

# LEVERAGING THE POWER OF TEACHING TO DISRUPT INJUSTICE

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SCHOOL OF EDUCATION




TeachingWorks



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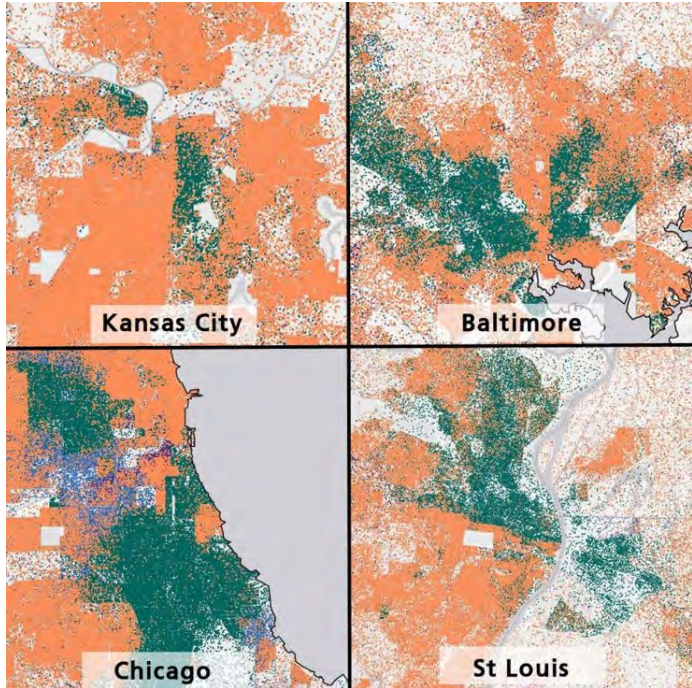


There is an increasingly shared  
recognition that racism and  
oppression are systemic and  
rooted in our histories and  
institutions.



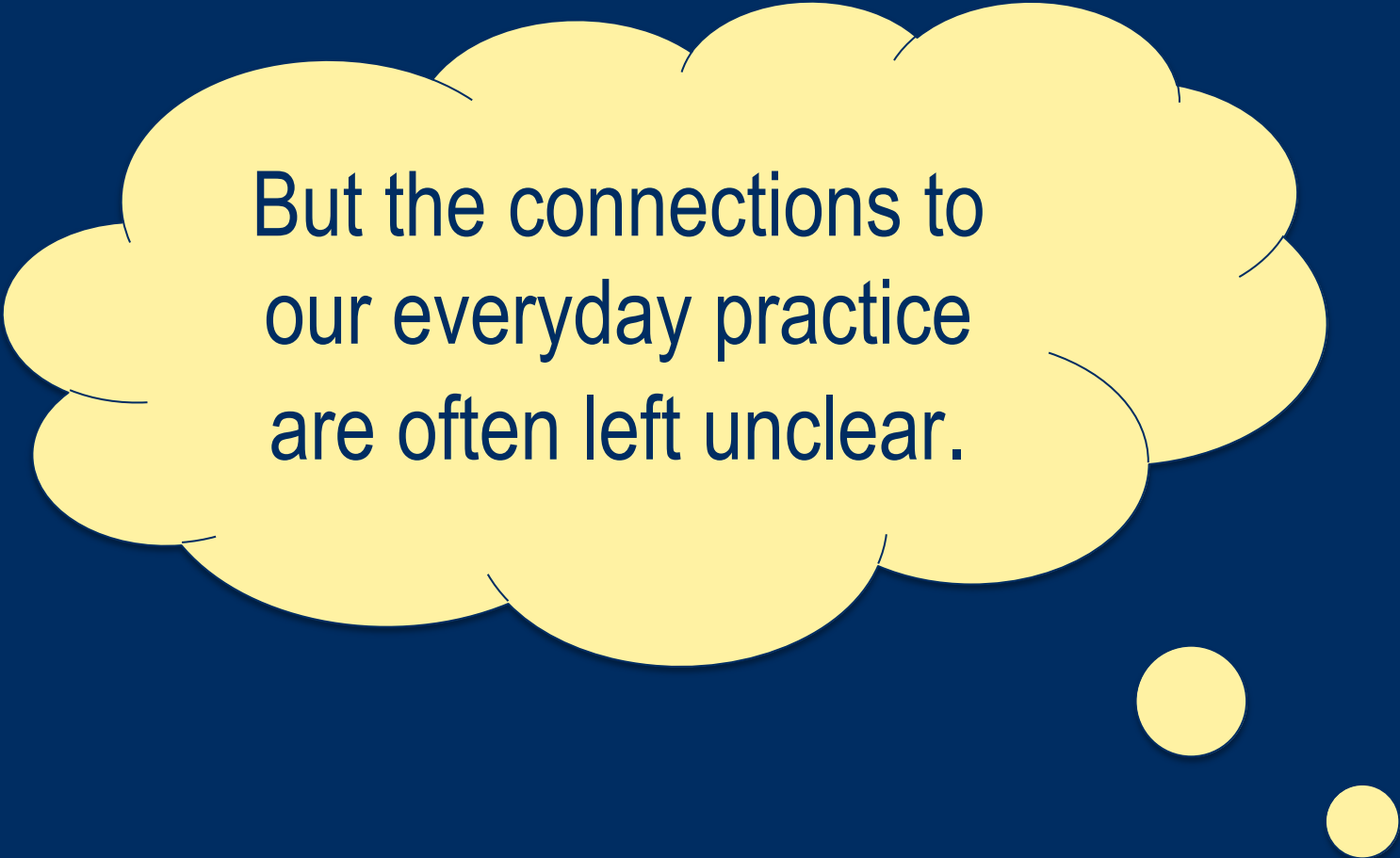
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OUR CRIMINAL JUSTICE SYSTEM NEEDS REFORM

Being uninsured is *deadly*.  
A comprehensive review of studies, published in the Annals of Internal Medicine, confirms that **thousands of people die each year because they don't have coverage**. We need to close these gaps and cover everybody with improved Medicare for all.  
PNHP  [pnhp.org/mortality](https://pnhp.org/mortality)



But the connections to  
our everyday practice  
are often left unclear.



