DEVELOPING CARING MATHEMATICS CLASSROOMS THROUGH ATTENDING TO INTERACTIONS

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GOOD MATHEMATICS TEACHING

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

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
- Use less resources such as manipulatives, even when available

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

FRAMES

- *Frames* guide our interpretation of and response to situations through the systems of categorization (Lackoff, 2014).

- 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 AS REVEALING 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 (High): "Don't touch, don't turn it over or you will be disqualified. *Don't touch*." *Mr. T*

Framing Student Ability -

- Positive (Low): "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*

RELATIONAL INTERACTIONS (CONT.)

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*

Attending to Culture or Language -

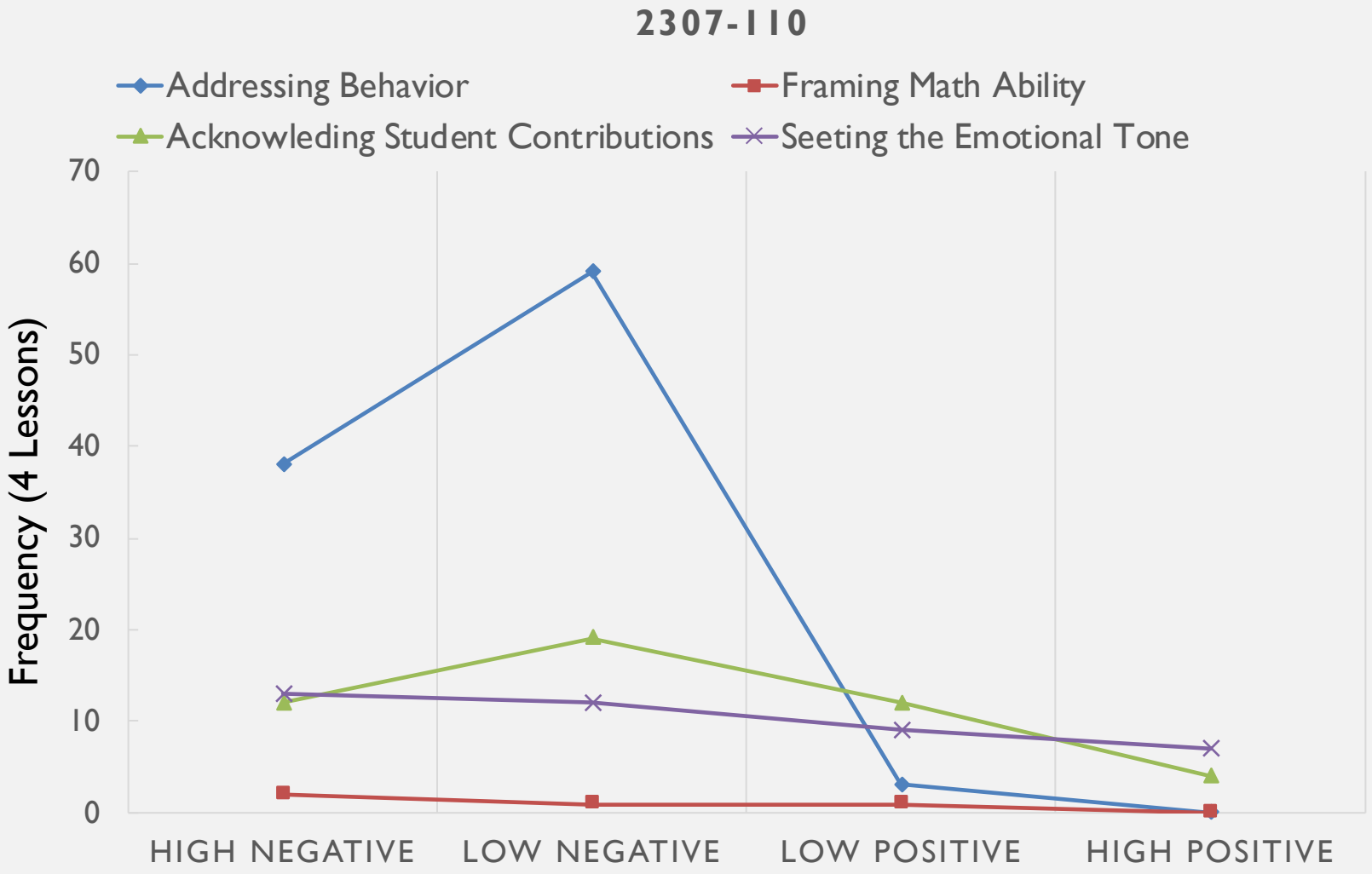
- Positive (High): Teacher introduces the problem in the context of the world cup, something many students were discussing as the class began. *Mr. L*
- Negative (High): Teacher corrects African American Vernacular English, never addressing the mathematical contribution of the student. *Ms. S*

