Academic achievement and classification of students from the Freely Associated States in Guam schools

What's Happening

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Guam is home to the largest population of migrants from the Freely Associated States (FAS): the Federated States of Micronesia, the Republic of the Marshall Islands, and the Republic of Palau. FAS students made up 22 percent of total student enrollment in Guam public schools in 2012. FAS students face a number of challenges when they enter Guam public schools, including low English language proficiency and low socioeconomic status. Using data from the 2013/14 administration of the Stanford Achievement Test 10th edition reading, math, and language arts subtests in Guam, this study sought to better understand how the characteristics and outcomes of FAS students compare with those of other students in Guam. The study found that few test takers (both FAS and non-FAS students) scored at proficient or advanced levels and that FAS students were more likely than non-FAS students to receive a below basic score and less likely to receive any other score. FAS students were more likely than non-FAS students to be classified as English learner students and less likely to be receiving special education services.

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Why this study?

Guam is home to the largest population of migrants from the Freely Associated States (FAS), which consist of the three island nations of the Federated States of Micronesia, the Republic of the Marshall Islands, and the Republic of Palau. The Freely Associated States have entered into Compacts of Free Association with the United States that allow residents to live, work, and travel freely throughout the United States and its territories (see box 1 for definitions of key terms). Guam, the closest unincorporated U.S. territory to the three island nations, has attracted the largest number of FAS migrants because of both its proximity and its educational and occupational opportunities (U.S. Government Accountability Office, 2011).

Although the Compacts of Free Association confer the right to move to and work within the United States and its territories on citizens from participating jurisdictions, there are challenges, perhaps particularly for students. For example, FAS students may have difficulty adjusting to or may be less prepared for schooling in the United States or its territories as a result of limited English language skills, the quality of education in their countries of origin, and language and cultural barriers that may create challenges to engaging their parents and other family members in children's schooling (Government Accountability Office, 2011; Iding, Cholymay, & Kaneshiro, 2007). These and other challenges may require targeted solutions by the Guam public school system to address the specific needs of FAS students and their families. (A brief review of the literature and the educational challenges faced by FAS students is in appendix A.)

The Guam Alliance for Engaging Families and Communities—whose members include Guam educators, community leaders, and policymakers—is committed to finding ways to better support the academic and nonacademic needs of FAS students and their families. Alliance members have noted that the demographic characteristics of their communities and schools have changed substantially in recent years; the Office of the Governor (2013) reports that the number of FAS students enrolling in Guam schools increased from 3,752, or 12 percent of enrollment, in 2002/03 to 6,979, or 22 percent of enrollment, in 2011/12. This migration has presented new service challenges to the education system in Guam.

Little is known about how students from one of the Freely Associated States are faring in Guam schools compared with non-FAS students. In particular, alliance members have not had access to comparative academic achievement data for FAS and non-FAS students on a high-stakes standardized assessment like the Stanford Achievement Test 10th edition (SAT-10). Additionally, alliance members do not know whether

Box 1. Key terms

Freely Associated States (FAS). Composed of the three island nations of the Federated States of Micronesia, the Republic of the Marshall Islands, and the Republic of Palau, the Freely Associated States have entered into Compacts of Free Association with the United States that allow residents to live, work, and travel freely throughout the United States and its territories. A Compact of Free Association between the Federated States of Micronesia and the Republic of the Marshall Islands and the United States took effect in 1986 and was renewed in 2003; it expires in 2024. A Compact of Free Association between the Republic of Palau and the United States was signed in 1994 and renewed in 2010; it expires in 2024.

Performance levels. Students can achieve one of four performance levels on the Stanford Achievement Test 10th edition (SAT-10) subtests (reading, math, and language arts): below basic, basic, proficient, or advanced.

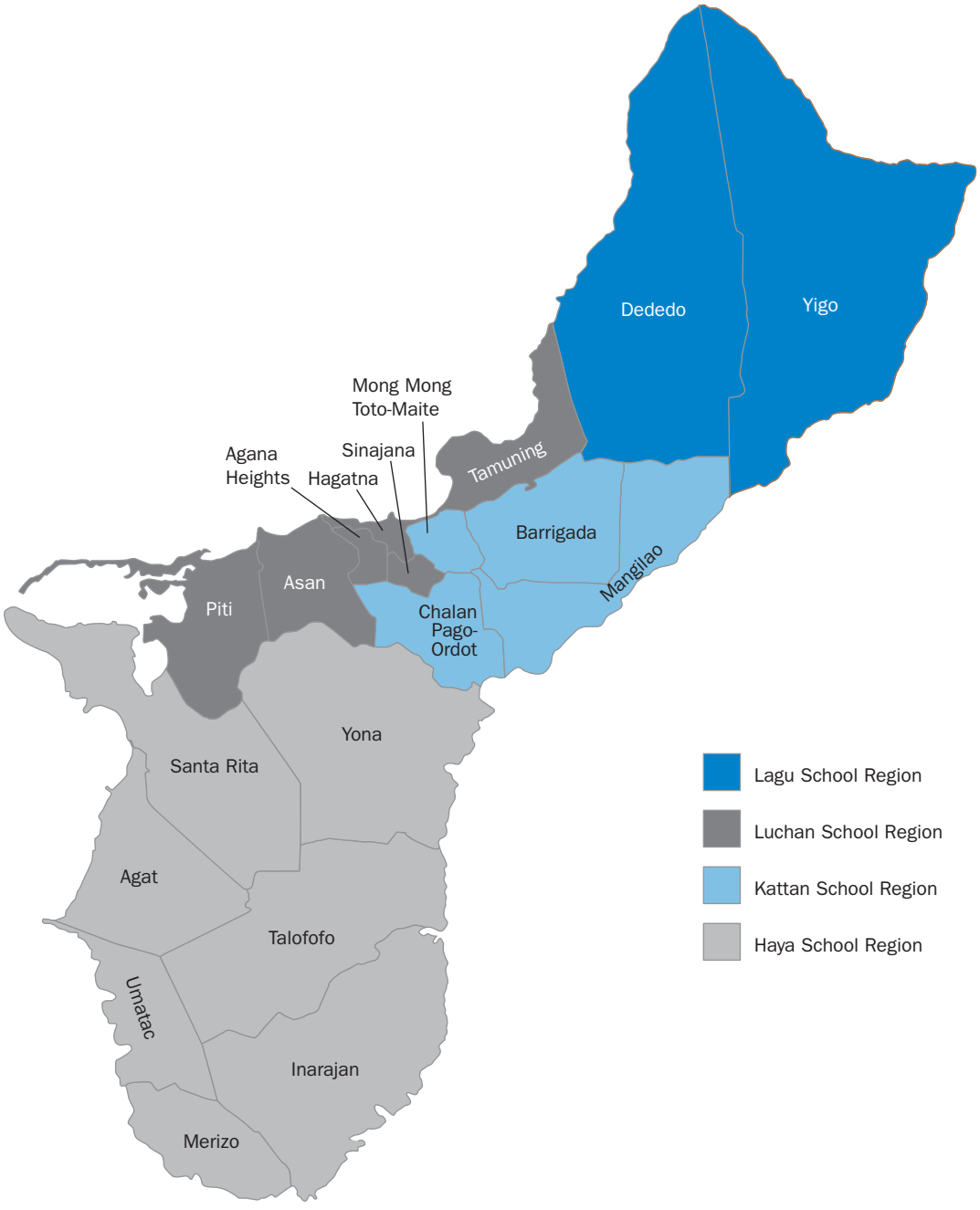
School levels in Guam. The elementary school level includes grades 1–5, the middle/intermediate school level includes grades 6–8, and the high school level includes grades 9–12.

Subtests. Data for the study are drawn from the reading, math, and language arts subtests of the SAT-10.

