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NOTETAKER CHECKLIST FORM

(Complete one for each talk.)

Name: Neelesh Tiruviluamala **Email/Phone:** tiruvilu@usc.edu

Speaker's Name: Lawrence Clark, Charles Wilkes, Imani Masters-Goffney, Danny Martin, and Whitney Johnson

Talk Title: Observing Practices that Support Learners' Identity Development and Participation in Mathematics Classrooms

Date: 2 / 11 / 16 **Time:** 1 : 00 **am** (**pm**) **(circle one)**

List 6-12 key words for the talk: Classroom observation, identity development, lens identification, emerging foci in mathematics education pedagogy research

Please summarize the lecture in 5 or fewer sentences:
The speakers talked about the importance of identifying correct lenses through which to observe interactions between teachers, students, and mathematics content. The speakers then discussed a study that they conducted in which they examined whether teachers are aware of their students' mathematical dispositions. They also examined whether this awareness makes a difference in terms of student performance.

CHECK LIST

(This is **NOT** optional, we will **not pay** for **incomplete** forms)

- Introduce yourself to the speaker prior to the talk. Tell them that you will be the note taker, and that you will need to make copies of their notes and materials, if any.
- Obtain ALL presentation materials from speaker. This can be done before the talk is to begin or after the talk; please make arrangements with the speaker as to when you can do this. You may scan and send materials as a .pdf to yourself using the scanner on the 3rd floor.
  - **Computer Presentations**: Obtain a copy of their presentation
  - **Overhead**: Obtain a copy or use the originals and scan them
  - **Blackboard**: Take blackboard notes in black or blue **PEN**. We will **NOT** accept notes in pencil or in colored ink other than black or blue.
  - **Handouts**: Obtain copies of and scan all handouts
- For each talk, all materials must be saved in a single .pdf and named according to the naming convention on the "Materials Received" check list. To do this, compile all materials for a specific talk into one stack with this completed sheet on top and insert face up into the tray on the top of the scanner. Proceed to scan and email the file to yourself. Do this for the materials from each talk.
- When you have emailed all files to yourself, please save and re-name each file according to the naming convention listed below the talk title on the "Materials Received" check list. (*YYYY.MM.DD.TIME.SpeakerLastName*)
- Email the re-named files to notes@msri.org with the workshop name and your name in the subject line.

Observing practices that support learners' identity development and participation in mathematics classrooms

Lawrence M. Clark
University of Maryland

Imani Masters-Goffney
University of Houston

Charles Wilkes
University of Michigan

Danny Bernard Martin
University of Illinois - Chicago

Whitney Johnson
Morgan State University

Mathematical Sciences Research Institute

Contemporary Issues in Mathematics Education Workshop

February 11, 2016

Berkeley, CA

Goals of session

- To consider the importance of identifying a ‘lens’ through which to observe interactions between teachers, students, and mathematics content
- To consider and discuss frequently-referenced and emerging foci in mathematics education research
- To engage in using two different lenses to observe interactions between teachers, students, and mathematics content
- To discuss implications for practice, policy, and mathematics teacher education

Promises and challenges

- Increased use of video in efforts to better understand and identify interactions in mathematics classrooms (Sherin et al., 2009)
- This increased use has great promise, but presents challenges (Derry et al., 2010)

Selection

How does a researcher decide ***which elements of a complex environment should be recorded****, or which aspects of an extensive video corpus should be sampled for further examination?*

(Derry et al., 2010, p. 6)

Analysis

*What **analytical frameworks** and practices **are available**, and which of these are scientifically valid and **appropriate for given research problems**?*

(Derry et al., 2010, p.10)

‘Lens’ identification

The ability to **decompose a complex event** and **select specific parts to pay further attention** to is jointly influenced by a researcher’s perception and by what actually occurs in the presence of the recording device. Psychological studies have shown that **people often “see” events similarly in terms of causal, behavioral, and thematic structures**, although professional vision or **expert ways of interpreting events**, develops through specialized training and experience. (Derry et al., 2010)

Lens Exercise

Frequently-referenced foci in mathematics education pedagogy research

- Effective strategies & practices
- Use of mathematical language
- Discourse practices
- Decision-making
- Questioning
- Maintaining cognitive demand
- Formative assessment strategies
- Wait time

Emerging foci in mathematics education pedagogy research

- Participation & inclusion
- Equitable practices
- Power dynamics
- Positioning
- Agency
- Identity formation and development
- Productive mathematical disposition development

Why are new foci emerging?

