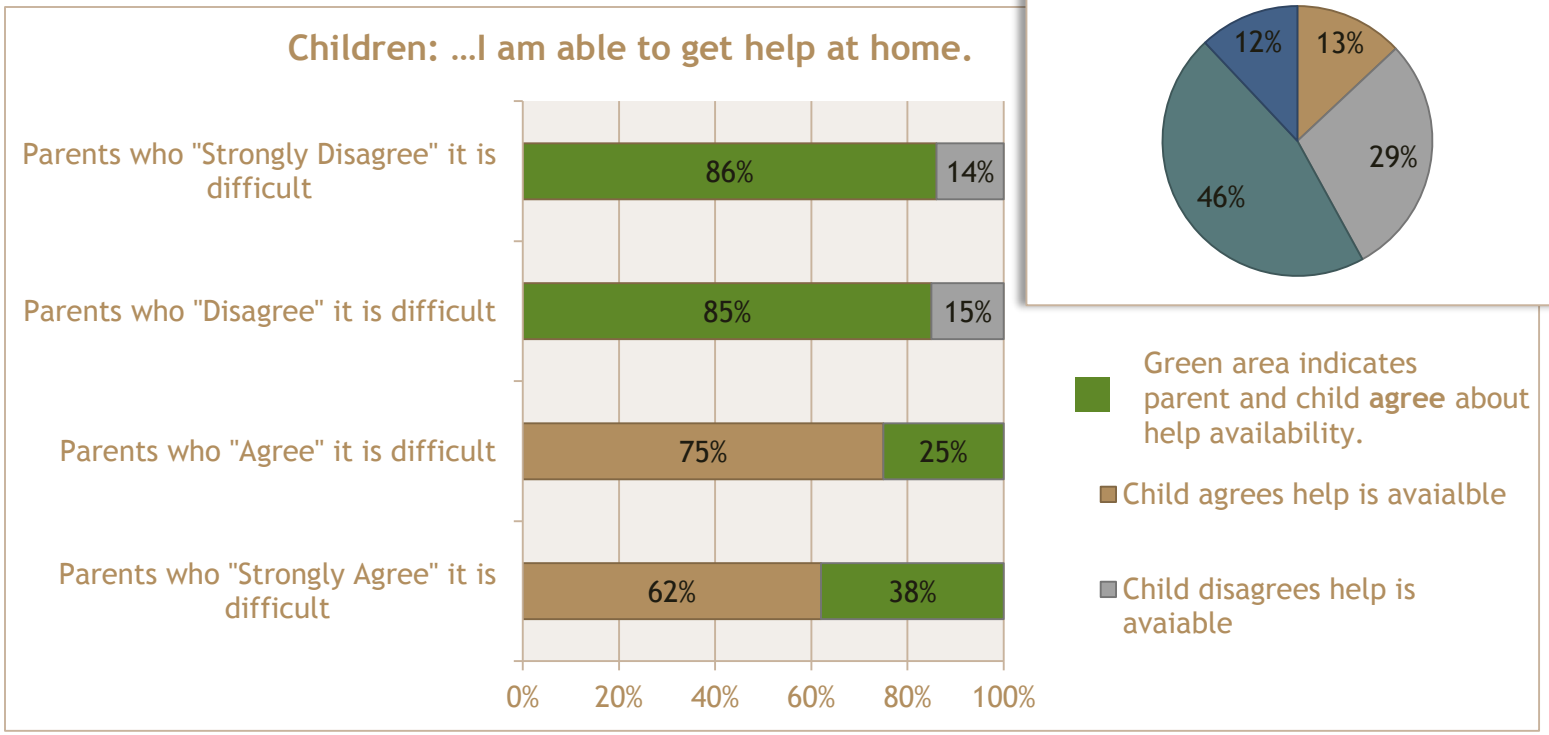
**How essential and important is it for schools to teach students the following before they're done with high school and go out in the real world?**



# Parents' Understanding and Performance in Mathematics and Science: 7th- and 10th-Grade Parents' Ability to Help Their Child

