Math Narrative Project: Teachers Comprehensive Findings

Goodwin Simon Strategic Research,
Wonder: Strategies for Good
March 2024

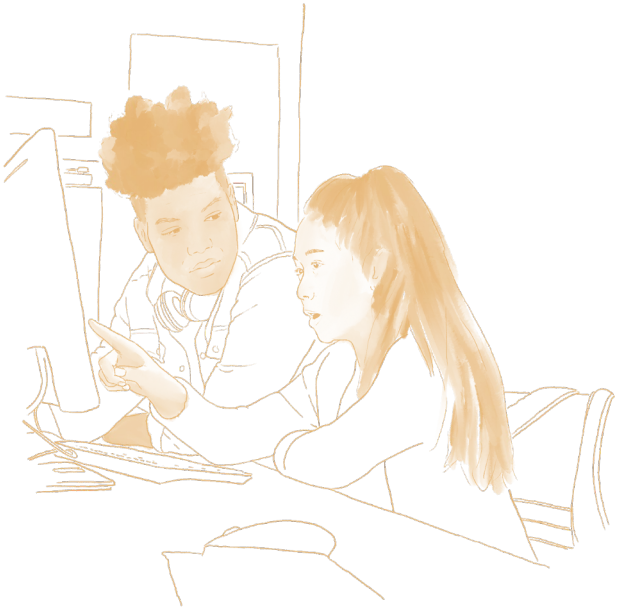
BILL & MELINDA GATES foundation

THE MATH NARRATIVE PROJECT

PROJECT OVERVIEW AND GOALS

The Math Narrative Project uses the Heartwired research approach *(see slide 5)* to understand the cultural narratives that inform how 6th to 10th grade public school students who are Black or Hispanic* from any income level, or Asian American Pacific Islander (AAPI) or white from lower-income households, think and feel about learning math, and to discover how and who can disrupt harmful narratives and replace them with positive ones.

To better understand the experiences of young people in this age group, Goodwin Simon Strategic Research (GSSR) and Wonder: Strategies for Good conducted research with students in 6th through 10th grades. The research team also conducted research with adults who influence students' feelings and mindsets around math: teachers and parents of 6th to 10th grade students.



*Consistent with what the research team heard in focus group discussions and in surveys, a 2022 Pew Research survey of 3,030 U.S. Hispanic adults found that 53 percent of Hispanics prefer to describe themselves as "Hispanic," 26 percent prefer "Latino," two percent prefer "Latinx," and 18 percent have no preference.

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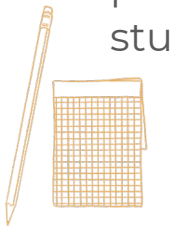
PROJECT & RESEARCH GOALS

The **Math Narrative Project** aims to advance an evidence-based messaging and narrative change strategy by:

- Developing an understanding of the emotions, beliefs, values, lived experiences, identities, and influences that shape the mindsets of 6th-10th grade students who are Black or Hispanic from any income level, or AAPI or white from lower-income households, around learning math. This includes conducting research with parents and teachers who influence students' mindsets around learning math.

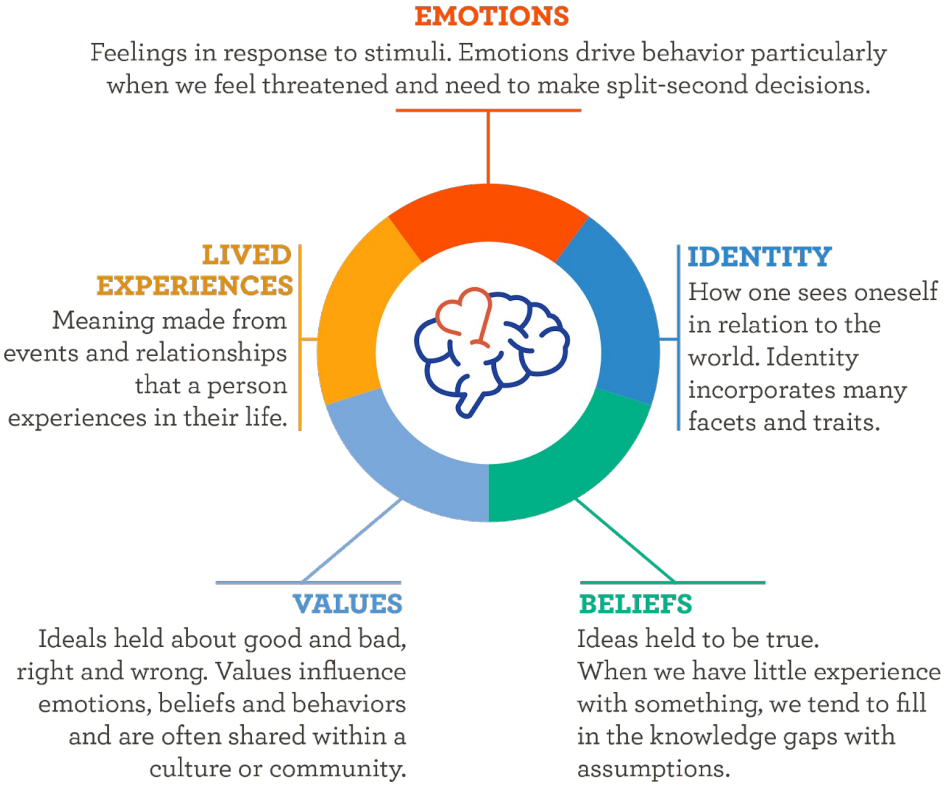
- Developing and testing a set of messaging interventions that lead to positive math narrative shifts among Black, Hispanic, and AAPI and white students from lower-income households.



THE HEARTWIRED RESEARCH APPROACH

The Math Narrative Project deploys an approach to audience research and messaging called Heartwired. Developed by Goodwin Simon Strategic Research and Wonder: Strategies for Good, this approach focuses on the ways that emotions, identity, lived experiences, values, and beliefs combine, and often collide, to shape people's attitudes and behaviors.

Heartwired research uncovers the narratives that shape how people think and feel about a topic, such as math teaching and learning. Heartwired narrative interventions connect to people's experiences and values — shaping new narratives that help people change how they think and feel about that issue.



HEARTWIRED RESEARCH PHASES

Change

What is the specific change that we (research team and Gates Foundation advisors) want to create to support better math learning outcomes among students?

Landscape

What is already known about the narrative landscape that is shaping how students, parents, and teachers relate to math and math learning?

Mindset

What stories, beliefs, people, and lived experiences shape how students, parents, and teachers think and feel about learning math?

Persuasion

What narrative interventions help students, parents, and teachers think and feel differently about learning and teaching math?

Action*

How can the messaging recommen-dations and research findings be put into action by field partners?

**Action Phase is not included in this round of research*

METHODOLOGY: OVERVIEW

- Research was conducted with participants across the states of California, Florida, New York, and Texas
- Participants:
  - **Students** in 6th-10th grades in public school
  - **Parents** and guardians of 6th-10th grade public school students
  - Math **Teachers** of 6th-10th grade students in public schools
- This report is focused on the findings for **teachers**
- See the Appendix for the detailed methodology
- Note that subgroups with base sizes below 50 are not shown

For qualitative research, Students and Parents were limited to: Black and Hispanic any income, AAPI and white lower income

For qualitative research, Math Teachers were limited to: AAPI, Black, Hispanic, and white teachers primarily from schools serving lower-income students

Population	Interviews	Dyads	Focus Groups	Surveys
Students	☑	☑	☑	☑
Teachers			☑	☑ n 820
Parents			☑	☑

PARTICIPANT QUOTES IN THIS REPORT

- Quotes from research participants are shown throughout this report, and they come from one of two sources:
    - Qualitative research (focus groups): These quotes are taken directly from transcripts of the group, with minimal edits for readability.
    - Survey: Throughout the survey, respondents are asked to type in their responses to open-ended questions, including at the end of the survey where respondents are asked to reflect generally on anything they're thinking about differently after having viewed all the messaging in the survey. These quotes are verbatim responses that respondents typed, with minimal edits for readability.

- The source of quotes used on each slide is noted at the bottom of that slide.

THE POWER OF NARRATIVE CHANGE

WHAT IS NARRATIVE?

- A narrative is a **pattern of stories**
- Narratives are **understood subconsciously or consciously**
- Narratives are **shared by a group of people with a common identity**
- Narratives **shape our attitudes and behaviors about people, places, objects, or ideas**
- Narratives are **established, amplified, and reinforced over time** through the **careful, deliberate curation of narrative tools** like stories, language, messengers, and messages

Sources: Wonder: Strategies for Good, Narrative Initiative, FrameWorks Institute

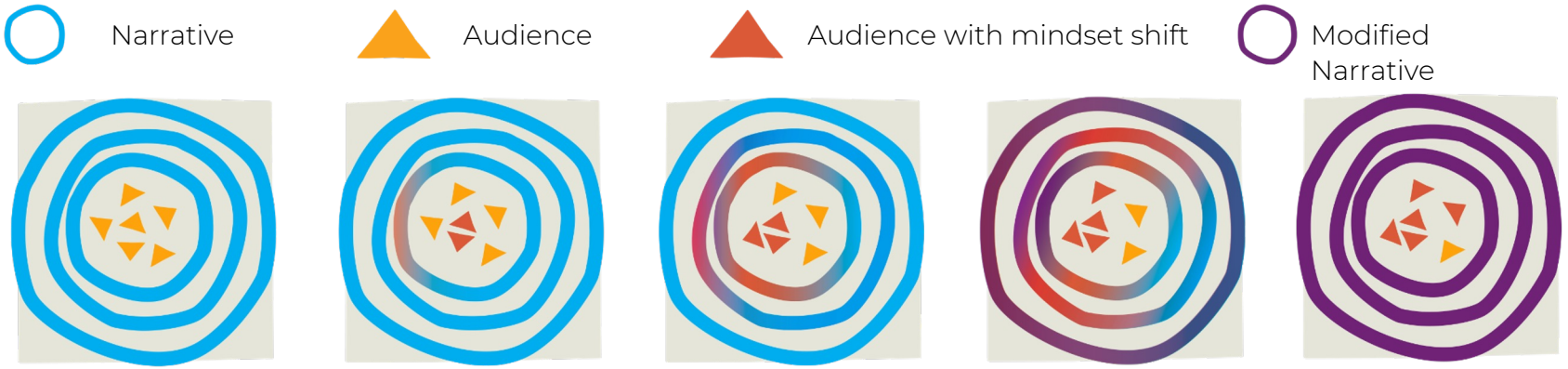
DOMINANT NARRATIVES

Dominant narratives are generated by and help to reinforce the dominant group's power; **dominant narratives** often reinforce inequities in society and uphold the status quo.

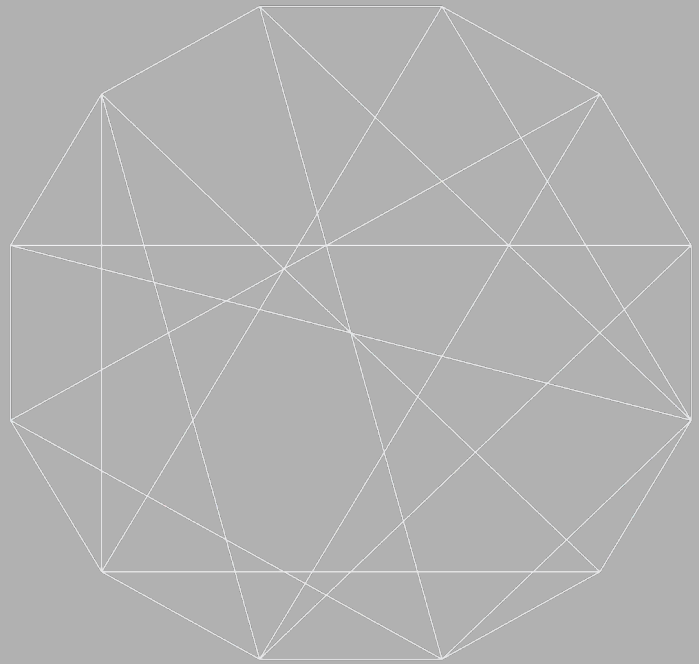
Source: Rashad Robinson, "Changing Our Narrative about Narrative: The Infrastructure Required for Building Narrative Power"

WHAT IS NARRATIVE CHANGE?

Narrative change is an effort to create a new narrative; amplify or modify an existing narrative; or counter, reframe, or replace existing narratives through deployment of different narratives.*



*Source: February 2021, ORS Impact, Measuring Narrative Change, Understanding Progress and Navigating Complexity



NARRATIVE ECOSYSTEM

An interconnected **system** of **narratives** that **informs students, teachers, and parents' attitudes and behaviors** around math learning.

- Narratives in the ecosystem can be helpful — supporting math learning — or problematic, presenting a barrier to learning math.
- Many dominant narratives about math are problematic
- Any intervention regarding math narratives must be credible across all three audiences — students, teachers, and parents. Otherwise, a narrative shift effort may receive pushback from one of the audiences in the narrative ecosystem, undermining the ability to drive narrative change among the other audiences.

ECOSYSTEM: OPPORTUNITIES FOR NARRATIVE INTERVENTION

Dominant narratives about math learning:

- Some people are **good at math**, and some people are not
- If a student **struggles** while learning math, no amount of **support** will help them get better
- A **teacher's job** is to teach; a **student's job** is to learn
- Higher-level math like algebra is **only valuable** as a **gatekeeper** subject
- Higher-level math is **only relevant** to a few **STEM careers**
- **Math learning** is rational, **not emotional**

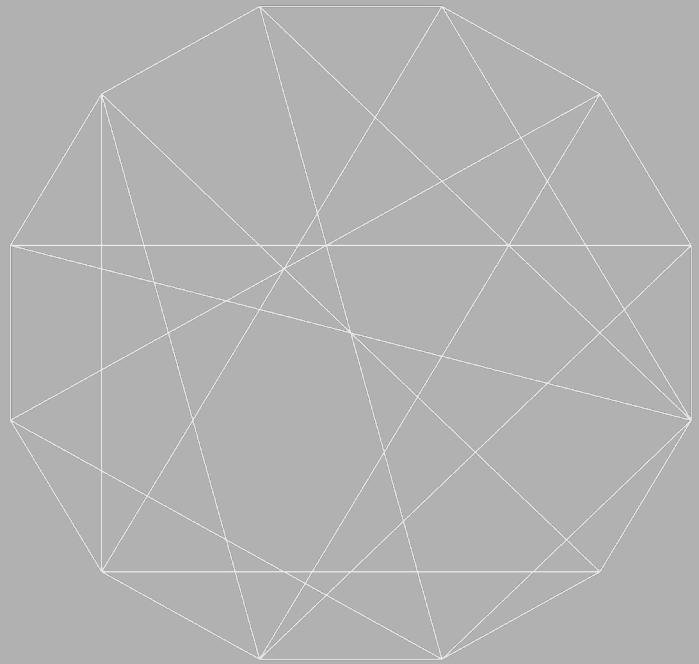
** In the survey, 'higher-level math' is described for respondents as 'higher-level math like algebra,' in contrast to 'basic math like addition, subtraction, multiplication, and division.'*

WHAT IS A NARRATIVE INTERVENTION FOR MATH?

- Narrative interventions are stories, messages, language, frames, and other narrative tools that are designed to connect to people's experiences and values — and act to change dominant narratives

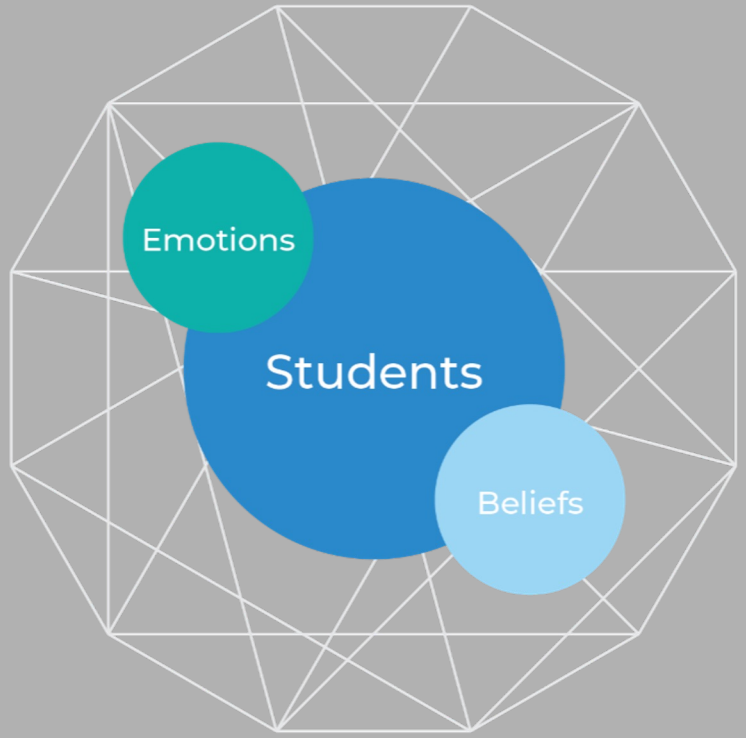
- Narrative interventions seed or model the beliefs necessary to help our audiences change how they think and feel about learning and teaching math

- Narrative interventions are delivered in a variety of ways including curriculum and instructional materials; classroom teaching; teacher training and professional development; online resources for teachers, youth, and parents; popular and social media; print materials like articles and trade journals; policy and budgets, and more



WHAT IS OUR NARRATIVE CHANGE GOAL?