- Social turn (Lerman, 2000) and sociopolitical turn (Guiterrez, 2013) in mathematics education research
- The presence and role of multilevel ‘forces’ (Martin, 2000)
- The instructional triangle (Cohen, Raudenbush, & Ball, 2003)
- Persistent underrepresentation and underperformance of subgroups

Clark et al., 2014
Campbell et al., 2014

Are teachers aware of their students' mathematical dispositions?

Does having this awareness make a difference (in terms of student performance)?

Productive disposition

the inclination to see mathematics as sensible, useful, and worthwhile, coupled with a belief in diligence and one's own efficacy. (NRC, 2001, p. 116)

Awareness survey items

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For the majority of my students I have a good sense of their motivations for wanting to succeed in mathematics.

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For the majority of my students I have a good sense of their motivations for wanting to succeed in mathematics.

I have a good sense of what my unsuccessful students perceive as challenges to their mathematical performance.

Awareness survey items

For the majority of my students I have a good sense of their motivations for wanting to succeed in mathematics.

I have a good sense of what my unsuccessful students perceive as challenges to their mathematical performance.

For the majority of my students, I have a good sense of whether or not they see how the mathematics we do in class connects to their everyday lives.

Study design

Study design

443
teachers

Study design

443
teachers

Teachers' mathematical knowledge score

Study design

443
teachers

Teachers' mathematical knowledge score

Teachers' beliefs about teaching and learning math scores

Study design

443
teachers

Teachers' mathematical knowledge score

Teachers' beliefs about teaching and learning math scores

Teachers' awareness of their students' mathematical dispositions score

Study design

443 teachers

Teachers' mathematical knowledge score

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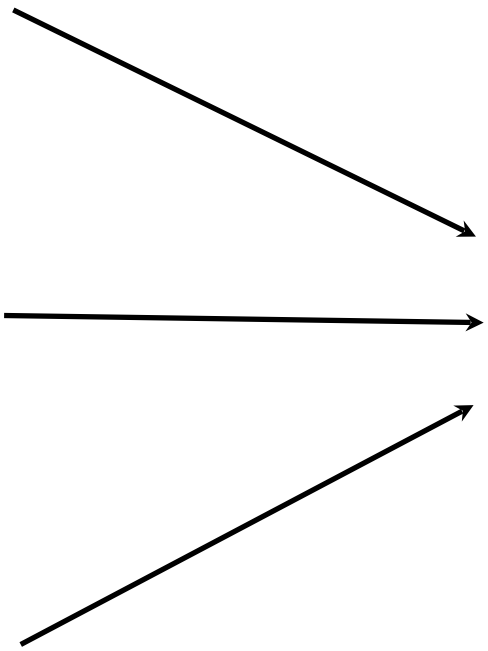
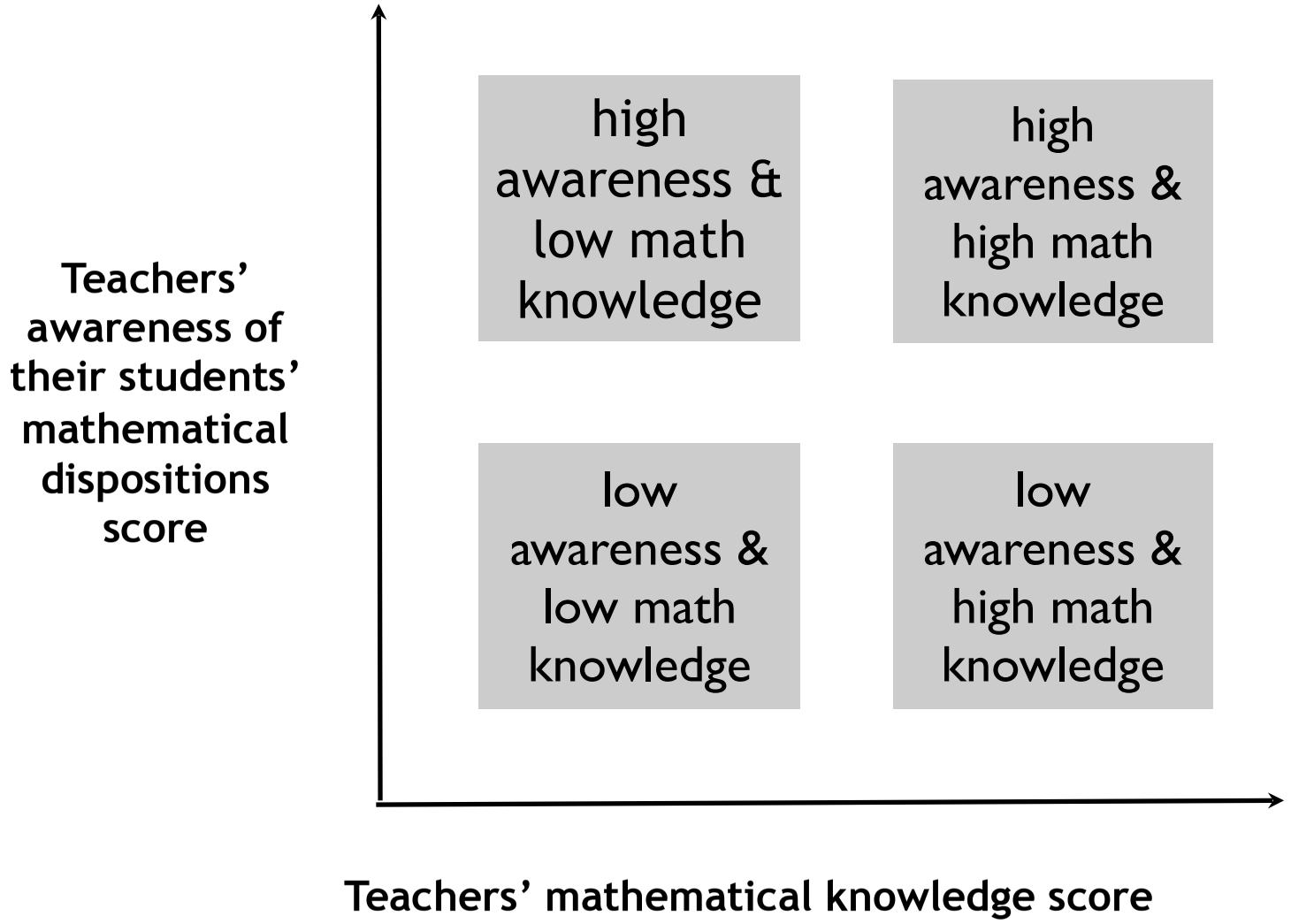
Teachers' awareness of their students' mathematical dispositions score



