

Beyond Caring for the Mathematics: Building Caring Mathematical Relationships with Students

Dan Battey
Rutgers University
dan.battey@gse.rutgers.edu
Tweet me @dan.battey

Good Mathematics Teaching

Conceptualizing “good” teaching in mathematics: teacher knowledge and instructional practices are the two most commonly cited components (Wilson, Cooney, & Stinson, 2005)

Urban Mathematics Instructional Practices

Mathematics teachers of students of color are more likely to:

- Disconnect taught procedures from students’ thinking
- Teach fragmented or unexplained procedures
- Teach mathematics vocabulary out of context
- Assess students based on following steps rather than student thinking or even correct/incorrect answers
- Use less resources such as manipulatives even when available

(Anyon, 1981; Jackson, 2009; Ladson-Billings, 1997; Lubienski, 2002; Means & Knapp, 1991; Spencer, 2009)

Relational Interactions

- Teacher ratings of their relationships with white students are more accurate than with African American and Latinx students
- Teachers rate relationships with African American and Latinx students as more conflictual
- Teacher-student conflict is a better predictor of standardized mathematics performance than closeness

(Jerome, Hamre, & Pianta, 2009; Pianta, La Paro, Payne, Cox, & Bradley, 2002; Pianta, Nimetz, & Bennett, 1997)

- Rated through surveys of teacher and student report (STRS)
- Does not measure specific interactions (CLASS)
- Not content specific (STRS & CLASS)

Stiff (1998): the need to control minority students is a common belief among math teachers & is achieved through teacher-centered classrooms

Frames

- *Frames* guide our interpretation of and response to situations through the systems of categorization (Lackoff, 1987).
- As events and people get categorized, we develop expectations for how activity should unfold and the roles that different individuals will take (Hand, 2012).
- Frames elicited and developed across educational contexts shape interactions that take place, affecting access to learning opportunities.

Framing Students of Color

Think about the frames your students encounter:

- Within society more broadly
- Within schools
- Within mathematics

Common Frames for African American and Latinx Students

- Aggressive or Violent Behavior
- Lack of Intelligence or Ability
- Language Proficiency Confounded with Intelligence
- Lack of Interest in Education
- Cultural or Family Deficiencies

Frames in Classrooms

How might you expect the frames to play out in mathematics classrooms?

- What types of interactions might you expect?
- How might you expect instruction to be modified?
- How might you expect the content to change?
- How could you expect students be organized?
- In what ways might you expect teachers to talk to or about students?

Relational Interactions that Reveal Frames

Classroom interactions can be seen as embodying societal or classroom frames.

“A communicative action or episode of moment-to-moment interaction between teachers and students, occurring through verbal and nonverbal behavior that conveys meaning” (Battey, 2013)

5 Types of Relational Interactions:

- Addressing Behavior
- Framing Student Ability
- Acknowledging Student Contributions
- Attending to Culture or Language
- Setting the Emotional Tone

Relational Interactions

Addressing Behavior -

- Positive (Low): “Some people are doing mathematics very quietly in front.” *Mr. L*
- Negative (Medium): “Don’t touch, don’t turn it over or you will be disqualified. *Don’t touch.*” *Mr. T*

Framing Student Ability -

- Positive (Medium): “Please think about that, I know you can understand it, I know you can get it.” *Ms. S*
- Negative (Low): “The original problem said 20 but I cut it down, um I didn’t want to make it too difficult.” *Mr. D*

Acknowledging Student Contributions -

- Positive (Low): “Ok, I see a couple of people have the answer... pretty good. A couple of people have the answers for both parts.” *Mr. Jones*
- Negative (High): “No, *wrong* answer... Thomas, that is *incorrect.*” (italics – speaker’s emphasis) *M. B*

Relational Interactions (cont.)