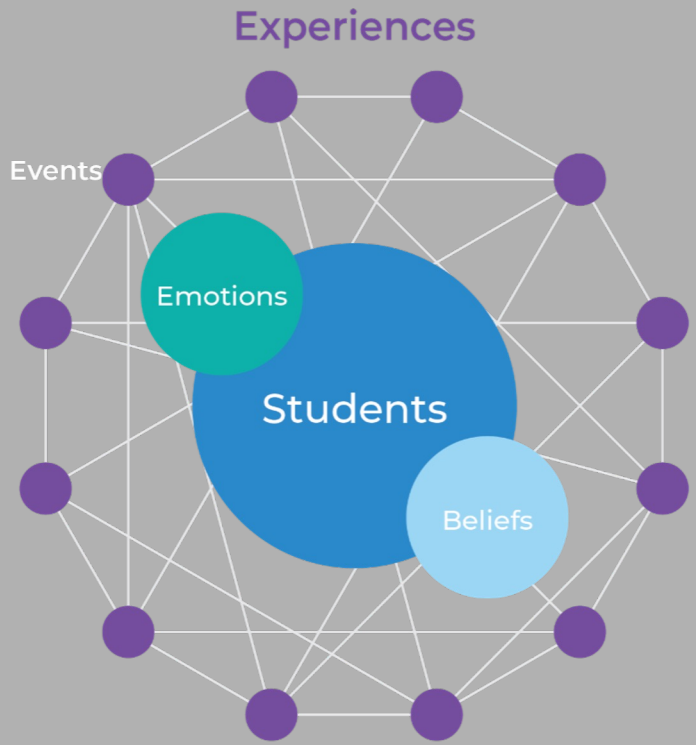
- To leverage narrative change to improve math instruction and outcomes for 6th to 10th grade Black and Hispanic students, and AAPI and white students from lower-income households
- To positively influence how young people **think, feel, and experience learning math** and **motivate** them to **persist** when math learning gets hard, by positively influencing the narrative ecosystem
- To facilitate a more supportive learning math environment and create conditions that enable positive student and adult behavior change



NARRATIVE ECOSYSTEM

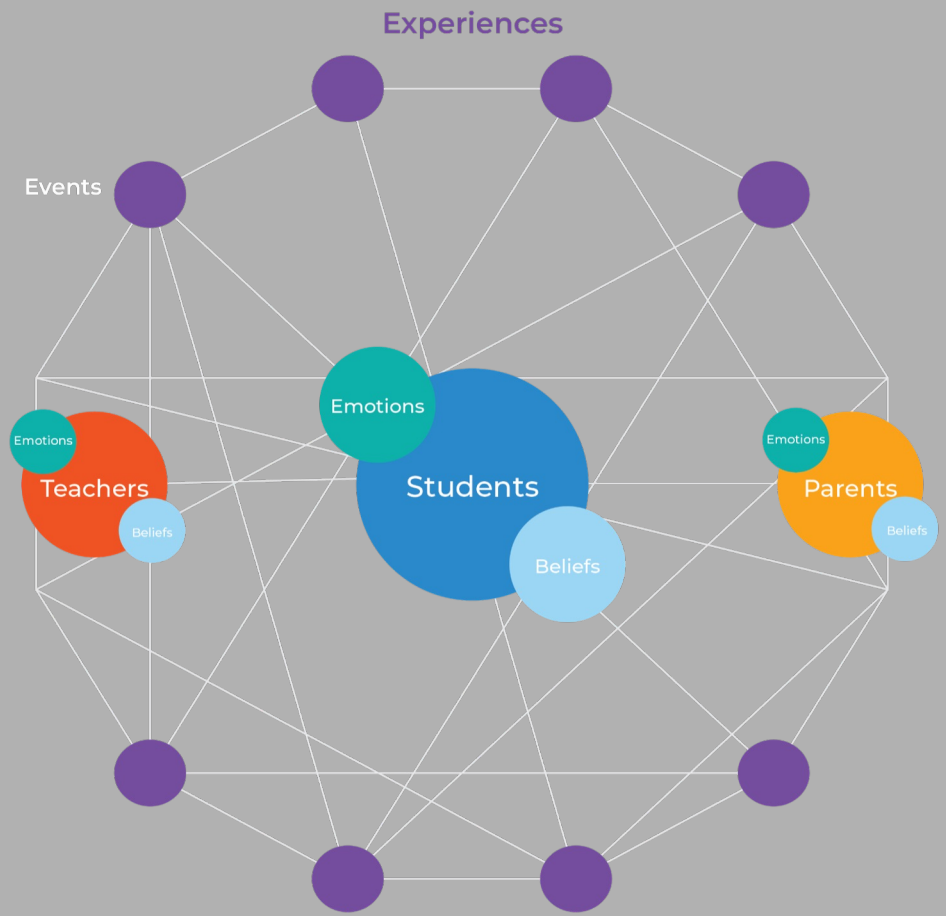
- **Beliefs** and **Emotions** are the **connective tissue** that reinforce or support narratives
- Interventions that **reinforce positive narratives and disrupt negative narratives** in the ecosystem are particularly potent when they **target emotions and beliefs**
- These narrative interventions are felt at a **visceral level, as much as or more than on an intellectual one**

NARRATIVE ECOSYSTEM



Students' behaviors are shaped by:

- The **events** that they experience
- The meaning they make from those events **(beliefs, emotions, narratives)**



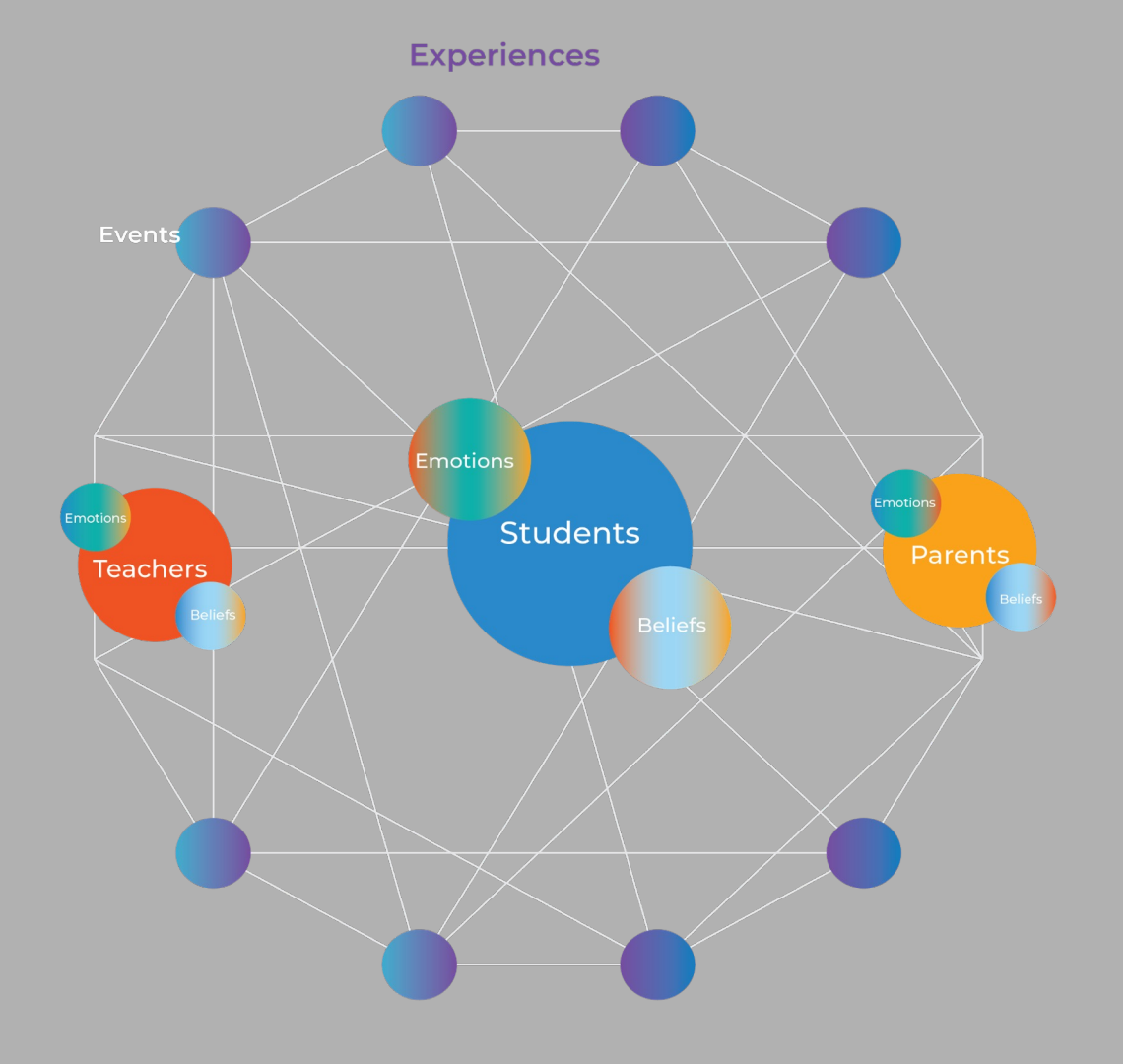
NARRATIVE ECOSYSTEM

Adults also influence the environments in which kids learn math in ways that impact their experiences with math learning:

- **Teachers** at School
- **Parents** at Home

NARRATIVE INTERVENTIONS CAN...

- **Students**
  - ...Help to shift beliefs and reinterpret emotions and experiences, enabling students to draw new meaning from their math learning experiences, including interpreting their math learning experiences more positively
  - ...Change how students see the relevance of higher-level math in their own lives
- **Adults**
  - ...Help adults understand how their actions impact students' beliefs and learning experiences
  - ...Help adults feel more motivated to help students persist when learning math gets hard
  - ...Help equip adults with positive narratives for themselves and to share with students



NARRATIVE CHANGE HYPOTHESIS

- When narrative interventions effectively help audiences (youth and adult) shift their beliefs and reinterpret their emotions, it can create the conditions for positive behavior change among students, teachers, and parents
- These behavior changes create the enabling conditions for a more supportive math learning environment

TEACHERS IN THE NARRATIVE ECOSYSTEM

Students' experience of math is greatly impacted by:

- Their relationship with their math teachers
- The classroom environment that each teacher creates
- Their teachers' comments and behavior that communicate the teachers' perception of students' capability to learn math
- Reactions from their teachers when they make mistakes or ask questions
- How their math teacher communicates the relevance and utility of higher-level math

The messaging recommendations in this report are meant to help craft messaging for teachers, given their important place in the narrative ecosystem.

OVERVIEW: KEY TEACHER FINDINGS

MESSAGING RECOMMENDATIONS: OVERVIEW (1 OF 2)

Elevate student agency: Messaging for teachers should elevate student agency and center students' emotions and experiences, which are critical to their math learning

Acknowledge real-world context: Empathize with teachers by acknowledging and naming the real-world challenges they face

Acknowledge emotions in math learning: Normalize the emotional nature of math learning, and give teachers examples for how to help students reinterpret and respond differently to their negative emotions in math class

Make math relevant: Deliver examples of messaging to teachers on the relevance, value, and utility of higher-level math (algebra and above) that are credible and motivational for their students

Affirm the value of mistakes: Equip teachers with messages that reframe mistakes as learning opportunities, and help them address students' negative emotions such as embarrassment or fear that they experience with mistakes

MESSAGING RECOMMENDATIONS: OVERVIEW (2 OF 2)

- **Encourage help-seeking:** Help teachers understand the barriers to seeking help that many students experience, and motivate them to create an environment in which students feel more comfortable asking questions
- **Reframe struggle and capability:** Reframe struggle from a sign of lacking capability to a sign of students needing more support
- **Reassess assumptions:** Encourage teachers to reexamine their assumptions about what certain student behaviors mean and the impact of students' negative emotions on their math learning experience
- **Prioritize building relationships:** Show teachers the impact of their relationships with students on math learning, and support teachers to prioritize relationship building in their classrooms

RESEARCH INSIGHTS: OVERVIEW (1 OF 3)

- **Math is an emotional experience for teachers:** Teaching math is an emotional experience. While many of those emotions are positive, teachers report feeling stressed, frustrated, and overwhelmed — especially since they've been feeling stretched thin and under-resourced following COVID.

Applies to every recommen-dation

- **Teachers face barriers to building relationships with students:** Many teachers believe that relationships and belonging, as well as offering individualized help to students who are struggling, are important for their students. However, they face barriers (especially time constraints), to prioritizing those things in their classrooms.


- **Many teachers feel the need to prioritize students who they see as putting in effort:** As teachers try to balance the varied needs of all of their students, many report giving less time to the students who appear to be "checked out" — so that they can reserve time for students they see as "meeting them halfway."


- **Some teachers may inadvertently reinforce negative narratives about student capability:** While many teachers report explicitly telling their students that they can get better at math, many simultaneously hold the belief that there are students who will never be good at math — and can behave in ways that communicate this belief to students.


RESEARCH INSIGHTS: OVERVIEW (2 OF 3)

- **Teachers may be unintentionally contributing to the embarrassment students' feel about making mistakes:** Teachers know that mistakes can be demoralizing for kids, and some either pass over mistakes without addressing them, or try to keep students motivated by "rescuing" them or giving them the answer when they make a mistake or are struggling — especially students they see as having lower capability for learning math.

- **Many teachers believe that students' emotions are not relevant to learning math:** Many teachers report being aware of embarrassment and other negative emotions students can feel in math class. At the same time, many seem unaware of the ways in which students' negative emotions can hinder students' math learning. Teachers believe they have little to no role in helping students manage or reinterpret their negative emotions.

- **Many teachers believe that it is the responsibility of students to seek help when they need it:** Some teachers believe that it is their job to present information, and the students' job is to learn it. This can lead teachers to put the onus on students to find the help they need when they get stuck.

RESEARCH INSIGHTS: OVERVIEW (3 OF 3)

- **Many teachers do not credibly answer the common student question "why do I have to learn this":** Some teachers feel they do not have a good answer for this question. Other teachers feel they do have a good answer for this question, however students report that the kinds of answers they give are often not credible or motivating.

- **Teachers are often skeptical of new teaching recommendations:** Many teachers report feeling that they are constantly being asked to rework their teaching strategies to align with new, untested trends in education, rather than getting the support they need to help students within their real-world constraints.

KEY DIMENSIONS TO KEEP IN MIND: DEMOGRAPHIC AND EXPERIENTIAL DIFFERENCES

- The findings in this report apply to math teachers of 6th-10th grade public school students in the four states, and the messaging recommendations are generally effective across demographics

- However, there are a few important dimensions of teachers' demographics and experiences to keep in mind when deploying the recommendations, considerations which are outlined in this section

KEY DIMENSIONS TO KEEP IN MIND: COMMUNITY THAT A TEACHER'S SCHOOL SERVES

- Teachers working at schools with a higher percentage of students that qualify for free or reduced lunch programs (serving lower-income communities) are more likely than teachers at schools with a lower percentage of students qualifying for free or reduced lunch programs (serving higher-income communities) to report:
  - More mixed emotions, compared to only positive emotions, about teaching math
  - Belief that getting to know students early in the school year is important
  - Struggling with challenges like requirements to maintain a certain pace, students with vastly different levels of math knowledge in the same class, and students' lives outside of school interfering with their math learning
  - Higher interest in learning more about the narrative and messaging approaches for math teachers that are included in the teachers' survey

- In the teacher survey, the percentage of Black and Hispanic students that a school serves is correlated with the percentage of students that qualify for free or reduced lunch programs; teachers who report a higher percentage of students at their school that qualify for free or reduced lunch programs are more likely to also report a majority of Black and Hispanic students in their classes

*Percentage of students that qualify for free or reduced lunch programs at a teacher's school throughout this report refers to this question:
Question text: About what proportion of students at your school qualify for free or reduced lunch programs? Your best guess is fine.

Less than 25%, At least 25% but less than 50%, At least 50% but less than 75%, or 75% or more

KEY DIMENSIONS TO KEEP IN MIND: EXPERIENCE TEACHING MATH

- Teachers who have more years of experience teaching math (especially over 10 years) are more likely than newer teachers to report:
    - More mixed emotions, compared to only positive emotions, about teaching math
    - Belief that getting to know students early in the school year is important
    - Belief that most students DO need higher-level math in their lives
    - That it is a student's responsibility to ask for the help they need

- Note that age is correlated with tenure; teachers who report having taught for longer also tend to be older

MESSAGING RECOMMENDATIONS: FRAMING AND PACKAGING MESSAGES TO TEACHERS

When implementing any of the recommendations in this report, framing can make a big difference in how teachers react, and whether they are open to adopting changes in the messaging once they have heard them.

Many teachers report feeling overwhelmed by how often they are asked to rework or adopt new teaching strategies. So, when communicating the messages in this report to teachers, frame them as:

- Small tweaks or changes rather than an overhaul of their teaching strategy
- Evidence-based tools to add to their toolkit
- Developed from a broad range of teaching environments, with different options to match the varied needs they have with their particular classes and students

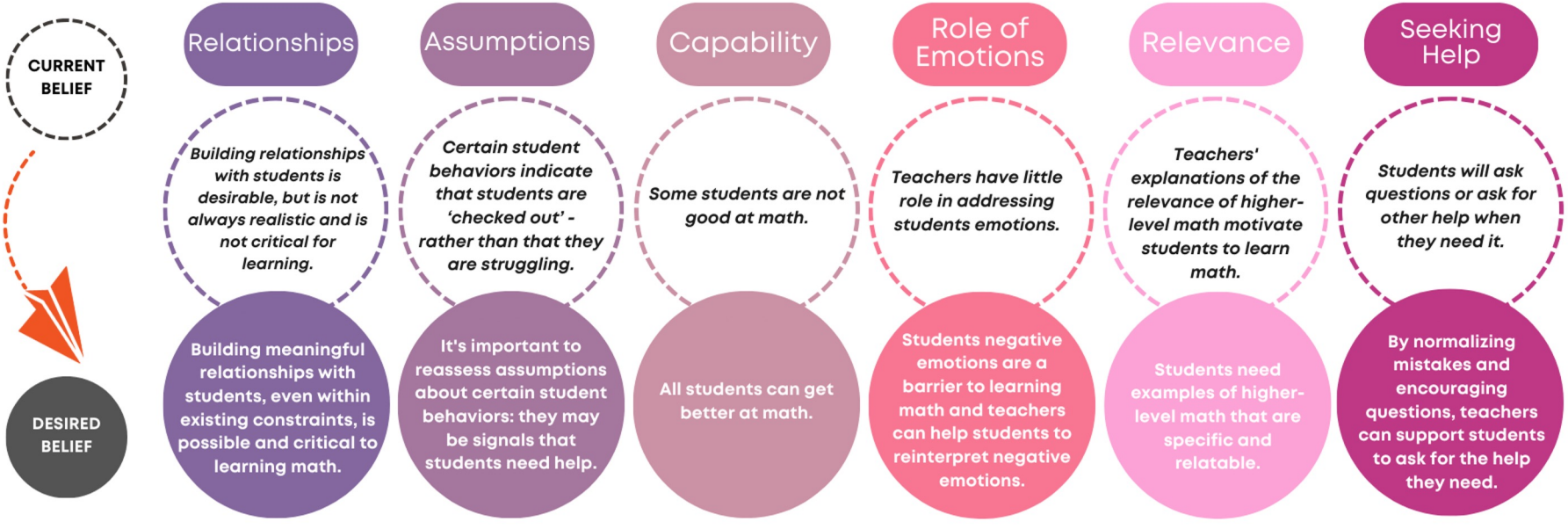
HELPING TEACHERS SHIFT THEIR BELIEFS THROUGH NARRATIVE INTERVENTIONS

Overall, effective narrative interventions:

- Impact and shift the ways in which teachers interpret their emotions, in part by disrupting problematic narratives and replacing them with more positive ones
- Can support teachers to shift their beliefs from those that reinforce problematic narratives to those that support learning math

On the next slide, you'll see the 'Teacher Belief Pathway.' This belief pathway depicts existing beliefs that uphold problematic narratives about math, as well as desired beliefs that will support teacher behaviors to create a more helpful narrative ecosystem around math.