FAS students are participating in English learner or special education support services offered by Guam public schools at similar rates as their non-FAS peers.

This study analyzed comparative achievement and support services data that may help stakeholders identify next steps in meeting the needs of FAS students in Guam. The study also examined how SAT-10 performance as well as English learner and special education classification rates vary by school level (elementary, middle, or high school) and across the four Guam Department of Education school regions of Haya (southern), Kattan (eastern), Lagu (northern), and Luchan (western), which correspond to the school districts in Guam (map 1).[1]

Map 1. Guam Department of Education school regions



Source: Mayors' Council of Guam, http://www.mcoguam.org/guam_map.html. Used with permission.

What the study examined

The study examined the following research questions on FAS and non-FAS test takers in Guam based on SAT-10 reading, math, and language arts subtest data for the 2013/14 school year:

- What percentage of SAT-10 test takers were FAS students?
- What percentages of FAS test takers and of non-FAS test takers scored in each performance level on the SAT-10 reading, math, and language arts subtests?
- What percentages of FAS test takers and of non-FAS test takers were classified as English learner students or as students receiving special education services?

Achievement outcomes and classification rates were analyzed by school level and region. (See box 2 and appendix B for detail on the study data and methods.)

Box 2. Data and methods

Data

Sample. Guam public schools enrolled 28,670 students in grades 1–12 during the 2013/14 school year (Guam Department of Education, 2014). Guam public school students in grades 1–12 are required to take the Stanford Achievement Test 10th edition (SAT-10) reading, math, and language arts subtests regardless of their English learner student or special education classification. The Guam Department of Education provided the sample for this study, which consisted of students in grades 1–12 in Guam public schools for whom scores were reported on the Stanford Achievement Test 10th edition (SAT-10) reading, math, or language arts subtests during the 2013/14 school year: 23,732 students for reading (83 percent of all students attending public schools in Guam), 24,244 for math (85 percent), and 23,586 for language arts (82 percent).

Because the number of students with reported scores varied by subtests, demographic data associated with the subtest with the largest sample size (math) were analyzed for the first and third research questions. Data for the third research question were received from the Guam Department of Education as the total number of students by English learner status and by special education status, by grade level and region. The number of math subtest test takers with data on English learner classification was 13,056 and with data on special education status was 23,445.

Data consisted of counts of students aggregated at the school level for the 2013/14 school year. All counts of students within SAT-10 reading, math, and language arts subtest proficiency levels were disaggregated by grade levels, ethnicity (FAS or non-FAS; see appendix B for more information on ethnicity classification), and classification as an English learner student or a student receiving special education services (appendix B).

FAS/non-FAS classification. Students' self-selected ethnicity reported on the SAT-10 answer sheet was used to identify FAS and non-FAS students; 119 students did not select an ethnicity and are not included in the analytic sample (see appendix B).

English learner classification. Classification as an English learner student was determined prior to test administration. During the 2013/14 academic year the Guam Department of Education reported that 15,033 kindergarten through grade 12 English learner students were enrolled in Guam public schools (Guam Department of Education, 2014). The study sample included 9,057 test takers who were classified as English learner students (see appendix B).[1]

Special education classification. Special education classification was based on whether the student had an Individualized Education Program. The Annual State of Public Education Report for 2013/14 identified 1,768 students in kindergarten through grade 12 in Guam as students with special education classifications (Guam

(continued)

Box 2. Data and methods *(continued)*

Department of Education, 2014). The study sample included 1,277 test takers who were classified as receiving special education services (see appendix B).[2]

Method

Frequencies and percentages were calculated to examine characteristics of FAS and non-FAS test takers. In some cases, fewer than five test takers scored at the advanced level across the SAT-10 subtests. As a result, the narrative combines proficient and advanced categories in order to maintain confidentiality.

Notes

1. Because the Guam Department of Education (2014) English learner classification data are not disaggregated by grade level (these data include counts of kindergartners), researchers cannot calculate the percentage of English learner students who did not take the SAT-10 or who did not have a scorable SAT-10.

2. Because the Guam Department of Education (2014) special education prevalence data are not disaggregated by grade level (these data include counts of kindergartners), researchers cannot calculate the percentage of students receiving special education services who did not take the SAT-10 or who did not have a scorable SAT-10.

What the study found

This study determined the percentage of test takers who were from the Freely Associated States and examined information about their academic achievement and classification as an English learner student or a student receiving special education services, or both, in Guam schools in comparison with the same information for non-FAS students.

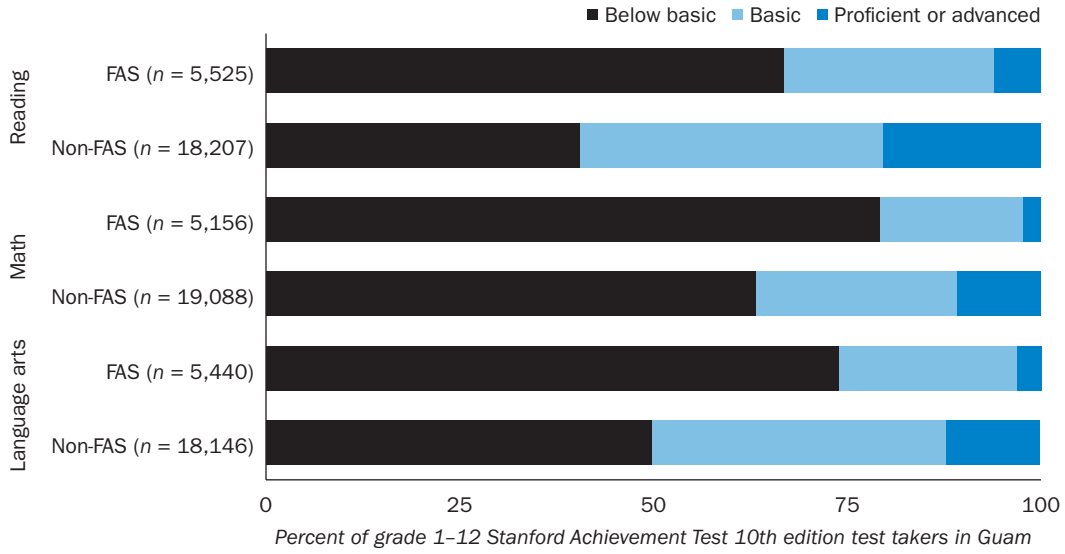
Slightly more than 21 percent of test takers in Guam self-identified as having a Freely Associated States ethnicity

Of the 24,244 students who took the SAT-10 math subtest in 2013/14, the Guam Department of Education classified 5,156 students (21 percent) as having an FAS ethnicity. The composition of FAS students as self-identified on their SAT-10 math test answer sheet was 4,872 test takers from the Federated States of Micronesia (90 percent), 444 from Republic of Palau (8 percent), and 119 from the Republic of the Marshall Islands (2 percent). The total of these self-reported numbers of test takers from each FAS jurisdiction (5,435) exceeds the Guam Department of Education count of FAS students (5,156), likely because some test takers selected more than one ethnicity on the SAT-10 test form.

Across the three Stanford Achievement Test 10th edition subtests, non–Freely Associated States students scored at the advanced or proficient levels more often than did Freely Associated States students

Overall, a majority of FAS students scored below basic on each SAT-10 subtest, whereas only on the math subtest did a majority of non-FAS students score below basic (figure 1). On all SAT-10 subtests fewer FAS than non-FAS students scored at the proficient or advanced levels. FAS students also were less likely than non-FAS students to score at the basic level on all SAT-10 subtests. A similar pattern was found at each grade level and in each region. The data reveal a trend of decreasing proficiency from elementary through high school for both FAS and non-FAS students, as well as a narrowing of the achievement gap between FAS and non-FAS students at the high school level. The largest percentage point difference between FAS and non-FAS students in the proficient and advanced categories on the math subtest was in middle school (13 percentage points), and the smallest difference was in high school (6 percentage points; see tables C1–C3 in appendix C for detailed results and tables C4–C6 for detailed results by region).