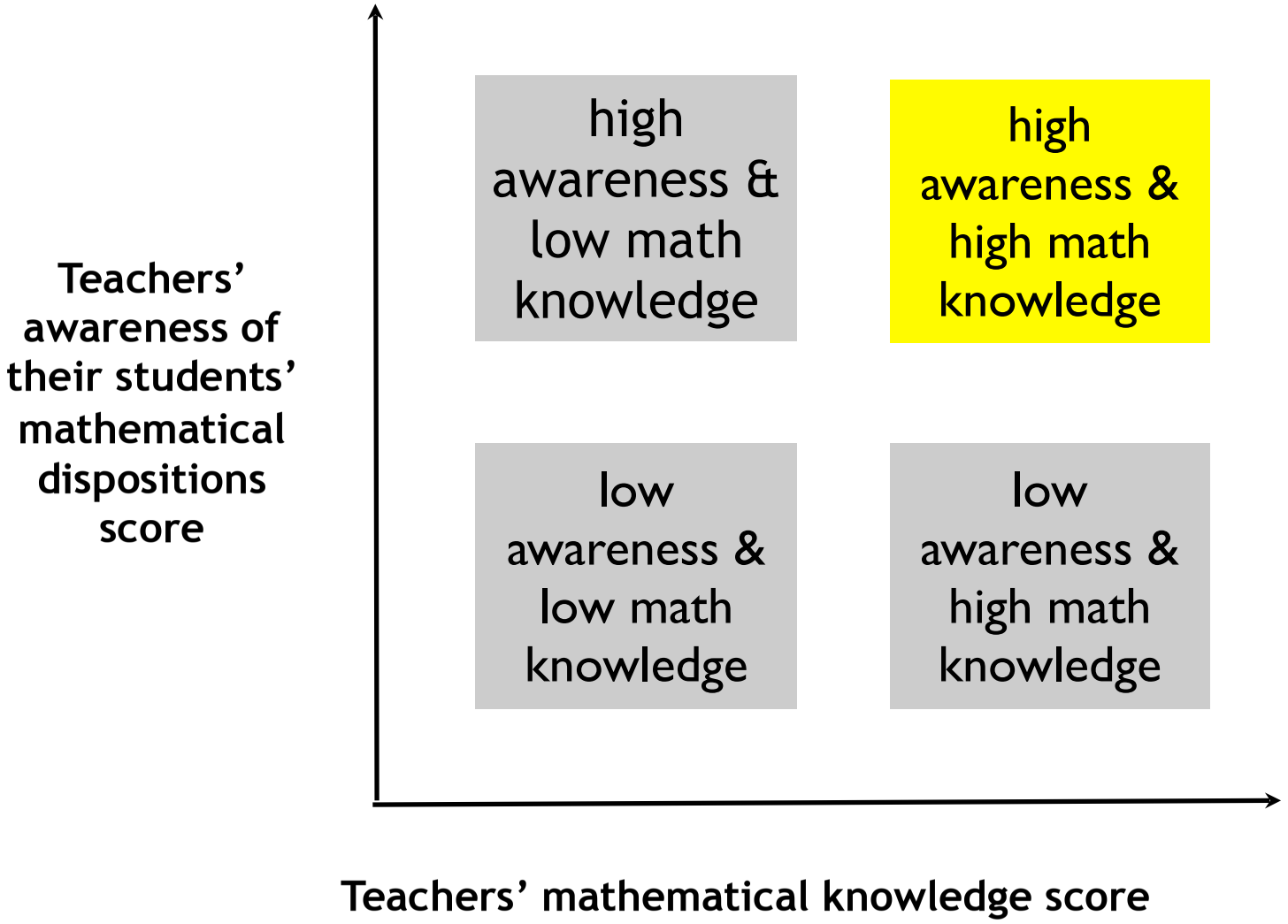
17,300 students

Growth in their students' mathematics achievement over one academic year

Findings


high awareness & low math knowledge
high awareness & high math knowledge
low awareness & low math knowledge
low awareness & high math knowledge
Teachers' awareness of their students' mathematical dispositions score
Teachers' mathematical knowledge score