Belief Pathway: Teacher

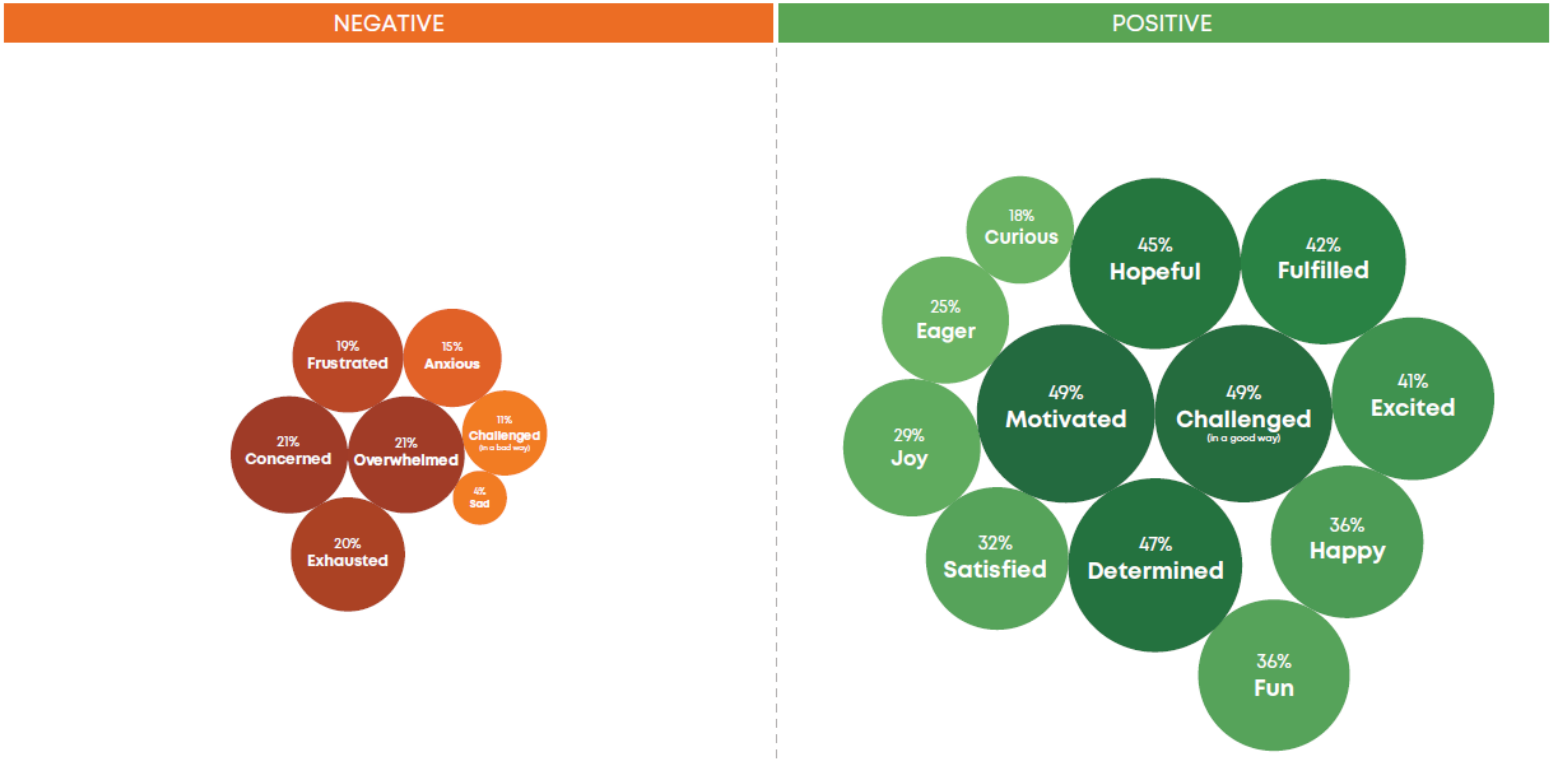


Teacher Emotions

Teaching math is emotional for teachers. Many of these emotions are positive, but negative emotions can interfere with teachers' capacity to help students learn math.

TEACHERS FEEL A RANGE OF EMOTIONS ABOUT TEACHING MATH – AND THEY ARE NOT ALL POSITIVE

Which, if any, of the following words describe emotions or feelings you have when you are teaching math?



Source: MNP Teacher Survey Data, n820 respondents

MATH EMOTIONS VARY BY THE PROPORTION OF LOWER-INCOME STUDENTS A TEACHER'S SCHOOL SERVES

Which, if any, of the following words describe emotions or feelings you have when you are teaching math?

Note that <25% is a small sample size – n 39 – so is not shown here

Source: MNP Teacher Survey Data, n820 respondents

IMPACT OF NARRATIVE INTERVENTIONS IN THE RESEARCH: TEACHER JOURNEY IN A FOCUS GROUP

White Male Teacher, FL

Pre-Messaging

- Believes most of his students aren't paying attention
- Feels that being high energy is the only way to keep students from getting distracted

"I feel most of these kids don't want to learn, and I have to perform. I have to almost trick them into learning, because they're not paying attention, a lot of the kids. Maybe 20% of the kids are on task, on target. I feel like I'm an actor and I'm literally jumping around."

Post-Messaging

- Recognizes how hard it is for some students to ask questions/ask for help
- Recognizes the importance of engaging with students 1:1 / feels motivated to make connections with kids who he thought were "checked out"

"[Maybe] some kids are intimidated or embarrassed to ask questions. Maybe there's a way as a teacher I can be more in tune with those kids to try to maybe pull out some of those questions. I feel there are certain kids that, I hate to say it, almost like a lost cause...Maybe I need to explore that a little bit more. Maybe there's some other issue that I'm unaware of ...Maybe I need to [talk] to them and [try] to understand what the issue is on a one-on-one basis."

IMPACT OF NARRATIVE INTERVENTIONS IN THE RESEARCH: OPEN ENDED RESPONSES AT SURVEY'S END SHOW TEACHERS REFLECTING

At the end of the survey after having viewed messaging, respondents are asked to write down anything they are thinking about differently

"[Through this survey] I have learnt and understood that understanding math for kids depends on so many things and not just their ability. Their emotional struggles, anxieties, and insecurities need to be addressed first."
–Black Male, Teacher, NY

"All of it was very helpful and gives me a better idea on how I can be more helpful to my students."
–White Female, Teacher, FL

"I got new ideas and solutions for my teaching, so I can use them for my students and help them."
–AAPI Female, Teacher, TX

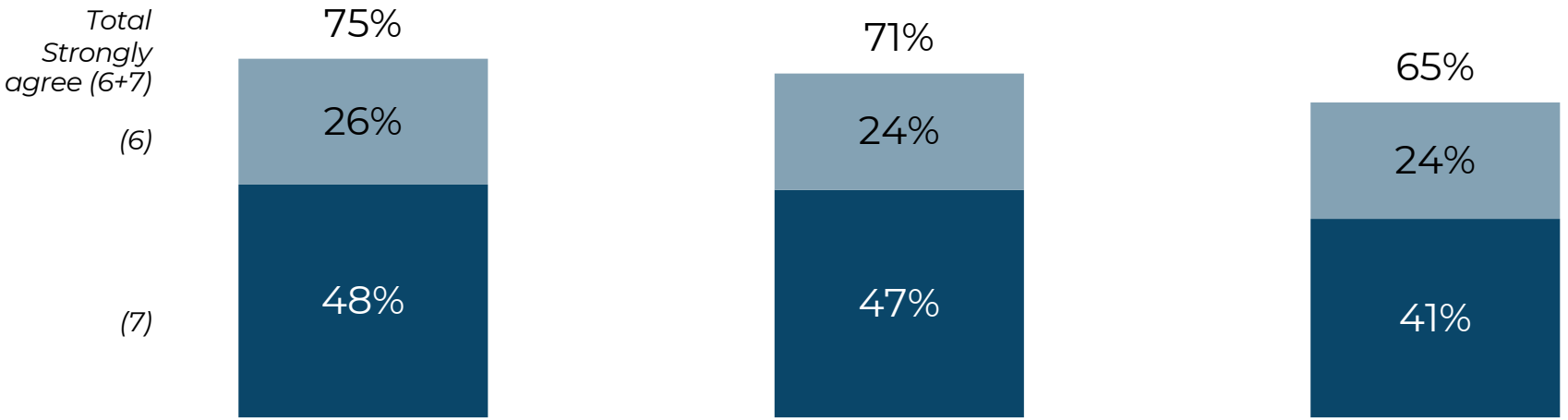
"At first, I didn't think that question really applied to me. I didn't think I'd often encountered that situation, but now I realize that I probably have, and my students probably have gotten embarrassed, and I felt like the speaker in one of the videos had a great idea about how to connect with kids and how to be more understanding that they might have questions and be embarrassed. So now I feel like I have tools to deal with that."
–Hispanic Female, Teacher, CA

Source: MNP Teacher Survey Data, n820 respondents

IMPACT OF NARRATIVE INTERVENTIONS IN THE RESEARCH: MESSAGING TESTED IN THE TEACHER SURVEY IS EFFECTIVE (1 OF 2)

*Please tell us how much you personally agree or disagree with each of the following statements on a scale of 1 to 7, with 1 meaning you strongly **disagree**, and 7 meaning you strongly **agree**.*

The tools and strategies in this survey are helpful to math teachers like me	*I would attend a professional development session to learn more about the material in this survey*	*I am thinking differently about the student experience in my math class after this survey*

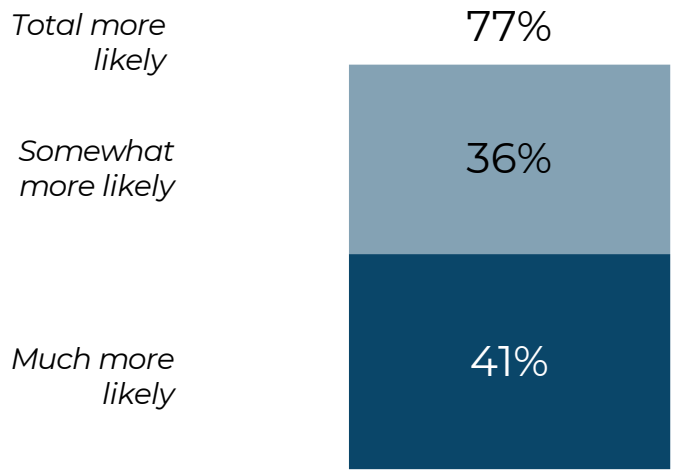


Source: MNP Teacher Survey Data, n820 respondents

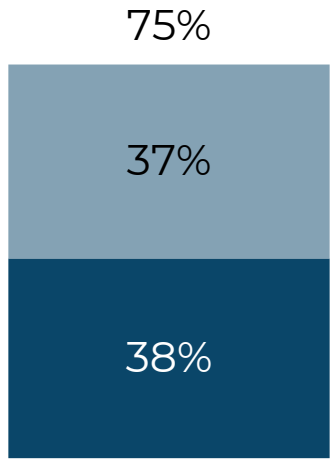
IMPACT OF NARRATIVE INTERVENTIONS IN THE RESEARCH: MESSAGING TESTED IN THE TEACHER SURVEY IS EFFECTIVE (2 OF 2)

For each of the following, please rate whether you are MORE or LESS likely to do it, based on what you have seen or heard in this survey. If it makes no difference, please say so.

Use some of the tools and strategies from this survey



Make the kinds of small changes or subtle shifts in my teaching that can make a big difference in how my students feel about learning math



Source: MNP Teacher Survey Data, n820 respondents

DETAILED INSIGHTS: MINDSET

TEACHING MATH IS EMOTIONAL

- Just like learning math is an emotional experience for students and parents, teachers' own emotions while teaching math impact how they respond to students and impact students' experience learning math
- Most teachers report at least some positive emotions about teaching math, but many are also feeling stressed, frustrated, and overwhelmed — especially as they've been feeling stretched thin and under-resourced following COVID
- For teachers that have mixed emotions, their own negative emotions can interfere with their ability to help students manage *their* negative emotions about math
- Note that in the survey, the messaging recommendations are especially effective for teachers who report having some negative emotions related to teaching math

> **"The survey helped me understand my own feelings in dealing with students having difficulty with math"**
> –White Male Teacher, NY

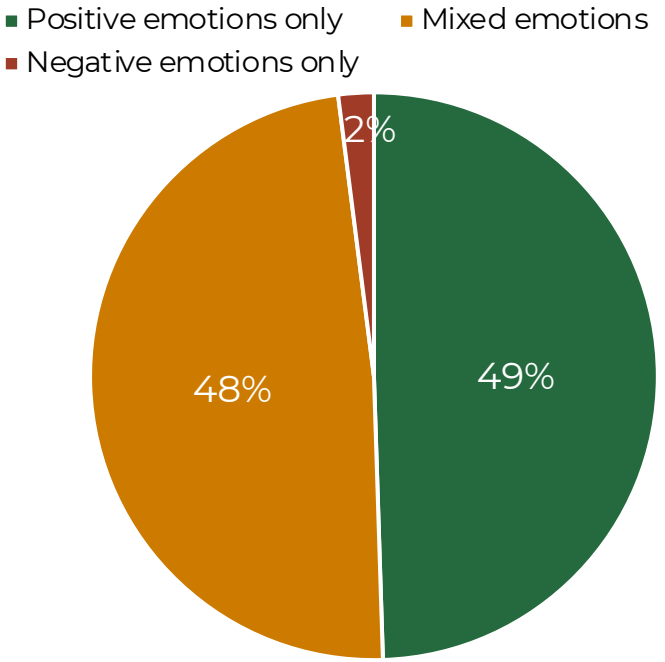
Source: MNP Teacher Survey Data, n820 respondents

WHILE ALMOST ALL RESPONDENTS HAVE SOME POSITIVE EMOTIONS, ALMOST HALF ALSO HAVE NEGATIVE EMOTIONS

"I am experiencing extreme burnout post COVID. Teachers are definitely feeling the pressure from the state, district, and school administrators for our students to master standardized tests. We (students and teachers) are frustrated, tired, and overwhelmed."

–Black Female Teacher, TX

Which, if any, of the following words describe emotions or feelings you have when you are teaching math?

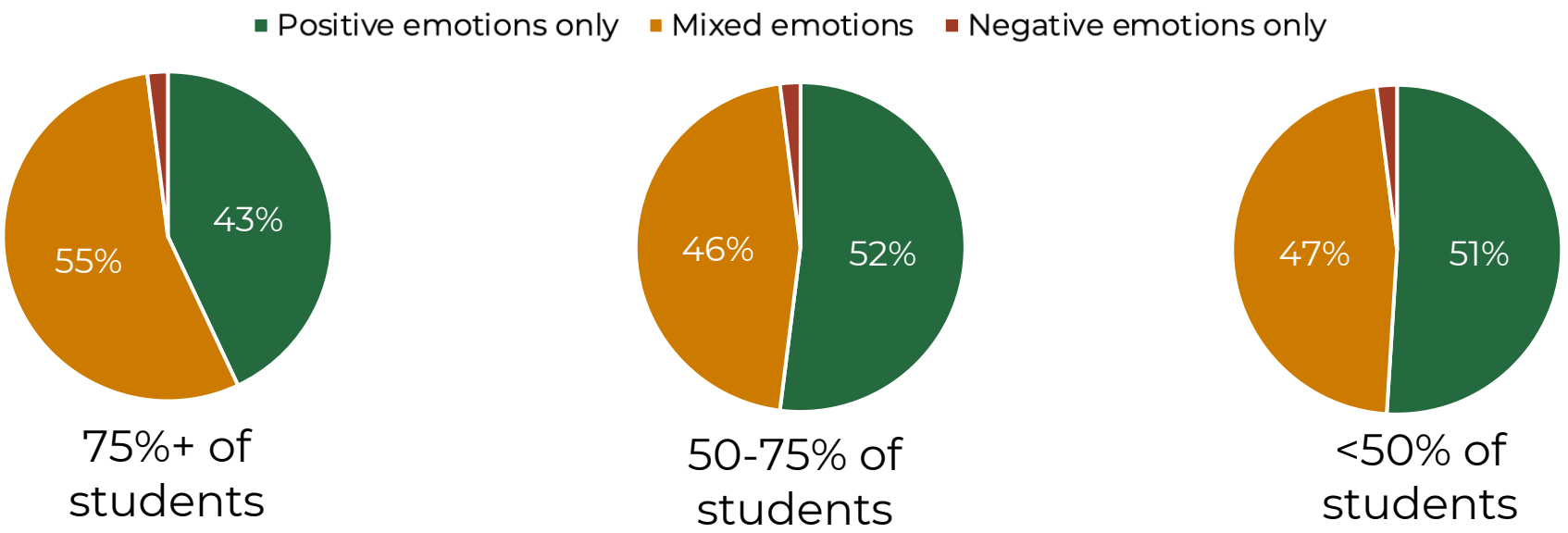


Source: MNP Teacher Qualitative Research; See Detailed Methodology in the Appendix for more information on the research methodology.

Source: MNP Teacher Survey Data, n820 respondents

TEACHERS AT SCHOOLS SERVING LOWER-INCOME COMMUNITIES* ARE MORE LIKELY TO HAVE NEGATIVE EMOTIONS WHEN TEACHING MATH

Which, if any, of the following words describe emotions or feelings you have when you are teaching math?



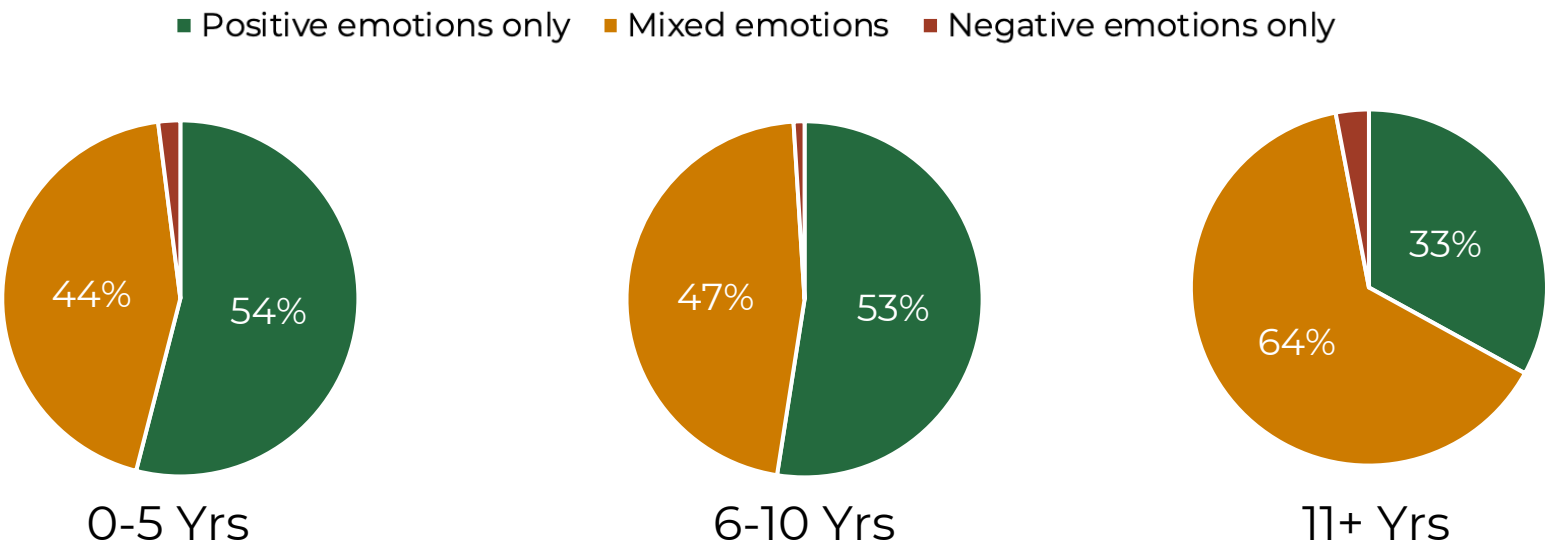
Reported proportion of students at a teacher's school that qualify for free or reduced lunch programs

**Schools serving lower-income communities refers to schools where teachers report a higher proportion of students that qualify for free or reduced lunch programs*

Source: MNP Teacher Survey Data, n820 respondents

LONGER-TENURED TEACHERS HAVE MORE NEGATIVE EMOTIONS WHEN TEACHING MATH

Which, if any, of the following words describe emotions or feelings you have when you are teaching math?