Figure 1. In Guam a majority of Freely Associated States students scored below basic on each SAT-10 subtest in 2013/14, whereas only on the math subtest did a majority of non–Freely Associated States students score below basic



FAS is Freely Associated States.

Note: The Freely Associated States have entered into Compacts of Free Association with the United States that allow residents to live, work, and travel freely throughout the United States and its territories. Percentages may not sum to 100 because of rounding.

Source: Authors' calculations based on Guam Department of Education data; see appendix B for details.

A larger percentage of Freely Associated States test takers than of non-Freely Associated States test takers was classified as English learner students

A majority (69 percent) of test takers in Guam were classified as English learner students: 85 percent for FAS test takers and 60 percent for non-FAS test takers, a difference of 25 percentage points (figure 2).

The percentage of both FAS and non-FAS test takers classified as English learner students was highest in elementary school and lowest in high school. The differences in English learner classification rates for FAS and non-FAS students were larger in middle (29 percentage points) and high school (29 percentage points) than in elementary school (11 percentage points; see table C7 in appendix C for detailed results).

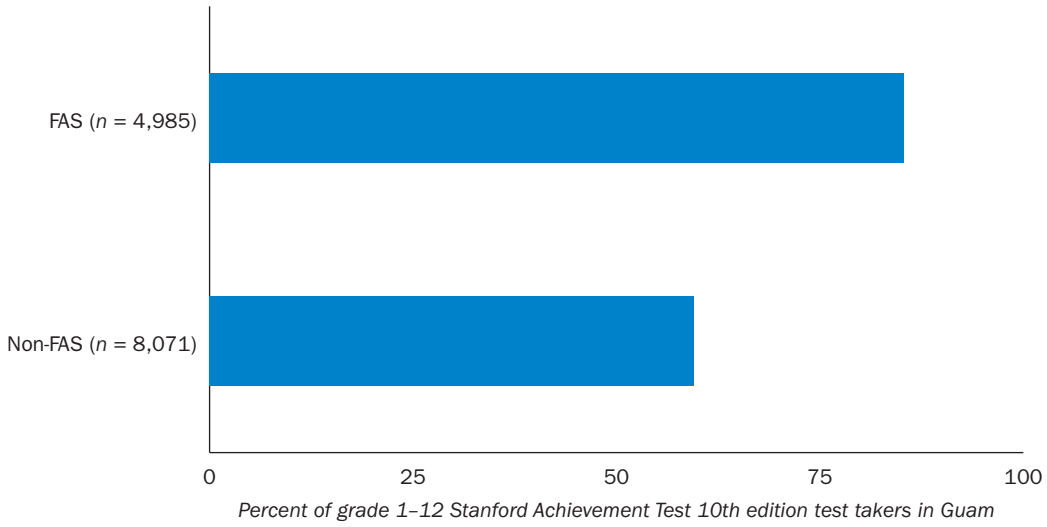
The Haya region had the highest percentage of FAS and non-FAS students classified as English learner students, and the Luchan region had the lowest. The differences in English learner classification rates for FAS and non-FAS students were largest (29 percentage points) in the Luchan region and smallest in the Haya region (21 percentage points; see table C8 in appendix C for detailed results).

A lower percentage of Freely Associated States test takers than of non-Freely Associated States test takers was classified as receiving special education services

On the SAT-10 math subtest the percentage of test takers classified as receiving special education services was 5 percent–4 percent for FAS test takers and 6 percent for non-FAS test takers, a difference of 2 percentage points (figure 3).

The percentage of FAS students classified as receiving special education services was highest in middle school, followed by high school and then elementary school; this pattern also held for non-FAS students.

Figure 2. In Guam 85 percent of Freely Associated States test takers and 60 percent of non–Freely Associated States test takers were classified as English learner students in 2013/14

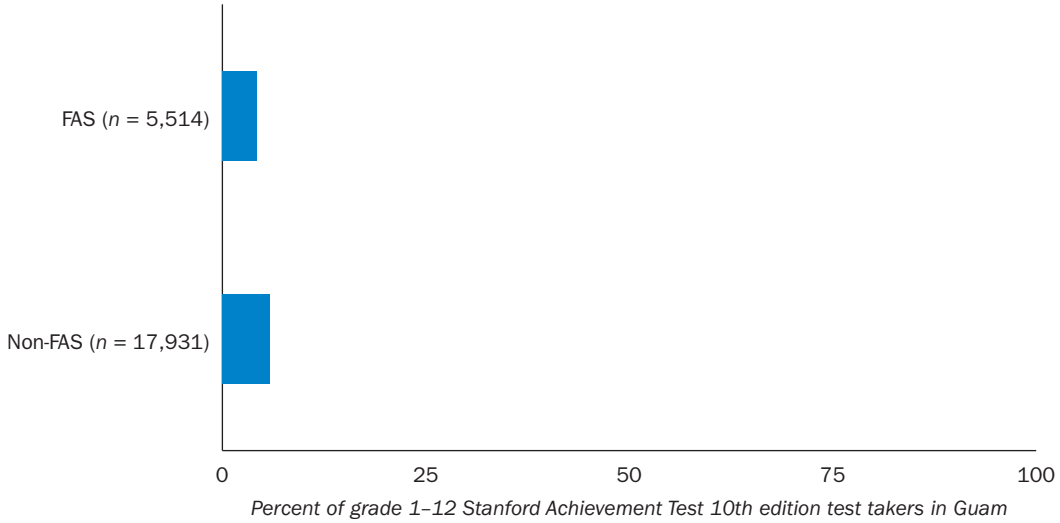


FAS is Freely Associated States.

Note: The Freely Associated States have entered into Compacts of Free Association with the United States that allow residents to live, work, and travel freely throughout the United States and its territories.

Source: Authors' calculations based on Guam Department of Education data; see appendix B.

Figure 3. In Guam 4 percent of Freely Associated States test takers and 6 percent of non–Freely Associated States test takers were classified as receiving special education services in 2013/14



FAS is Freely Associated States.

Note: The Freely Associated States have entered into Compacts of Free Association with the United States that allow residents to live, work, and travel freely throughout the United States and its territories.

Source: Authors' calculations based on Guam Department of Education data; see appendix B.

Differences between FAS and non-FAS test takers classified as receiving special education services ranged from 1 percentage point in middle school to 2 percentage points in high school (see table C9 in appendix C for detailed results).

The percentage of FAS students classified as receiving special education services was largest in the Haya region and smallest in the Lagu region (see table C10 in appendix C for detailed results). The difference in the percentage of students classified as receiving special education services between FAS and non-FAS test takers was largest in the Kattan region (3 percentage points) and smallest in the Luchan region (0.1 percentage point).

Implications of the study findings

The results raise four considerations for educators and policymakers about FAS students' experiences in Guam schools.

Measures of academic achievement indicate that students from the Freely Associated States may require additional supports and a stronger focus on academic achievement and integration into Guam schools

FAS students in Guam scored lower than their non-FAS peers on all three subtests of the SAT-10. Moreover, SAT-10 scores were lower for FAS students at the elementary, middle, and high school levels on all three SAT-10 subtests.