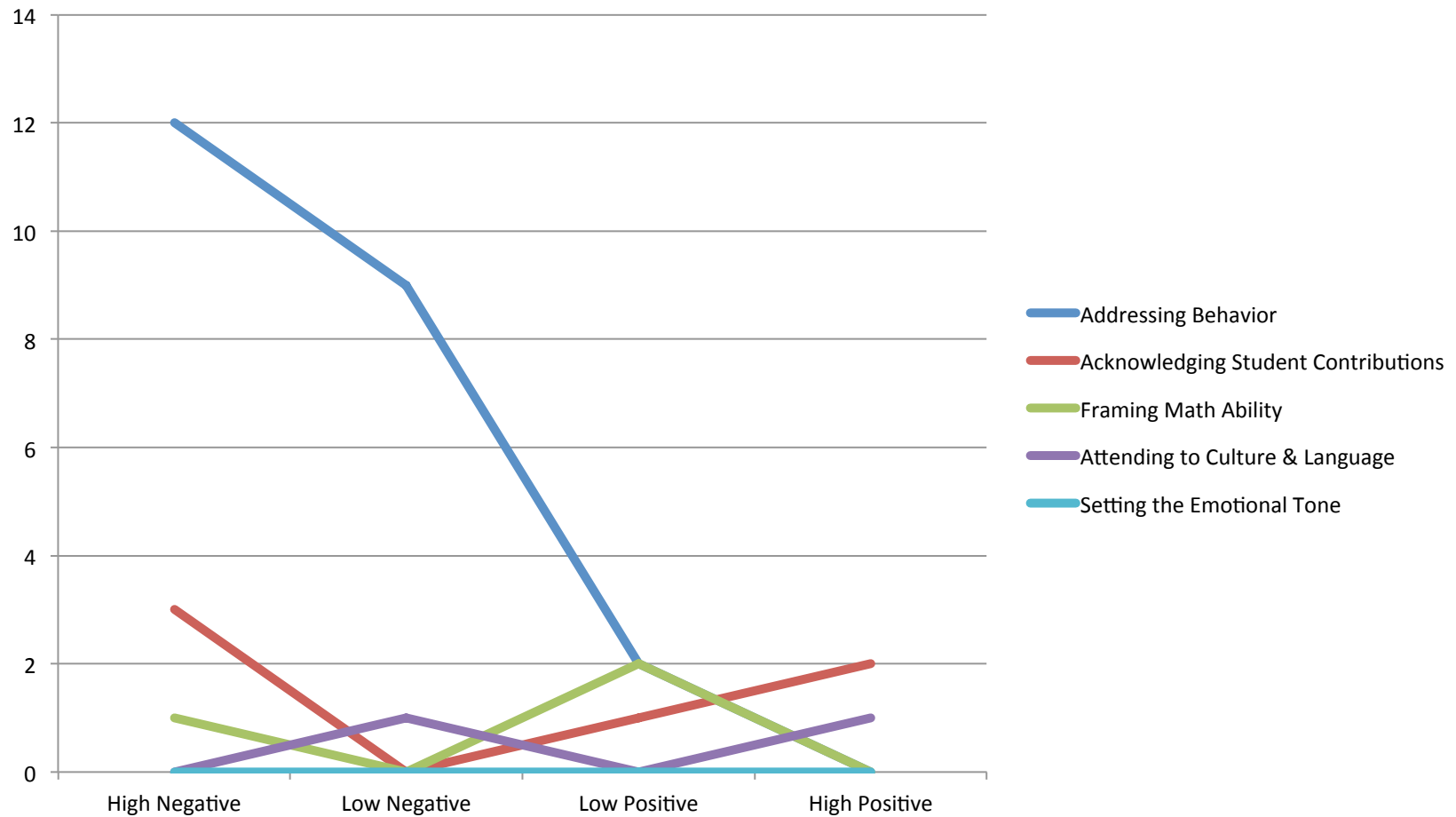
Attending to Culture or Language -

- Positive (Medium): Teacher introduces the problem in the context of the world cup, something many students were discussing as the class began. *Mr. L*
- Negative (High): Teacher corrects African American Vernacular English, never addressing the mathematical contribution of the student. *Ms. S*