Findings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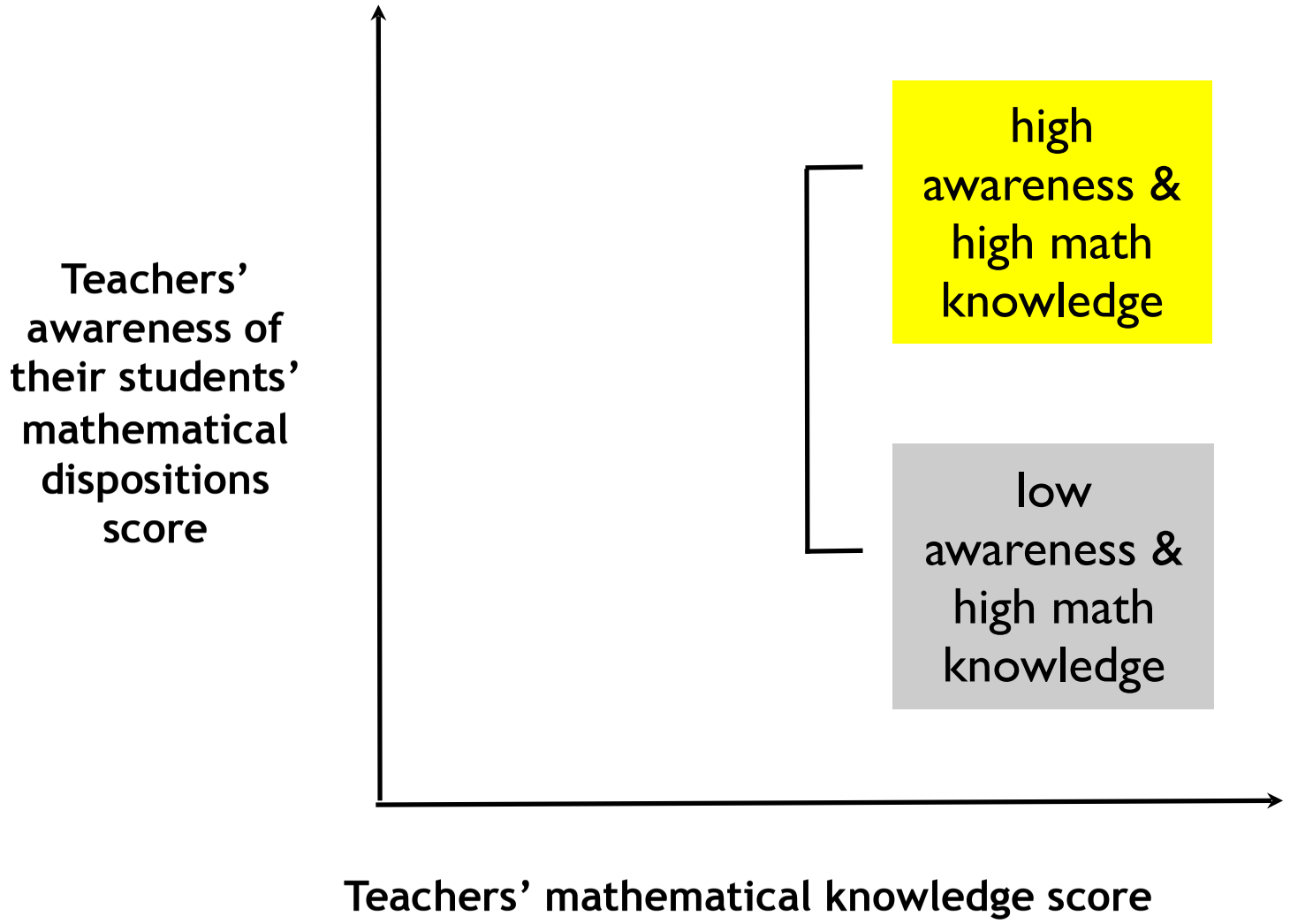
Findings