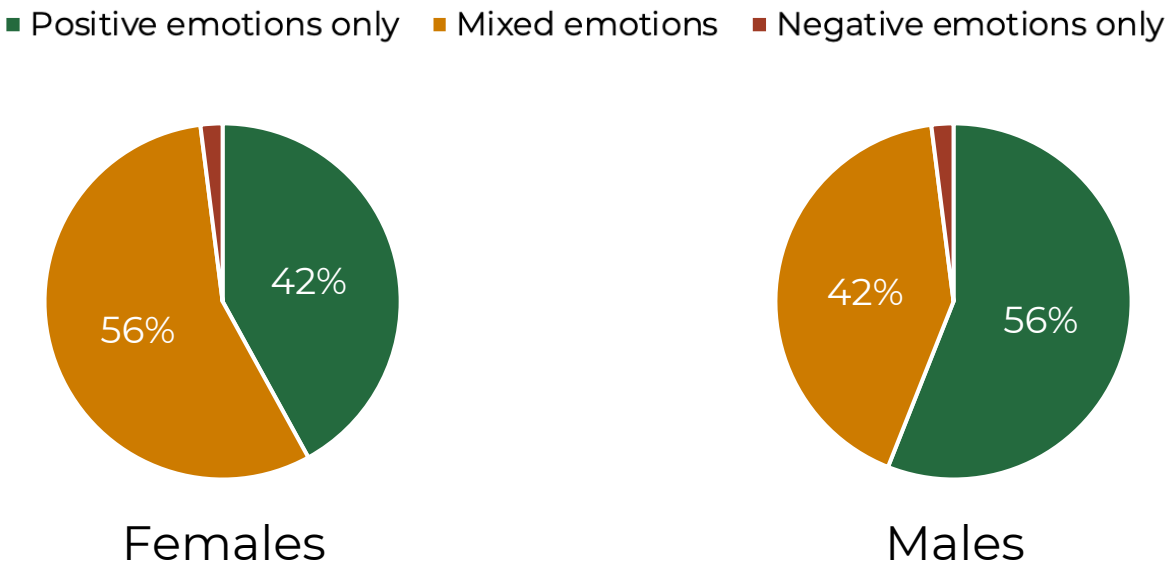


Reported number of years having taught math

Source: MNP Teacher Survey Data, n820 respondents

MALE TEACHERS ARE MORE LIKELY TO HAVE ONLY POSITIVE EMOTIONS THAN FEMALE TEACHERS

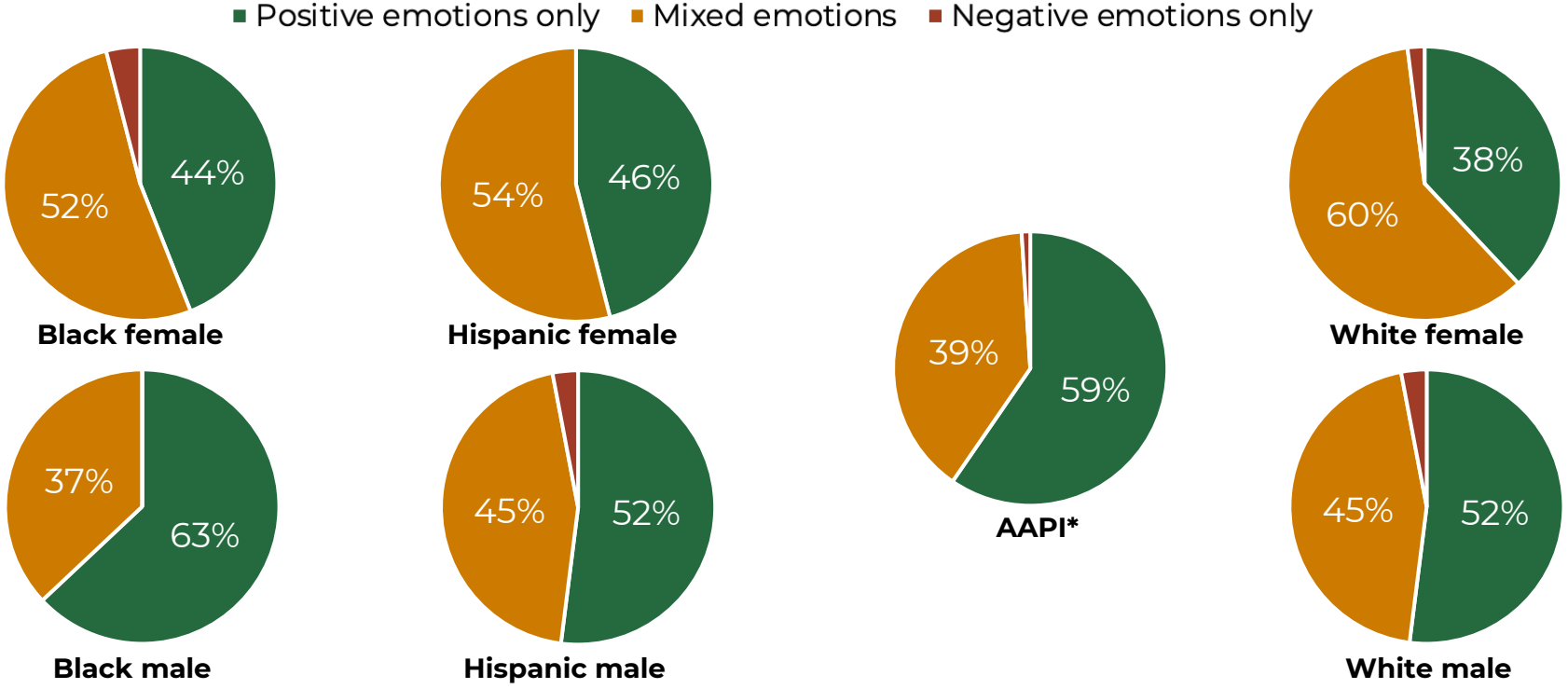
Which, if any, of the following words describe emotions or feelings you have when you are teaching math?



Source: MNP Teacher Survey Data, n820 respondents

PATTERN OF MALE/FEMALE EMOTIONS HOLDS ACROSS RACE

Which, if any, of the following words describe emotions or feelings you have when you are teaching math?



**Note that this sample size – n(71) – is small; however, this group is included here because it is comparatively informative*

Source: MNP Teacher Survey Data, n820 respondents

TEACHERS FACE BARRIERS TO BUILDING RELATIONSHIPS WITH STUDENTS

- Most teachers report feeling it is important for their students to feel like they belong in the classroom. These teachers believe that students' sense of belonging and mattering are important components of a welcoming classroom environment conducive to learning.
    - Many Black and Hispanic teachers describe the impact of not seeing any math teachers who looked like them when they were growing up. Most report that those experiences became a source of motivation to become a math teacher, and they cite that experience as an example of how important providing a sense of belonging is, especially to students of color.
- However, teachers report facing barriers that prevent them from prioritizing building and fostering relationships in the classroom. Barriers include: time constraints, administrative pressures, testing requirements, students with widely varying levels of math knowledge in the same class, and large class sizes.

MANY TEACHERS FEEL THE NEED TO PRIORITIZE STUDENTS WHO THEY SEE AS PUTTING IN EFFORT

- As teachers try to balance the needs of all their students within the limited time they have, many prioritize the students who they perceive to be putting in effort, and they give less time to the students who appear to be “checked out.”
- These teachers report believing that when a student looks like they aren’t putting in effort in class, it’s because they just don’t want to or don’t care. Teachers often report that they perceive those behaviors as being disrespectful to the teacher.
- Some teachers report their belief that students need to meet teachers part way by showing that they are trying, to be worth it for teachers to try to help them — otherwise teachers will focus their limited time on students they feel *are* trying.

TEACHERS DESCRIBE MANAGING CLASSROOMS WITH A WIDE RANGE OF NEEDS – WHILE FEELING THAT SOME KIDS DO NOT TRY

"Some kids will just not try no matter what I do as a teacher…we just can't get every student on grade level, that is not reality."

–Hispanic Male Teacher, CA

"Having to retrack and having to make sure that [some] students are not left behind and yet still keep up with those students who are getting it at the same time… sometimes it's successful, and sometimes it's not."

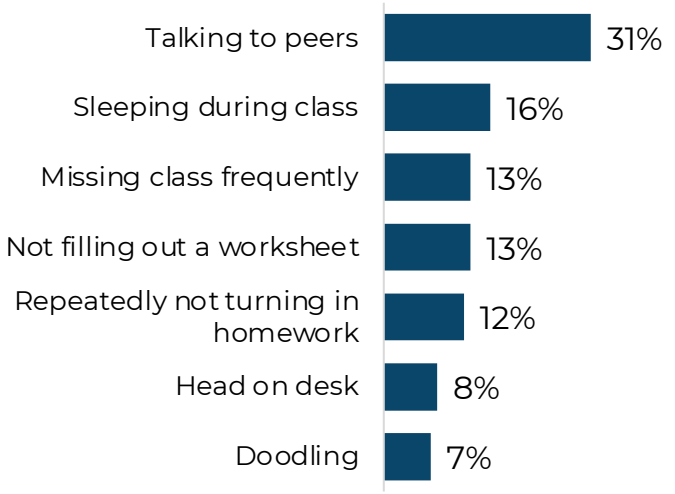
–Black Female Teacher, FL

Source: MNP Teacher Qualitative Research

TEACHERS USE BEHAVIORS TO TRY TO KNOW WHICH STUDENTS ARE ENGAGED – AND WHICH STUDENTS ARE NOT TRYING

- Some students report when they feel overwhelmed they do things like doodling, looking down or away, staring at a blank worksheet, or talking to another student to ask them to explain something
- Teachers and students both report that teachers often interpret these same behaviors as signs students are "checked out" or are not trying, are intentionally not paying attention, or do not care about learning math

In research conducted with math teachers, many say that sometimes students behave in ways that make them feel like the kids don't respect them, or are checked out. This can look like disruptive or disengaged behavior. Below you will see some examples of the behaviors teachers have observed that make students look like they're "checked out".
Please rank the following behaviors by how often you see students engaging in them in your classroom
Showing the % that ranked each MOST common



Source: MNP Teacher Survey Data, n820 respondents overall; using split samples, this question asked of n167 respondents

SOME TEACHERS MAY BE INADVERTENTLY REINFORCING NEGATIVE NARRATIVES ABOUT STUDENT CAPABILITY

While many teachers report explicitly telling their students that they can get better at math, many simultaneously express the belief that some people just “get” math while others do not. In the qualitative research, some teacher participants make both explicit and implicit comments about limits on certain students’ innate capability to learn math.

> **“I think math teachers...we have that math brain. It comes easier to us. You’ve heard that some people are math-brained—left brain, right brain, and all that.”**
>
> –White Male Teacher, NY

> **“I've come to realize after many years of teaching that math isn't for everyone. I try my best but sometimes, students just don't get math.”**
>
> –AAPI Male Teacher, CA

Source: MNP Teacher Qualitative Research

TEACHERS KNOW THAT MISTAKES CAN BE DEMORALIZING FOR KIDS, AND SOME TRY TO KEEP STUDENTS MOTIVATED BY "RESCUING" THEM

- Teachers often report that students who make mistakes can be embarrassed or teased and feel discouraged. Some teachers report they try to help alleviate the embarrassment that often comes with mistakes.
    - One tactic some teachers report using is glossing over the mistake — for example when a student gives a wrong answer in class, just moving on to another student for the answer.
    - Another tactic teachers report using is giving students the answer when they make a mistake or are struggling — especially students they believe have lower capability for learning math and students they believe will not be able to get the answer on their own.
- However, students report both of these tactics as frustrating and not helpful. Some students report these tactics increase their embarrassment from mistakes rather than alleviating it, and do not help them learn *how* to do the math.

A teacher survey respondent reflects on her own responses to mistakes in her classroom after watching a video where a peer teacher describes why they stopped trying to "rescue" students by giving them the answer when the students struggle

> **"[When students make mistakes I] try to save them. I find myself trying to help students by saving them too but that doesn't work because they won't learn it."**
> –Hispanic Female Teacher, TX

Source: MNP Teacher Qualitative Research

MANY TEACHERS REPORT FEELING THEY SHOULD HAVE LITTLE TO NO ROLE IN HELPING STUDENTS MANAGE THEIR EMOTIONS

- Many teachers say that taking the time to understand students' emotions related to math learning, and helping students understand their own emotions, are not an important part of teaching or learning math.
- Especially given all the other responsibilities that teachers are juggling, teachers are wary of trying to be "psychologists" for their students, and note they are not trained as counselors.
- While some teachers recognize that students' negative emotions can interfere with their math learning, they do not feel it is part of their job to help students reinterpret their negative emotions (frustration, being overwhelmed) as an indication to seek help.
- When asked how important each of the following are to math learning in their own classrooms, fewer than half **(49%)** say 'knowing how students are feeling when they walk into my math class each day' is extremely important (7 on a scale of 1 to 7). Compare this to the two-thirds **(67%)** who say that 'creating an environment where my students feel comfortable asking questions when they need help' is extremely important.

Source: MNP Teacher Survey Data, n820 respondents

MANY TEACHERS BELIEVE THAT IT IS THE RESPONSIBILITY OF STUDENTS TO SEEK HELP WHEN THEY NEED IT

- Many teachers place the responsibility of seeking help on students, in part because of the barriers they face to building relationships and offering individualized support (like time constraints and managing classrooms of students with vastly different levels of math knowledge)
- Teachers are often not fully aware of the barriers students face to asking questions (e.g., fear of embarrassment, worry they will be teased by classmates), and expect students to request help when they need it
- Teachers also recognize that students are only in their classrooms for a small percentage of the time, and many express a desire for more parental involvement at home when students need help
- Some teachers say they purposely do not offer help or encourage students to ask questions when they seem like they may be struggling because they do not want to be "too invasive"

> **"If someone is having difficulty at this level, I still have to progress the class according to what I have to get through, but at the same time I can always say, 'If anyone's having difficulty, or challenges or any questions, please come at the end of the day and you can talk to me privately or you can ask somebody else about it.'...but you have to make sure that you stay on track"**
>
> –AAPI Male Teacher, TX

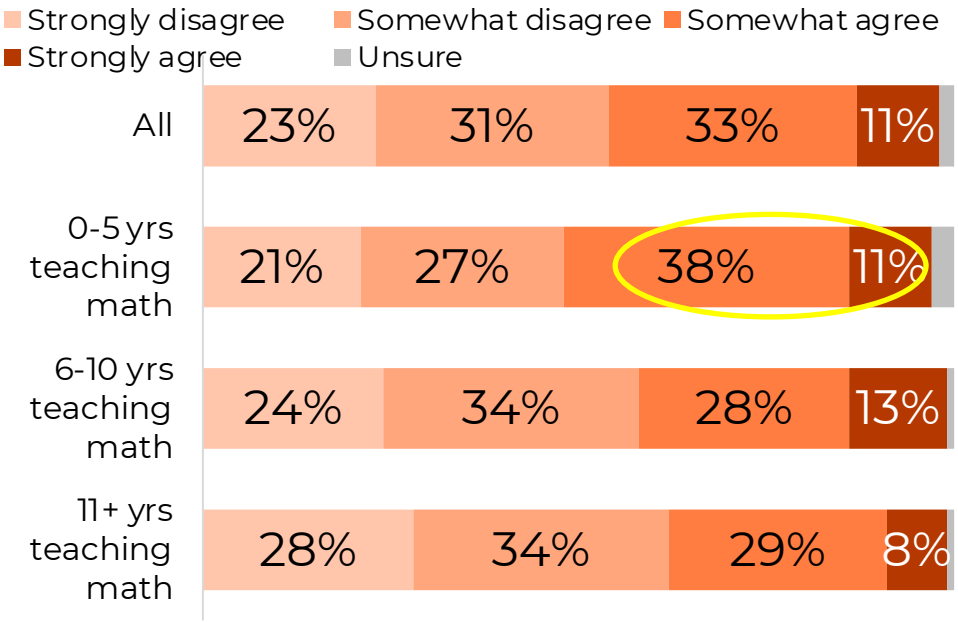
Source: MNP Teacher Qualitative Research

MANY TEACHERS DO NOT CREDIBLY ANSWER THE COMMON STUDENT QUESTION: "WHY DO I HAVE TO LEARN THIS"

- Some teachers feel they do not have a good answer for the common student question about math: "Why do I have to learn this?"
- Some teachers (more commonly newer math teachers) do not believe that students will need higher-level math in their lives past school
    - Both teacher and student research participants report that the answer some teachers give is that higher-level math is NOT relevant to their future lives, but they just need to get through it to graduate
- Some teachers believe they have good answers to that question, however when the research team tested examples of those answers with students, they found that some of the most common answers aren't credible

Please rate how much you agree or disagree with each of the following statements.

Most students do not need higher-level math skills after high school or college



Source: MNP Teacher Survey Data, n820 respondents

TEACHERS ARE WARY OF ALL THE "NEW" PROGRAMS AND "CONSTANT CHANGES" IN MATH EDUCATION

- Teachers report feeling that they are too frequently asked — or told — adopt new teaching strategies or rework their pedagogical practices
- They report being skeptical of the many new strategies they are asked to implement, because they perceive them as being developed in labs rather than based in the realities of the classroom, or believe they do not apply to their specific challenges or their specific kinds of students

TEACHERS REPORT BEING TOLD TO REWORK THEIR TEACHING STRATEGIES TOO OFTEN

"Being a teacher right now requires more than ever before. It means being totally flexible to constant changes in education."
–Hispanic Male Teacher, TX

"We are all constantly being asked to try new things, teach a new curriculum, learn a new program."
–White Male Teacher, CA

"In our district, every year it's some new thing, it's something different. At my particular school we are the steppingstone for administrators getting their doctorates who come in, create some new program, we all have to do it, they get the data for their doctorate, they write their dissertation, they get their doctorate, and then they pack up and move on, and we get another person who brings in another program so they can do the same thing."
–White Female Teacher, CA

"Please stop bombarding us with new strategies."
–Hispanic Female Teacher, TX

Source: MNP Teacher Qualitative Research

DETAILED MESSAGING RECOMMENDATIONS

MESSAGING RECOMMENDATIONS: HOW TO COMMUNICATE EFFECTIVELY WITH TEACHERS

- As a reminder, these recommendations are intended for people communicating directly with teachers. They are meant to support professionals, including instructional designers, district leaders, curriculum developers, content developers, and others who work to support and prepare teachers for the classroom.