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But the connections to our everyday practice are often left unclear.

And without making those connections, the patterns are reproduced through normalized practices.











1. Teaching is powerful. When it is done with care and judgment, students can thrive — learn mathematics, develop positive identities, learn to value others, and work collectively.
2. Teaching also involves enormous discretion.
3. How that discretion is exercised can either reinforce patterns of social, personal, and epistemic injustice and harm, or disrupt these patterns.

# THE UNIQUE POTENTIAL OF THE STEM FIELDS TO PERPETUATE—OR DISRUPT—INJUSTICE

- The dominant representations of STEM fields as white, male, heteronormative, western
- The melding of “intelligence” and mathematics/science (and the history of “intelligence”)
- Narrow constructions of “mathematics” and “science” that uphold these
- The rich resources of mathematics and science in many communities and cultures
- The power afforded by seeing oneself as “smart” or “good at math/science”
- The imaginative creative space possible in mathematics and science, for invention, experimentation, construction, representation, and performance
- The assets of collective work in mathematics and science

What would it take to harness the power of mathematics teaching to disrupt white supremacy and oppression?



What would it take to harness the power of mathematics teaching to disrupt white supremacy and oppression?

leveraging the many discretionary spaces of teaching



What would it take to harness the power of mathematics teaching to disrupt white supremacy and oppression?

and knowing mathematics in ways that support that work

leveraging the many discretionary spaces of teaching



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This work—to disrupt longstanding patterns of racial, social, personal, and epistemic injustice and harm—is ever more crucial as we all consider what it would take to create a truly **healthy** return to school.



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# LET'S LOOK INSIDE SOME MATHEMATICS TEACHING



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What number does the orange arrow point to?  
Explain how you figured it out.





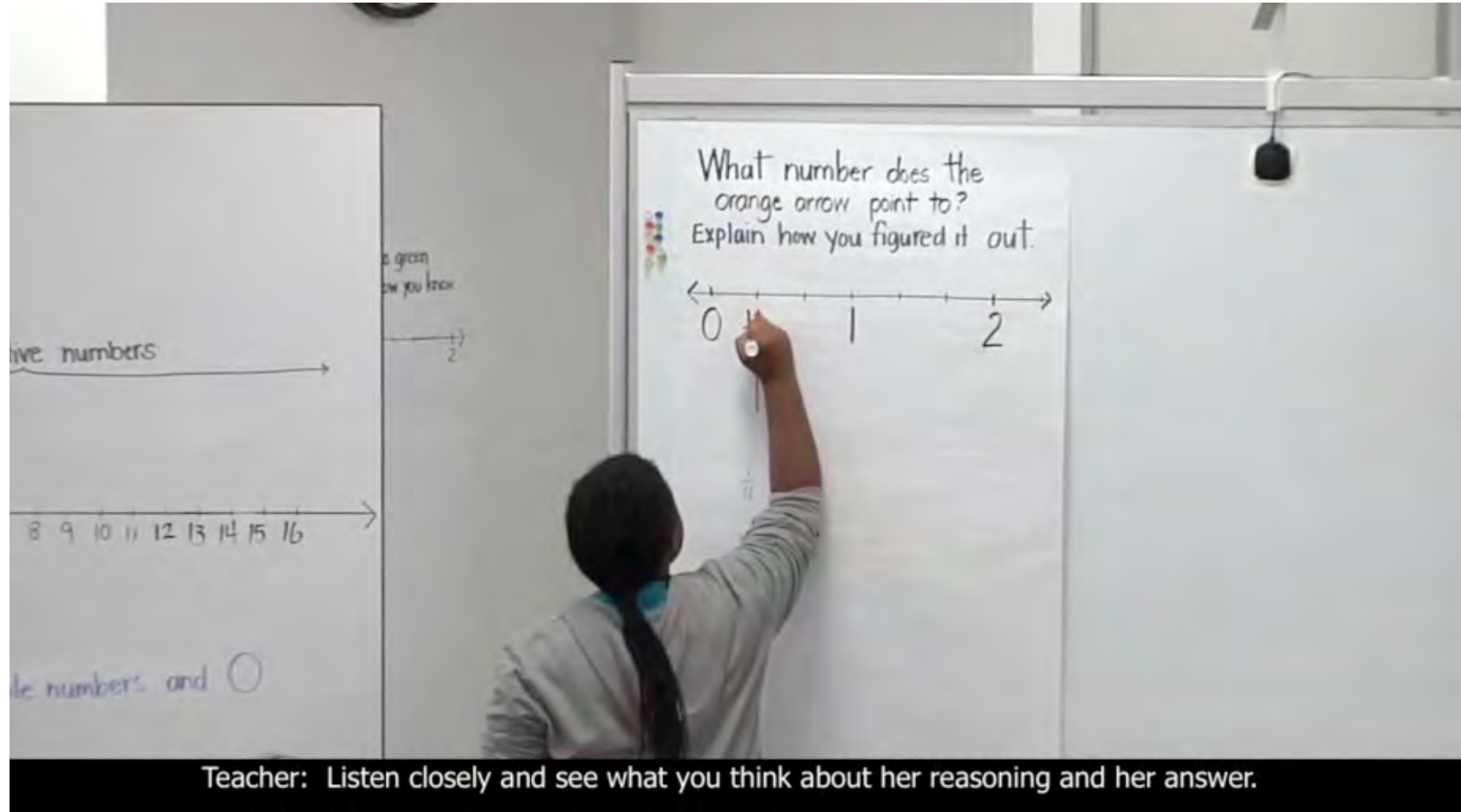
# ANIYAH AND TONI



# VIEWING FOCUS

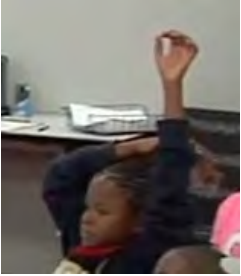
What do you think are the most frequent comments that educators make about Toni? About Aniyah?

