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Exploring Hispanic/Latinx Students' Perceptions of Parental Support for Math and Equitable Instructional Practices in Math Class

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Introduction

This research brief presents descriptive findings from an investigation of Hispanic/Latinx students' perceptions of parental support for their math learning and their experiences of equitable instructional practices during math class. The data for this brief comes from the 2023 NORC Youth and Teen Math Mindset Study, which surveyed a nationally representative sample of youth (ages 10-12) and teens (ages 13-17) about their math mindsets, math identities, experiences in math class, and math course-taking behaviors. The STEM workforce is a crucial labor market issue. This research is of interest because Hispanic/Latinx students continue to be underrepresented in STEM majors and careers, comprising 14% of the U.S. population but only receiving 9% of STEM degrees (NCSES, 2021). Research indicates that some of these differences in STEM participation are related to students' early math and science course-taking, classroom learning environments, and beliefs about math's importance and math abilities (Gonzalez et al., 2020). We begin the brief with a brief literature review that summarizes study findings on the role of parents in supporting their child's learning and the importance of equitable instructional practices, particularly for students from racial/ethnic minority backgrounds. Then, we present the results of questions we

asked youth and teens about parental support and their teacher's use of equitable instructional practices.

Brief Literature Review

Parents play a vital role in students' academic performance. For example, research shows that parental participation in school events and holding conversations with their children about school positively affect students' achievement, engagement, and motivation. (Barger, M. M., Kim, E. M., Kuncel, N. R., & Pomerantz, E. M., 2019). As children move from the early grades into middle and high school, parental involvement changes from direct activities (such as reading with children) to setting expectations for academic performance and fostering conditions that enable them to be met (Boonk, L., Gijselaers, H. J. M., Ritzen, H., Brand-Gruwel, S., 2018). Outcomes related to math education are positively associated with many aspects of parental involvement, including positive beliefs and expectations parents associate with their child's math learning, their presence at home and availability to help with math, and positive conversations they have with their children about school and homework. (Fiskerstrand, 2022).

Given parents' critical role in their children's education, it is essential to note that there are cultural differences in expectations for parental involvement. Parental involvement by immigrant Latinos may reflect cultural norms that assign parents to their child's home life and consider involvement in school life as interfering (Delgado-Gaitan, 1991, 2004). In addition, Latino families who come to the U.S. due to economic constraints may be unfamiliar with the American school system and unable to communicate in English fluently (Mena, 2011).

Equitable instructional practices are teaching methods and strategies that address disparities marginalized students have historically faced in the classroom. Culturally responsive teaching (CRT) practices validate students' cultural identities and experiences, treating both as resources to draw upon rather than deficits in the classroom. When using CRT practices, teachers must scrutinize their cultural values, beliefs, and perceptions and adopt multicultural awareness. (Aceves, T. C., & Orosco, M. J., 2014). That lens is increasingly vital as public schools in the United States continue diversifying.

Findings

In this research brief, we report on findings from the 2023 NORC Youth and Teen Math Mindset Survey, a larger study NORC conducted to explore how youth and teens view math (math mindset), their math abilities (math identity), and their

experiences studying math (instructional contexts). This survey was administered to a nationally representative panel of youth (ages 10-12) and teens (ages 13-17) from spring to early summer 2023. The study also surveyed the parents of students ages 10 – 17 on topics like those included in the student survey.

An equity centered approach. This research brief is guided by scholarly work that calls for equity research efforts towards STEM reform to look beyond student outcomes and the use alternative research approaches to avoid the "gap-gazing" phenomenon (Rodriguez, 2001; Gutierrez, 2008). Gap gazing may occur when students from different race/ethnicity groups are compared absent of any discussion about why disparities exist. This approach can inadvertently promote the belief that marginalized students have inherent shortcomings and other misleading ideas about academic achievement. Instead, this research brief presents the results of a descriptive subgroup analysis focusing solely on data collected from Black/African American youth. Using this approach enables us to understand the within-group nuances of Black students' experiences with factors empirically linked to student participation in math (Volpe et al., 2022; Gonzalez et al., 2020).