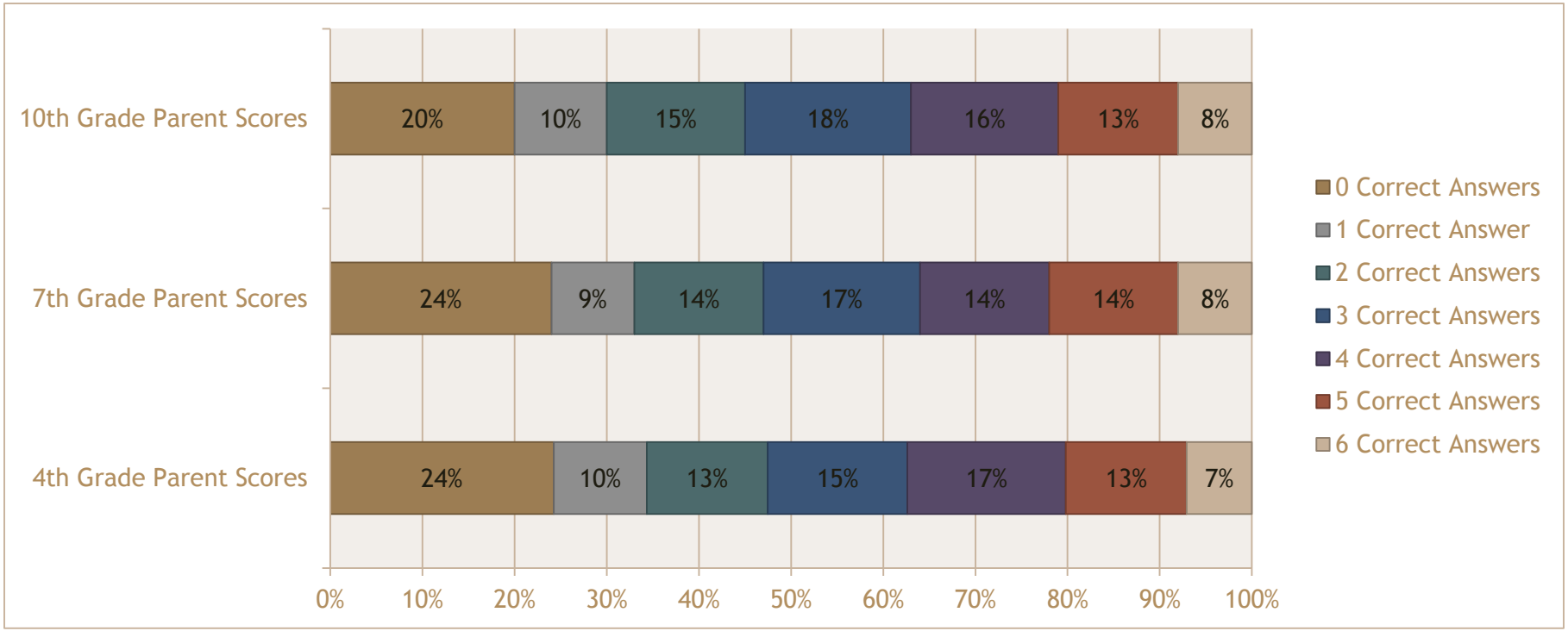
Fifty-eight percent of 7th and 10th graders' parents said their own level of science knowledge makes it difficult to help their child with her or his science homework. Parents and students are more likely to share an understanding of whether help is available when the parent feels they have the knowledge to help the student. However, for the 60%-74% children whose parents feel their knowledge makes helping their child difficult, students report they are getting help at home when needed. One possible explanation is that children are getting help from another person in the home, rather than relying only on the parent. They might be getting help from a sibling, relative, family friend or the parent who did not complete the survey.