Stakeholders may use these results to inform further inquiry into FAS students' academic achievement in Guam schools. Although the SAT-10 is only one measure of academic achievement, the consistent results presented here may indicate that FAS students require additional academic supports. Anecdotal evidence from members of the Guam Alliance for Engaging Families and Communities suggests that FAS students are also not doing as well as non-FAS students on other measures of student performance in Guam schools. Stakeholders may want to better understand the extent of this achievement gap in order to inform efforts to improve supports for FAS students and their families in Guam. According to the Office of the Governor (2013), the population of FAS students in Guam public schools has been rising steadily, from 3,752 (12 percent of all students) in 2002/03 to 6,979 (22 percent) in 2011/12, for a 9 percent average annual growth rate over the period. This study found that FAS students made up 21.3 percent of test takers in Guam public schools in 2013/14, further reinforcing the understanding that Guam has experienced an increase in its population of FAS students over more than a decade. Improving FAS students' academic achievement and their overall integration into Guam schools may become increasingly important as the share of FAS students enrolled in Guam public schools remains at more than 20 percent.

Future research might focus on identifying likely causes for this disparity between FAS and non-FAS students. Potential influential factors to examine are language challenges, poverty levels, and differences in cultural norms. Additionally, research might assess the extent to which gaps in achievement for FAS and non-FAS students continue over time or across other measures of student achievement.

More supports may be required for English learner students in order to help Freely Associated States students succeed on measures of academic achievement

Though many students in the study sample were classified as English learner students, FAS students were more likely than their non-FAS peers to be classified as English learner students. Although this study did not compare academic achievement of FAS and non-FAS English learner students, the findings that FAS students are more likely to be English learner students and to score lower on the SAT-10 subtests than their

non-FAS peers indicate that English proficiency may be a factor in SAT-10 performance. Therefore, stakeholders may choose to examine current supports for English learner students to determine whether adjustments are needed to help this subgroup succeed on measures of academic achievement like the SAT-10. Future research could examine academic achievement by both English learner status and ethnicity.

More research is needed to understand the differences in special education classification between Freely Associated States students and non–Freely Associated States students

Guam stakeholders have not had access to data about special education classification rates for FAS and non-FAS students. Understanding comparative special education classification rates is a first step in exploring supports to help students and their families navigate the special education diagnostic process. The lower rates of special education classification among FAS students than among non-FAS students may reflect the need for additional school staff training on how to identify students receiving special education services (for example, some students who are English learner students may be misclassified as needing special education services, or school staff may need greater cultural understanding of FAS students). These differences may also reflect the barriers FAS families face when interacting with school professionals, such as less familiarity with the Guam Department of Education system, which make it difficult to advocate effectively for their children. Navigating a foreign school system is complicated by language barriers and teacher expectations due to cultural bias (Iding, Cholymay, and Kaneshiro, 2007). Therefore, the complex process of diagnosing special needs and developing an Individualized Education Program may be impeded by linguistic, cultural, and programmatic challenges. Research that addresses questions related to understanding, diagnosing, and planning for special education services is needed to fully grasp the reasons for the differences in special education classification for FAS and non-FAS students.

Limitations of the study

This study had seven primary limitations.

Because the study sample included only students who took the SAT-10 reading, math, and language arts subtests during the 2013/14 school year, the generalizability of the results may be limited. Students who took the math subtest accounted for 85 percent of all students attending public schools in Guam, students who took the reading subtest accounted for 83 percent, and students who took the language arts subtest accounted for 82 percent.

A second limitation relates to the format of the data. Only aggregated data, rather than individual student data, were provided. Results of the study are based on aggregating counts of SAT-10 performance level data and classification rates by grade level within schools and then across schools. Therefore, it is not possible to check data quality to determine whether the sample was similar to the population in individual characteristics such as socioeconomic status, prior achievement, and gender.

A third limitation relates to the ethnic identification data. Students self-reported their ethnicity on the SAT-10 answer sheets. The accuracy of that information may be limited in some cases, particularly among young respondents at the elementary school level. In addition, the data did not include important information such as when an FAS student arrived in Guam, so while two students might have the same FAS classification, one might have been born in Guam and one might have arrived in Guam only recently. The data did not indicate how long a student attended Guam schools. Therefore, this study examined only students in the broad category of FAS students rather than examining within-group differences such as years since migration. Guam schools may decide to collect more detailed information about students from the Freely Associated States would allow for finer-grained analyses of academic achievement and classification

rates. The study excluded students who did not select an ethnic identity or who wrote in an ethnic identity that did not correspond to the provided categories. Ethnicity data were missing for 119 test takers (53 at the elementary, 26 at the middle, and 40 at the high school level).

A fourth limitation relates to the special education data. The Guam Department of Education Division of Special Education maintains special education data, which were unavailable for this study. As such, there were likely discrepancies in the SAT-10 special education classification, which was reported by students under the guidance of their classroom teacher or test coordinator based on whether the student had an Individualized Education Program and on the total number of students receiving special education services. The *Test Coordinator's Handbook* requires teachers or test administrators to review student answer sheets to ensure that only students with an established Individualized Education Program had selected special education classification options on the test (Taitano, Sanchez, & Camacho, 2012). The study team, however, was unable to confirm whether this was done correctly. In the 2013/14 academic year the Guam Department of Education reported that 1,768 kindergarten through grade 12 students who had a special education classification were enrolled in its public schools. However, this reported value was not disaggregated by grade. The study team received data for 1,277 test takers with a special education classification. The disparity between Guam Department of Education reported numbers of students receiving special education services and the data given to the study team reflects in part the fact that the Guam Department of Education data include kindergarteners who are not SAT-10 test takers; in addition, the sample of test takers did not include all students enrolled in Guam Department of Education schools. And some of the disparity could have arisen if teachers did not always ensure that students properly self-identify during testing or if some students receiving special education services did not have scorable subtests.

A fifth limitation is that English learner classification data were available for only 54 percent of test takers. Based on the report by the Guam Department of Education (2014), 49 percent of students in kindergarten through grade 12 were English learner students; however, based on the English learner classification contained in the SAT-10 data used for the current study, 69 percent of students in grades 1–12 were classified as English learner students. This suggests that students who did not have data on English learner classification for the current study were less likely to be classified as English learner students using the method that the Guam Department of Education used in its 2014 report. Therefore, the percentage of English learner students by ethnicity in this study is inflated.

A sixth limitation relates to the fact that the SAT-10 reading, math, and language arts tests were discontinued before the 2014/15 school year (Hernandez, 2015). Moving forward, the Guam Department of Education plans to administer the ACT Aspire assessment, which is more closely aligned with Common Core Standards. As a result, future research efforts will need to explore FAS and non-FAS performance using other indicators of academic achievement.

Finally, based on the SAT-10 data provided to the study team, counts of students across the Freely Associated States do not match the Guam Department of Education's total counts of FAS students (which are supposed to be the aggregation of students with FAS ethnicity). For example, on the SAT-10 math subtest, the Guam Department of Education classified 5,156 test takers as FAS students. However, a count based on test takers' self-identification with a specific jurisdiction within the Freely Associated States (the Federated States of Micronesia, the Republic of the Marshall Islands, or the Republic of Palau) totaled 5,435 test takers who were FAS students. These values should be identical. This study used the Guam Department of Education's count of FAS students rather than student counts across each Freely Associated States. Guam Department of Education stakeholders explained that its FAS classification was more accurate because some students selected multiple countries. A breakdown of student counts across the Freely Associated States is presented in table C11 in appendix C.

Appendix A. Literature review

Students from the Freely Associated States (FAS) face numerous challenges upon moving to the United States or its territories. Educational challenges associated with FAS students include limited access to education in their home jurisdictions, poor preparation for U.S. schools due to the quality of education in their home country, limited English language skills of FAS students on arrival in Guam, and difficulties engaging parents in their children's education because of cultural and language barriers (U.S. Government Accountability Office, 2011; Iding et al., 2007).