The larger study oversampled Hispanic/Latinx students due to a particular interest in the experiences of racial/ethnic subgroups who are underrepresented in honors and advanced placement (AP) coursework (Flowers, 2008) and in STEM majors and careers (NCSES, 2021). Therefore, the final analytic sample consisted of 446 (N=446) Hispanic/Latinx youth and teens. It was balanced by gender, 50.4% male and 49.5% female (see Table 1). The sample was diverse regarding socioeconomic background as measured by parent education level and household income. For example, almost half of our respondents (46%) had at least one parent with a bachelor's degree or higher. Additionally, 56% of respondents came from households earning $60K yearly. Our sample of youth and teen respondents was also diverse concerning grade level, with a majority (71%) in 9th through 12th grades.

Table 1. Demographic Characteristics of Hispanic/Latinx Sample

Characteristic	Responses	% Response
Gender		
Male	225	50.4
Female	221	49.5
Grade		
4^{th} – 6^{th}	33	8.68
7^{th} – 8^{th}	79	20.79
9^{th} – 10^{th}	174	45.79
11^{th} – 12^{th}	94	24.74
Parent Education Level		
Less than HS	15	3.36
HS graduate	82	18.39
Vocational/tech school/some college/associates	144	32.29
Bachelor's degree	122	27.35
Post grad study/professional degree	83	18.61
Household Income		
Less than $30,000	70	15.7
$30,000 to under $60,000	122	27.35
$60,000 to under $100,000	121	27.13
$100,000 or more	133	29.82

To better understand the perspective and experiences of Hispanic/Latinx students, we focused on the following questions:

1. Do Hispanic/Latinx youth respondents' perceptions of parental support vary by demographic characteristics?
2. What are Hispanic/Latinx youth respondents' perceptions of equitable instructional practices? Do these perceptions vary by demographic characteristics?

We focused our analysis on a subset of 6 classroom practices and 7 parent support survey questions (see Table 2) to address our research questions. Each question about parent support asked respondents to indicate the extent to which they agreed with a statement using a six-point Likert scale ranging from "Strongly Disagree" to "Strongly Agree." Respondents were also asked to indicate how often they experienced an equitable instructional practice using the following six-point Likert scale: (1) "Never"; (2) "A few times a year"; (3) "About once a month"; (4) A few times a month"; (5) "About once a week"; (6) "Almost every day." In the next section, we report some of the findings from our analysis of these questions, both at the aggregate level and by covariates, including gender, parent education

level, household income, and grade level.

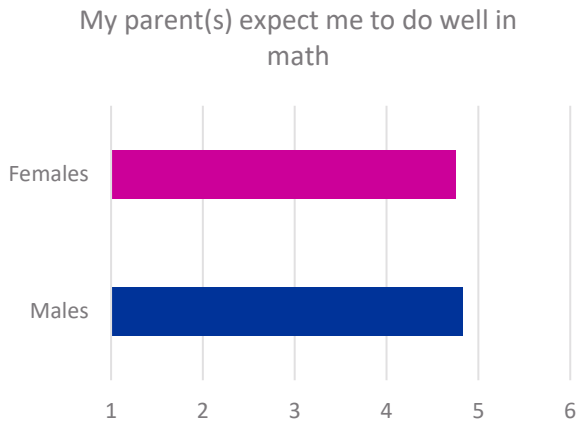
Table 2. Summary of Parent Support and Instructional Practices Survey Questions

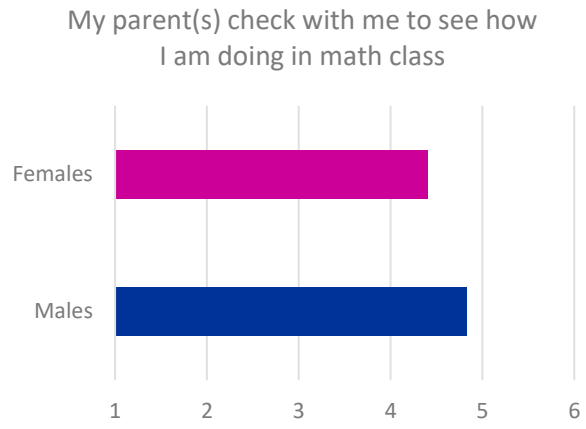
Parent Support Questions
My parent(s) expect me to do well in math
My parent(s) help me to decide which math classes to take
My parent(s) help me with my math homework
My parent(s) check with me to see how I am doing in math class
My parent(s) do fun math activities with me, like math games, puzzles or workbooks
My parent(s) encourage me to get involved in math outside of school (such as math clubs, math camps, tutoring)
My parent(s) pay for me to go to math camp or get math tutoring
Equitable Instructional Practices Questions
My teacher calls on the same few students in math
My teacher asks me easy math questions
My teacher asks me harder math questions
My math textbooks and/or online materials include people of many different races/ethnicities
My math teacher uses examples with people from many different races/ethnicities
We can use a language other than English in Math

PARENTAL SUPPORT: FINDINGS BY GENDER

Overall, we found no significant differences based on Hispanic/Latinx students' perceptions of their parental support.