- Some recommendations are focused on helping teachers reflect on their own beliefs and mindsets about math and math students, so that they are better able to support their students in learning math.

- Other recommendations are focused on encouraging and giving teachers the tools to change what they are communicating to their students about math learning (e.g., equipping teachers with statements about the relevance of higher-level math that are shown to be effective with students).

USING THESE RECOMMENDATIONS: HOW TO START THE CONVERSATION WITH TEACHERS

- Many teachers report feeling overwhelmed by how often they are asked to rework or adopt new teaching strategies. So, people who are communicating with teachers should frame the messaging in this report as:
    - Bitesize interventions that teachers can either adapt or take off the shelf — rather than an overhaul of their teaching strategy
    - Another set of tools for their toolkit — and ones that are evidence-based

> **"The way they gave clear examples for me to use with my students makes me feel like I can do it."**
>
> **–White Female Teacher, FL**

Source: MNP Teacher Survey Data, n820 respondents

- Many teachers report dismissing recommended practices because they feel they were not developed with their particular student or classroom needs in mind. So, it is important to also include that these recommended approaches were developed from a broad range of teaching environments — and that they include a range of options that teachers can pick between or modify.
- See the next slide for research-tested ways to frame these recommendations in a way that acknowledges teachers' real-world contexts and expertise in their own classrooms, while offering small changes they can make and describing the impact those changes could have. Survey results show that each tested messaging on the next slide is effective.

USING THESE RECOMMENDATIONS:
TESTED EXAMPLES OF HOW TO FRAME MESSAGES FOR TEACHERS

Below are some different descriptions or ways of introducing a set of tools and recommendations for math teachers. For each description, please rate how interested you would be in learning more about the tools and recommendations described	Extremely or very interested	Extremely, very, or somewhat interested
Students often enter the classroom with very different knowledge and skills, and it can be difficult for teachers to find time to support each student's individual math learning needs. These small, easy-to-implement changes can help teachers to engage and support more students across different learning levels.	70%	93%
It can be difficult for teachers to always know how to respond when students are struggling with learning math. These quick reflections and practices can help teachers to meet students where they are. When teachers understand how kids are feeling and what challenges they are experiencing, they can respond in ways that support their math learning.	66%	94%
Teachers are incredibly busy, and incorporating the newest methodologies is often not possible with how much is already on their plates. These are small, easy-to-implement changes that can make a big impact in helping teachers engage more students in math learning and helping teachers manage the classroom effectively.	64%	93%
As the people who know best what the day-to-day function of a classroom looks like, teachers are often each other's best resources. These simple but effective tools are informed by research with teachers and students about what is most effective for supporting students' math learning.	64%	93%

Source: MNP Teacher Survey Data, n820 respondents

ELEVATE STUDENT AGENCY:
WHY THIS RECOMMENDATION IS IMPORTANT

- Teachers are often trained to see their role in the classroom as delivering information to students, and students' role as absorbing information. In other words, the teacher's job is to teach, and the student's job is to learn.
- This one-dimensional relationship can constrain and undermine students' agency in learning math.
- Many teacher research participants report finding it helpful to hear from students about their experiences in math class — even (and sometimes especially) when it's not their own students — and report that it changes how they think about their own teaching strategies.

> **"I think it's helpful to hear from students in such an honest situation like that. There's a lot of times because of the pacing and the things that are going on, that we don't get to have those nice one-on-one conversations for them to really open up like that, so I liked hearing their point of view."**
>
> –White Female Teacher, TX

Source: Qualitative Research

> **"The kids' perspectives really changed my POV."**
>
> –Black Male Teacher, NY

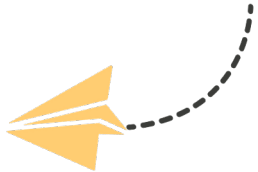
Source: MNP Teacher Survey Data, n820 respondents

ELEVATE STUDENT AGENCY:
HOW TO IMPLEMENT THIS RECOMMENDATION WITH TEACHERS

- Messaging should encourage teachers to be curious and have empathy about students' emotions and experiences learning math, by positioning students as important messengers
- To do this, messaging can:
  - Share a diversity of first-person student stories that give teachers insight into the impacts of students' emotional experiences learning math
  - Show teachers the barriers that interfere with some students seeking help, and the impacts teacher behavior have on students' learning environment
  - Create opportunities for teachers to hear from young people who are not their own students about their math classroom experiences, which fosters empathy and openness

“Sometimes it's really confusing just to make sure I understand what's going on, but once I finally get it, I'm really happy and proud of myself...If I really don't understand, I will ask the teacher for help. When I ask the teacher a question it's kind of nerve-wracking because I'm kind of nervous, and I'm worried it might sound like I wasn't paying attention or I wasn't interested in it, which isn't correct.”

ELEVATE STUDENT AGENCY: EXCERPT FROM A SAMPLE VIDEO MESSAGE OF BLACK MALE STUDENT TESTED WITH TEACHER AUDIENCE



- At the beginning, the student talks about his desire to learn and “get” the concepts they are being taught — it is why he is asking questions
- Detailing a student’s motivation to ask questions — and also the fact they are nervous about it — helps some teachers reevaluate how their actions in the classroom may create barriers to students asking for help

ELEVATE STUDENT AGENCY:
IMPACT OF THIS RECOMMENDATION IN THE RESEARCH

> **“I will try to spend more time thinking like a student as to why they are not working or feel afraid to ask questions.”**
>
> –Black Female Teacher, TX

> **“I think the honesty of the students was helpful. They were honest about their feelings and about what they wanted or needed to help them succeed."**
>
> –AAPI Male Teacher, NY

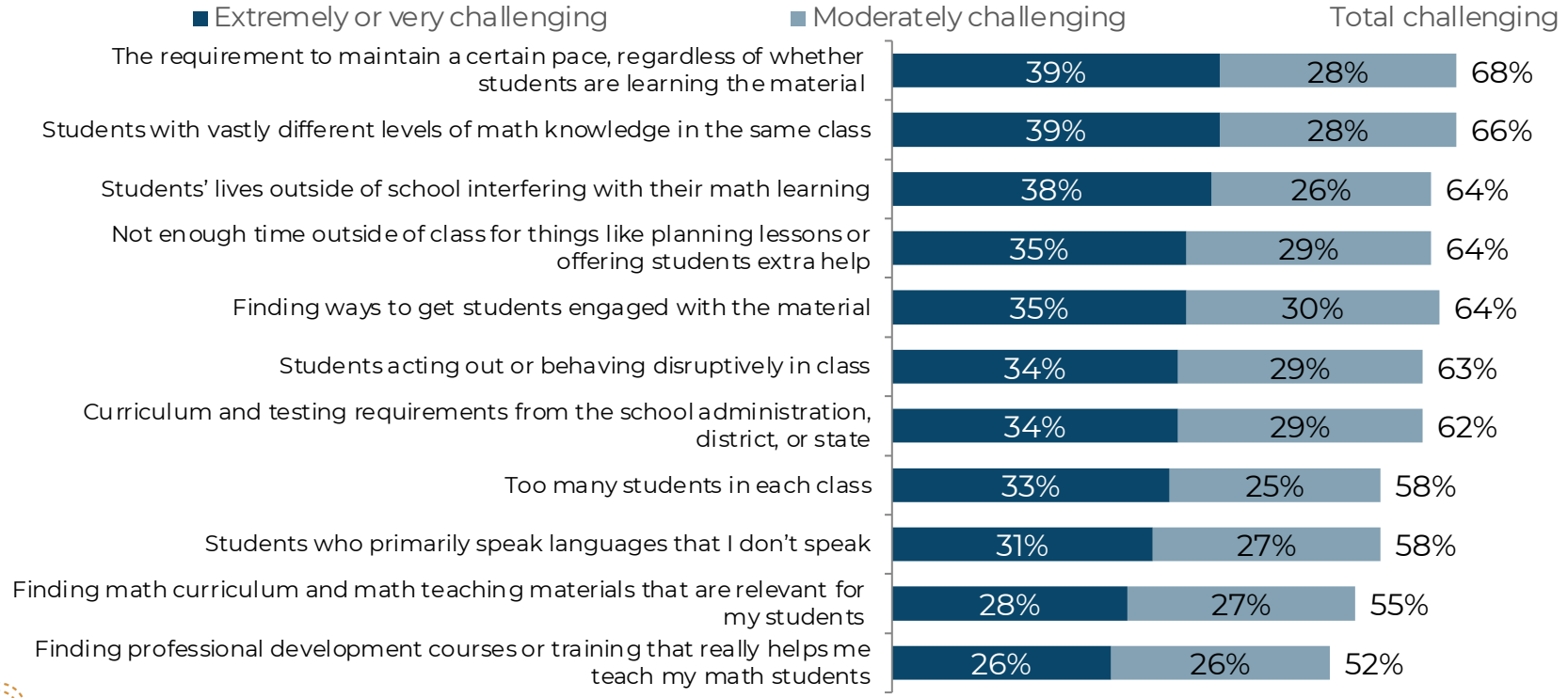
Source: MNP Teacher Survey Data, n820 respondents

ACKNOWLEDGE REAL-WORLD CONTEXT: WHY THIS RECOMMENDATION IS IMPORTANT (1 OF 2)

- Teachers often feel overwhelmed by how often they are asked to adopt new teaching practices and interventions, which can lead to skepticism and make teachers less likely to be receptive to messaging about making changes to their teaching practice
- In addition to framing the messaging to teachers overall as small changes meant to help them *(see slide 61)*, teachers need to feel that their challenges and constraints are taken into account
- The next slide shows the array of challenges that teachers report facing

ACKNOWLEDGE REAL-WORLD CONTEXT: WHY THIS RECOMMENDATION IS IMPORTANT (2 OF 2)

Here is a list of challenges some math teachers say they face. Please tell us how much of a challenge each one is for you personally as a math teacher.



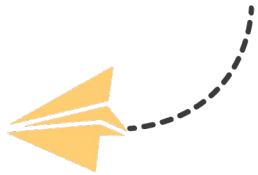
Source: MNP Teacher Survey Data, n820 respondents

ACKNOWLEDGE REAL-WORLD CONTEXT: HOW TO IMPLEMENT THIS RECOMMENDATION WITH TEACHERS

- When messages and messengers acknowledge the constraints that teachers experience in their profession, they help teachers to reduce their skepticism and make them more available to suggested changes
- Messaging can reference constraints like:
  - Large class sizes
  - Students with different levels of math knowledge and language proficiency in the same classroom
  - COVID-learning interruptions that have impacted foundational aspects of student math learning, producing gaps in knowledge for some students
  - Student absences
  - Administrative and district pressure and requirements
  - Pacing and curriculum requirements
  - Emphasis on testing and standardized testing outcomes
  - Lack of time both inside and outside the classroom
  - Less parental involvement and help outside of class than teachers would like
  - Intervention fatigue, feeling overwhelmed by the frequent introduction of new pedagogical approaches and interventions

“So what I stopped doing is I stopped assuming that all the students had a strong foundation. I understand how it feels to be in that environment and knowing you have a pacing calendar, you have district benchmarks, you have unit assessment tests you have to get through. The thing I did is I challenged myself to stop saying that I don't have the time.”

ACKNOWLEDGE REAL-WORLD CONTEXT: EXCERPT FROM SAMPLE VIDEO MESSAGE OF BLACK MALE TEACHER TESTED WITH TEACHER AUDIENCE



- The peer messenger acknowledges the pressure of pacing requirements, which helps establish his credibility — he “gets” what teachers have to deal with
- He also models for other teachers how they may be able to make changes despite challenges they have in and out of the classroom

ACKNOWLEDGE REAL-WORLD CONTEXT: IMPACT OF THIS RECOMMENDATION IN THE RESEARCH

“He said, ‘I challenged myself to stop saying that I don't have the time,’ which I feel very inspired by as I’m always stressed on getting everything ready in the short period of time I have.”

–White Male Teacher, NY

Source: Qualitative research

“What stands out to me is that even with the pacing guides, curriculum guide and assessment timelines, teachers make it work.”

–Black Male Teacher, FL

Source: MNP Teacher Survey Data, n820 respondents

ACKNOWLEDGE EMOTIONS IN MATH LEARNING: WHY THIS RECOMMENDATION IS IMPORTANT

- Teachers are sometimes unaware that students' negative emotions about learning math can interfere with their ability and motivation to learn math, and especially to persist when math learning gets hard
- Some teachers say they do not feel equipped to, or do not feel responsible for, helping students manage their negative emotions about learning math
- Others may feel that the demands of the classroom leave too little time for them to help students to manage their emotions

> **"It is not reasonable to expect teachers to become psychologists in addition to their other duties they must perform…Since I am not a trained counselor, I don't feel comfortable getting deep emotionally with students."**
>
> –Hispanic Male Teacher, CA

Source: Qualitative research

ACKNOWLEDGE EMOTIONS IN MATH LEARNING: HOW TO IMPLEMENT THIS RECOMMENDATION WITH TEACHERS (1 OF 2)

Messaging should do the following:

- **Encourage teachers to empathize** with students' negative or mixed emotional experiences learning math
- **Show teachers that they have a manageable role** in helping students to reinterpret their emotions
- **Equip teachers with language and messages they can use** to help students reinterpret their emotions in real-time

ACKNOWLEDGE EMOTIONS IN MATH LEARNING: HOW TO IMPLEMENT THIS RECOMMENDATION WITH TEACHERS (2 OF 2)

Encourage teachers to empathize	Show teachers they have a role in helping students reinterpret emotions	Equip teachers with language and messages
One way to do this is by using prompts that enable teachers to reflect on their own math learning journeys and the emotions they experienced learning math as young people. For example: • *Sometimes, students say that they feel embarrassed to ask questions or make mistakes. Is there a time in your life when you have been embarrassed to ask questions or to make mistakes? How, if at all, did you get past that embarrassment?*	Messaging can do this by affirming teachers' emotional need to see themselves as good teachers who care for their students, as well as meeting teachers' practical need to see positive outcomes. Peer teacher stories should include: • How the teacher previously did not recognize how students' negative emotions were interfering with their math learning • What prompted the teacher to realize they could help students manage their emotions, including the specific words or phrases they used to reframe emotions in the classroom • The change the teacher sees in their students as a result	For example, teachers may use or adapt statements like: • *When you're feeling frustrated, confused, or overwhelmed, that's a signal to ask questions and get extra help* • *When you feel lost in class or don't understand, it can be embarrassing to ask for help. Those moments are the best time to get extra support. Even though it's hard, it's important for you to ask for the help you need*

Teachers can affirm and normalize the emotional nature of learning math — and can help students reframe their emotions as signals to take positive action. Here's an example of something you could say to a student when they're feeling stuck, confused, or overwhelmed: 'When you feel lost in class or don't understand, it can be embarrassing to ask for help. Those moments are the best time to get extra support. Even though it's hard, it's important for you to ask for the help you need.'

ACKNOWLEDGE EMOTIONS IN MATH LEARNING: EXCERPT FROM A SAMPLE MESSAGE STATEMENT TESTED WITH TEACHER AUDIENCE

- This message starts by stating the role that teachers have in helping students reframe their own emotions
- It gives a specific example of something a teacher could say or adapt to their own students
- *See additional tested examples on the next slide*

ACKNOWLEDGE EMOTIONS IN MATH LEARNING: REACTIONS TO PRINT MESSAGING IN THE SURVEY

Teachers can affirm and normalize the emotional nature of learning math — and can help students reframe their emotions as signals to take positive action. Below you'll see some examples of responses that teachers can give to students when they are feeling stuck, confused, or overwhelmed. For each response, please rate how likely you would be to try it out in your classroom.	Extremely or very likely	Extremely, very, or somewhat likely
At some point in life, most students will struggle with learning math. If you feel frustrated, you're not alone. Other students probably have the same questions you do. When you are brave and ask questions, you're helping other students — and you're helping me, as a teacher, to help all of you learn.	70%	95%
It can feel stressful to make mistakes. Making mistakes is part of the learning process. Mistakes are an important part of how we learn as students and how we grow as people.	69%	95%
When you feel lost in class or don't understand, it can be embarrassing to ask for help. Those moments are the best time to get extra support. Even though it's hard, it's important for you to ask for the help you need.	68%	92%
When you're feeling frustrated, confused, or overwhelmed, that's a signal to ask questions and get extra help.	67%	92%

Source: MNP Teacher Survey Data, n820 respondents overall; using split samples, this question asked of n162 respondents

ACKNOWLEDGE EMOTIONS IN MATH LEARNING: IMPACT OF THIS RECOMMENDATION IN THE RESEARCH

For each of the following, please rate whether you are MORE or LESS likely to do it, based on what you have seen or heard in this survey. If it makes no difference, please say so.

Showing* much *or* somewhat *more likely

75%

Consider how my students' emotions might be interfering with their math learning

"If anything, I'll start checking out on my students' emotions and when they're struggling I'll approach them in a way where they don't feel stressed or embarrassed and try to help them out as best as I can."

–Hispanic Male Teacher, NY

Source: MNP Teacher Survey Data, n820 respondents

MAKE MATH RELEVANT:
WHY THIS RECOMMENDATION IS IMPORTANT

- Teachers report being asked the question “why do I have to learn this?” over and over every year
- Some teachers believe that their current answers to the question and examples of relevance are sufficient for students
- Other teachers do not feel well-equipped to offer credible examples to students when asked “why do I have to learn this?”

> **“Relevance and utility would be the one that…falls flat. It is the hardest to convey to students and get them to accept and understand. You might reach a few, but some are still not there yet with the maturity to be able to grasp why it is important to learn these concepts.”**
>
> –Hispanic Female Teacher, CA

Source: Qualitative research

MAKE MATH RELEVANT:
HOW TO IMPLEMENT THIS RECOMMENDATION WITH TEACHERS (1 OF 2)

- Messaging should encourage teachers to reflect on and consider whether their current examples describing the relevance of math resonate with students, while equipping them with tested, credible messages on the relevance, value, and utility of higher-level math for students' lives and futures — that research shows work with students *and* parents.
- Importantly, messaging to teachers about the relevance of math should frame it as a collection of ideas, or a toolbox for teachers — NOT a script or one-size-fits-all approach. A toolbox reinforces the idea that no one example of relevance will work for all students and encourages teachers to present varied examples to connect with different students in different contexts.
- Messaging should encourage teachers to pick a mix of relevance examples that fit in the different contexts in which they teach and their students learn — for example, teachers may choose examples that reflect what they know about the interests, concerns, or priorities of the students in their class.