# VIDEO: ANIYAH AND TONI



This video and additional supporting materials are available online [here](#).

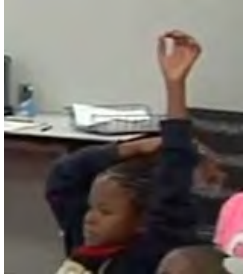
# WHAT ARE THE MOST FREQUENT COMMENTS?



**TONI**

- Toni is fooling around with another student across the room and laughing at Aniyah.
- Toni is being disrespectful to Aniyah.
- Toni knows that Aniyah is wrong and is trying to point that out.

# WHAT ARE THE MOST FREQUENT COMMENTS?



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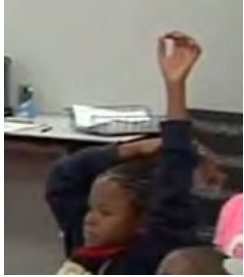
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**ANIYAH**

- Aniyah has the wrong answer.
- Aniyah should not remain at the board with a wrong answer. She probably feels bad and is possibly confusing other children.
- Aniyah is harmed by how Toni is treating her.

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What commonly  
would happen  
next?

What are the  
possible results?



# IN THIS MOMENT, A MOVE CAN REPRODUCE PATTERNS OF MARGINALIZATION OF BLACK GIRLS AND REDUCTIONIST VIEWS OF MATH

## NORMALIZED NEXT MOVES

- “Can someone help Aniyah out and show what we call the whole on the number line?”
- “Great, Aniyah, almost! But remember that the whole is from 0 to 1.”
- “Thumbs up if you agree with Aniyah; thumbs down if you disagree.”

## RESULTS

- Aniyah is excluded and her mathematical contributions are sidelined.
- Aniyah’s answer is signaled to be incorrect and she is positioned as not having contributed to the work.
- Aniyah’s solution is “voted” on by her classmates.



# IN THIS MOMENT, TOO

## NORMALIZED NEXT MOVES

- “Toni, when you’re ready to participate appropriately by not playing with your hair and laughing, and have a question to ask, I will come back to you.”
- “You need to be a better listener, Toni. Aniyah already explained why she picked one-seventh. Who else has a real question for Aniyah?”
- “In this classroom, we are respectful of one another. When you are ready to be respectful, you can rejoin the discussion, Toni.”

## RESULTS

- Toni is publicly excluded from the discussion.
- Toni is judged to not be listening, her question is judged as not good, and she is excluded from the discussion.
- Toni is publicly named and shamed as “disrespectful,” rebuked, and her role in advancing the mathematics is sidelined.

# WHAT DO THESE DIFFERENT TEACHING MOVES DO TO TONI AND ANIYAH? AND THE OTHER CHILDREN?

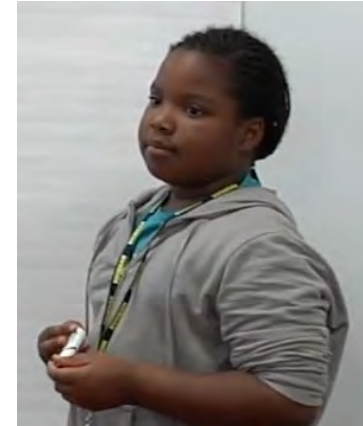


- Toni's contributions to the class are not read as appropriate or valuable.
- Her participation and mathematical attentiveness are made invisible.
- Her mathematical identity is not supported.

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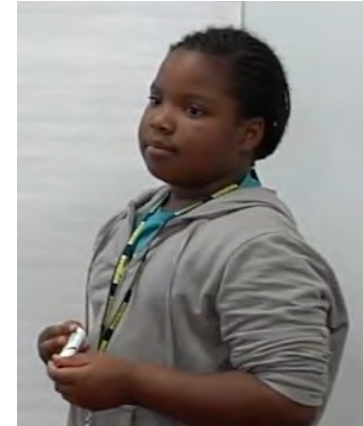
- Aniyah is positioned as “struggling.”
- Her precise explanation is not only not highlighted and acknowledged, but not even heard.
- Aniyah is interpreted as lacking confidence and needing to be protected.

# WHAT DO THESE DIFFERENT TEACHING MOVES DO TO TONI AND ANIYAH? AND THE OTHER CHILDREN?



- Toni's contributions to the class are not read as appropriate or valuable.
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These combine to eclipse their humanity.