- When it came to students' perceptions of parental support (whether parents helped them with math homework and encouraged them to get involved in math outside of school), we found no significant differences between male and female Hispanic/Latinx students.
- When it came to whether their parents expected them to do well in math, we also found no significant difference between male and female students.
- However, male students reported that their parents were more likely to check how they did in math class than female students.

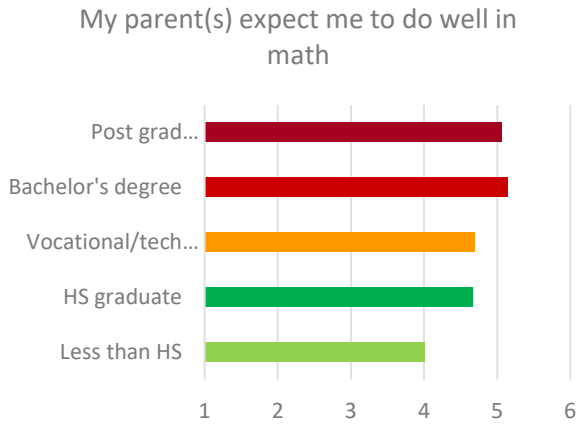


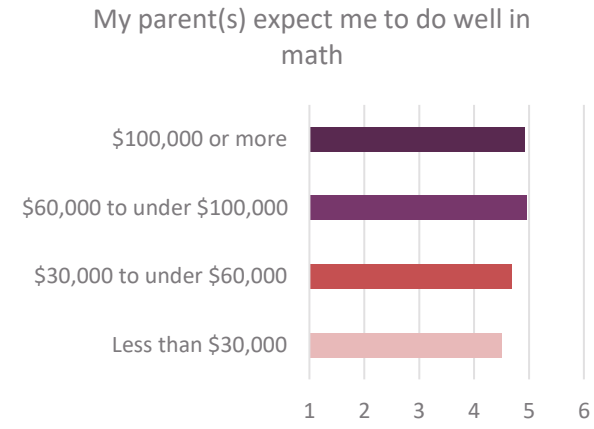


PARENTAL SUPPORT: FINDINGS BY HOUSEHOLD INCOME AND PARENT EDUCATION ATTAINMENT

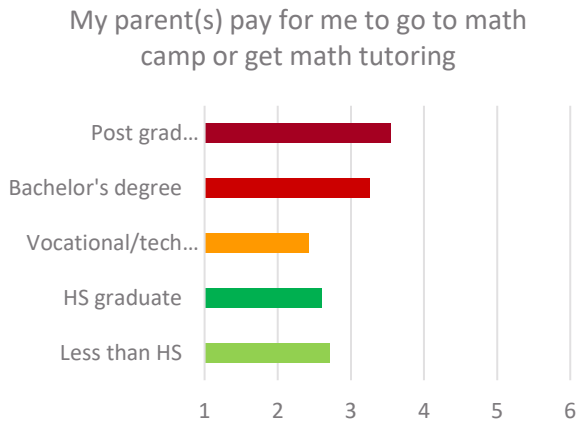
Students' perceptions of parental support showed similar patterns by parent education level and household income. Overall, Hispanic/Latinx students from higher-income households with parents with higher educational attainment report more parental support.