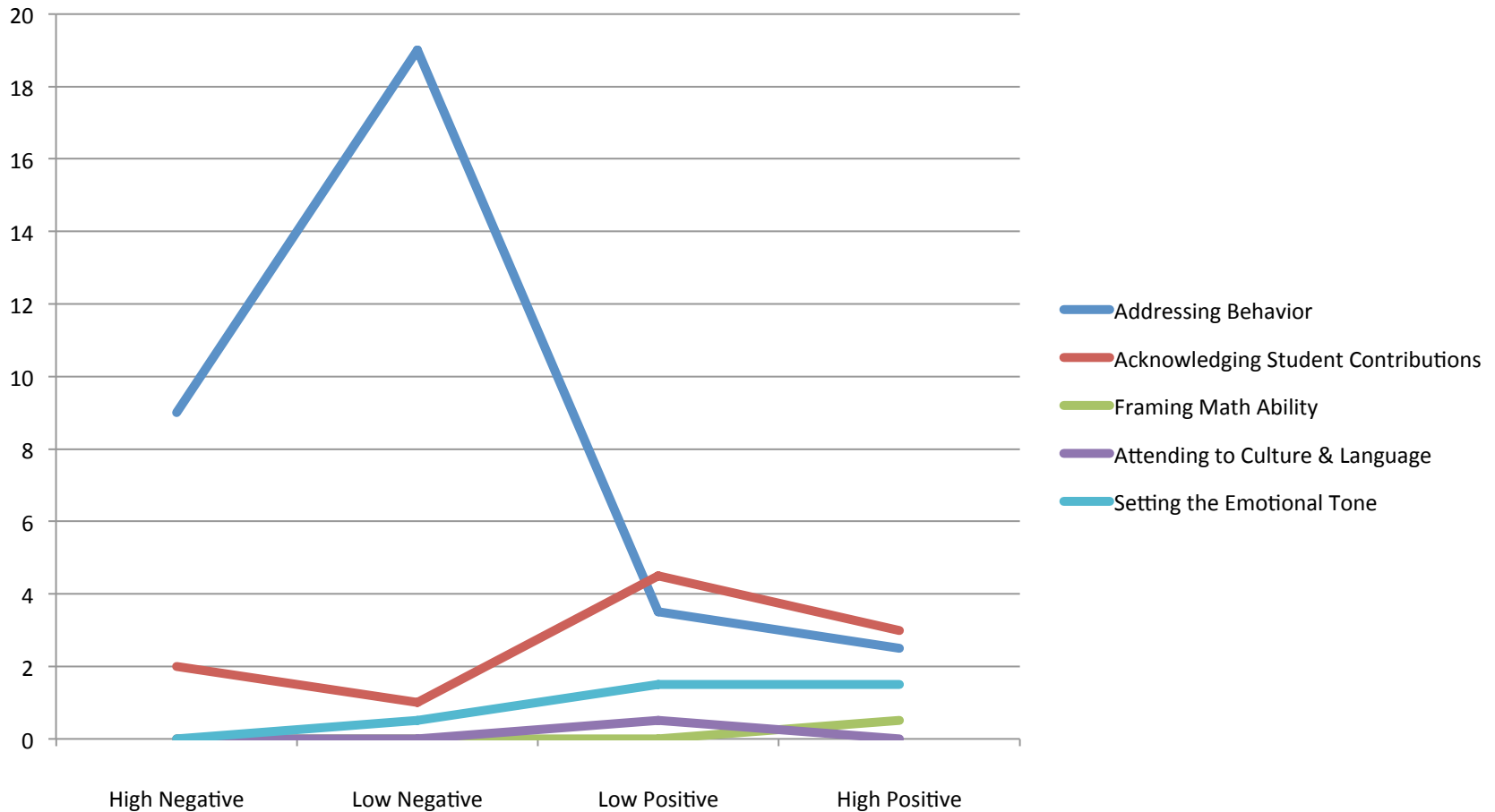
Setting the Emotional Tone

- Positive (High): "Is there anybody that doesn't understand this problem still? Don't be ashamed. You know you can't be ashamed in this class because I tell you all the time, there's a lot of stuff I don't understand in math and math, I'm going to make it one of my... It's one of my goals. If you're working on that too, it's ok." *Mr. G*
- Negative (Low): "If I see you are arguing and this and that, I may have to step in and help you." *Ms. S*