MAKE MATH RELEVANT:
HOW TO IMPLEMENT THIS RECOMMENDATION WITH TEACHERS (2 OF 2)

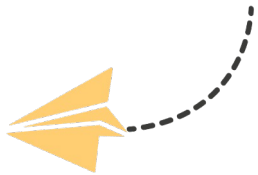
- As part of the 'toolbox' framing, messaging to teachers should encourage them to think about using:
  - Examples about the relevance of math that are developmentally appropriate for students. For example, consider sharing examples of the immediate importance of higher-level math with students who are middle-school age, and share the longer-term or career-oriented examples with older students. A mix is best regardless of age.
  - Examples about the relevance of math that are connected to contexts that students understand, believe are real, and care about such as: keeping your career options open; financial literacy; and having greater financial power so you don't get scammed or cheated and can protect your family from financial scams.
  - Connections between specific math concepts and how they are applied in real-world examples. For example, describe how linear equations can help students to understand loans.

MAKE MATH RELEVANT: SAMPLE MESSAGE STATEMENT TESTED WITH TEACHER AUDIENCE (1 OF 2)

Examples of math's relevance that are most likely to be credible with young people help them to understand how higher-level math can benefit themselves and their families.

Try using examples that:

- ***Emphasize how knowing higher-level math can help students to figure out things that are important to them now, for example, whether it is better to pay for a new phone all at once or in installments and with fees…***
- ***…Or how it can help them in their future, like understanding how to manage loans, whether for college, to buy a car, a house, or other big purchases***
- ***Show how knowing higher-level math can help students to protect themselves and their families by making them better able to recognize scams and companies that want to take advantage of them and their families (e.g., predatory lenders and pay-day loans)***
- ***Show how higher-level math can help them 'pivot' in their careers. For example, if when they are an adult, they find themselves in a job they don't like, understanding math can help them to have more options about what to do next.***

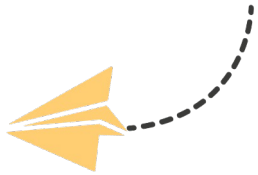


- This message offers teachers a variety of relevance messages that students find credible so that teachers are better equipped to answer the question they widely report being asked by students about higher-level math: "Why do I have to learn this? When am I ever going to use it?"

MAKE MATH RELEVANT: SAMPLE MESSAGE STATEMENT TESTED WITH TEACHER AUDIENCE (2 OF 2)

Certain more abstract ideas are less likely to be credible for young people, especially with students who may be struggling learning math. Here are some examples of messaging that many students did not find credible.

- ***Math is a universal language***
- ***Math helps you build critical thinking skills*** ***(note: they reply that they learn that in many classes, and they don't need math to learn it)***
- ***Examples that undermine students' agency*** ***(e.g., it's not fair, but you need to do this or you would not be able to graduate/get a good job)***



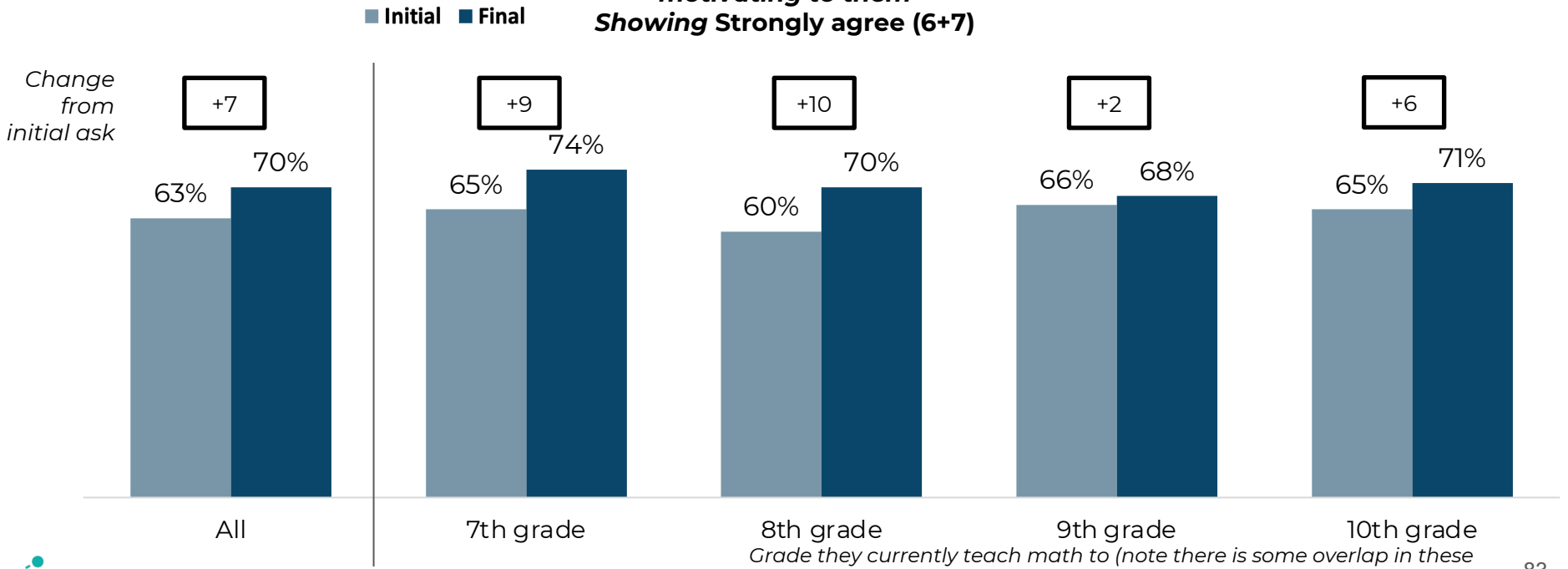
- In this second part of the message, it also points out some examples that students generally find less credible (for example, "math is a universal language") so they know what to avoid

MAKE MATH RELEVANT:
IMPACT OF THIS RECOMMENDATION IN THE RESEARCH (1 OF 2)

Please tell us how much you personally agree or disagree with each of the following statements on a scale of 1 to 7, with 1 meaning you strongly disagree, and 7 meaning you strongly agree.

When students ask, "Why do I have to learn this?" about higher-level math, I have answers that are credible and motivating to them

***Showing* Strongly agree (6+7)**



Grade they currently teach math to (note there is some overlap in these groups, i.e., a teacher may teach math to both 7th and 8th graders)

Source: MNP Teacher Survey Data, n820 respondents

MAKE MATH RELEVANT:
IMPACT OF THIS RECOMMENDATION IN THE RESEARCH (2 OF 2)

> **After going through this survey and seeing perspectives from kids and seeing what helps them and what they like to hear, it helps me give answers to my students on why they should learn math."**
>
> –Hispanic Female Teacher, TX

> **I actually liked some of the answers in the video better than my own, so I need to reflect on those answers and make sure I'm ready. One teacher mentioned adding to each student's toolbox so they are prepared for whatever life throws at them…I need to add this to my at-the-ready repertoire."**
>
> –White Female Teacher, CA

> **I can't always think of things to say in the spot but now I know I need to give them a real reason. I don't know if it will convince them but I know what things to include so they understand that the future is unknown and I just want to give them the skill of understanding math if they go down that road."**
>
> –White Female Teacher, CA

Source: MNP Teacher Survey Data, n820 respondents

AFFIRM VALUE OF MISTAKES: WHY THIS RECOMMENDATION IS IMPORTANT

Teachers frequently know that making mistakes can be demoralizing for kids. Some teachers try to keep students motivated by “rescuing” them — giving them the answer rather than working through the mistake with them.

> **For a student that maybe doesn't quite grasp it yet — sometimes you have to almost feed them the answer just to give them that confidence. If you basically slip in that answer and they repeat it, ‘Yes, that's it.’ Just so they get a sense of the reward and the acceptance of getting it right to let that drive them, as opposed to being exiled from the class and just wanting to sit in the corner and not participate at all.”**
>
> –AAPI Male Teacher, NY

Source: Qualitative research

AFFIRM VALUE OF MISTAKES: HOW TO IMPLEMENT THIS RECOMMENDATION WITH TEACHERS (1 OF 3)

- Messaging should:
  - **Show teachers how to respond positively to students' mistakes** and address the negative emotions such as embarrassment or fear that students experience with mistakes
  - **Help teachers to realize that students need to hear explicit messages** that reframe making mistakes as a valuable part of the math learning process
  - **Utilize diverse teacher messengers** with varied levels of teaching experience who can share stories and best practices that destigmatize students' mistakes

AFFIRM VALUE OF MISTAKES: HOW TO IMPLEMENT THIS RECOMMENDATION WITH TEACHERS (2 OF 3)

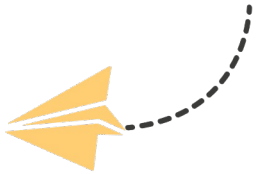
- To show teachers how to respond positively to students' mistakes and address negative emotions, messaging can encourage teachers to try:
  - Acknowledging mistakes that students — or adults — make as opportunities for learning
  - Modeling how you can unpack a mistake to learn from it
  - Affirming that making mistakes is not a reflection of a student's overall capability, but rather an indication of needing more help or support on a specific topic or concept
  - Affirming the parts of the student's work or assignment that they did correctly or got right, before talking about where they struggled
  - Acknowledging that mistakes are learning opportunities in certain contexts, like homework or in the classroom (ignoring that mistakes on tests are higher stakes can undermine credibility)

AFFIRM VALUE OF MISTAKES: HOW TO IMPLEMENT THIS RECOMMENDATION WITH TEACHERS (3 OF 3)

- To help teachers realize that students need to hear explicit messages reframing mistakes as a valuable part of the learning process, messaging can:
  - Share stories from students describing how they feel when they make a mistake and how their teachers respond. When sharing these stories, include both negative experiences where a student feels embarrassed or ashamed (to help build empathy) and also positive experiences where a student feels good when a teacher responds to a mistake without judgement and breaks down the steps to solving a problem (to model for teachers what students need from them).
  - Share stories from peer teachers describing what they do to create a positive learning environment in their classroom where mistakes are valued. This may include drawing a parallel with the value of making mistakes when learning other subjects or skills, explicitly naming mistakes as valuable learning opportunities for the entire class, validating students' who get part of the answer correct, or teaching from mistakes such as through error analysis.

I've taught for a good amount of years. I know when the concept gets really challenging and students make a lot of common mistakes. I just preload them and prefund them and be like, 'Hey guys, this unit's going to be really tough. This is the hardest unit of this section, but just know that you're going to make a lot of mistakes. I'll make mistakes too, but making mistakes is part of the learning process. These mistakes are how we learn as students and how we grow as people. So continue to make your mistakes because it's better to make mistakes now, on the practice, on the assignments, on the quizzes, than to make mistakes on the tests.'

AFFIRM VALUE OF MISTAKES: EXCERPT FROM A SAMPLE VIDEO MESSAGE OF AAPI MALE TEACHER TESTED WITH TEACHER AUDIENCE



- The messenger begins by establishing his credibility by citing his experience
- Then he offers a straightforward strategy other teachers can use to normalize mistakes and reaffirm they are part of the learning process (including both modeling making mistakes and letting students know that they are common and OK)
- Importantly, the messenger also notes that the context of mistakes matters

AFFIRM VALUE OF MISTAKES: REACTIONS TO PRINT MESSAGING IN THE SURVEY (1 OF 2)

Introduction to sample print message statements tested with teacher audience:

Students often think that if they make a mistake in math or struggle with new concepts, then they are just bad at math. It can lead them to feel frustrated or discouraged or to want to give up entirely. Math teachers can help students change the way they think about mistakes and struggle by changing how they respond to mistakes in the classroom.

Of course, the context in which students make the mistake matters: When a student makes a mistake on a worksheet in class or on homework, the stakes are much lower than when they make a mistake on a test. Acknowledging this is important, and helping students persevere through making a mistake in a lower-stakes context will ultimately help them improve when taking a test.

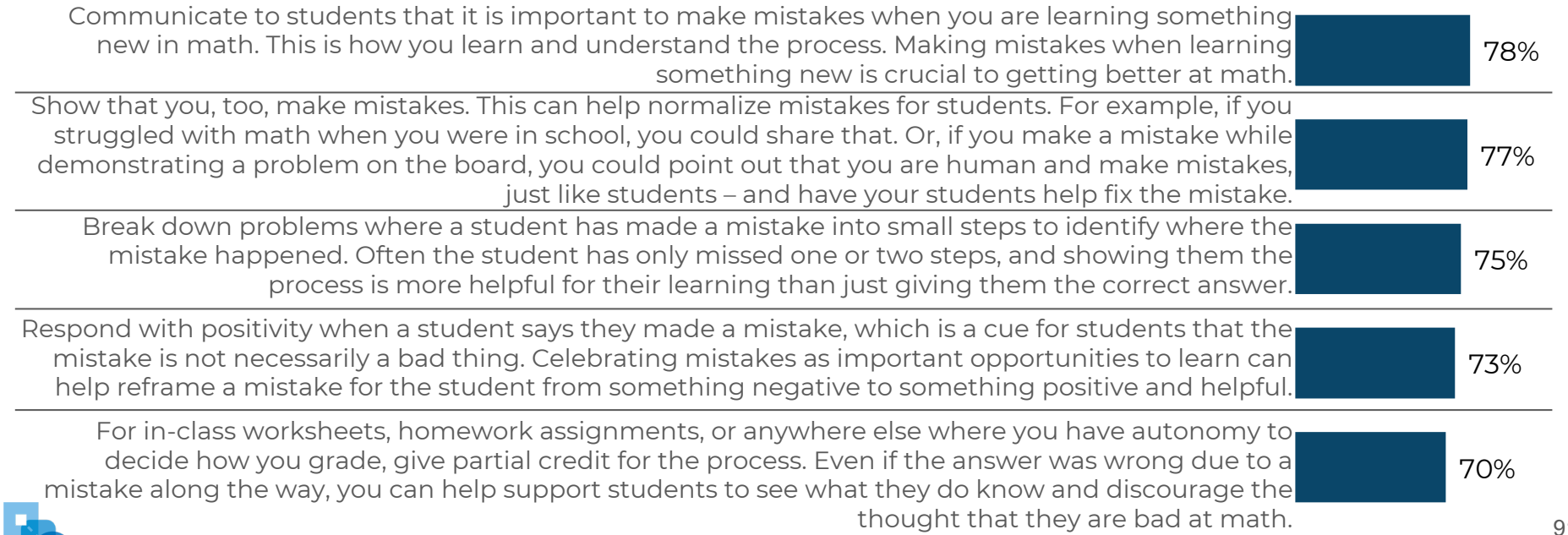
Below, you'll see some examples of ways some math teachers respond when students make mistakes learning math to create a safe and encouraging learning environment. For each one, please indicate how likely you would be to try it out in your classroom.

See next slide

AFFIRM VALUE OF MISTAKES: REACTIONS TO PRINT MESSAGING IN THE SURVEY (1 OF 2)

Below, you'll see some examples of ways some math teachers respond when students make mistakes learning math to create a safe and encouraging learning environment. For each one, please indicate how likely you would be to try it out in your classroom.

Showing* extremely *or* very *likely



Source: MNP Teacher Survey Data, n820 respondents overall; using split samples, this question asked of n162 respondents

AFFIRM VALUE OF MISTAKES:
IMPACT OF THIS RECOMMENDATION IN THE RESEARCH

> **Based on the last video I watched in which other tenured teachers shared examples of phrases they use with their own students while teaching, I feel I have...a few more techniques I can use when helping my own students cope when they realize they've made mistakes—including admitting that I make mistakes, too."**
>
> –Hispanic Male Teacher, TX

> **I liked the video very much and it has shifted my way of asking and welcoming wrong answers. This will help more kids to participate in the classroom discussions."**
>
> –Hispanic Female Teacher, FL

Source: Qualitative research

> **After watching the videos I was able to reflect on how much more I could do to reduce student stress and potential embarrassment with the tools the teachers in the video discussed."**
>
> –White Female Teacher, NY

Source: MNP Teacher Survey Data, n820 respondents

ENCOURAGE HELP-SEEKING:
WHY THIS RECOMMENDATION IS IMPORTANT

Teachers often expect students to ask questions or seek help when they need it. However many students won't ask for help unprompted, in part because they feel uncomfortable or embarrassed doing so, or they feel so lost they are unsure of what to even ask.

75%

Of teacher survey respondents agree (*strongly* or *somewhat*) that 'students need to take responsibility for asking for the help they need if they are struggling in math'

Note: agreement is even higher (83%) among teacher survey respondents who have been teaching math for 11+ years

Source: MNP Teacher Survey Data, n820 respondents

ENCOURAGE HELP-SEEKING:
HOW TO IMPLEMENT THIS RECOMMENDATION WITH TEACHERS (1 OF 4)

Messaging should do the following:

- **Encourage teachers to better understand** the barriers to seeking help that many students experience
- **Help teachers to feel better equipped** to encourage students to seek help
- **Motivate teachers to create an environment** in which students feel more comfortable asking questions

ENCOURAGE HELP-SEEKING:
HOW TO IMPLEMENT THIS RECOMMENDATION WITH TEACHERS (2 OF 4)

- To encourage teachers to better understand the barriers to seeking help that many students experience, messaging to teachers can:
  - Use student stories or reflection questions for teachers to help them think about the role they have in encouraging questions in the classroom and the ways they may be inadvertently discouraging students from asking questions in their own classroom.
  - Remind teachers about the realities of students' developmental age, which may mean some students won't ask questions because they don't want to be perceived as needing help, or because they are afraid of being teased or embarrassed by other kids who will say they are "dumb" for asking questions.
  - Embed cues that enable teachers to reflect on how many kids are asking questions and, if very few kids ask questions, consider ways in which the teacher or peers inhibit question-asking and help-seeking.
  - Show teachers how their behaviors and responses sometimes inadvertently shame or embarrass students. For example, share experiences of students who describe the impact of teachers who respond to questions by saying, " I just explained that" or "You weren't paying attention," and how these statements make students less likely to ask questions.