RELATIONAL INTERACTIONS (CONT.)

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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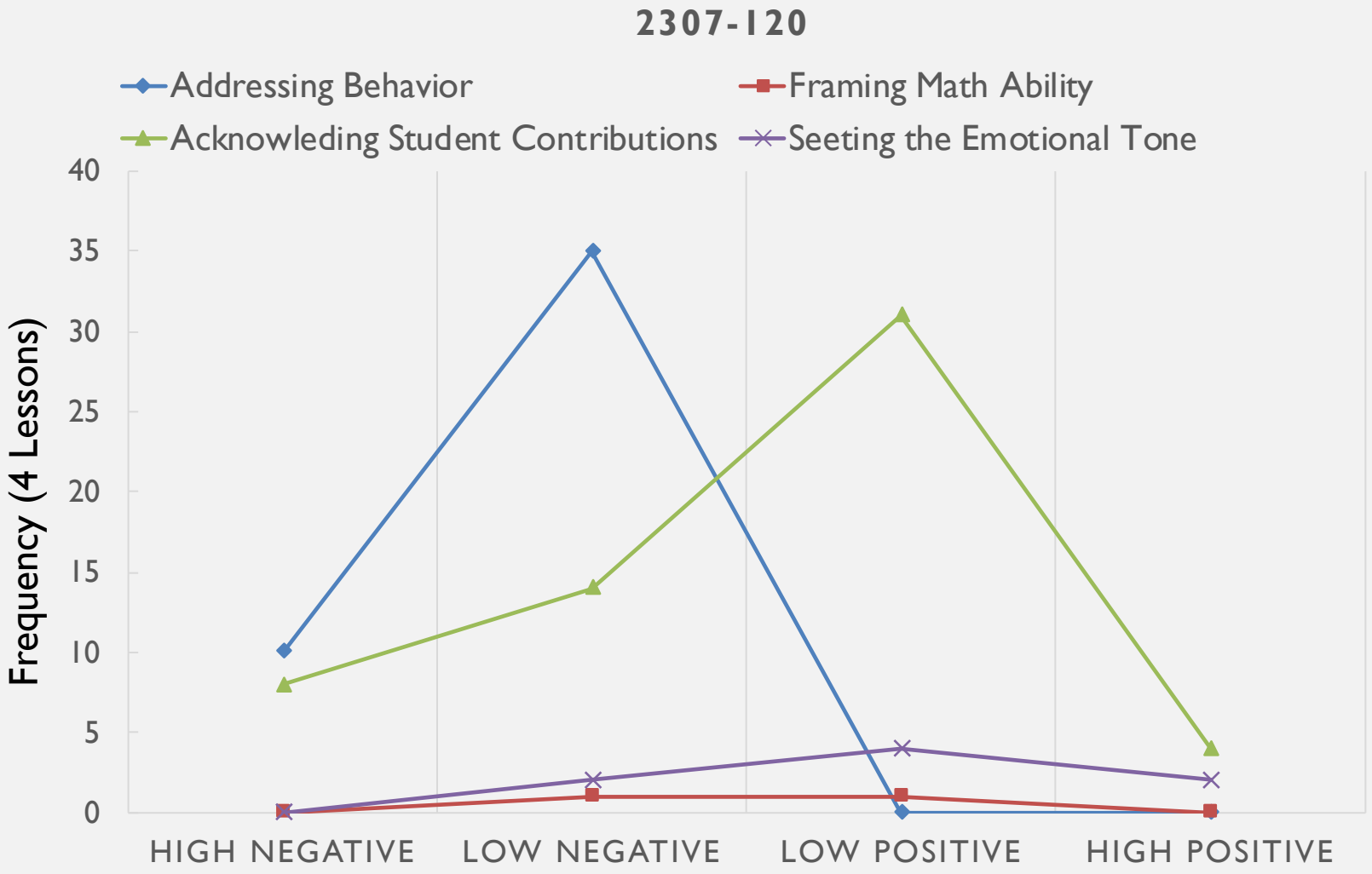