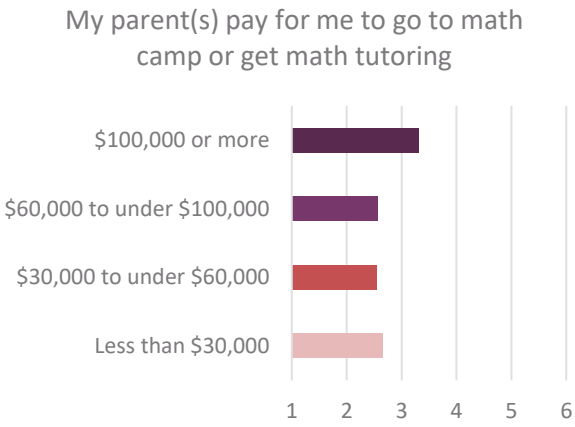
- When it came to Hispanic/Latinx students' perception of how well their parents expected them to do in math, we found significant differences in parent education. Students whose parents had higher levels of education reported higher expectations.
- We also found a similar pattern for household income. students from higher-income households reported higher expectations.





- Hispanic/Latinx students whose parents had higher levels of educational attainment were more likely to have access to math camps or tutoring.
- Hispanic/Latinx students from households with an annual income of $100,000 or more were likelier to report that their parents pay for math camp or tutoring than students from households with a lower annual income.



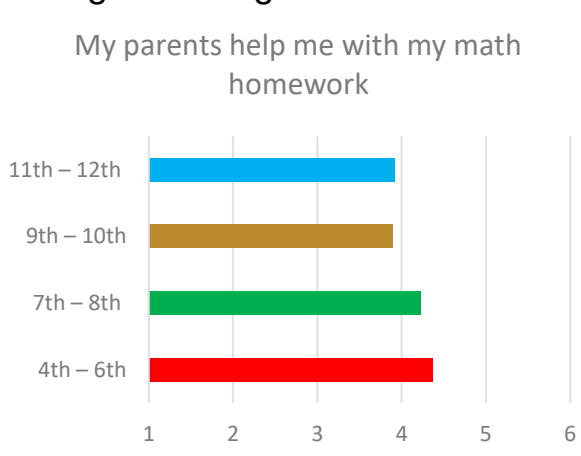


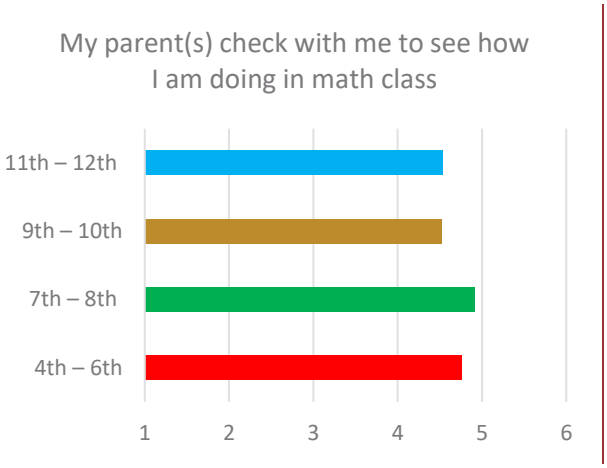
- However, we did find differences in how income and parent educational attainment related to parental support. Regarding Hispanic/Latinx students' reports of how often their parents helped them with their math homework, we found differences based on parent education but not by household income.
- When it came to Hispanic/Latinx students' perception of whether their parents check to see how they are doing, we found no statistical differences by either parent educational attainment or income.

PARENTAL SUPPORT: FINDINGS BY STUDENT GRADE LEVEL

Overall, Hispanic/Latinx elementary and middle school students were more likely to agree with statements of parental support than students in high school. In particular,

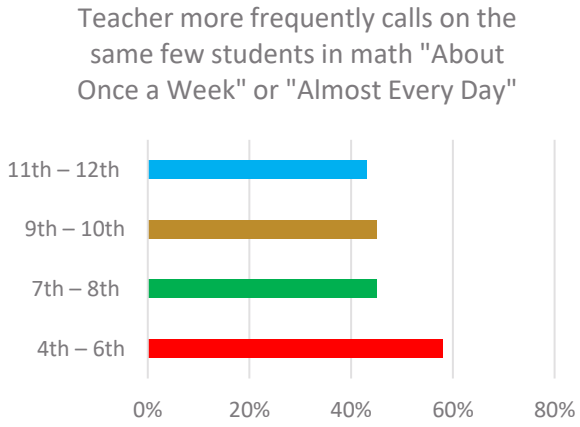
- Younger Hispanic/Latinx students were more likely to agree that their parents expected them to do well in math than older students.
- Younger Hispanic/Latinx students were also more likely to agree that their parents supported them in math outside of school by encouraging them to be involved with math activities and paying for them to go to math camps or get tutoring.