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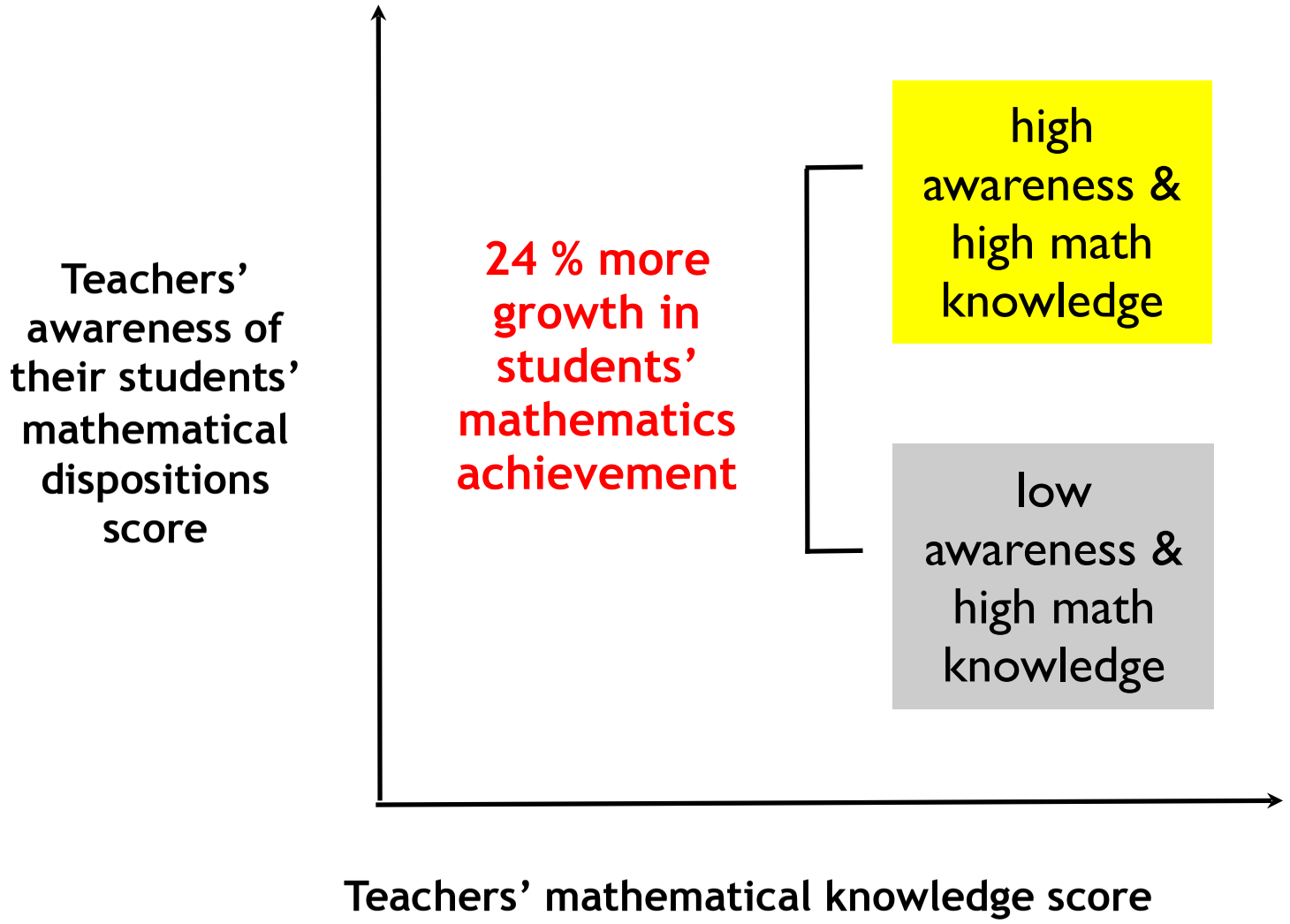
Teachers' mathematical knowledge score