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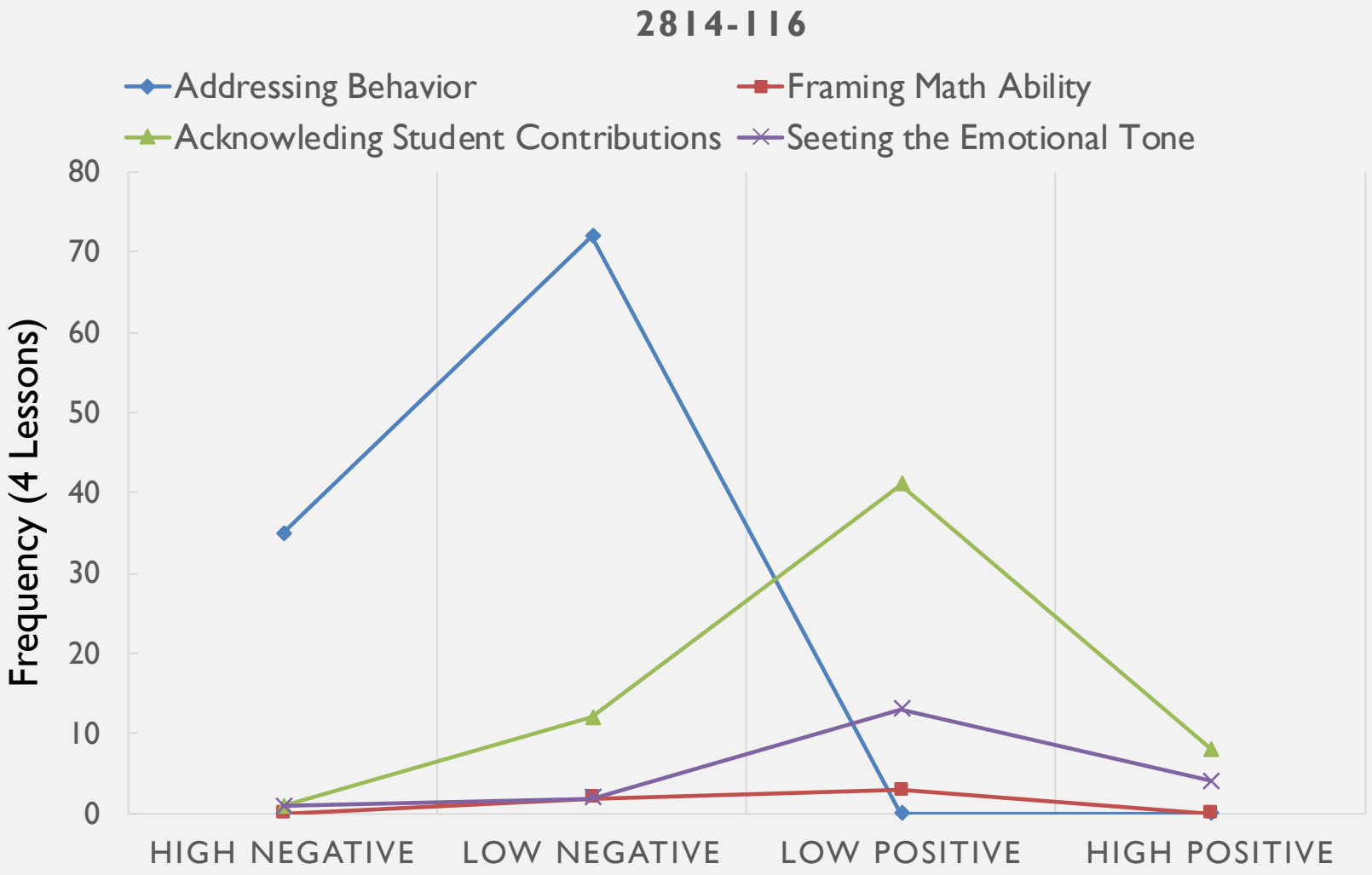