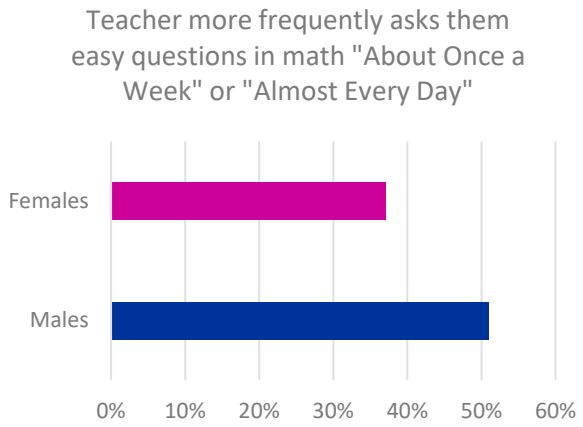
EQUITABLE INSTRUCTIONAL PRACTICES: FINDINGS BY DEMOGRAPHIC CHARACTERISTICS

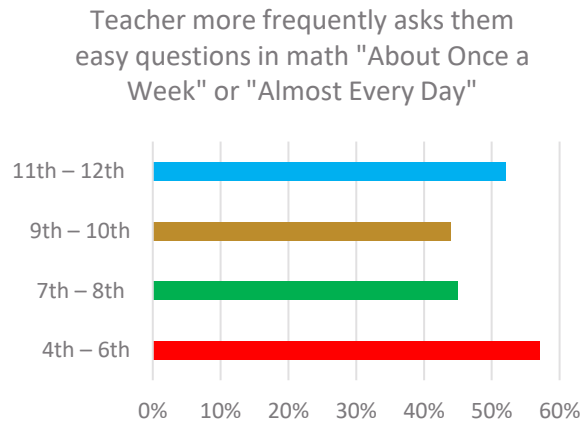
Fifty-eight percent of Hispanic/Latinx youth in grades 4 – 6 reported that their teacher calls on the same few students about once a week or almost daily compared to 45% of youth in grades 7 – 12. The mean differences between groups by grade level were statistically significant.



Close to half (44%) of the Hispanic/Latinx students we surveyed reported that their teacher more frequently asks them easy questions in math.

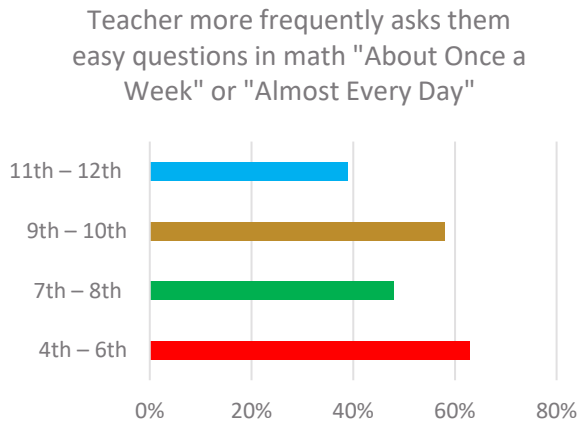
- Here, we see variation by gender as 51% of male Hispanic/Latinx students compared to 37% of female Hispanic/Latinx students reported that their teacher asks them easy questions about once a week or almost every day
    - There was a statistically significant mean difference between males (*M*=4.16, *SD*= 1.66) and females (*M*=3.72, *SD*=1.58) reporting that their teacher more frequently asked them easy questions
- As parent education level increases, more Hispanic/Latinx students reported that their teacher asks them easy questions about once a week or almost every day.
- The highest percentage of students (57%) reporting that their teacher asks them easy questions about once a week or almost every day came from families making over 100K per year. This was followed by students (50%) from families making less than 30K per year.
- More than half of students in grades 4-6 (57%) and 11-12 (52%) reported that their teacher asks them easy questions about once a week or almost every day.
    - The mean differences between groups by grade level were statistically significant