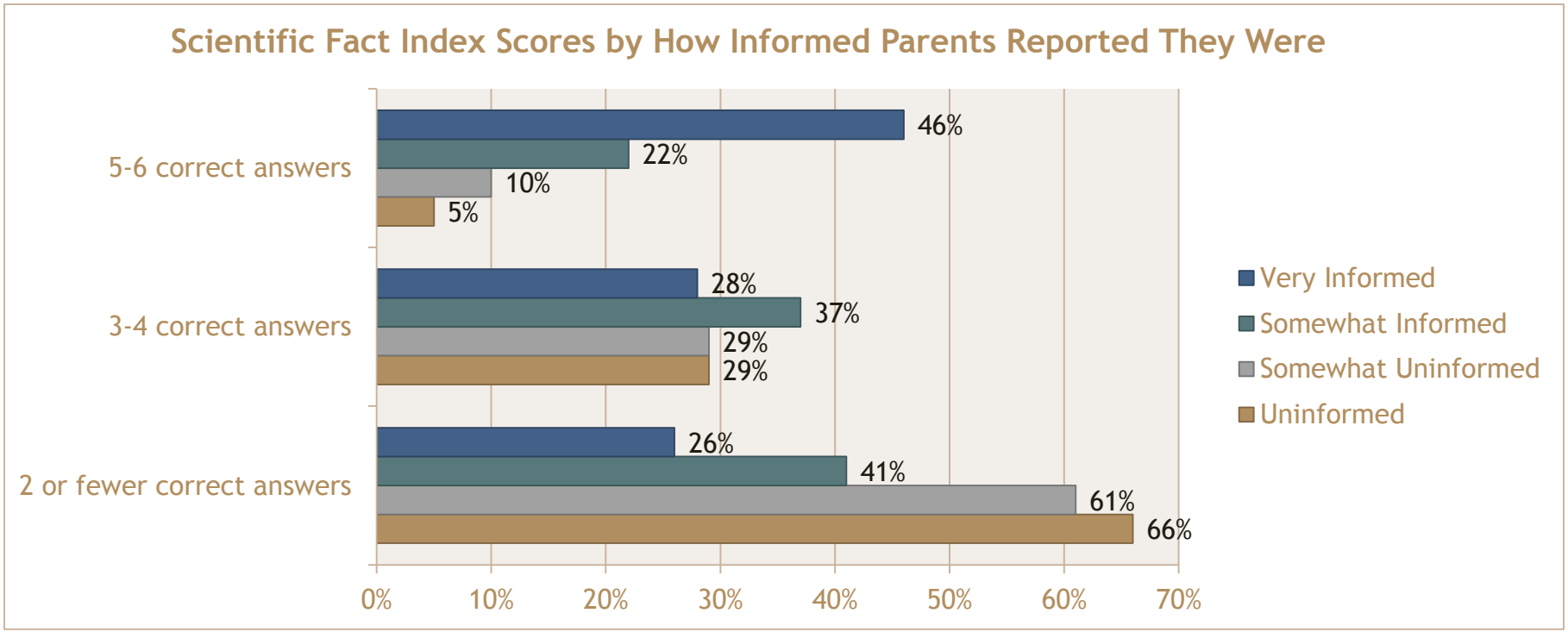
# Parents' Understanding and Performance in Mathematics and Science: Parents' scores on the Scientific Fact Index

To test science literacy, the survey included a scientific fact index comprising six questions to measure parents' science knowledge. A similar set of questions were given to 7th-grade and 10th-grade students. Over 60% of parents answered three3 or fewer questions correctly. For comparison, 48% of 10th graders and 69% of 7th graders answered three or fewer questions correctly.