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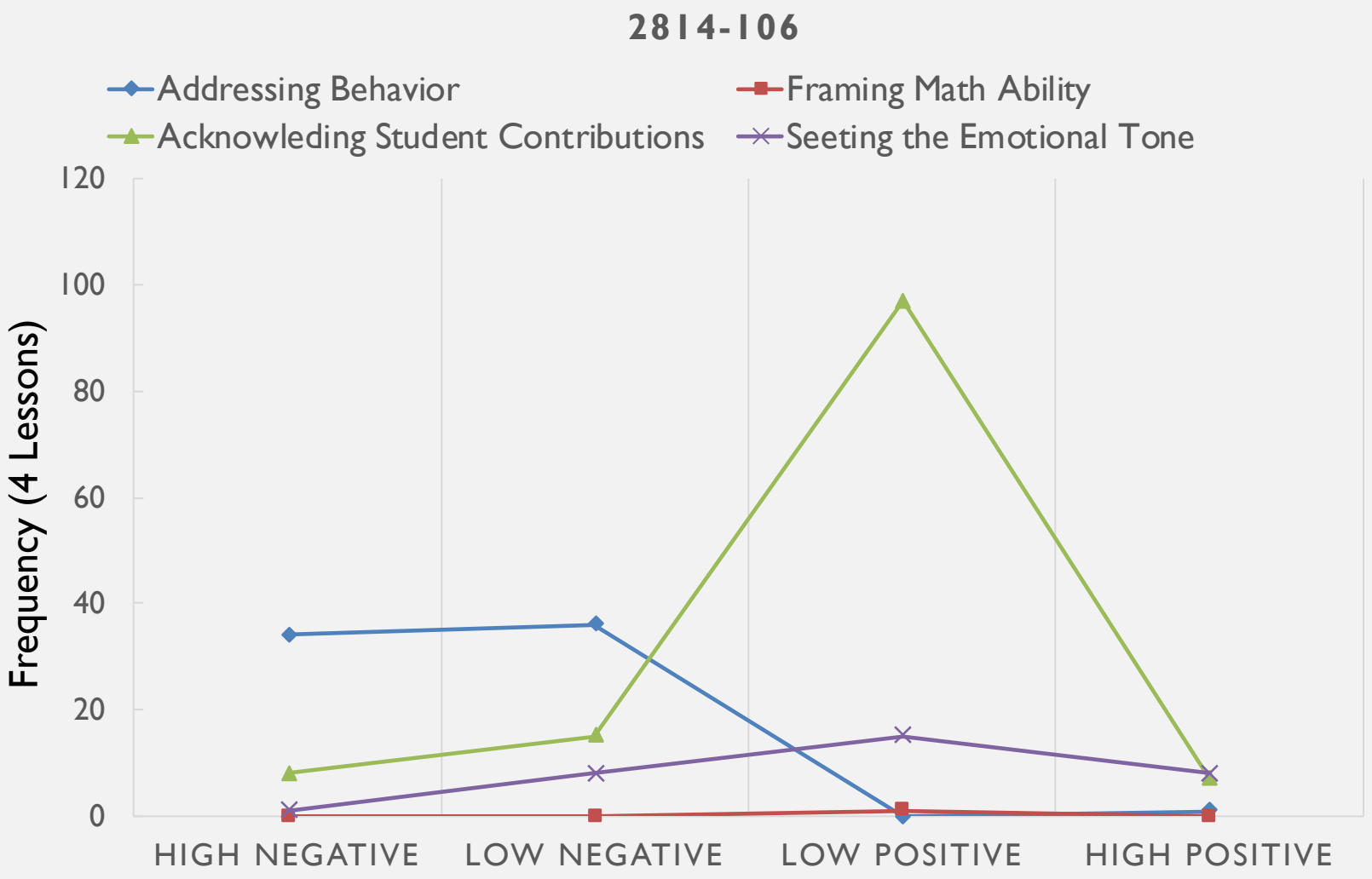