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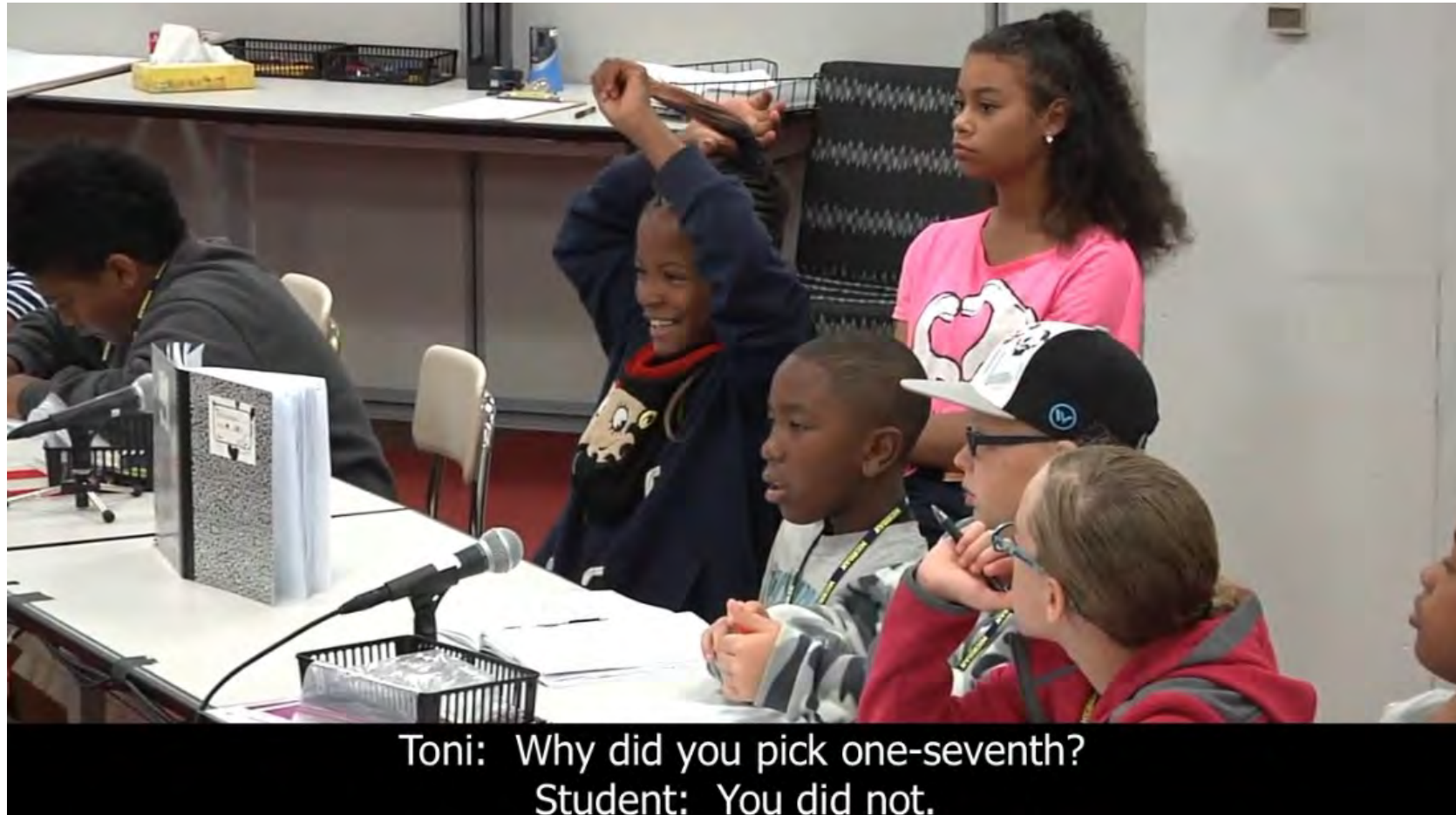
These combine to eclipse their humanity.



- Aniyah is positioned as “struggling.”
- Her precise explanation is not only not highlighted and acknowledged, but not even heard.
- Aniyah is interpreted as lacking confidence and needing to be protected.

These perpetuate images of Black girls as “troublemakers” and not “good at math.”

# VIDEO: ANIYAH AND TONI



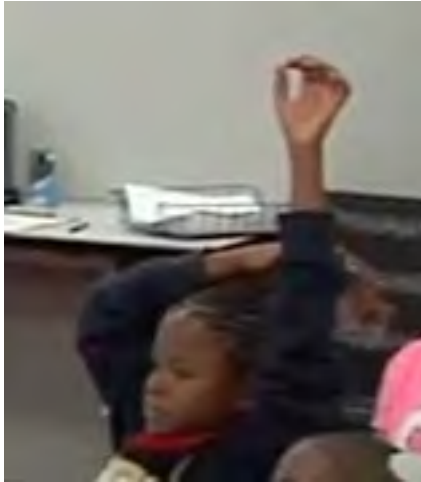
This video and additional supporting materials are available online [here](#).

# USING DISCRETIONARY SPACES TO DISRUPT INSTEAD OF PERPETUATE PATTERNS



- Interpreting Toni as asking a real question that she means.
- Hearing Toni's question as central to advancing the mathematical content.
- Reinforcing her mathematical identity, not choosing to read her body as disruptive.

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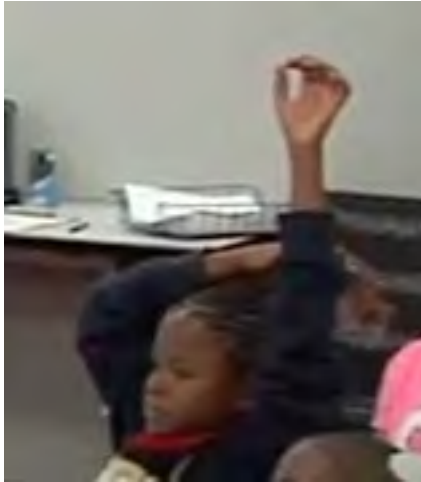
- Interpreting Toni as asking a real question that she means.
- Hearing Toni's question as central to advancing the mathematical content.
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- Interpreting Aniyah as competent to answer questions about her ideas.
- Hearing Aniyah's explanation as central to advancing the mathematical content.
- Reinforcing her mathematical identity, not choosing to read her body as struggling.