Findings


Teachers' awareness of their students' mathematical dispositions score
24 % more growth in students' mathematics achievement
high awareness & high math knowledge
low awareness & high math knowledge
Teachers' mathematical knowledge score

Observing instruction

Lens 1 – Promotion of precision of mathematical language

Lens 2 – Promotion of high expectations for all students

Lens 1 - Precision

Teachers who attend to precision use correct mathematical language and hold students accountable for doing the same. Mathematically proficient students try to communicate precisely to others. They try to use clear definitions in discussion with others and in their own reasoning. They state the meaning of the symbols they choose, including using the equal sign consistently and appropriately. They are careful about specifying units of measure, and labeling axes to clarify the correspondence with quantities in a problem. They calculate accurately and efficiently, express numerical answers with a degree of precision appropriate for the problem context. In the elementary grades, students give carefully formulated explanations to each other. By the time they reach high school they have learned to examine claims and make explicit use of definitions.

Lens 1 - Attention to precision

None: The teacher does not hold students accountable for using precise mathematical language. The teacher consistently makes incorrect statements or identifies mathematical objects incorrectly. During visual communication, the teacher writes of draws mathematical objects incorrectly.

Some: The teacher holds students accountable for using precise mathematical language at some times, but does not consistently do so. The teacher generally uses correct and precise mathematical language, but also makes a few incorrect statements. Teacher's visual communication may be confusing or contain errors.

Substantial: The teacher consistently uses correct mathematical language and consistently requires students to do so. If a student is imprecise, the teacher engages in corrective actions. All visual communication is clear and error-free.

Lens 2 – High expectations

Look for evidence that the teacher says or does something that conveys the belief that mathematics or the mathematics task at hand is something every student can do. Examples may include encouraging participation by pointing out that a student(s) has something to add, or there is value to a student answer or solution, whether it is mathematically correct or not. Additionally, the teacher may praise student effort or encourage students to keep trying because their effort matters. Examples that represent low expectations would be instances where comments made imply that some students in a classroom are not valued over other students, some students are positioned as “smarter” than others in the class, or not all students are included in the mathematical work of the lesson.

Lens 2 – High expectations

None: There is no evidence that the teacher has high expectations that all students have the capability to engage in the mathematical activities of the lesson. Also select "none" if there is evidence that the teacher positions some students as "smart" and others as "not as smart". In your short answer response, provide examples that support your rating choice.

Some: There is some evidence that the teacher demonstrates that s/he has high expectations that all students have the capability to engage in the mathematical activities of the lesson but there are also instances of low expectations from the video clip. In your short answer, note the evidence and instances you identified.

Substantial: There are multiple instances of evidence that the teacher has high expectations for all students and that all students have the capability to engage in the mathematical activities of the lesson. There are no instances of low expectations. In your short answer, note the actual examples you identified.

Implications

- Practice
- Policy
- Mathematics teacher education

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