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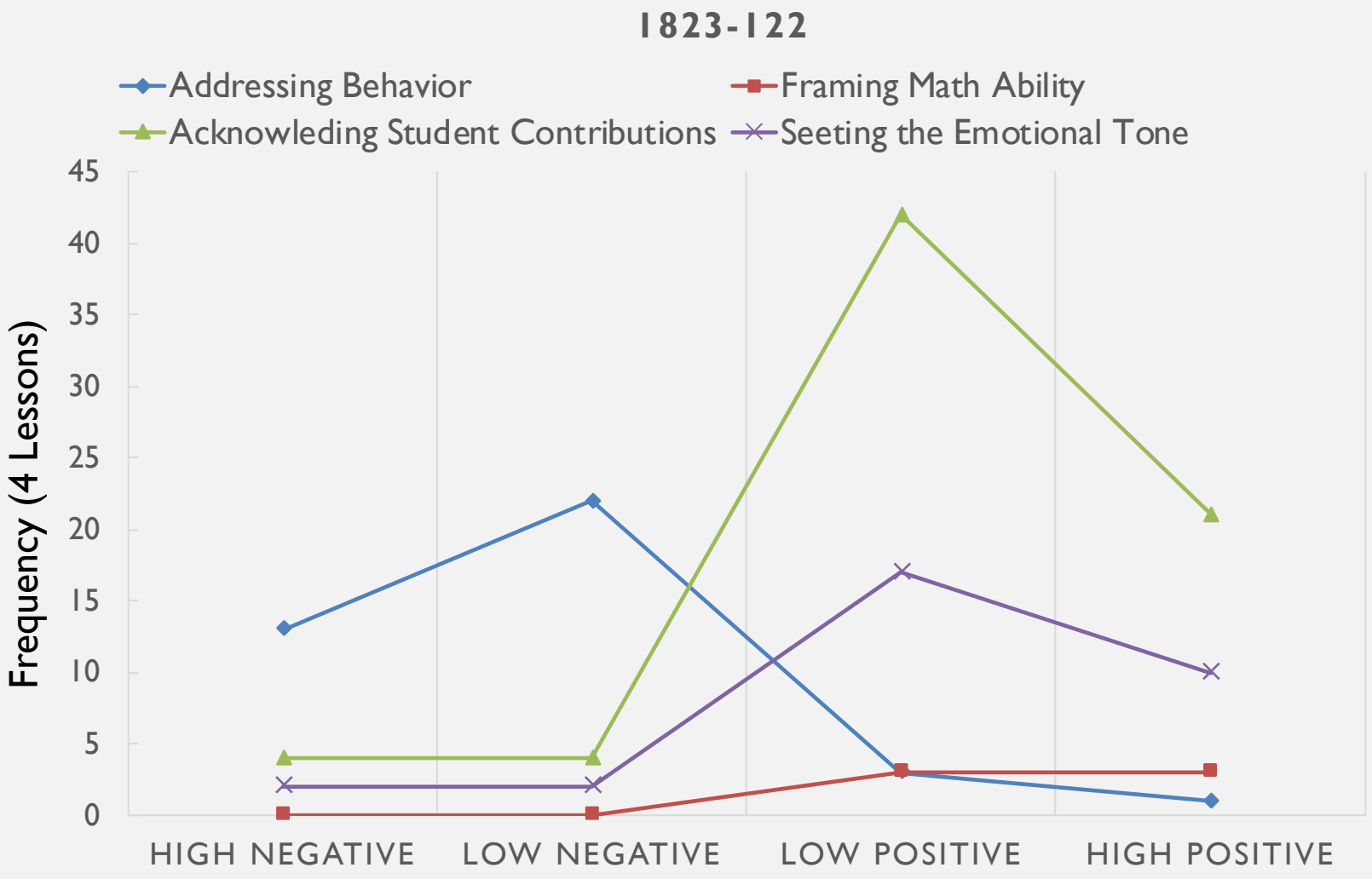