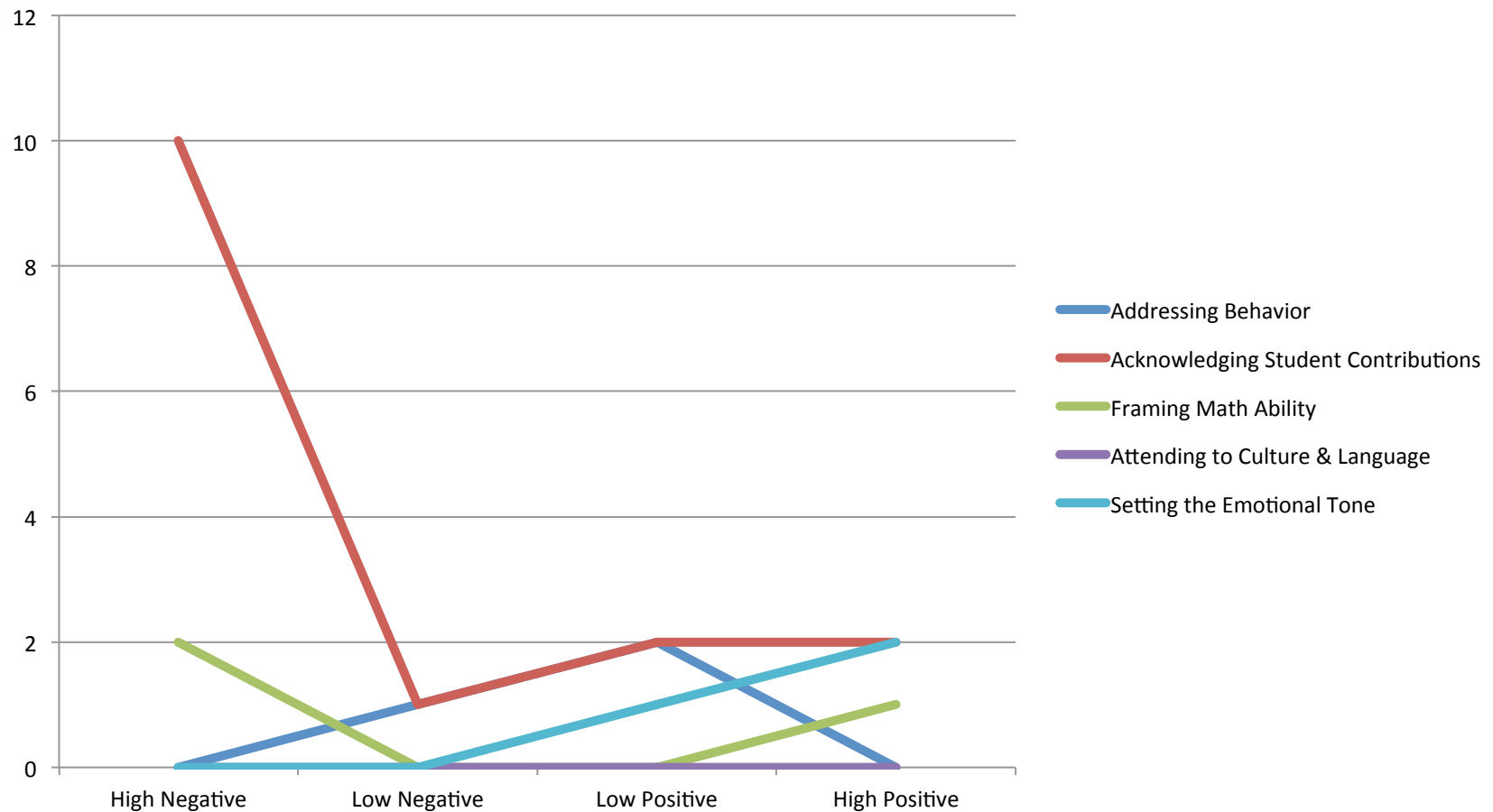
Notice any Frames?