Language challenges affect student achievement

FAS students arriving in Guam, particularly those in elementary school grades, may not have the level of English language proficiency necessary to succeed in U.S. classrooms (Hawaii Department of Education, 2007; Heine, 2002). Consequently, most FAS students in Guam were classified as English learner students. Indigenous languages, of which there are many in the Freely Associated States (the most common are Chuukese, Kosraean, Marshallese, Palauan, Pohnpeian, and Yapese),[2] tend to be the first languages learned at home and the preferred languages of FAS families at home. An estimated 62 percent of people living in Guam identified as foreign born and speak "Other Pacific Island Languages" exclusively or more frequently than English at home.[3]

The languages of instruction within the Freely Associated States vary, but generally, they are English and the indigenous languages of each jurisdiction. In the Federated States of Micronesia states of Kosrae and Yap, as well as in the Republic of Palau, the indigenous language (Kosraaen, Yapese, and Palauan) is the language of instruction for grades K–3. In grades 4–5, students are instructed in both their indigenous language and English. In grades 6–12, English is the language of instruction. In the Federated States of Micronesia state of Pohnpei, Pohnpeian is the language of instruction through grade 3. Students are instructed in both Pohnpeian and English in grades 4–5. In grades 6–12, English is the language of instruction. In the Federated States of Micronesia state of Chuuk, Chuukese and English are the languages of instruction in grades 1–8. English is the language of instruction from grade 9 onward (Regional Educational Laboratory Pacific, 2014).

In the Republic of the Marshall Islands the languages of instruction are English and Marshallese, or Kajin Aelōñ Kein. Kajin Aelōñ Kein and English are taught as a subject at all grade levels (Kajin Aelōñ Kein language arts and English language arts). Kajin Aelōñ Kein is the language of instruction for all subjects other than English language arts in grades K–6. English is then introduced gradually, and both English and Kajin Aelōñ Kein are the languages of instruction through grade 12 (Marshall Islands Public School System, 2015).

Another factor influencing academic success is the age at which students enter school in the United States and its territories. The age at which an English learner student begins attending a school where English is the language of instruction influences the rate of language acquisition and proficiency with oral and academic English (Conger, 2009; Kim, 2011). A large study of English learner programs in New York City public schools found that students entering U.S. public schools at an older age required more time to become proficient in English (Conger, 2009). Just 14 percent of 10-year-old entrants were proficient within one year after entry into the U.S. public school system, compared with 40 percent of five-year-old entrants (Conger, 2009). Although the context of New York City schools differs greatly from the context in Guam, this research suggests that Micronesian students' English proficiency may differ based on when they entered the Guam public school system.

Challenges associated with low socioeconomic status and low levels of parental education may lower student performance

Poverty, low parent education levels, and health issues are all challenges associated with Micronesian socioeconomic status in Guam, and all may contribute to lower outcomes for migrant students. The wages of many Micronesian migrants to the United States and its territories are often low and "there is no discernible correlation between the lengths of stay in the US and the salary earned" (Hezel & Samuel, 2006, p. 22). A positive relationship exists between socioeconomic status and academic achievement, with socioeconomic status generally recognized as "one of the strongest predictors of the child's academic achievement and educational attainment" (Reardon, 2011, p. 3). Although there are exceptions, students who live in poverty typically underperform students from higher-income households (Coleman et al., 1966; Duncan & Magnuson, 2011).

In addition to the negative impact that socioeconomic stress is posited to have on student outcomes (Conger et al., 2002), low-income families are often unable to provide their children with the academic resources to help them succeed (Heine, 2002). Academic resources such as books, basic supplies, and academic experiences all can have an impact on student success. For example, in one study, Micronesian migrant parents described challenges in purchasing school uniforms and resources for school projects—especially in families with multiple children (Stoicovy, Murphy, & Sachuo, 2011). These parents also explained that they do not have private transportation and that inadequate public school transportation prevents their children from attending school regularly. Other research supports the relationship between vocabulary development and access to resources (Marzano, 2003; Nagy & Herman, 1987). Students who come from higher-income families have a larger vocabulary than do students from lower-income families, an important difference because academic vocabulary is a significant predictor of academic success (Hart & Risley, 2003).

Parent education is also a strong predictor of academic achievement; children whose parents are more highly educated tend to have higher educational aspirations and higher attainment than children whose parents are less educated (Dubow, Boxer, & Huesmann, 2009; Reardon, 2011). Fewer than 54 percent of Micronesian adults graduated from high school and fewer than 4 percent graduated from college (U.S. Government Accountability Office, 2011).

Cultural norms can lead to a disconnection between families and schools

In addition to linguistic and socioeconomic challenges, Micronesian students may lack familiarity with the school culture in Guam. Micronesian students often lack cultural understanding of how to succeed in their new schools. Essoyan (2007) found that "Micronesian students tend not to ask questions, take initiative or compete—activities that are stressed in American classrooms. They avoid direct eye contact with their teachers and remain quiet as a sign of respect" (para. 12). Although this study was conducted in Hawaii schools, these are behaviors demonstrated by some Micronesian students, which may also pose challenges for them in Guam public schools.

A growing literature has found that students with involved parents, regardless of socioeconomic status or background, are more likely to earn high grades, pass their classes and be promoted, attend school regularly, have better social skills, graduate on time, and move on to postsecondary education (Henderson & Mapp, 2002). Micronesian parents may not be accustomed to being involved in their children's academic education (Iding et al., 2007; Viotti, 2003). For example, Micronesian parents of elementary school children in Hawaii were surprised by the expectation that they would check their children's backpacks for homework or notes to sign; "they see the homework but they don't take it out because they believe it belongs to the school" (Viotti, 2003, para. 16). In interviews with 235 men and women in Guam who came from eight

Micronesian areas, respondents identified education in public schools as one of the most serious problems they faced, naming poor availability of accurate information prior to their move, language differences that deterred enrollment of their children, and perceived ethnic discrimination directed at both parents and children during school interactions. Their responses also indicated limitations in their knowledge of Guam's education policies (Smith, 1994).

Research on FAS migrants in Guam, Hawaii, and Arkansas identified equitable and culturally sensitive attitudes and behaviors of school and classroom personnel, as well as of members of the greater community, toward FAS migrant students and their families as important factors in the success of these migrant students (Brekke, Filibert, & Hammond, 2007; Heine, 2002; Iding et al., 2007; Kupferman, 2009; Okamoto et al., 2008; Paul, 2003; Ratliffe, 2010; Smith, 1994; Smith et al., 1997; Smith, Smith, & Twaddle, 1998; Spencer, 2011; Talmy, 2006, 2009; Walter, Salas, & Li, 2011; Watts, 2011). Recommendations to Hawaii educators on best practices for teaching Micronesian students stressed a need to emphasize cultural sensitivity—including the need for counseling and recognizing the value of Micronesian students' contributions—and to emphasize the importance of literacy skills as a way to improve student achievement (Ross, 2004). These same recommendations may be applicable to Guam educators. Ratliffe (2010) discussed the strong family obligation systems in Micronesian cultures and the conflicts that can occur when these obligations and school priorities clash.

Appendix B. Data sources and methodology

This appendix provides detailed information on data sources, collection, and analysis.

Data sources

Guam public school students in grades 1–12 are required to take the Stanford Achievement Test 10th edition (SAT-10) reading, math, and language arts subtests regardless of their English learner student or special education classification. The Guam Department of Education's (GDOE) ReadyResults database, developed by Pearson, was the source of all data used in the study, including Freely Associated States (FAS) and non-FAS identification, English learner and special education classification, and SAT-10 performance. The data received and used for the study had already been collected by GDOE; no original data were collected for this study.