# USING DISCRETIONARY SPACES TO DISRUPT INSTEAD OF PERPETUATE PATTERNS



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- Hearing Toni's question as central to advancing the mathematical content.
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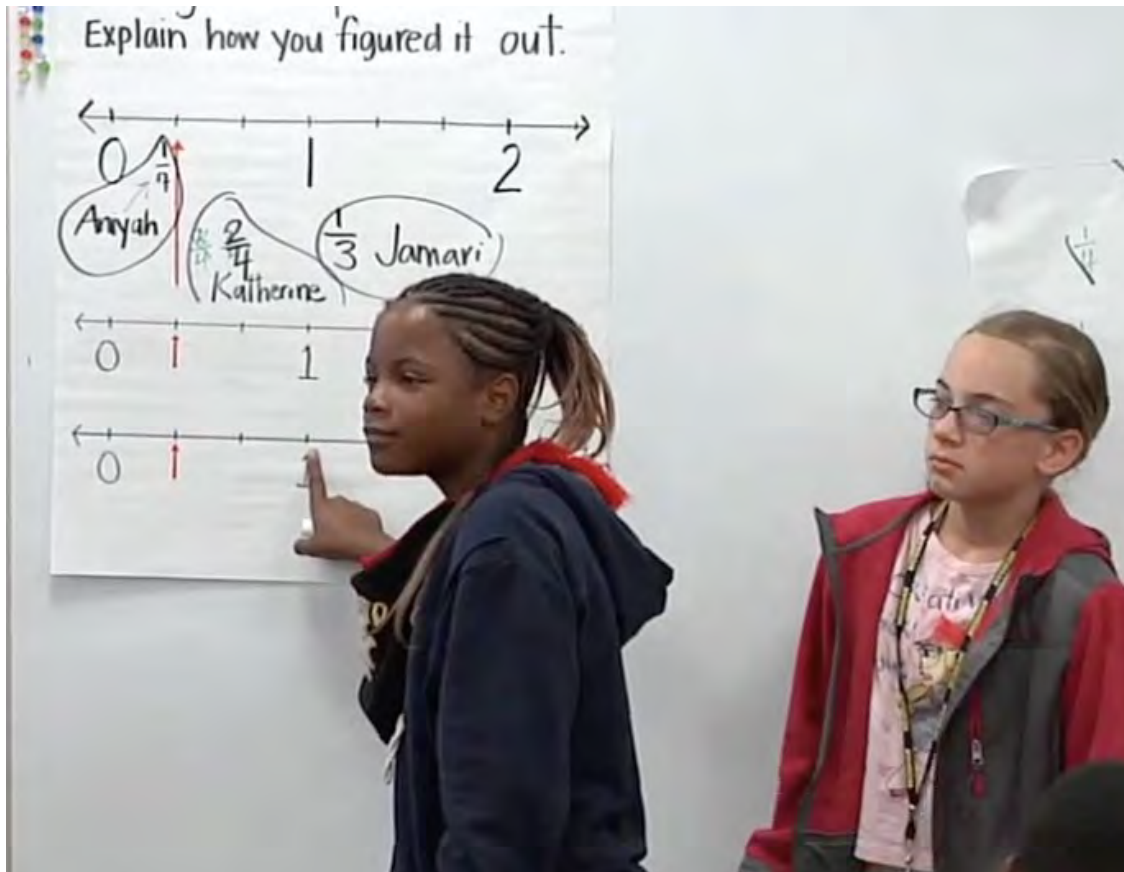


- Interpreting Aniyah as competent to answer questions about her ideas.
- Hearing Aniyah's explanation as central to advancing the mathematical content.
- Reinforcing her mathematical identity, not choosing to read her body as struggling.

- Other children hear Aniyah as getting the discussion going, and Toni as asking an important mathematical question.
- Aniyah and Toni are both positioned as contributing to the discussion.
- Children see a teacher attending to Black girls as mathematical thinkers and contributors to collective work.

# 14 MINUTES AFTER WHERE WE STOPPED

TONI



ANIYAH

I did well on my goal today because my goal was to to share my ideas with the class and I did I went up to the board And share my idea with the Class on Fractions.

# LEVERAGING OUR POWER DEPENDS ON CRITICALLY CONSCIOUS PROFESSIONAL PRACTICE



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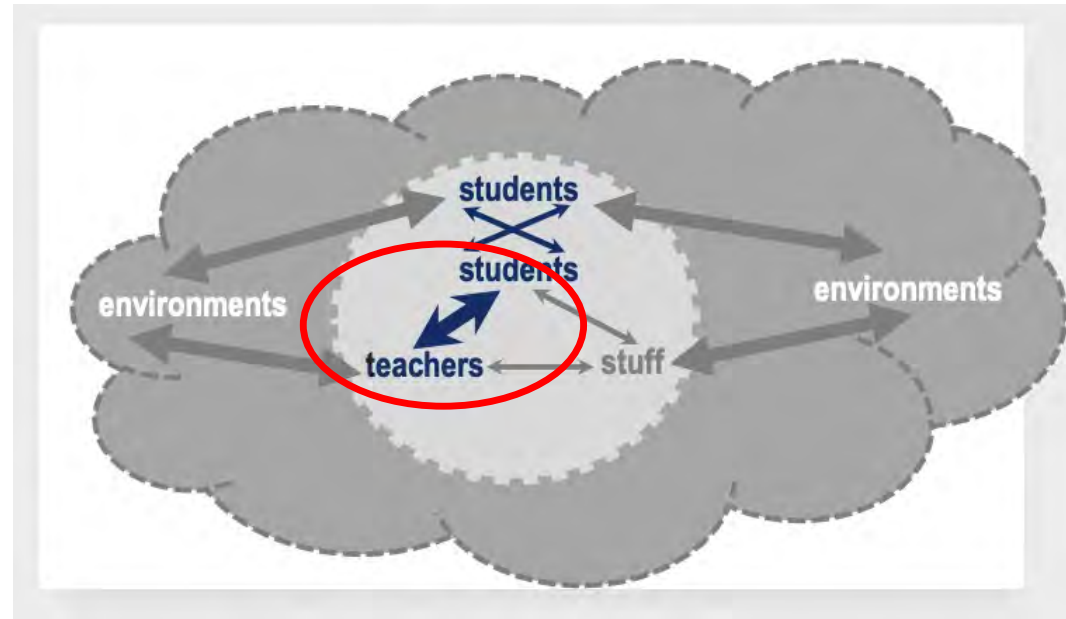