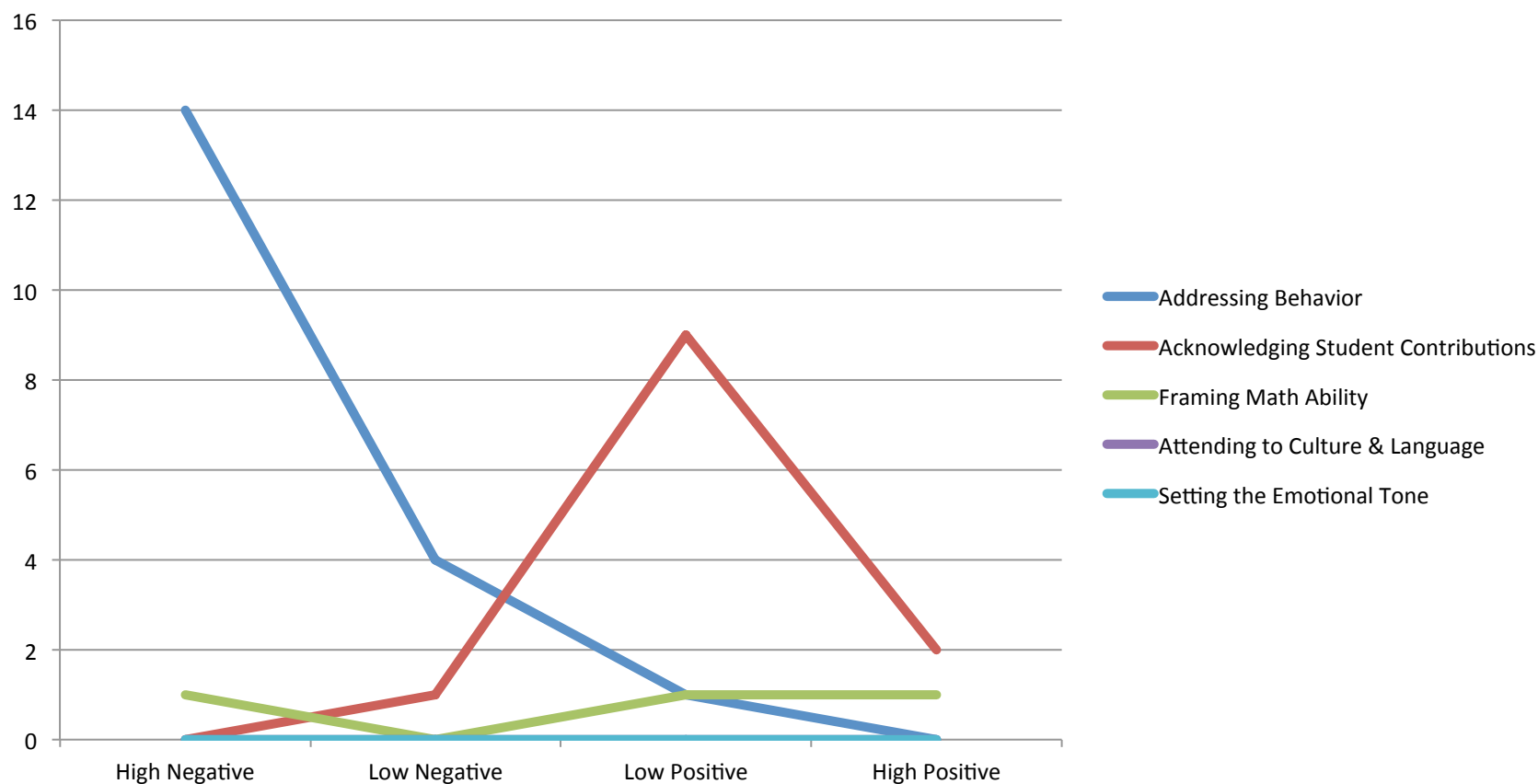
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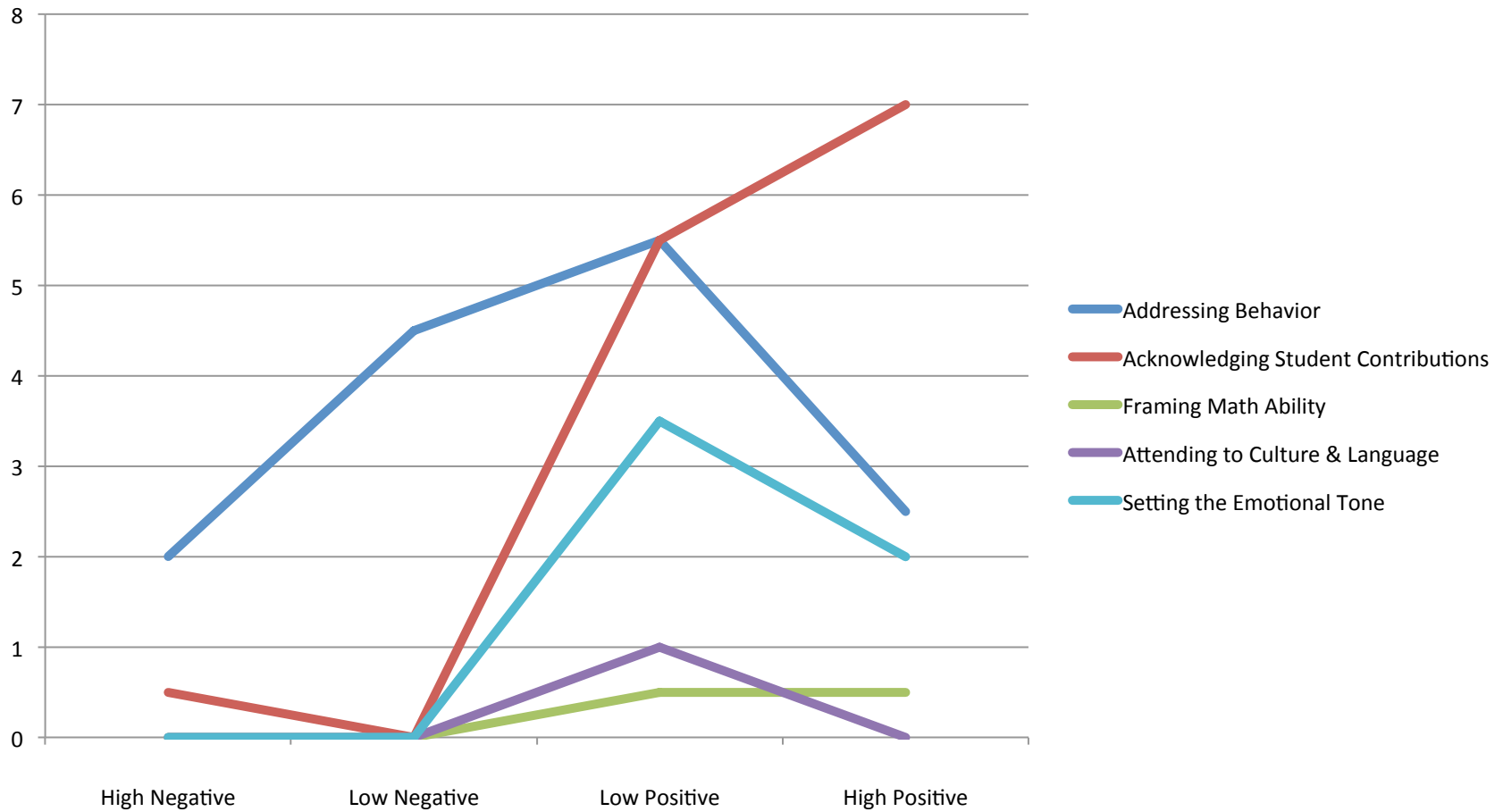