According to Pearson Assessments, the SAT-10 test developer, the SAT-10 is a standardized test sold to accredited and approved school districts (Pearson Education, 2015). Norms include scaled scores, national and local percentile ranks and stanines, grade equivalents, and normal curve equivalents. The test has kindergarten through grade 12 versions and includes subject subtest options. For instance, subtests such as reading, math, and language arts are available for different grade levels. ReadyResults allows participating organizations such as the GDOE to scan test documents and create online school-level reports. GDOE provided data organized by grades 1–12. To protect student confidentiality, the GDOE provided the Regional Educational Laboratory Pacific study team with the "School Multi-Group Frequency Distribution Report," which lists SAT-10 results by school. The SAT-10 data received through the ReadyResults database were displayed in graphs in portable document format (PDF) files.

At each SAT-10 test administration, the test coordinator is required to ensure that students enter their demographic information correctly on all answer sheets (step 7 in the GDOE *Test Coordinator's Handbook*; Taitano et al., 2012). This additional verification of demographic information is important because the study sample was based on students who took the SAT-10.

Overall coding scheme

GDOE provided the study team with data files with each participating school's assessment scores for reading, math, and language arts and an Excel workbook in which to enter the data. PDF data files corresponded to the data queries described in table B1. Each file name contained the grade level and the code for the specific data file (for example, Grade01_01). Each grade had 27 PDF data files, representing each combination of variables queried.

The last page of each PDF data file was checked to ensure that the data file aligned with the data characteristics in table B1. For example, the code filter information for file _04 would show that sex = male and the FAS ethnic identity codes = 5, 6, or 7. When errors were found in the code filter information, the study team re-ran the data and produced corrected PDF data files.

The Excel workbook contained 12 spreadsheets—one for each grade. For each spreadsheet the first column contained the names of all 42 participating schools and the first row contained the data file name and number of the 27 corresponding PDF data files (for example, Total Sample [1], FAS Total [2], non-FAS Total [3]). For each PDF data file the study team entered the following data for each school: number of students that scored below basic, basic, proficient, or advanced for reading, math, and language arts. The values associated with the data entry process are in table B2.

Table B1. Coding scheme for the 27 queries assigning students to study groups using ReadyResults data supplied by the Guam Department of Education, 2013/14

Variable	FAS ethnic identity codes: 5, 6, 7	Non FAS ethnic identity codes: 1 , 2, 3, 4, 8
	TOTAL (unspecified included) Only filter is Department of Education	
Total	(2)	(3)
English learner student, Male	(8) English learner student codes 1,2,3,4,5,8	(9) English learner student codes 1,2,3,4,5,8
English learner student, Female	(10) English learner student codes 1,2,3,4,5,8	(11) English learner student codes 1,2,3,4,5,8
Non-English learner student, Male	(12) English learner student codes 0,6,7,9	(13) English learner student codes 0,6,7,9
Non-English learner student, Female	(14) English learner student codes 0,6,7,9	(15) English learner student codes 0,6,7,9
Special education, Male	(16) Special education code: Yes	(17) Special education code: Yes
Special education, Female	(18) Special education code: Yes	(19) Special education code: Yes
Non-special education, Male	(20) Special education code: Not special education	(21) Special education code: Not special education
Non-special education, Female	(22) Special education code: Not special education	(23) Special education code: Not special education
	(24) Total Federated States of Micronesia code 5 (25) Total Palau code 6 (26) Total Republic of Marshall Islands code 7 (27) Total unspecified and unknown—code unspecified and 0,9	na

FAS is Freely Associated States; na is not applicable.

Note: This table shows the data queries corresponding to the data files that the Guam Department of Education provided to the study team. Variables that were not used for this study were deleted, and male and female subcategories were aggregated for cross-tabulation calculation of FAS and non-FAS student totals.

Source: Authors' compilation.

The study team entered 99 when data for a school were missing. For example, if a school had no male students classified as receiving special education services, 99 was entered for the special education FAS Male (16) and special education non-FAS Male (17) sections for each grade of that school. The 99 score was also entered if no scores were provided for an entire subject area (reading, math, or language arts). However, when a school had scores for a subject area but not for every performance level (below basic, basic, proficient, and advanced), a score of 0 was entered for any performance level without a score. In addition, because the first column of each spreadsheet contained a full list of participating schools, a school would have 99 across all columns if the school did not serve that particular grade. For example, high schools had 99 in all columns for grades 1–8. Once data entry was complete, the data file was spot-checked against the PDF data files.

Ethnicity. The "Ethnic Identity" codes for FAS students were organized in a special ReadyResults subgroup called "Other Info C" (Taitano et al., 2012). The GDOE created this special subgroup because the standard ReadyResults race/ethnicity codes (for example, American Indian/Alaska Native, Asian, Black or African American, Native Hawaiian/Other Pacific Islander) did not offer suboptions within the Pacific Islander category. The SAT-10 answer sheet incorporated additional FAS ethnicity options, which included the Federated States of Micronesia (Chuukese, Pohnpeian, Kosraean, or Yapese); Palauan; or Marshallese ethnicity (Taitano et al., 2012). There is also a code for unknown ethnicity. No unknown ethnicity data were included for this study. The SAT-10 math dataset included 53 elementary school students with unknown or unspecified ethnicity, 26 middle school students, and 40 high school students. These students made up less than 1 percent of the test taker sample. The study team cross-referenced the sample of test takers in this study to GDOE reported counts of students for 2013/14 (Guam Department of Education, 2014) to

Table B2. Codes from the *Test Coordinator's Handbook* used in the data entry process

Column	Subgroup	Directions
A	English learner students	Mark the following in Column A based on the description: Exited English as a Second Language students, WITH follow up Consultation Students, No accommodations Consultation Students, WITH Accommodations Students Serviced in ESL No Accommodations Students Serviced in ESL WITH Accommodations Students with Parental Waiver Exited ESL students—no follow up Passed Initial Testing (PIT) Special education—no ESL service Not yet assessed or placed
B	Special education students	Mark the "1" circle in *Column B* for all SPECIAL EDUCATION students who took the SAT *without accommodations* Mark the "3" circle in *Column B* for all SPECIAL EDUCATION students who took the SAT *with accommodations*
C	Ethnic identity	Indicate the student's ETHNIC IDENTITY in *Column C* by marking only 1 of the following: Unknown Chamorro (including Guam, Rota, Saipan, Tinian) Filipino White non-Hispanic Asian (Vietnamese, Chinese, Korean, Indonesian, Japanese) Federal States of Micronesia (Chuukese, Pohnpeian, Kosraean, Yapese) Palauan Marshallese Other/Mixed (Ethnic categories other than numbers 1 through 7 and those who identify more than one ethnic category)

ESL is English as a Second Language program.

Source: Taitano et al., 2012.

account for any discrepancies in counts within subanalyses (see table B1). In addition, queries were run for each of the FAS entities (the Federated States of Micronesia, the Republic of the Marshall Islands, and the Republic of Palau). A query also was created for all unspecified or unknown ethnic data (see table B1), since it would not be possible to include them in either the FAS or the non-FAS categories.

English learner students. The English learner student code was found in a special ReadyResults subgrouping called "Other Info A." Data were disaggregated by English learner students and non-English learner students; "unspecified" was not included in any English learner grouping. Counts of students with an unspecified ethnicity by English learner status were not provided as they were mutually exclusive.

Students receiving special education services. ReadyResults includes a filter for students receiving special education services. Data were disaggregated by "yes" (receives special education services) and "not special education." "Unspecified" was not included in any special education grouping. It is important to note that the special education designation in ReadyResults may not match the designation maintained by the GDOE Division of Special Education. Counts of students with an unspecified ethnicity by special education status classifications were not provided as they were mutually exclusive.

Resulting database. An Excel workbook, organized by grade, was created for the database analyzed in this study. The schools were listed as rows, and the variables (the 27 queries) were listed as columns. The study team completed data entry of each PDF file for each grade level.