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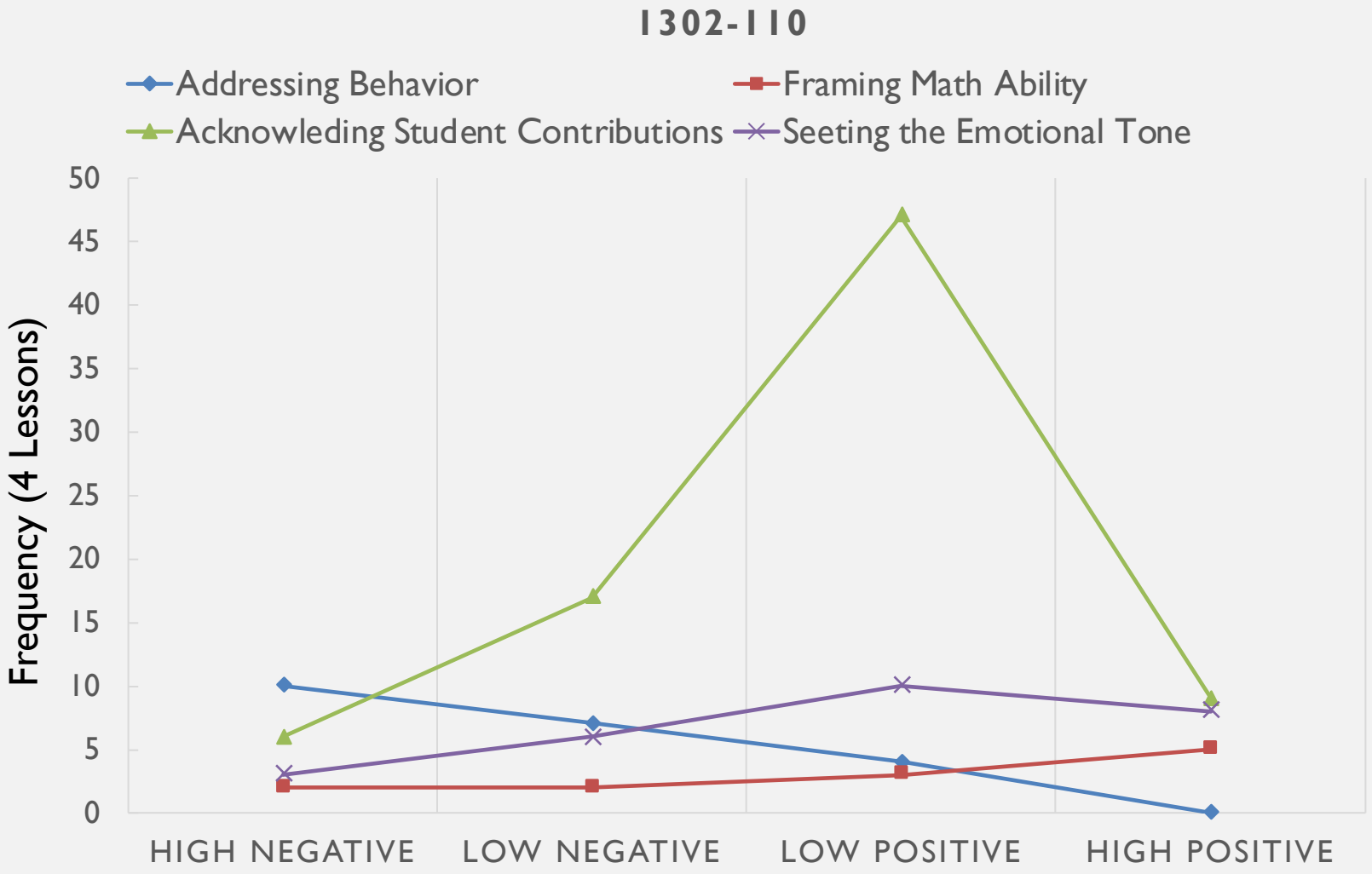