ENCOURAGE HELP-SEEKING: HOW TO IMPLEMENT THIS RECOMMENDATION WITH TEACHERS (3 OF 4)

- To help teachers to feel better equipped to encourage students to seek help, messaging can:
  - Share stories of peer teachers who have successfully created classroom environments where kids ask for help regularly – including showcasing what teachers do to encourage students to seek help
  - Explicitly discuss the different places, spaces, and people where students can get help (e.g. in school, after-school, one-on-one at the teacher's desk, by email etc.)
  - Share stories from students about the barriers they feel they face to seeking help

ENCOURAGE HELP-SEEKING: HOW TO IMPLEMENT THIS RECOMMENDATION WITH TEACHERS (4 OF 4)

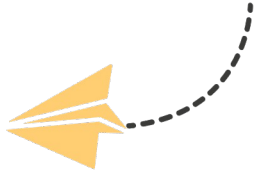
- To motivate teachers to create an environment in which students feel more comfortable asking questions, messaging can:
  - Show teachers how they can take shame and embarrassment out of learning math and asking questions by sharing stories of other teachers who started more actively soliciting questions and offering different avenues to ask questions, such as in group settings and one-on-one. Include how these teachers have been able to get more students to ask questions more frequently.
  - Share examples of teachers responding positively to questions in ways that affirm questions as a valuable part of the learning process, such as:
    - Praising asking questions: 'That is a great question.'
    - Destigmatizing asking questions: 'It's helpful when you ask a question. If you have a question, a lot of other kids probably have the exact same question too.'
    - Deciding not to use asking questions as a public moment to accuse a student of not paying enough attention in class or not doing their homework.

As teachers we always think on our feet. I have gotten really good at explaining things in 3 or 4 different ways because I want to make sure as many of my kids as possible can connect to the content and understand the lesson. But I still need students to speak up and ask questions when they need something explained a different way. It's hard to know where everyone is at when we only have 50-minute classes and so much material to get through.

Recently I happened to see a YouTube video of a teacher in Atlanta who does this thing where she praises kids for asking questions. So, for example, when someone asks a question, she tells the student, "It's really courageous of you to speak up. When you speak up you are helping your classmates to learn too." I decided to try it with my kids when the new semester started.

Now that I've started praising kids for asking questions, even more of my students are asking questions when they are getting stuck or have made a mistake on a problem they are trying to solve. I feel like in my small way, I'm helping kids in my class to feel more confident in the classroom. This will serve them in my class and also in their education to come.

ENCOURAGE HELP-SEEKING: SAMPLE MESSAGE STATEMENT TESTED WITH TEACHER AUDIENCE



- This messenger begins with empathy for other teachers by acknowledging the challenges teachers face to creating good math-learning environments for students.
- The messenger then models a journey of realizing there is something they could do better to encourage student help-seeking behavior, and implementing that change. Importantly, the messenger also describes the positive impact of the change - demonstrating to other teachers that it might be effective for them as well.

ENCOURAGE HELP-SEEKING:
IMPACT OF THIS RECOMMENDATION IN THE RESEARCH (1 OF 2)

"I feel this survey opened my mind to be more of a relatable teacher for my students when I detect feelings of embarrassment during a lesson."
–AAPI Male Teacher, CA

"I feel that I have a better understanding on how to approach students when it comes to asking questions. I feel I can create a safe space."
–Hispanic Female Teacher, TX

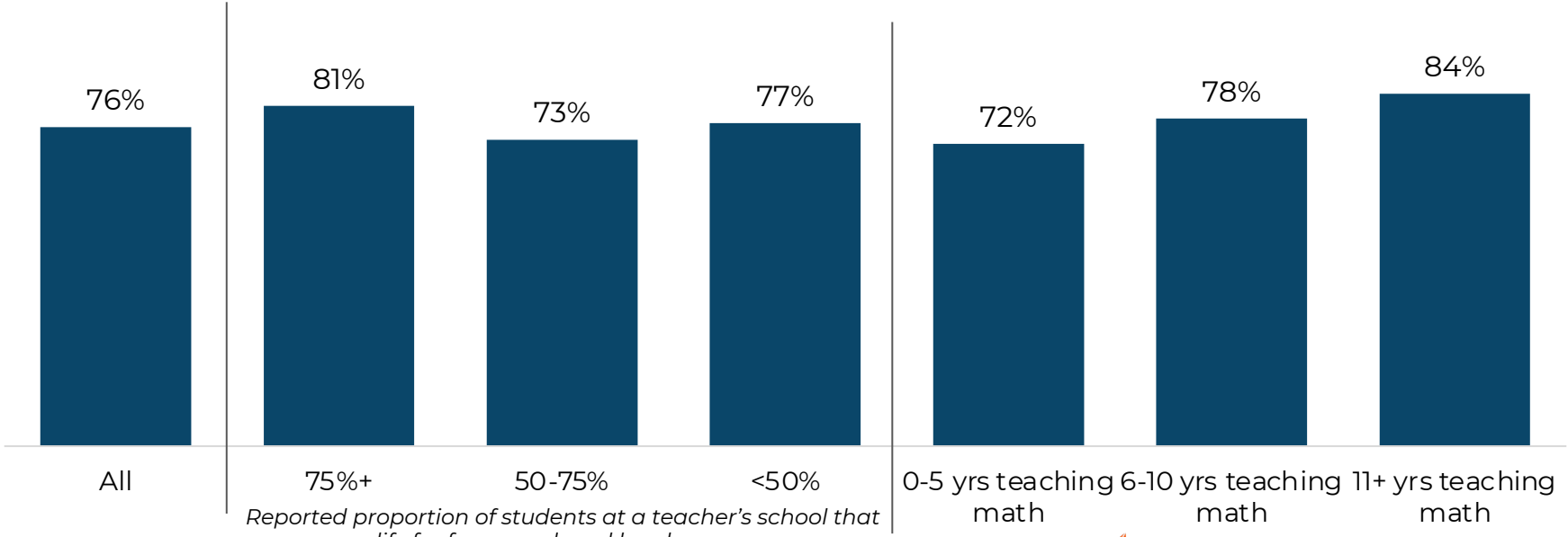
"Before I thought there was nothing I could do to help a student who couldn't ask a question when they needed to, or were too busy/afraid to set up a meeting. I heard from one of the parts of this survey that teachers keep their emails open, and it seems like a much less stressful environment for the students to ask questions."
–White Female Teacher, CA

Source: MNP Teacher Survey Data, n820 respondents

ENCOURAGE HELP-SEEKING:
IMPACT OF THIS RECOMMENDATION IN THE RESEARCH (2 OF 2)

For each of the following, please rate whether you are MORE or LESS likely to do it, based on what you have seen or heard in this survey. If it makes no difference, please say so.

Encourage students to ask for help when they feel frustrated, confused, or overwhelmed
Showing* much *or* somewhat *more likely



Source: MNP Teacher Survey Data, n820 respondents

REFRAME STRUGGLE AND CAPABILITY: WHY THIS RECOMMENDATION IS IMPORTANT

- Teachers own beliefs can sometimes reinforce the notion that only some students can be good at math, or can learn higher-level math
- Even when teachers explicitly tell students that they can get better at higher-level math, many simultaneously hold the belief that there are students who will never be good at math – and can behave in ways that communicate this belief to students

61%

Of teacher survey respondents say they agree (5-7 on a scale of 1-7) that 'some students just don't seem to get higher-level math, no matter how many different ways it's taught or explained'

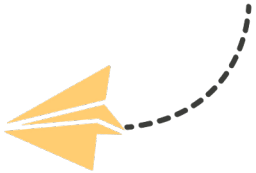
Source: MNP Teacher Survey Data, n820 respondents

REFRAME STRUGGLE AND CAPABILITY: HOW TO IMPLEMENT THIS RECOMMENDATION WITH TEACHERS

- Messaging should encourage teachers to reflect on when and why they determine that some students are unable, or less likely to be able, to learn higher-level math like algebra. To do this, messaging can:
  - Describe the varied levels at which many students arrive in their math class and how peer teachers have successfully managed this range in their own classrooms.
  - Share stories of peer teachers who describe their own motivations to reconsider how they determine students' capability in the classroom. For example, spotlight stories where a teacher shares an example of when they realized they were assuming specific students could not or would not understand the materials; or ignored students who struggle often or don't appear to get better at math. Then counter this with what led the teacher to question their own behavior, and how small changes helped them to engage with this student differently, and get the student the help they needed. (*See next slide for example of this story structure*)

"I've been teaching for 10 years now. I generally do believe that all students can learn high degrees of math with the right guidance. I really do believe that. I really like seeing my students feel proud of themselves. When I first started teaching, I was pretty quick to rescue the kids. It's really easy as a teacher to just tell them what the formula is. I think kids actually understand more than they think they do. When I hear kids say, I don't get it. I just ask them, 'what DO you get?' Try to figure out what they do understand and start working from there, and help guide them into how they can apply what they already know. Over time, you just see kids changing their mindsets and it was just like a really beautiful thing to see."

REFRAME STRUGGLE AND CAPABILITY: EXCERPT FROM A SAMPLE VIDEO MESSAGE OF AAPI FEMALE TEACHER TESTED WITH TEACHER AUDIENCE



- This messenger begins by providing the motivation for reassessing some of her approaches in the classroom–she not only wants her students to learn but also to feel proud of themselves
- The messenger also normalizes frequent teacher behavior and shows others how to pivot to a different approach in small steps (i.e., it does not require a complete overhaul to their pedagogy)

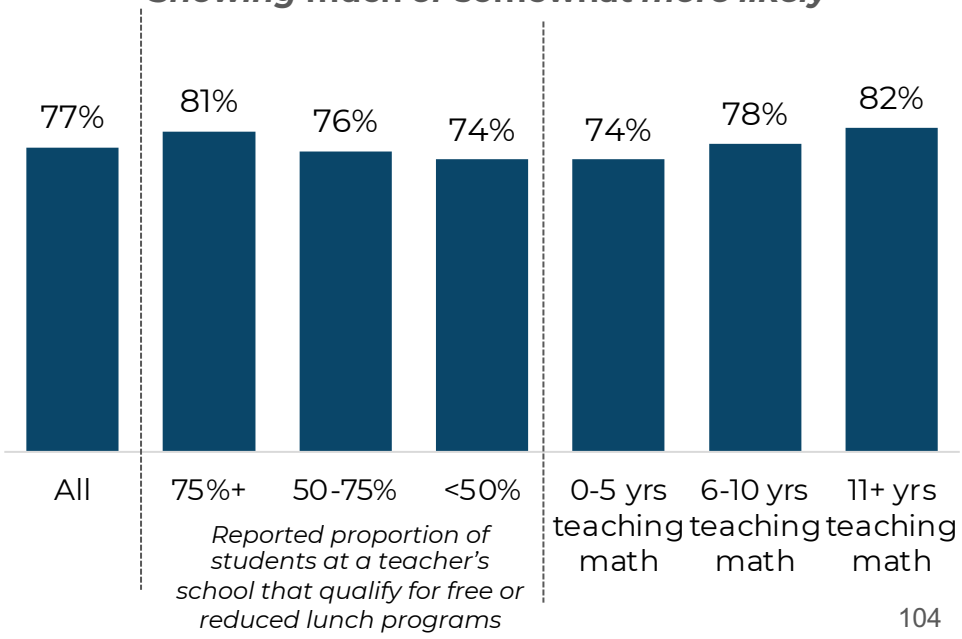
REFRAME STRUGGLE AND CAPABILITY: IMPACT OF THIS RECOMMENDATION IN THE RESEARCH

> **I feel that these videos have helped me be more confident in helping my students understand that they are capable of learning math."**
>
> –Hispanic Female Teacher, TX

> **I feel a little bit differently now because after hearing the different strategies and experiences of the teachers and the video, I feel like there's a lot more I could do better in order to reduce my students' stress and allow them to reach their highest potential as math learners."**
>
> –Hispanic Male Teacher, CA

Source: MNP Teacher Survey Data, n820 respondents

For each of the following, please rate whether you are MORE or LESS likely to do it, based on what you have seen or heard in this survey. If it makes no difference, please say so.



REASSESS ASSUMPTIONS:
WHY THIS RECOMMENDATION IS IMPORTANT

- Teachers often feel they do not have the time to provide every student with one-on-one support. So when they see certain student behaviors and interpret those as the student not trying to learn, they focus their attention on other students instead.
- Helping teachers to understand students' feelings (confusion, frustration, overwhelmed) around learning math and how these feelings are expressed, can help teachers to reassess their existing beliefs about what certain student behaviors may really mean, and whether a student is “checked out” or “unwilling to learn.”

“I don't like having to take on students that are unwilling to learn, since I can be investing that time with students that are more proactive and receptive.”

–AAPI Male Teacher, FL

Source: MNP Teacher Survey Data, n820 respondents

REASSESS ASSUMPTIONS:
HOW TO IMPLEMENT THIS RECOMMENDATION WITH TEACHERS (1 OF 2)

- Messaging should encourage teachers to get curious about how students feel about learning math and the impact of students' negative emotions on their experience of math learning
- Messaging can do this by:
    - Building teachers' empathy with students who seem "checked out" by **encouraging teachers to reflect** on alternate reasons for problematic student behaviors in class
    - Helping teachers see the connection between student behaviors and student emotions by **sharing stories from students and other teachers**

REASSESS ASSUMPTIONS:
HOW TO IMPLEMENT THIS RECOMMENDATION WITH TEACHERS (2 OF 2)

Encourage teachers to reflect using questions such as:	Share stories from students and other teachers
• What do I believe confusion and frustration look like in my students? • Could this student feel lost or stuck on a problem or a concept? • Could they be feeling so confused, frustrated, or overwhelmed that they have given up? • How can I find out if something else is going on for this student?	Stories from students should elevate or highlight instances in which behaviors like doodling, submitting a blank worksheet or test, or talking to another student in class are interpreted differently by students and teachers. • For example, students may perform the behaviors above when they are feeling stressed or overwhelmed, while teachers may see these behaviors and assume students are checked out. Stories from other teachers can model reflection and behavior change for teachers. • For example, a peer/math teacher or coach can talk about a time they assumed a student was "checked out", realized there was another reason for that student's behavior, and then was able to make a positive difference for that student once they understood what was really going on with them.

I do my best to help my students learn, and as long as a student is willing to try, I can help them make progress. But last year, a failing student helped me to grow in an unexpected way. Alex was failing my Algebra 1 class and seemed checked out - he never raised his hand, didn't turn in homework, and I could see him doodling during class instead of taking notes.

One day I got an email from Alex's mom that said he had tried to work on his homework in the beginning of the year but felt completely stuck, and she felt like she didn't understand the math well enough to help him. She said she encouraged Alex to ask questions in class, but he was so confused he didn't even know what questions to ask.

When I reflected on what she said, I wondered whether I had a blind spot for students like Alex who were failing quietly. I showed Alex and his mom some places to get extra support online, and started meeting with him once a week. Showing that I cared about his learning seemed to make a big difference. He began to raise his hand and turn in homework. He got his grade up to a C by the end of the semester.

This shifted my perspective in a small, but transformative way — the importance of checking my own assumptions about what's really going on when a student seems checked out.

REASSESS ASSUMPTIONS: SAMPLE MESSAGE STATEMENT TESTED WITH TEACHER AUDIENCE

- The messenger expresses good intentions and a belief that students need to meet the teacher halfway – which is shared by many teachers
- Then they name some behaviors that teachers report commonly seeing, and interpreting as the student being "checked out"
- After getting more information, the messenger models a change of heart and realization that the student is not intentionally disengaging, but needs a little extra support

REASSESS ASSUMPTIONS:
IMPACT OF THIS RECOMMENDATION IN THE RESEARCH (1 OF 3)

> **[I am thinking about] finding out what else is going on in their lives that might be disrupting or negatively affecting their learning."**
>
> –Mixed Race Female Teacher, TX

> **[I am thinking about] the importance of…assuming that kids aren't just being lazy and just need some extra guidance or background. This is helpful information as a new teacher."**
>
> –Hispanic Male Teacher, FL

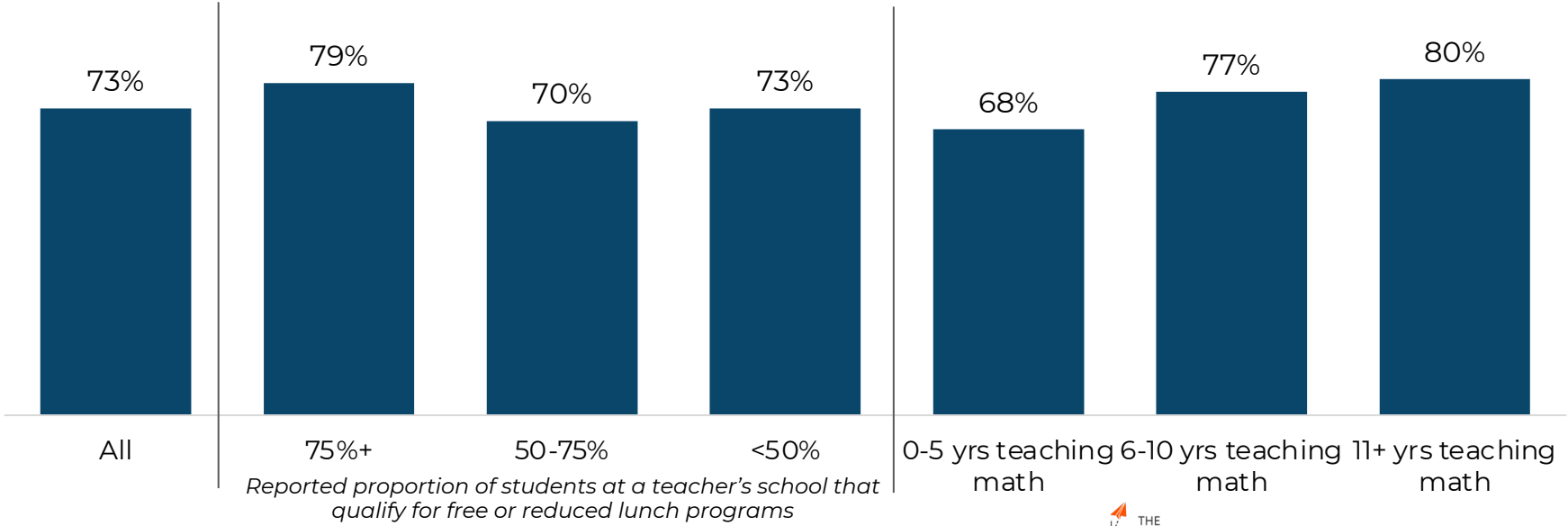
> **I have reflected on my own experiences and challenges as a learner and teacher, and how they have shaped my beliefs and attitudes. I have gained new insights and perspectives from the survey questions and feedback, and how they relate to my own teaching context and goals."**
>
> –Hispanic Male Teacher, FL

Source: MNP Teacher Survey Data, n820 respondents

REASSESS ASSUMPTIONS:
IMPACT OF THIS RECOMMENDATION IN THE RESEARCH (2 OF 3)

For each of the following, please rate whether you are MORE or LESS likely to do it, based on what you have seen or heard in this survey. If it makes no difference, please say so.