Appendix C. Cross-tabulation tables

This appendix includes cross-tabulation tables (tables C1–C11) that provide specific student counts and percentages by subtest. Results are presented by Stanford Achievement Test 10th edition (SAT-10) subtest for two reasons. First, the Guam Department of Education provided data for each Guam public school aggregated at the grade level by SAT-10 subtest. Second, information on student English learner and special education classifications was collected with each SAT-10 subtest a student took. Therefore, English learner and special education classification data for students could not be calculated for the Guam public schools' student population as a whole, only by SAT-10 subtest.

Guam public schools enrolled 28,670 students in grades 1–12 during the 2013/14 school year (Guam Department of Education, 2014). In the study sample the reading subtest consisted of 82.8 percent of all students attending public schools in Guam, the math subtest consisted of 84.6 percent, and the language arts subtest consisted of 82.3 percent.

Table C1. Stanford Achievement Test 10th edition reading subtest performance level, by Guam public school level and Freely Associated States status, 2013/14

	Elementary school (*n* = 10,260)		Middle school (*n* = 5,618)		High school (*n* = 7,854)	
Performance level	FAS students (percent)	Non-FAS students (percent)	FAS students (percent)	Non-FAS students (percent)	FAS students (percent)	Non-FAS students (percent)
Total	2,616 (25.5)	7,644 (74.5)	1,343 (23.9)	4,275 (76.1)	1,566 (19.9)	6,288 (80.1)
Below basic	1,696 (64.8)	2,693 (35.2)	811 (60.4)	1,540 (36.0)	1,184 (75.6)	3,120 (49.6)
Basic	725 (27.7)	3,105 (40.6)	452 (33.7)	1,767 (41.3)	322 (20.6)	2,272 (36.1)
Proficient	182 (7.0)	1,593 (20.8)	[a]	901 (21.1)	53 (3.4)	818 (13.0)
Advanced	13 (0.5)	253 (3.3)	[a]	67 (1.6)	7 (0.4)	78 (1.2)

FAS is Freely Associated States.

a. Cells with sample sizes of fewer than five students have been suppressed to protect student confidentiality. Adjacent cells have also been suppressed for confidentiality.

Source: Authors' calculations based on Guam Department of Education data described in appendix B.

Table C2. Stanford Achievement Test 10th edition math subtest performance level, by Guam public school level and Freely Associated States status, 2013/14

Performance level	Elementary school (*n* = 10,307)		Middle school (*n* = 5,776)		High school (*n* = 8,161)	
	FAS students (percent)	Non-FAS students (percent)	FAS students (percent)	Non-FAS students (percent)	FAS students (percent)	Non-FAS students (percent)
Total	2,591 (25.1)	7,716 (74.9)	1,364 (23.6)	4,412 (76.4)	1,201 (14.7)	6,960 (85.3)
Below basic	1,667 (64.3)	2,876 (37.3)	1,257 (92.2)	3,049 (69.1)	1,158 (96.4)	6,121 (87.9)
Basic	816 (31.5)	3,210 (41.6)	100 (7.3)	1,050 (23.8)	39 (3.2)	710 (10.2)
Proficient	101 (3.9)	1,443 (18.7)	[a]	268 (6.1)	[a]	117 (1.7)
Advanced	7 (0.3)	187 (2.4)	[a]	45 (1.0)	[a]	12 (0.2)

FAS is Freely Associated States.

a. Cells with sample sizes of fewer than five students have been suppressed to protect student confidentiality. Adjacent cells have also been suppressed for confidentiality.

Source: Authors' calculations based on Guam Department of Education data described in appendix B.

Table C3. Stanford Achievement Test 10th edition language arts subtest performance level, by Guam public school level and Freely Associated States status, 2013/14

Performance level	Elementary school (*n* = 10,547)		Middle school (*n* = 5,420)		High school (*n* = 7,619)	
	FAS students (percent)	Non-FAS students (percent)	FAS students (percent)	Non-FAS students (percent)	FAS students (percent)	Non-FAS students (percent)
Total	2,585 (24.5)	7,962 (75.5)	1,457 (26.9)	3,963 (73.1)	1,398 (18.3)	6,221 (81.7)
Below basic	1,853 (71.7)	3,490 (43.8)	1,036 (71.1)	1,798 (45.4)	1,132 (81.0)	3,755 (60.4)
Basic	652 (25.2)	3,419 (42.9)	349 (24.0)	1,434 (36.2)	250 (17.9)	2,028 (32.6)
Proficient	[a]	911 (11.4)	[a]	651 (16.4)	[a]	403 (6.5)
Advanced	[a]	142 (1.8)	[a]	80 (2.0)	[a]	35 (0.6)

FAS is Freely Associated States.

a. Cells with sample sizes of fewer than five students have been suppressed to protect student confidentiality. Adjacent cells have also been suppressed for confidentiality.

Source: Authors' calculations based on Guam Department of Education data described in appendix B.

Table C4. Stanford Achievement Test 10th edition reading subtest performance level, by Guam public school region and Freely Associated States status, 2013/14

Performance level	Haya (*n* = 3,524)		Kattan (*n* = 5,644)		Lagu (*n* = 10,011)		Luchan (*n* =4,553)	
	FAS students (percent)	Non-FAS students (percent)	FAS students (percent)	Non-FAS students (percent)	FAS students (percent)	Non-FAS students (percent)	FAS students (percent)	Non-FAS students (percent)
Total	457 (13.0)	3,067 (87.0)	1,411 (25.0)	4,233 (75.0)	2,623 (26.2)	7,388 (73.8)	1,034 (22.7)	3,519 (77.3)
Below basic	300 (65.6)	1,475 (48.1)	911 (64.6)	1,788 (42.2)	1,832 (69.8)	2,944 (39.8)	648 (62.7)	1,146 (32.6)
Basic	135 (29.5)	1,049 (34.2)	383 (27.1)	1,613 (38.1)	665 (25.4)	2,961 (40.1)	316 (30.6)	1,521 (43.2)
Proficient	[a]	489 (15.9)	109 (7.7)	750 (17.7)	119 (4.5)	1,337 (18.1)	64 (6.2)	736 (20.9)
Advanced	[a]	54 (1.8)	8 (0.6)	82 (1.9)	7 (0.3)	146 (2.0)	6 (0.6)	116 (3.3)

FAS is Freely Associated States.

a. Cells with sample sizes of fewer than five students have been suppressed to protect student confidentiality. Adjacent cells have also been suppressed for confidentiality.

Source: Authors' calculations based on Guam Department of Education data described in appendix B.

Table C5. Stanford Achievement Test 10th edition math subtest performance level, by Guam public school region and Freely Associated States status, 2013/14

Performance level	Haya (*n* = 4,039)		Kattan (*n* = 5,403)		Lagu (*n* = 10,191)		Luchan (*n* = 4,611)	
	FAS students (percent)	Non-FAS students (percent)	FAS students (percent)	Non-FAS students (percent)	FAS students (percent)	Non-FAS students (percent)	FAS students (percent)	Non-FAS students (percent)
Total	506 (12.5)	3,533 (87.5)	1,425 (26.4)	3,978 (73.6)	2,375 (23.3)	7,816 (76.7)	850 (18.4)	3,761 (81.6)
Below basic	407 (80.4)	2,363 (66.9)	1,137 (79.8)	2,621 (65.9)	1,903 (80.1)	4,803 (61.5)	635 (74.7)	2,259 (60.1)
Basic	89 (17.6)	852 (24.1)	243 (17.1)	934 (23.5)	432 (18.2)	2,198 (28.1)	191 (22.5)	986 (26.2)
Proficient	[a]	277 (7.8)	[a]	390 (9.8)	[a]	721 (9.2)	[a]	440 (11.7)
Advanced	[a]	41 (1.2)	[a]	33 (0.8)	[a]	94 (1.2)	[a]	76 (2.0)

FAS is Freely Associated States.

a. Cells with sample sizes of fewer than five students have been suppressed to protect student confidentiality. Adjacent cells have also been suppressed for confidentiality.