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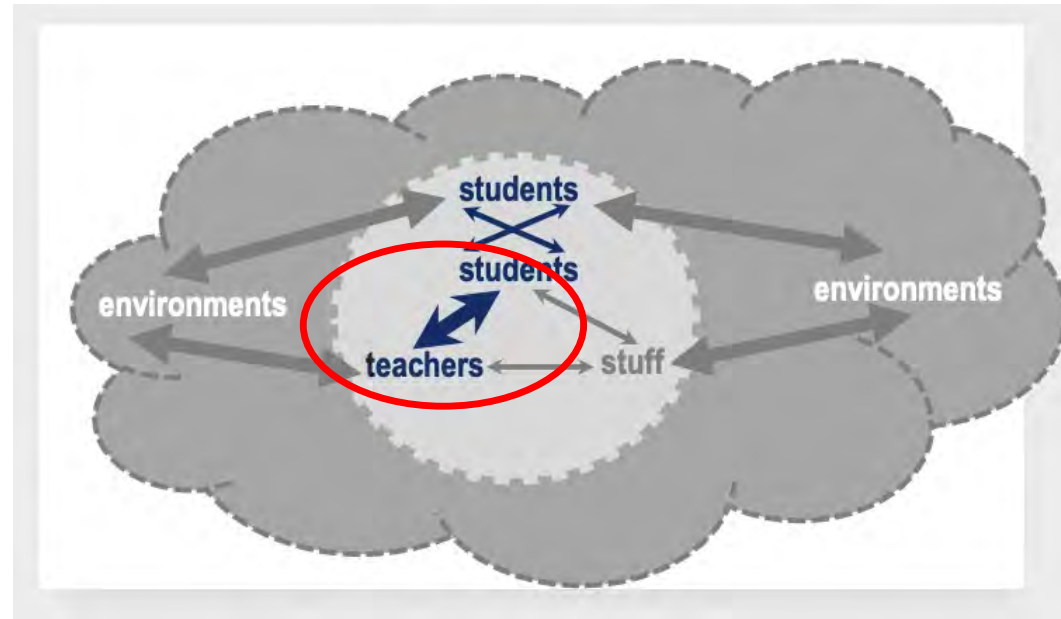


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Speaker	Talk	Discretionary space
Teacher	Who would like to try to explain what you think the answer is? And show us your reasoning by coming up to the board?  Who'd like to come up to the board and try to tell-  And you know, it might not be right. That's okay because we're learning something new.  (I'd like someone to come up and sort of be the teacher and explain how you are thinking about it. Who'd like to try that this morning?)	1. Deciding when to open whole-group discussion 2. Deciding what to do to launch discussion  3. Framing the expectation for presenting  4. Framing of what it "coming to the board" entails
Teacher	Okay, Anyah?	5. Selecting a student to present
Toni Other children	Playing with hair Laying on arms	6. Deciding whether to comment 7. Deciding whether to comment
Teacher	When someone's presenting at the board, what should you be doing?	8. Setting norms for what to do when a student is presenting
Students in chorus	Looking at them.	
Teacher	Looking at that person-	9. Responding to students
Teacher	Uh-huh?	10. Taking up an individual student question
Anyah	You want me to write it?	
Teacher	You're trying to mark what you think this number is and explain how you figured it out.	11. Clarifying task
Teacher	Listen closely and see what you think about her reasoning and her answer. (Anyah writes $\frac{1}{7}$ by the orange line).	12. Setting task for the other students
Anyah	I put one-seventh because there's-	
Toni	Did she say one-seventh?	13. Responding to student
Anyah	(turns to Toni) Yeah. (continues to class) Because there's seven equal parts, like one, two, three, four, five, six, and then seven. (Uses her fingers to count the parts on the number line).	
Teacher	Before you agree or disagree, I want you to ask questions if there's something you don't understand about what she did.  No agreeing and disagreeing. Just. All you can do right now is ask Anyah questions. Who has a question for her?	14. Setting task for responding to student explanation
Teacher	Okay, Toni, what's your question for her?	15. Selecting student to speak
Dane	You did not!	16. Responding to student speaking across room
Toni	Why did- (laughs at another student who says something to her from across the room)	17. Responding to student laughing
Teacher	Go ahead, it's your turn.	17. Responding to student laughing
Toni	Why did you pick one-seventh?	
Dane	You did not!	18. Responding to student speaking across room
Teacher	Let's listen to her answer now. That was a very good question.	19. Setting task for class 20. Responding to student