Reflect on how my teaching practices influence my students' experience learning math
Showing* much *or* somewhat *more likely

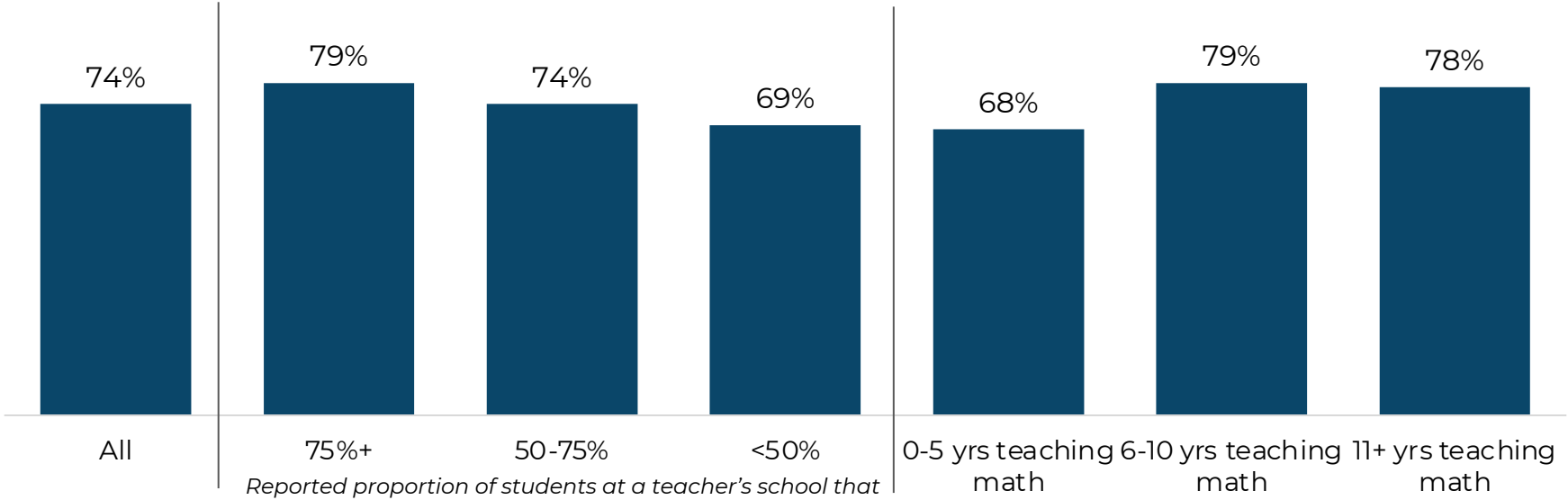


Source: MNP Teacher Survey Data, n820 respondents

REASSESS ASSUMPTIONS:
IMPACT OF THIS RECOMMENDATION IN THE RESEARCH (3 OF 3)

For each of the following, please rate whether you are MORE or LESS likely to do it, based on what you have seen or heard in this survey. If it makes no difference, please say so.

Ask a student who seems "checked out" what else might be going on that is affecting their math learning
Showing* much *or* somewhat *more likely



Source: MNP Teacher Survey Data, n820 respondents

PRIORITIZE BUILDING RELATIONSHIPS: WHY THIS RECOMMENDATION IS IMPORTANT

- Teachers believe their primary goal is to help students learn math – and many believe that building relationships with students can help with math learning
- However, teachers often do not feel they have time to prioritize building relationships

> **"[Getting to know all your students] is the ideal, but it is often difficult when you have 150 students to get to know. Some students make it easier to get to know them and look for the connections to their teachers early on, but some want to fly under the radar and would rather be anonymous."**
>
> –White Female Teacher, NY

Source: Qualitative research

PRIORITIZE BUILDING RELATIONSHIPS: HOW TO IMPLEMENT THIS RECOMMENDATION WITH TEACHERS (1 OF 4)

- Messaging should position building relationships as critical to learning math – an element of math learning that significantly helps students learn higher-level math effectively and successfully
- Messaging can do this by:
  - Tapping into and **reinforcing most teachers' existing beliefs about the importance of relationships** and belonging to student learning
  - **Motivating and encouraging teachers** to take on and try out interventions **by emphasizing the value of taking small steps** throughout the school year to build relationships based on mutual respect
  - **Supporting teachers** in prioritizing building relationships in the classroom **by providing examples of small, specific steps** they can take throughout the school year

PRIORITIZE BUILDING RELATIONSHIPS: HOW TO IMPLEMENT THIS RECOMMENDATION WITH TEACHERS (2 OF 4)

- Messaging can reinforce most teachers' existing beliefs about the importance of relationships by:
  - Using stories from both students and peer teachers to emphasize the importance of building empathy and trust in the classroom, and how once built, trust yields positive learning outcomes
  - For new teachers, emphasizing that a sense of belonging and trust is important to establish early in the school year, and share success stories of novice teachers who built strong connections with their students from the beginning
  - For more seasoned teachers, emphasizing the value of continued relationship-building

PRIORITIZE BUILDING RELATIONSHIPS: HOW TO IMPLEMENT THIS RECOMMENDATION WITH TEACHERS (3 OF 4)

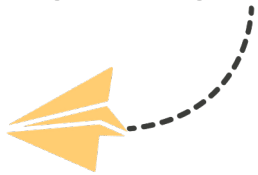
- Messaging can motivate and encourage teachers by emphasizing the value of taking small steps by:
  - Showing the power of small changes teachers can make to build and strengthen relationships with students
  - Encouraging teachers to use storytelling as a tool to build empathy and trust – both by sharing stories with their students about their own journeys to becoming a math teacher including challenges they faced in learning math or other subjects, and by inviting their students to share their experiences with learning math

PRIORITIZE BUILDING RELATIONSHIPS: HOW TO IMPLEMENT THIS RECOMMENDATION WITH TEACHERS (4 OF 4)

- Messaging can support teachers by providing examples of small, specific steps including:
  - An assortment of bitesize interventions, and how other teachers have adapted them or taken them off the shelf with little time and little prep
  - Examples that match the varied needs and realities of different types of teachers (e.g., new and seasoned), working with different student demographics, in different geographic and political contexts

Teachers know they need to build connections with students; however, there is often limited time to connect with each student individually. Teachers can build relationships with students in ways that are meaningful and built on mutual respect by sharing stories with the class about their own math learning experiences, or a story that connects those experiences with the decision to become a math teacher. These types of honest personal stories, which include challenges along the way, help to build trust with students.

PRIORITIZE BUILDING RELATIONSHIPS: SAMPLE MESSAGE STATEMENT TESTED WITH TEACHER AUDIENCE



- The message begins by affirming teachers' existing beliefs, and also the real-life constraints they face, which makes it more likely to create an emotional connection and establish credibility with teacher audiences
- The message then offers examples that are easy for teachers to implement and require little, if any, additional time from a class period

PRIORITIZE BUILDING RELATIONSHIPS: IMPACT OF THIS RECOMMENDATION IN THE RESEARCH (1 OF 3)

> **I'm thinking about really trying to understand my students and on a daily basis check up on them."**
>
> –Black Male Teacher, CA

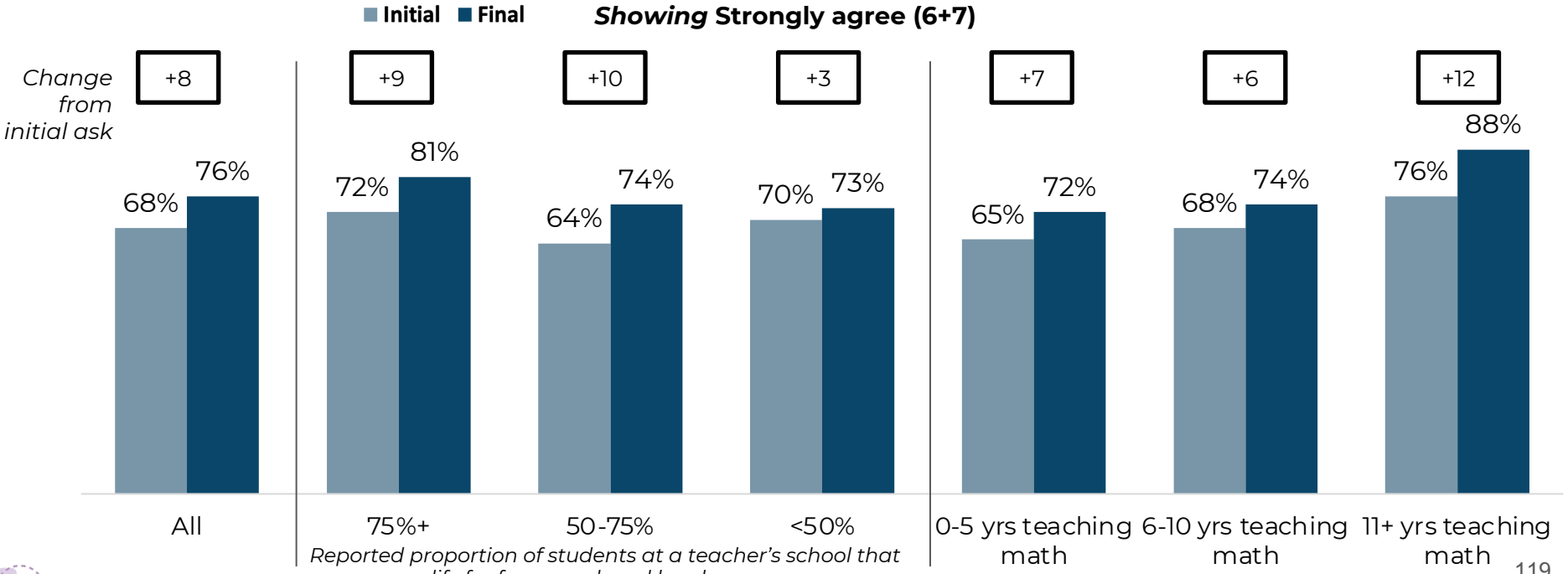
> **Based on what I've seen and heard in this survey, I am thinking about including more of my own math journey in my teaching process. I would love to share more about my own mistakes and times I've felt embarrassed, as well as share why I became so passionate about math."**
>
> –Hispanic Male Teacher, CA

Source: MNP Teacher Survey Data, n820 respondents

PRIORITIZE BUILDING RELATIONSHIPS:
IMPACT OF THIS RECOMMENDATION IN THE RESEARCH (2 OF 3)

Please tell us how much you personally agree or disagree with each of the following statements on a scale of 1 to 7, with 1 meaning you strongly disagree, and 7 meaning you strongly agree.

Getting to know my students personally early in the school year is important for creating the classroom environment they need to learn math



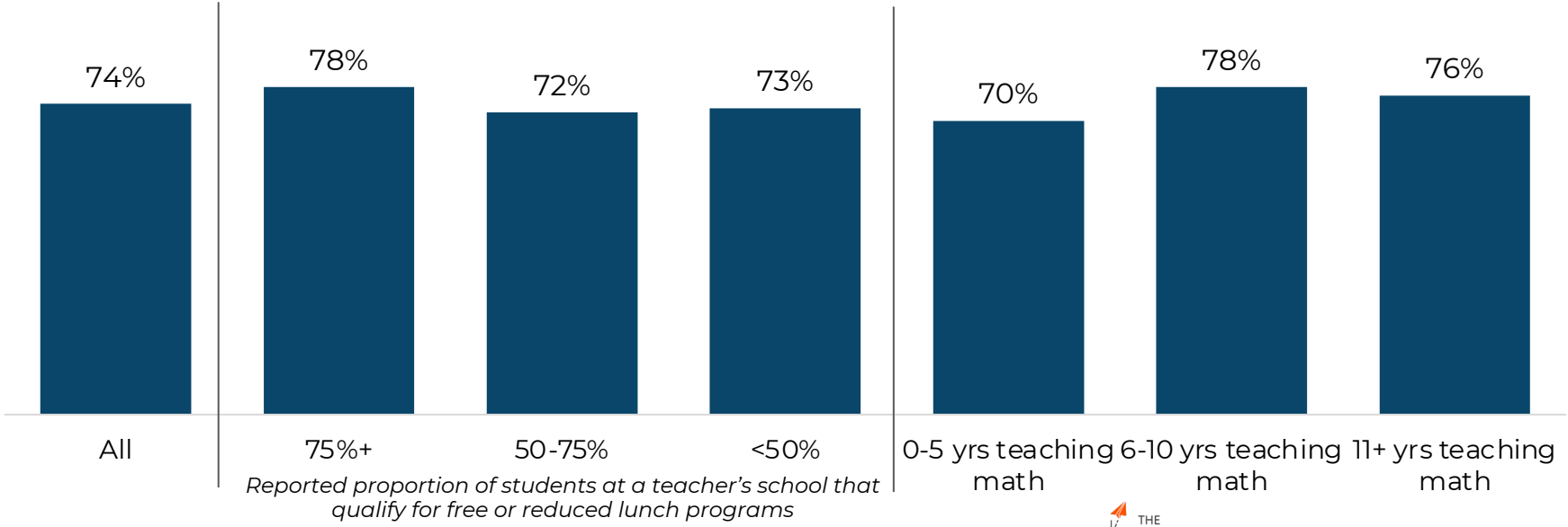
Source: MNP Teacher Survey Data, n820 respondents

PRIORITIZE BUILDING RELATIONSHIPS:
IMPACT OF THIS RECOMMENDATION IN THE RESEARCH (3 OF 3)

For each of the following, please rate whether you are MORE or LESS likely to do it, based on what you have seen or heard in this survey. If it makes no difference, please say so.

Share my math journey story with my students—for example, times I struggled to learn math or why I became a math teacher

Showing* much *or* somewhat *more likely



Source: MNP Teacher Survey Data, n820 respondents

APPENDIX:
DETAILED METHODOLOGY

METHODOLOGY: TEACHER AUDIENCE

- Research participants are full-time public school teachers in California, Florida, New York, or Texas who teach math to at least one of the following grades: 6th, 7th, 8th, 9th or 10th, grade.

- Research participants for qualitative research self-identify as Asian American Pacific Islander (AAPI), Black, Hispanic*, or white, or identify as mixed race and also identify as AAPI, Black, Hispanic, or white to participate. Research participants for the survey were included regardless of race.

- In the qualitative research, participants primarily taught at schools serving lower-income communities; the survey included math teachers regardless of what proportion of students at the teacher's school qualify for free or reduced lunch programs.

*Consistent with what the research team heard in focus group discussions and in surveys, a 2022 Pew Research survey of 3,030 U.S. Hispanic adults found that 53 percent of Hispanics prefer to describe themselves as "Hispanic," 26 percent prefer "Latino," two percent prefer "Latinx," and 18 percent have no preference.

METHODOLOGY: TEACHER QUALITATIVE RESEARCH

- Participants in a live, spoken research discussion are of the same race and gender as one another

- Interviews and discussions are facilitated by an experienced, professional moderator of the same race or ethnicity as the participant(s)
    - Moderators use a guide with questions carefully designed to provide a particular order and flow of discussion; the content of each moderator's guide is informed by prior phases of research

- Focus group participants do not know each other and do not teach in the same school

METHODOLOGY: TEACHER MINDSET RESEARCH

- Mindset research was focused on better understanding:
  - How teachers approach teaching math
  - The opportunities and challenges they have teaching math
  - Their personal journey to becoming a math teacher
- Tested messaging interventions were informed by the Landscape research and further iterated throughout the Mindset research based on cumulative learnings

METHODOLOGY: TEACHER MINDSET LIVE ONLINE FOCUS GROUPS

- The research team conducted eight live online focus group discussions in March and April 2023 among 56 public school teachers in the four priority states teaching math to at least one of 6th, 7th, 8th, or 9th grade, including:
  - 11 AAPI teachers (6 females, 5 males; 2 focus groups)
  - 15 Black teachers (8 females, 7 males; 2 focus groups)
  - 14 Hispanic teachers (7 females, 7 males; 2 focus groups)
  - 16 white teachers (8 females, 8 males; 2 focus groups)

METHODOLOGY: PARENT/GUARDIAN PERSUASION RESEARCH

- Persuasion teacher research was focused on gauging reactions to messaging interventions intended to help teachers help more students learn higher-level math like algebra*

- Tested messaging interventions were informed by the cumulative learnings to that point, including from the Mindset research, and were further iterated over the course of the Persuasion research

*In qualitative research, students and parents frequently expressed a belief that 'basic math' (e.g., addition, subtraction, multiplication and division and sometimes concepts like fractions or percentages) is valuable to know as adults, but many were skeptical about the utility of concepts learned in higher-level math like algebra and beyond. In order to better understand how to talk about these different types of math, the research team tested several ways of describing algebra and beyond in the qualitative research. The phrase 'higher-level math like algebra' was clearest for most students and was also commonly understood by parent/guardian research participants.

METHODOLOGY: ASYNCHRONOUS FOCUS GROUP

- In an online asynchronous focus group (AFG), participants log onto a platform and respond in writing to specific questions and test materials that are programmed in advance.
    - The written discussion takes place across four days spread out over two weeks; this multi-day approach enables the research team to iteratively test materials, incorporate feedback, and revise approaches as they go.
- Trained moderators communicate privately via email with participants (thereby reducing social desirability bias) to probe their responses, and they also facilitate online group written discussions. Participants know whether their response is private to the moderator or posted to the group for discussion.

METHODOLOGY: TEACHER PERSUASION ASYNCHRONOUS FOCUS GROUPS

- The research team conducted two Persuasion AFGs, one in August 2023 and one in October 2023, among 59 public school teachers in the four priority states teaching math to at least one of 6th, 7th, 8th, or 9th grade, including:

August 2023

- 7 AAPI teachers (3 females, 4 males)
- 9 Black teachers (5 females, 4 males)
- 8 Hispanic teachers (4 females, 4 males)
- 8 white teachers (4 females, 4 males)

October 2023

- 2 AAPI teachers (1 female, 1 male)
- 7 Black teachers (4 females, 3 males)
- 8 Hispanic teachers (4 females, 4 males)
- 10 white teachers (6 females, 4 males)

METHODOLOGY: TEACHER PERSUASION LIVE ONLINE FOCUS GROUPS

- The research team conducted eight live online focus group discussions in September 2023 among 50 public school teachers in the four priority states teaching math to at least one of 6th, 7th, 8th, or 9th grade, including:
  - 12 AAPI teachers (6 females, 6 males; 2 focus groups)
  - 11 Black teachers (5 females, 6 males; 2 focus groups)
  - 12 Hispanic teachers (6 females, 6 males; 2 focus groups)
  - 15 white teachers (8 females, 7 males; 2 focus groups)

METHODOLOGY: TEACHER QUANTITATIVE RESEARCH

- The survey was designed to test the effectiveness of various messaging interventions developed based on the prior phases of research and includes both video and print messaging interventions

- This helped to quantify the qualitative results and allowed the research team to further analyze results by subgroups, including race, gender, state, proportion of students at their school qualifying for free or reduced lunch programs, and length of time being a teacher

- The survey was conducted using an online convenience sample panel

METHODOLOGY: PARENT/GUARDIAN PERSUASION ONLINE SURVEY

- The survey was conducted from December 23, 2023 to February 2, 2024 among 820 math teachers of 7th to 10th graders in public school in California, Florida, New York, and Texas, including:

- 71 AAPI teachers
- 181 Black teachers
- 185 Hispanic teachers
- 375 white teachers
- 8 teachers of mixed or other races who did not also identify as AAPI, Black, Hispanic, or white