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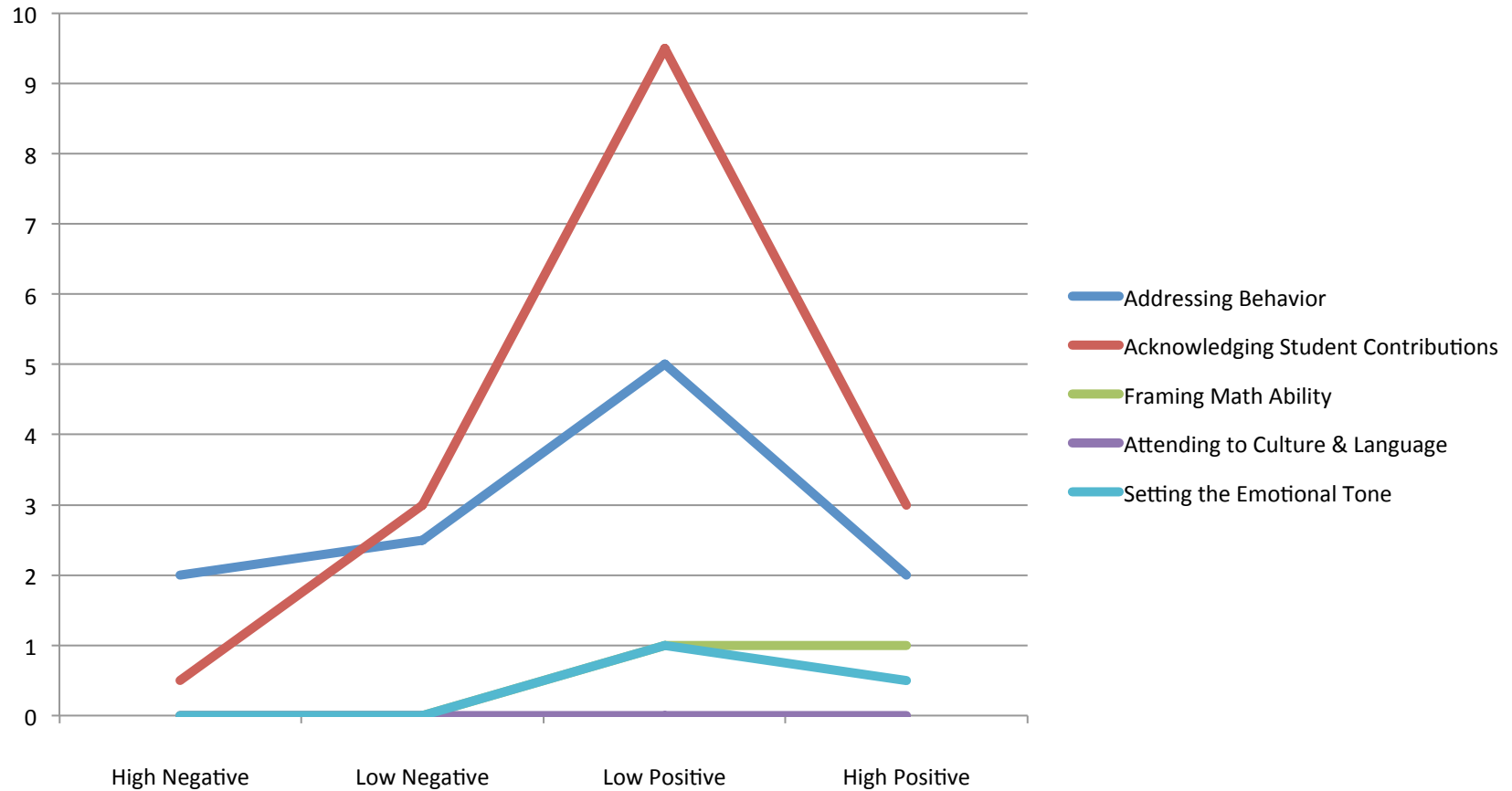
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