20 in 1:28

Speaker	Talk	
Teacher	Who would like to try to explain what you think the answer is? And show us your reasoning by coming up to the board? Who'd like to come up to the board and try to tell— And you know, it might not be right. That's okay because we're learning something new. (I'd like someone to come up and sort of be the teacher and explain how you are thinking about it. Who'd like to try that this morning?)	1. Deciding to discuss 2. Deciding to discuss 3. Framing 4. Framing board
Teacher	Okay, Aniyah?	5. Selecting student to speak
Toni Other children	Playing with hair Laying on arms	6. Deciding to discuss 7. Deciding to discuss
Teacher	When someone's presenting at the board, what should you be doing?	8. Setting norms for what to do when a student is presenting
Students in chorus	Looking at them.	
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Aniyah	You want me to write it?	
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Teacher	Listen closely and see what you think about her reasoning and her answer. (Aniyah writes $\frac{1}{7}$ by the orange line).	12. Setting task for the student
Aniyah	I put one-seventh because there's—	
Toni	Did she say one-seventh?	13. Responding to student
Aniyah	(turns to Toni) Yeah. (continues to class) Because there's seven equal parts, like one, two, three, four, five, six, and then seven. (Uses her fingers to count the parts on the number line).	
Teacher	Before you agree or disagree, I want you to ask questions if there's something you don't understand about what she did. No agreeing and disagreeing. Just— All you can do right now is ask Aniyah questions. Who has a question for her?	14. Setting task for responding to student explanation
Teacher	Okay, Toni, what's your question for her?	15. Selecting student to speak
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**Teacher**

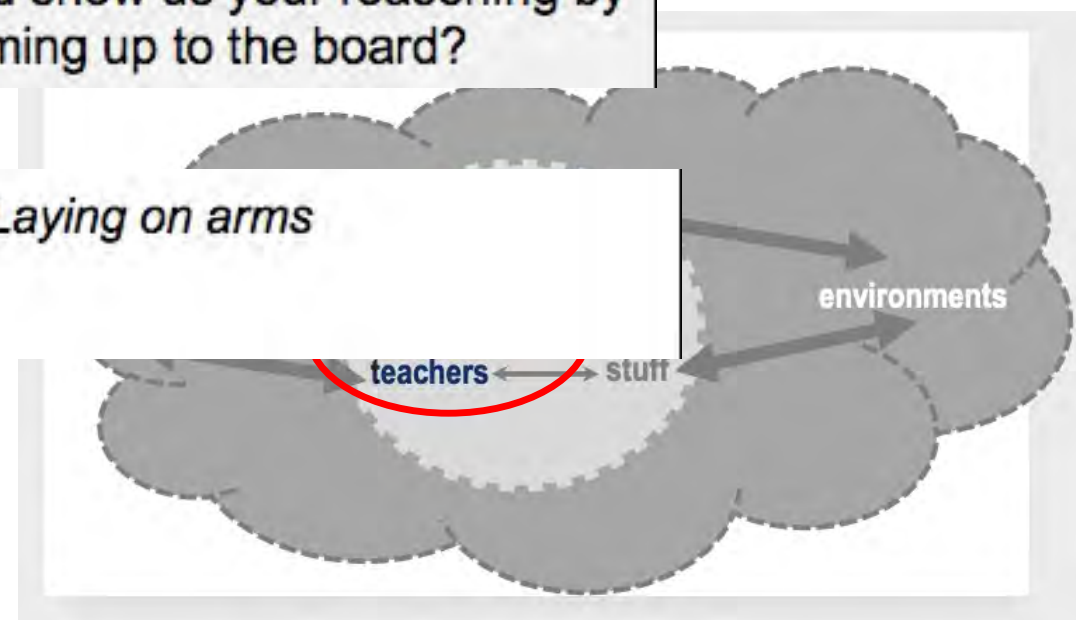
Who would like to try to explain what you think the answer is? And show us your reasoning by coming up to the board?

**Other children**

Laying on arms

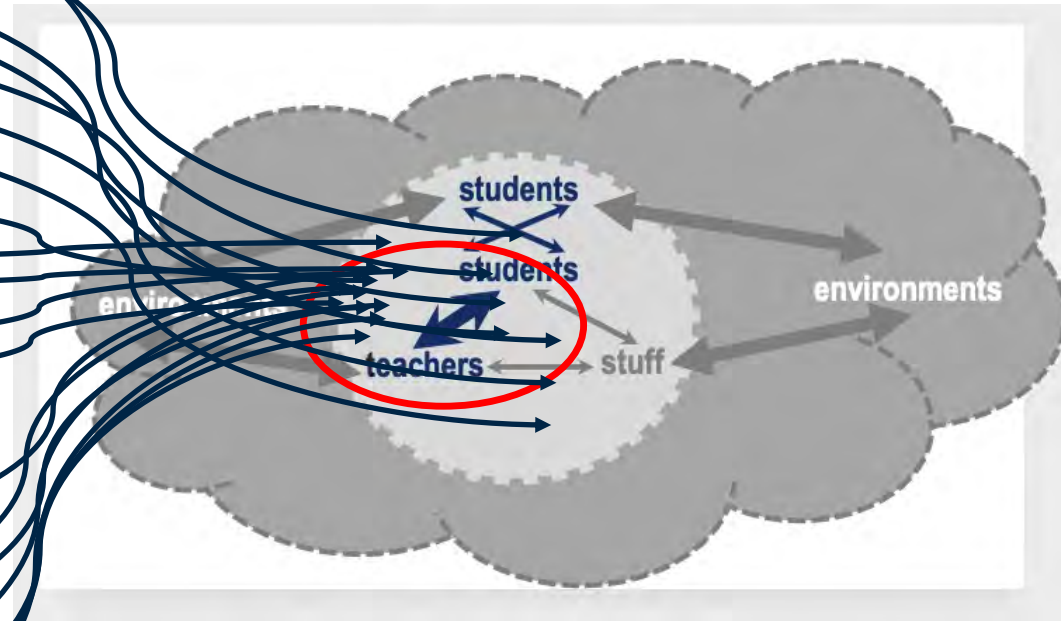
**Dante**

You did not!