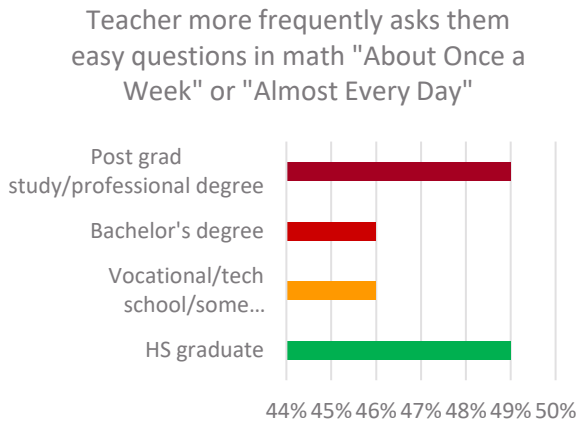


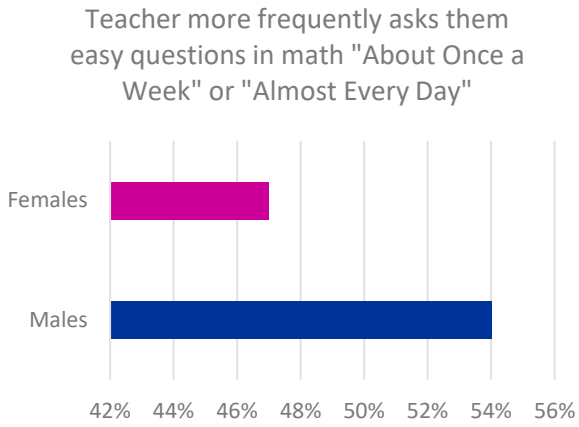


Fifty-one percent (51%) of the Hispanic/Latinx students we surveyed indicated that their teacher asks them harder math questions about once a week or almost daily.

- We did see variation in responses by gender, parental education level, and grade level but not household income. Fifty-four percent (54%) of Hispanic/Latinx male students reported that their teacher asks them harder questions in math about once a week or almost every day compared to 47% of Hispanic/Latinx female students
    - There was a statistically significant mean difference between males (*M*=4.35, *SD*= 1.56) and females (*M*=3.84, *SD*=1.60) reporting that their teacher more frequently asked them harder questions
- Thirty-six percent (36%) of Hispanic/Latinx students living in households with a parent who does not have a high school diploma reported that their teacher asks them harder questions once a week or almost every day. The percentages were much higher for students living in households with a parent who graduated from high school (49%), had some college or vocational/technical education training (46%), completed an undergraduate degree (46%), and completed a postgraduate degree (49%)
    - The mean differences between groups by parent education level were statistically significant
- Sixty-three percent (63%) of Hispanic/Latinx students in grades 4-6 reported that their teacher asks them harder math questions about once a week or almost daily. This compares to 48% of students in grades 7-8, 58% of youth in grades 9-10, and 39% of youth in grades 11-12.

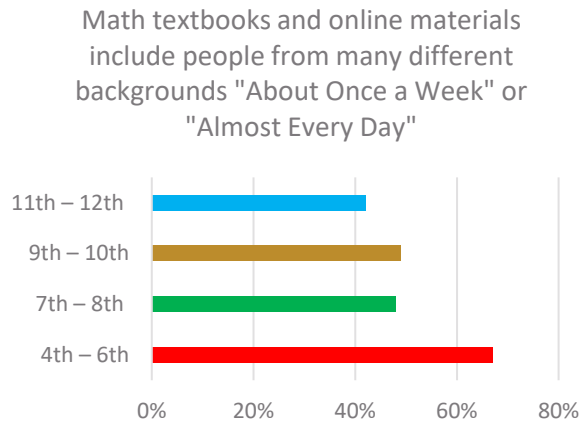


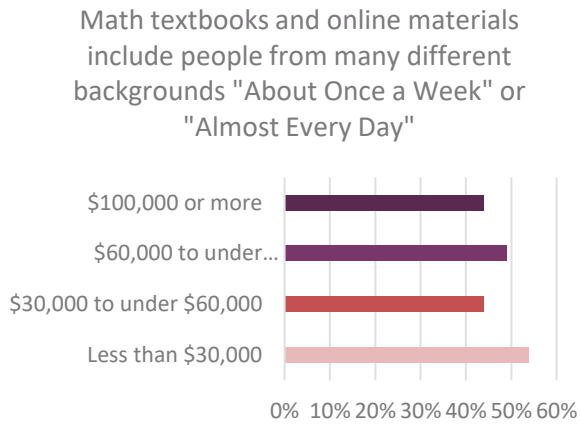




Overall, 47% of Hispanic/Latinx students reported that their math textbooks and online materials include people from many different backgrounds about once a week or almost daily.