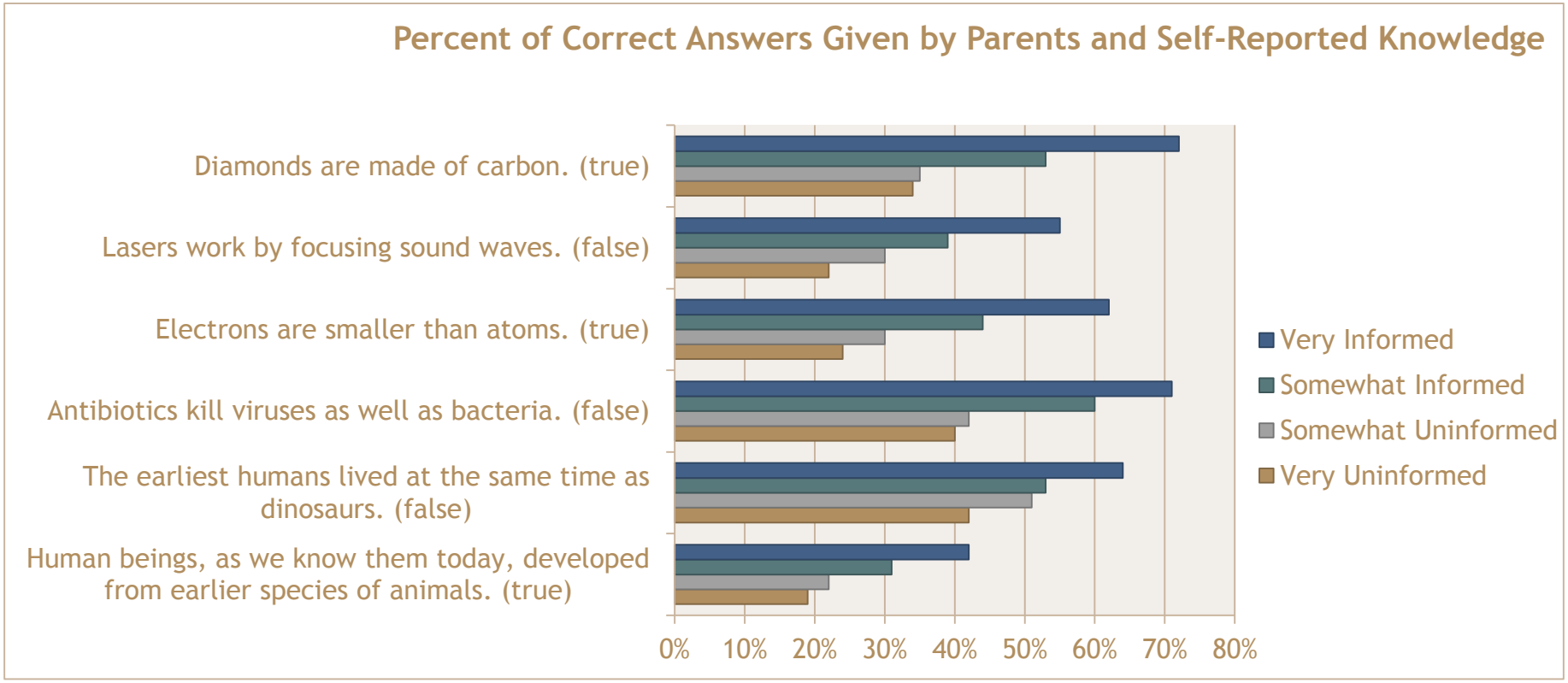
# Parents' Understanding and Performance in Mathematics and Science: Parents' Perceptions and Performance on the Scientific Fact Index

The survey included a question asking parents, "In the area of science, how informed or uninformed would you say you are generally?" Parents scores on the Scientific Fact Index were positively correlated with parents' self-reports of how informed they were about science, $r$=.25, $p$<.0001. Based on this finding, parents do have some self-understanding when assessing their own knowledge of science.



# Parents' Understanding and Performance in Mathematics and Science: Scientific Fact Index Scores for Individual Questions