RELATIONAL INTERACTIONS: GENERAL FINDINGS

- 96% of behavioral interactions are negative
- 63% of acknowledging student contributions are positive
- 53% of all Relational Interactions are positive
- Negative interactions are typically of higher intensity
- RIs account for between 11-13% of change in mathematics achievement
- No relationship between the quality of content instruction and *quality* of RIs. However, the quality of content instruction does predict the *frequency* of RIs.

RELATIONAL INTERACTIONS: SPECIFIC FINDINGS

- Negative Addressing Behavior *decreases* achievement for African American students
- Positive Framing Mathematics Ability *increases* in achievement for African American students
- High intensity positive Acknowledging Student Contributions *increases* in achievement for African American students

TEACHERS BUILDING CARING MATHEMATICAL RELATIONSHIPS

Emphasizing Competence:

- Expecting student understanding
- Normalizing student difficulties
- Finding valid mathematics in students' ideas

Relating to Students:

- Leading with Care
- Drawing on student interests
- Building on student's informal language

NORMALIZING DIFFICULTY AND LEADING WITH CARE

T: Yeah, I know that [adding two negatives] can be a struggle for all you students. So let's talk about it as a class. Now, let me remind you students. Let me remind you. I know why this throws you off. I know why, so let me help you.

T: S1, whatcha doin? You don't feel well? What can I do to help? Well try to do the best you can.

TEACHERS BUILDING CARING MATHEMATICAL RELATIONSHIPS (CONT.)

Building Collective Responsibility:

- Crediting students with ideas
- Connecting students ideas to build the mathematics
- Students supporting each other

Undercurrents of praise and humor

COLLECTIVE RESPONSIBILITY

T: What is a net?

S1: It's like a shape laid out.

T: Ok, that's good, so you said a net is a shape that's laid out. Ok, Leonard, can you add to that?

S2: You can fold it into a solid figure.

T: OK! A net that's laid out (points to S1) that you can fold into a solid figure (points to S2). Before you can fold it into a solid figure, what do you have to do? What you gotta do? (students answers are mumbling but not offering an answer) Ok, let's, let's do it again. S1 said a net was, give it to me again S1.

S1: A shape that's laid out

T: So a shape that's laid out, flat, on paper, what dimension is that?

S3: 2-dimensional.

T: And then S2 said when you fold it together you get what, S2?

S2: A solid figure.

T: A solid figure which is three dimensional. Do you all follow?

NOTICING RIS THAT ALIGN WITH 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

MONITORING RIS

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 when students' bring their informal lives and language into the classroom?
- How do you provide space for a variety of emotions in mathematics?

MODIFYING RIS TO ALIGN WITH 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

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 to 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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