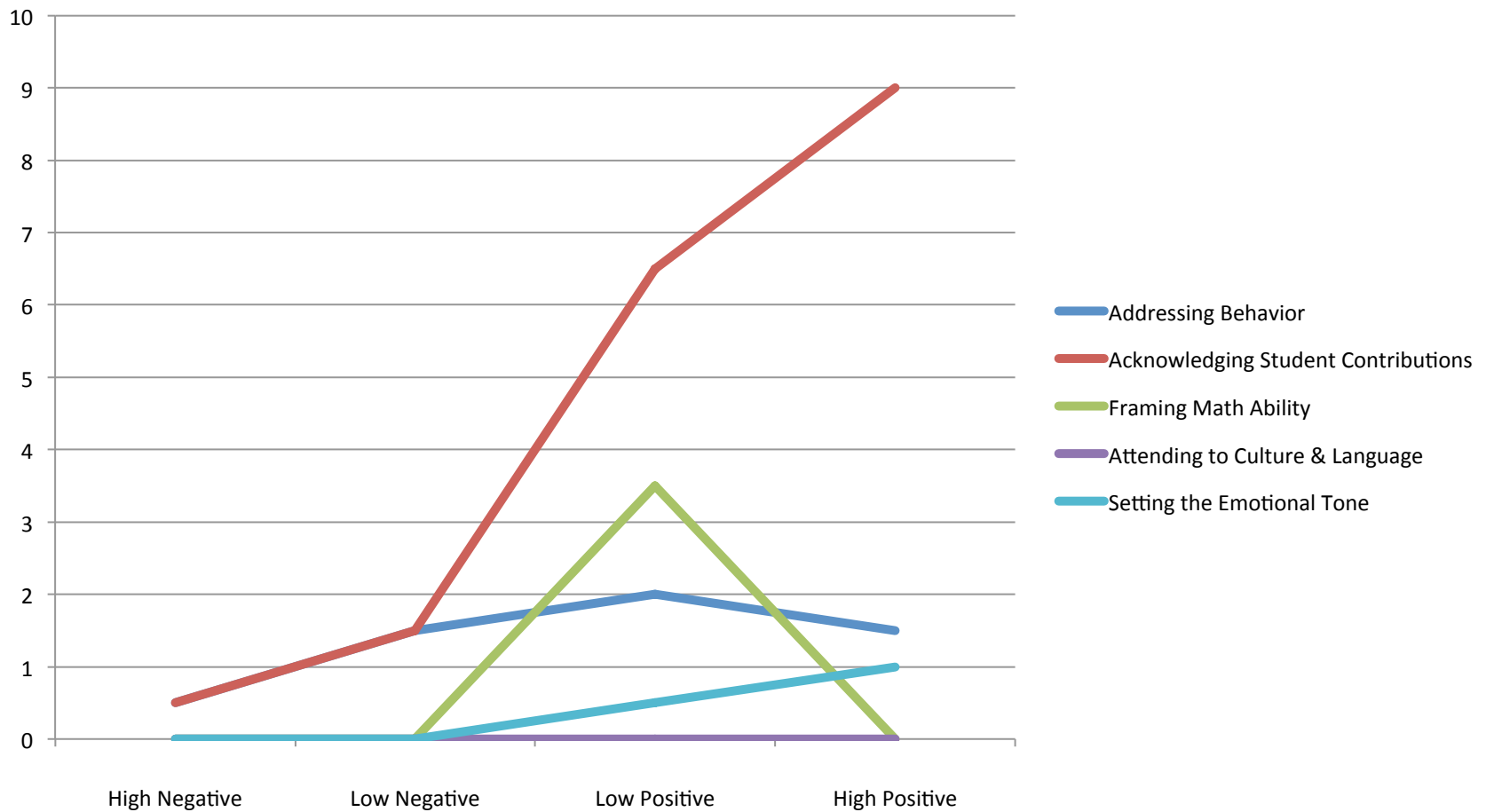
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Notice any Frames?