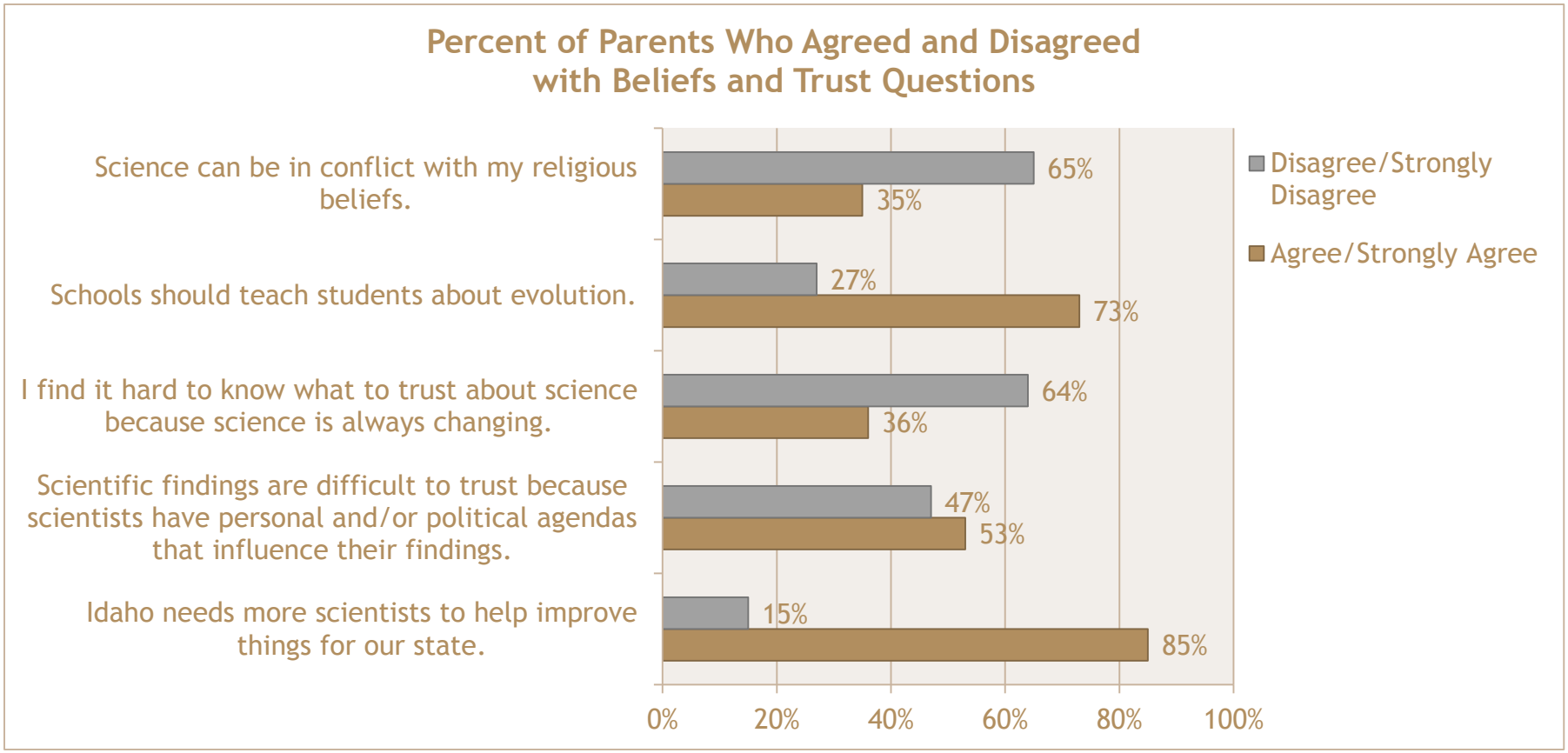
When examining parent responses based on how informed they reported they were about science and how they performed on each question in the Scientific Fact Index, we find that over 50% of very informed parents answered the questions correctly, except for the last question regarding evolution. All questions were true/false items, indicating that if a person was guessing randomly they would have a 50% chance of being correct. However, parents who were less informed had the lowest number of correct responses to this question.




The self-report items of knowledge are significantly related to performance on the SFI, such that more informed parents are more likely to provide correct answers on the Scientific Fact Index, $p<.001$.

# Parents' Understanding and Performance in Mathematics and Science: Parents' Beliefs and Trust in Scientists

Below, we examine some of the beliefs and trust questions included in the parent survey. No less than 73% of parents agreed that schools should teach students about evolution and 85% of parents said Idaho needs more scientists. Trust in science, however, seems difficult for a some parents, among whom 35% say science can be in conflict with their religious beliefs and find it hard to know what to trust because science is always changing (36%). Some distrust arises from a perception that scientists are influenced by personal and/or political agendas (53%).




There is no effect of grade level. All within item differences are significant, $p<.001$.

# Methodology of STEM Parents Surveys 4th-7th -10th

STEM Parent phone surveys began on January 15, 2013. There was a total of 2614 parents in the original pool to be called. We had phone numbers for 2509 and addresses for 1079. To increase the telephone survey response rate, a pre-calling postcard was sent to all respondents having an address and telephone number. The postcard stated the purpose of the survey, that the Social Science research Unit (SSRU) would be calling in the next few weeks, and also provided a toll-free number to call the SSRU if they had any questions concerning the survey. Respondents were called nine times in attempt to complete the survey. Interviewers made calls each week in the mornings, afternoons, evenings, and on Saturday 10-2 pm in an attempt to reach as many potential respondents for this project as possible. Spanish calls were made January 29 until the end of the calling process, March 14, 2013. We had 555 completed surveys before we sent out the mail surveys on March 22, 2013. After mailing out paper surveys we had a total of 1559 complete surveys. The response rate was 62 percent. Nine respondents partially completed the survey, 144 refused, 793 had no final disposition, 58 were ineligible, and 51 had no way of contact.