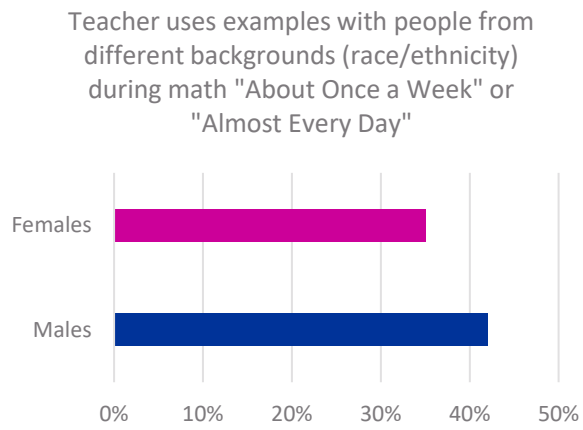
- We did see variation by household income and grade level but not by gender or parent educational level. The highest percentage of Hispanic/Latinx students (54%) reporting that their math textbooks and online materials contain people from different backgrounds about once a week or almost every day, live in households where the annual income is less than 30K per year. This compares to 44% of students living in households earning more than 30K but less than 100K per year and 49% living in households earning more than 100K per year.
  - As grade level increases, the percentage of Hispanic/Latinx students reporting that their math textbooks and online materials contain people from different backgrounds about once a week or almost every day decreases from 67% in grades 4-6 to 42% in grades 11-12. The mean differences between groups by grade level were statistically significant.

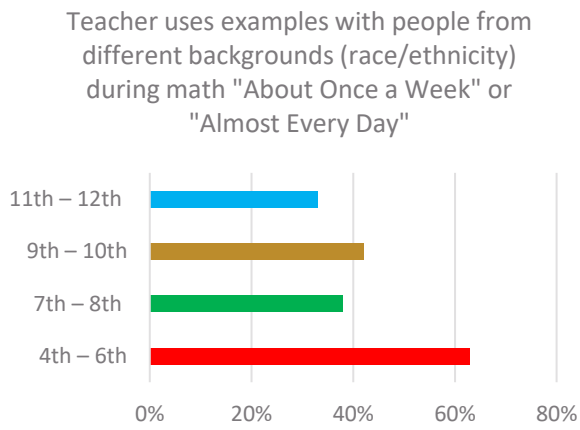




Approximately 39% of Hispanic/Latinx students reported that their teacher uses examples with people from different backgrounds (race/ethnicity) during math.

- We did see some variation by gender and grade level but not parent educational level or household income. About 42% of Hispanic/Latinx male students and 35% of female students report that their teacher uses examples with people from different backgrounds in math at least once a week or almost every day
  - There was a statistically significant mean difference between males (*M*=3.92, *SD*= 1.86) and females (*M*=3.36, *SD*=1.84) reporting that their teacher uses examples with people from different backgrounds (race/ethnicity) during math
- Sixty-three percent (63%) of Hispanic/Latinx students in grades 4-6 reported that their teacher uses examples with people from different backgrounds (race/ethnicity) during math. This compares to 38% of students in grades 7-8, 42% in grades 9-10, and 33% in grades 11-12.
  - The mean differences between groups by grade level were statistically significant.





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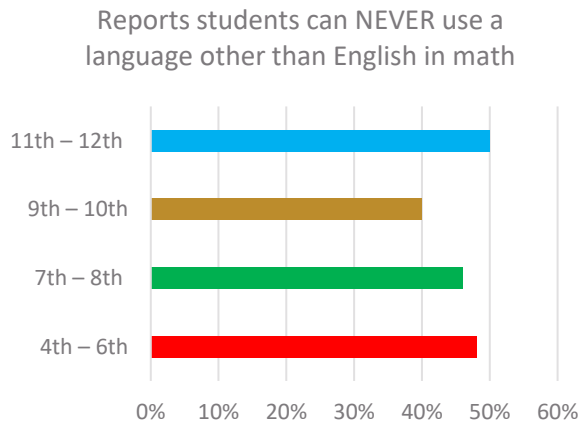
forty-five percent (45%) of Hispanic/Latinx students reported that they could NEVER use a language other than English in math. This compares to 17% of youth who reported they can use a language other than English in math almost daily.