Source: Authors' calculations based on Guam Department of Education data described in appendix B.

Table C6. Stanford Achievement Test 10th edition language arts subtest performance level, by Guam public school region and Freely Associated States status, 2013/14

Performance level	Haya (*n* = 4,027)		Kattan (*n* = 4,920)		Lagu (*n* = 10,524)		Luchan (*n* = 4,115)	
	FAS students (percent)	Non-FAS students (percent)	FAS students (percent)	Non-FAS students (percent)	FAS students (percent)	Non-FAS students (percent)	FAS students (percent)	Non-FAS students (percent)
Total	513 (12.7)	3,514 (87.3)	1,340 (27.2)	3,580 (72.8)	2,625 (24.9)	7,899 (75.1)	962 (23.4)	3,153 (76.6)
Below basic	384 (74.9)	2,063 (58.7)	965 (72.0)	1,688 (47.2)	2,014 (76.7)	4,107 (52.0)	658 (68.4)	1,185 (37.6)
Basic	119 (23.2)	1,150 (32.7)	308 (23.0)	1,399 (39.1)	557 (21.2)	2,866 (36.3)	267 (27.8)	1,466 (46.5)
Proficient	[a]	271 (7.7)	[a]	444 (12.4)	[a]	818 (10.4)	32 (3.3)	432 (13.7)
Advanced	[a]	30 (0.9)	[a]	49 (1.4)	[a]	108 (1.4)	5 (0.5)	70 (2.2)

FAS is Freely Associated States.

a. Cells with sample sizes of fewer than five students have been suppressed to protect student confidentiality. Adjacent cells have also been suppressed for confidentiality.

Source: Authors' calculations based on Guam Department of Education data described in appendix B.

Table C7. English learner classification reported on the Stanford Achievement Test 10th edition math, by Guam public school level and Freely Associated States status, 2013/14

English learner classification	Elementary school (*n* = 5,060)		Middle school (*n* = 3,265)		High school (*n*= 4,731)		Total (N =13,056)	
	FAS students (percent)	Non-FAS students (percent)	FAS students (percent)	Non-FAS students (percent)	FAS students (percent)	Non-FAS students (percent)	FAS students (percent)	Non-FAS students (percent)
Total	2,299 (45.4)	2,761 (54.6)	1,245 (38.1)	2,020 (61.9)	1,441 (30.5)	3,290 (69.5)	4,985 (38.2)	8,071 (61.8)
English learner student	2,210 (96.1)	2,357 (85.4)	1,024 (82.2)	1,066 (52.8)	1,020 (70.8)	1,380 (41.9)	4,254 (85.3)	4,803 (59.5)
Non-English learner student	89 (3.9)	404 (14.6)	221 (17.8)	954 (47.2)	421 (29.2)	1,910 (58.1)	731 (14.7)	3,268 (40.5)

FAS is Freely Associated States.

Source: Authors' calculations based on Guam Department of Education data described in appendix B.

Table C8. English learner classification reported on the Stanford Achievement Test 10th edition math, by Guam public school region and Freely Associated States status, 2013/14

English learner classification	Haya (*n* = 1,522)		Kattan (*n* = 2,620)		Lagu (*n*= 6,316)		Luchan (*n* = 2,598)	
	FAS students (percent)	Non-FAS students (percent)	FAS students (percent)	Non-FAS students (percent)	FAS students (percent)	Non-FAS students (percent)	FAS students (percent)	Non-FAS students (percent)
Total	469 (30.8)	1,053 (69.2)	1,253 (47.8)	1,367 (52.2)	2,307 (36.5)	4,009 (63.5)	956 (36.8)	1,642 (63.2)
English learner student	426 (90.8)	734 (69.7)	1,029 (82.1)	769 (56.3)	2,059 (89.3)	2,506 (62.5)	740 (77.4)	794 (48.4)
Non-English learner student	43 (9.2)	319 (30.3)	224 (17.9)	598 (43.7)	248 (10.7)	1,503 (37.5)	216 (22.6)	848 (51.6)

FAS is Freely Associated States.

Source: Authors' calculations based on Guam Department of Education data described in appendix B.

Table C9. Special education classification reported on the Stanford Achievement Test 10th edition math, by Guam public school level and Freely Associated States status, 2013/14

Special education classification	Elementary school (*n* = 10,450)		Middle school (*n* = 5,770)		High school (*n* = 7,225)		Total (N = 23,445)	
	FAS students (percent)	Non-FAS students (percent)	FAS students (percent)	Non-FAS students (percent)	FAS students (percent)	Non-FAS students (percent)	FAS students (percent)	Non-FAS students (percent)
Total	2,549 (24.4)	7,901 (75.6)	1,532 (26.6)	4,238 (73.4)	1,433 (19.8)	5,792 (80.2)	5,514 (23.5)	17,931 (76.5)
Special education	70 (2.7)	347 (4.4)	91 (5.9)	308 (7.3)	68 (4.7)	393 (6.8)	229 (4.2)	1,048 (5.8)
Non-special education	2,479 (97.3)	7,554 (95.6)	1,441 (94.1)	3,930 (92.7)	1,365 (95.3)	5,399 (93.2)	5,285 (95.8)	16,883 (94.2)

FAS is Freely Associated States.

Source: Authors' calculations based on Guam Department of Education data described in appendix B.

Table C10. Special education classification reported on the Stanford Achievement Test 10th edition math, by Guam public school region and Freely Associated States status, 2013/14

Special education classification	Haya (*n* = 3,668)		Kattan (*n* = 5,587)		Lagu (*n* = 9,481)		Luchan (*n* = 4,709)	
	FAS students (percent)	Non-FAS students (percent)	FAS students (percent)	Non-FAS students (percent)	FAS students (percent)	Non-FAS students (percent)	FAS students (percent)	Non-FAS students (percent)
Total	483 (13.2)	3,185 (86.8)	1,475 (26.4)	4,112 (73.6)	2,545 (26.8)	6,936 (73.2)	1,011 (21.5)	3,698 (78.5)
Special education	31 (6.4)	195 (6.1)	57 (3.9)	272 (6.6)	85 (3.3)	381 (5.5)	56 (5.5)	200 (5.4)
Non-special education	452 (93.6)	2,990 (93.9)	1,418 (96.1)	3,840 (93.4)	2,460 (96.7)	6,555 (94.5)	955 (94.5)	3,498 (94.6)

FAS is Freely Associated States.

Source: Authors' calculations based on Guam Department of Education data described in appendix B.

Table C11. Stanford Achievement Test 10th edition subtest participation rates, by Freely Associated State ethnicity, 2013/2014

	Federated States of Micronesia		Republic of Palau		Republic of Marshall Islands	
Subtest	Number	Percent	Number	Percent	Number	Percent
SAT-10 reading (*n* = 5,146)	4,626	89.9	406	7.9	114	2.2
SAT-10 math (*n* = 5,435)	4,872	89.6	444	8.2	119	2.2
SAT-10 language arts (*n* = 5,441)	4,895	90.0	428	7.9	118	2.2

SAT-10 is Stanford Achievement Test 10th edition.

Source: Authors' calculations based on Guam Department of Education data described in appendix B.

Notes

1. The Guam Department of Education uses the terms "regions" and "districts" interchangeably. To align the language of this report with the department's most recent annual report (Guam Department of Education, 2014), this report refers to these geographic locations as "regions."
2. Additional languages include Carolinian, Chamorro, Gilbertese, Kapingamarangi, Nauruan, Nukuoro, and Ulithian.
3. Information retrieved from U.S. Census Bureau's American FactFinder, http://factfinder2.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=DEC_10_GUSF_PCT24&prodType=table.

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