Relational Interactions: General Findings

- 90% of behavioral interactions are negative
- 65% of acknowledging student contributions are positive
- 55% of all Relational Interactions are negative
- Negative interactions are typically of higher intensity
- RIs account for between 6-14% of changes in mathematics achievement
- No correlation between quality of content instruction and quality of RIs
 - However, the quality of instruction does predict the frequency of RIs

Relational Interactions: Specific Findings

- African American and Latinx males receive overwhelmingly negative feedback on behavior
- Quality of Acknowledging Student Contributions predict increases in achievement for white students
- Quality of Framing Mathematics Ability and Setting the Emotional predict increases in achievement for African American students

Teaching Math through Negative Frames

- Teaching to the basics, only providing opportunities to engage in disconnected procedures, vocabulary out of context, and constraining access to challenging mathematics
- Hyper-focusing on misbehavior
- Punishing behavior harshly or removing students from instruction
- Missing the mathematical contributions of students
- Dismissing incorrect answers as having no value
- Discussing intellectual limitations of students
- Barring students' home language/disparaging student experiences

Teaching Math through Positive Frames

- Support students in learning mathematics (even the basics) through high cognitive demand tasks
- Make expectations for behavior and engagement clear
- Note model behavior and redirect off-task behavior
- Handle behavior as privately as possible/avoid escalating interactions
- Find the value in students' incorrect answers
- Clearly note students' competence
- Explicitly counter negative frames of student ability in math
- Draw on cultural and linguistic resources of students

Basing Instruction on Positive Frames

Watching our own interactional patterns –

- How do you react when students struggle with the “basics”?
- How do you tend to react to misbehavior?
- How do you react to students’ thinking when they give an incorrect answer?
- How do you note ALL students’ competence?
- How do you react to students’ bring in their informal lives and language into the classroom?
- How do you provide space for a variety of emotions in mathematics?

Strategies for Attending to RIs

- Begin to *notice* your relational interactions.
- *Monitor* your own interactions.
 - Or better yet, have a colleague do it for you!
 - Start with one dimension
- Ask yourself: What intentional and *unintentional* messages might my interactions be sending students?
- Strategize how to *modify* your interactions in areas where you find yourself possibly sending negative messages.

Challenge the consumption of negative frames!

Avoid the tendency to generalize from cases!

Thank you for attending!

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Contact me at:

Email: dan.battey@gse.rutgers.edu

Twitter: [@dan.battey](https://twitter.com/dan.battey)