In preparation for the parent telephone survey, the SSRU interviewers were trained in the purpose of the study and the basics of proper telephone interviewing. Interviewers were also trained in the use of Computer Assisted Telephone Interviewing (WinCati) stations and techniques. As calls were made, the interviewers recorded those who completed the surveys, asked to be called back, were no longer eligible to participate, and refusals. All telephone call attempts were recorded in WinCati. Interviewers were monitored during each calling session by trained supervisors. To increase response rate a mail version of the survey was sent to respondents upon request. We also mailed a paper version of the survey to respondents who had incorrect telephone numbers or who were unable to complete the survey on the telephone by the end of the calling process. Using a modified version of the Dillman method (Dillman and Frey, 1974), 938 respondents were mailed a paper version on March 22, 2013 and a reminder postcard on March 29, 2013. All 755 respondents who had not completed and returned the first survey were sent a second survey on April 12, 2013.

# Methodology of STEM Parents Surveys 4th-7th-10th

**10th grade**

There were a total of 1197 parents in the 10th-grade sample. Nine refused the survey before contact. Six were deemed ineligible because they had been selected twice (due to children in the same grade).We had phone numbers for 1153 and addresses for 1148. STEM Parent phone surveys began on January 15, 2013 and were completed on March 14, 2013. We had 583 completed surveys before we sent out the mail surveys on March 22, 2013. Forty-nine respondents requested a mail version of the survey and 404 respondents were mailed a paper version due to incorrect phone numbers or failure to complete the survey on the telephone. On April 12, 2013, 385 respondents were sent a second survey. Of these, 103 surveys were completed and returned. In total, 686 surveys were completed by phone and mail. Four respondents partially completed the survey, 65 refused, 395 had no final disposition, 19 were ineligible, and 28 had no way of contact.

**7th grade**

There were a total of 994 parents in the 7th grade sample. Nine refused the survey before contact. Ten were deemed ineligible because they had been selected twice (due to children in the same grade).We had phone numbers for 957 and addresses for 951. STEM Parent phone surveys began on January 24, 2013 and were completed on March 14, 2013. We had 505 completed surveys before we sent out the mail surveys on March 22, 2013. Thirty-eight respondents requested a mail version of the survey and 312 were mailed a paper version due to incorrect phone numbers or failure to complete the survey on the telephone. On April 12, 2013, 270 respondents were sent a second survey. Of these, 112 were completed and returned. In total, 617 surveys were completed by phone and mail. Five respondents partially completed the survey, 50 refused, 285 had no final disposition, 23 were ineligible, and 14 had no way of contact.

**4th grade**

There were a total of 423 parents in the 4th grade sample. Twenty-one refused the survey before contact. Seven were deemed ineligible because they had been selected twice (due to children in the same grade).We had phone numbers for 399 and addresses for 355. STEM Parent phone surveys began on February 6, 2013 and were completed on March 14, 2013. We had 211 completed surveys before we sent out the mail surveys on March 22, 2013. Eighteen respondents requested a mail version of the survey and 117 respondents were mailed a paper version due to incorrect phone numbers or failure to complete the survey on the telephone. On April 12, 2013, 100 respondents were sent a second survey. Of these, 45 were completed and returned. In total 256 surveys were completed by phone and mail. Twenty-nine respondents refused, 111 had no final disposition, 16 were ineligible, and 9 had no way of contact.

# References


* Dillman, D. A., & Frey, J. H. (1974). Contribution of personalization to mail questionnaire response as an element of a previously tested method. *Journal of Applied Psychology*, *59*, 297-301.
* Jeynes, William H. 2005. Parental Involvement and Student Achievement: A Meta-Analysis. Harvard Family Research Project.Acquired June 29, 2013, http://www.hfrp.org/publications-resources/browse-our-publications/parental-involvement-and-student-achievement-a-meta-analysis
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