- There was not much variation by gender, parent educational level, or household income, but we did see some variation by grade level. Forty-eight percent of Hispanic/Latinx students in grades 4-6 reported they could never use a language other than English in math compared to 46% of youth in grades 7-8, 40% of youth in grades 9-10, and 50% of students in grades 11-12.



Conclusion

This study examined nuances in Hispanic/Latinx students' experiences studying math by asking them about factors (parental support and equity-focused instructional activities) that influence their performance and persistence in math and STEM. Our analyses provide essential context when trying to understand the math experiences of Hispanic/Latinx students by considering how their experiences may vary by key demographic variables rather than assuming students of this ethnic group have universal experiences. In particular, we explored differences by demographics in their perceptions of parental support and equitable instructional practices in math class.

We asked Hispanic/Latinx students to report their perceptions of the support they get from their parents around their math learning. Generally, we found that students' perceptions of the math support they get from their parents vary by key demographic variables, particularly their household income and parents' educational attainment. We also found that younger Hispanic/Latinx students tend to report higher levels of parental support compared to Hispanic/Latinx students in High School.

The current study also documents Hispanic/Latinx students' experiences of equitable instructional practices during math. We asked respondents to report whether their teachers call on the same few students to answer questions during math and we found this practice happened more frequently among students in grades 4 – 6 compared to students in grades 7 – 12. We cannot speculate why many students in lower grades reported experiencing this practice. However, we believe this practice potentially signals a teacher's preference for calling on students who would answer the question correctly. This practice could negatively affect the mindsets or motivation of certain students not being called upon to answer questions during math. We also asked respondents to report the frequency that their teachers asked them easy and hard questions during math. We found that the percentage of students reporting that their teacher regularly asks them easy questions increased as their parent education level increased. Our findings by household income contradicted what we saw by parental educational attainment to some extent, as students from the highest and lowest income households in our sample reported that their teachers more regularly asked them easy questions.

A higher percentage of male Hispanic/Latinx students in our sample reported that their teachers more regularly asked them hard questions during math than female students. Additionally, a lower percentage of students from our lowest household income group were less likely to report that their teachers more regularly asked them more challenging questions during math than students from the other three household income groups. Lastly, as grade level increased, the percentage of students reporting that their teacher more regularly asked them more challenging questions decreased. Ideally, we would hope to see no gender differences to this question from an equity standpoint because it would suggest that gender stereotypes are not informing teacher beliefs about who is good at math and can handle challenging questions. We would also hope to see no differences by household income as well. To the extent that harder questions suggest more rigor in math, we hope all students have a similar experience regardless of household income. As for grade level, it isn't easy to draw inferences about what our findings mean, except to say that this is not what we expected because math is generally more challenging as grade level increases.

When we asked students to report how frequently their math textbooks and online materials included people from different racial/ethnic backgrounds, we found that students in grades 4 – 6 were more likely to experience being exposed to diverse individuals in their learning materials regularly. Students living in households with an annual income of less than 30K per year were also more likely to report being exposed to diverse individuals in their learning materials

more regularly. Male students were more likely to report that their teachers use examples with people from different backgrounds during math than female students. Furthermore, students in grades 4 – 6 were also more likely to report that their teachers use examples with people from different backgrounds. Again, it is difficult to infer what this means, but students from underrepresented backgrounds must see themselves reflected in their math curricular materials. With respect to disrupting racial/ethnic stereotypes about math, these actions that their teachers implement in the classroom, help to reinforce the idea that people from underrepresented backgrounds can do math.

Finally, most students we surveyed reported that they cannot use a language other than English in math. This finding was not surprising since we know that the percentage of classrooms that would formally allow this practice (i.e., two-way immersion classrooms) is small compared to classrooms that are solely taught in English. However, it begs the question of whether an opportunity is missed to validate the cultural identities and experiences of Hispanic/Latinx students.

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Acknowledgements

This work was funded by the Bill & Melinda Gates Foundation. The views expressed are those of the authors and should not be attributed to the funders.

ABOUT NORC

NORC at the University of Chicago conducts research and analysis that decision-makers trust. As a nonpartisan research organization and a pioneer in measuring and understanding the world, we have studied almost every aspect of the human experience and every major news event for more than eight decades. Today, we partner with government, corporate, and nonprofit clients around the world to provide the objectivity and expertise necessary to inform the critical decisions facing society.