20 in 1:28

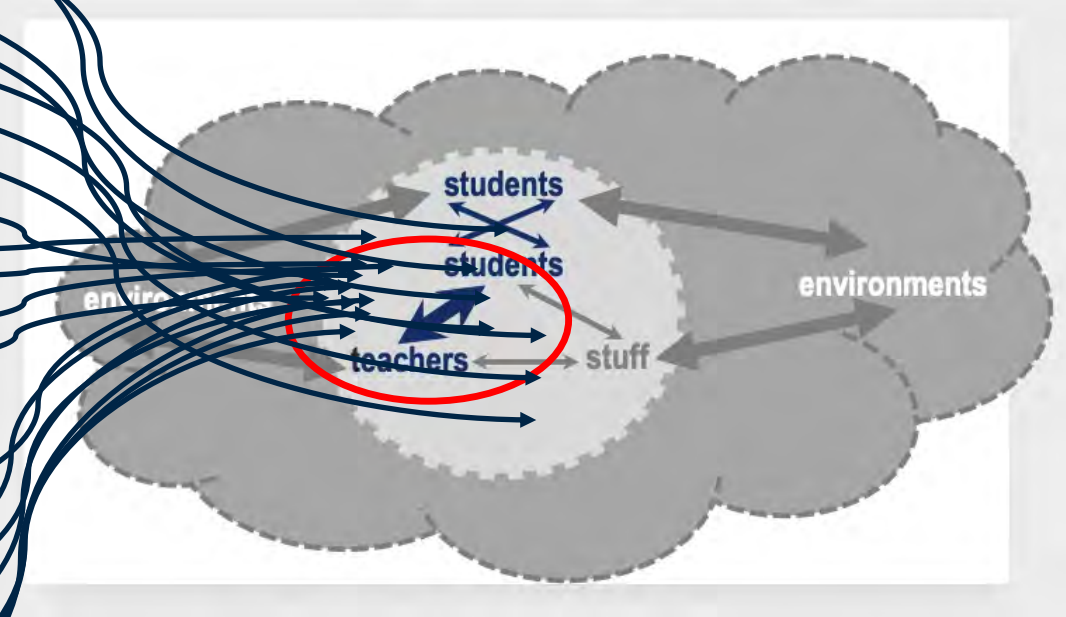
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# TEACHING IS DENSE WITH “DISCRETIONARY SPACES”

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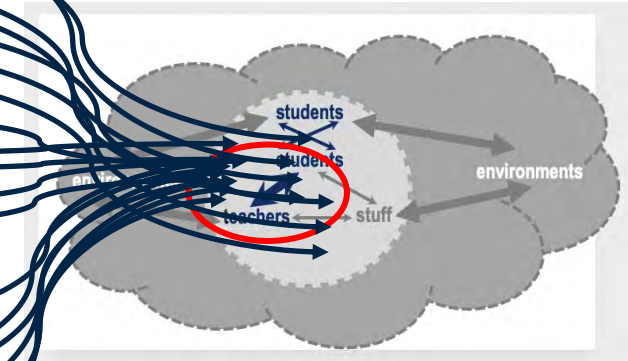
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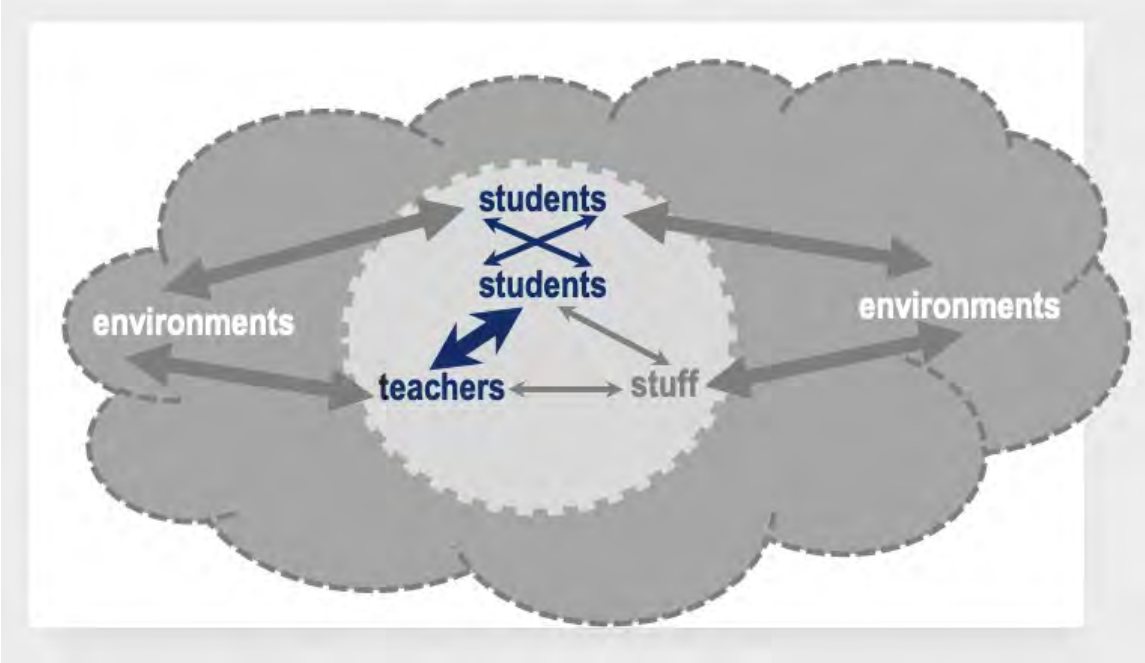
# DISCRETIONARY SPACES AND THE POWER OF TEACHING

- A discretionary space is where the next move or comment or question is necessarily determined by the teacher—and not by a policy or curriculum.
- In these discretionary spaces teachers have the power to reinforce or disrupt patterns of racism, sexism, and marginalization.
- Often we act without even realizing we have discretion to do something different. Countering these patterns requires habits of consciousness and alternative moves to make.

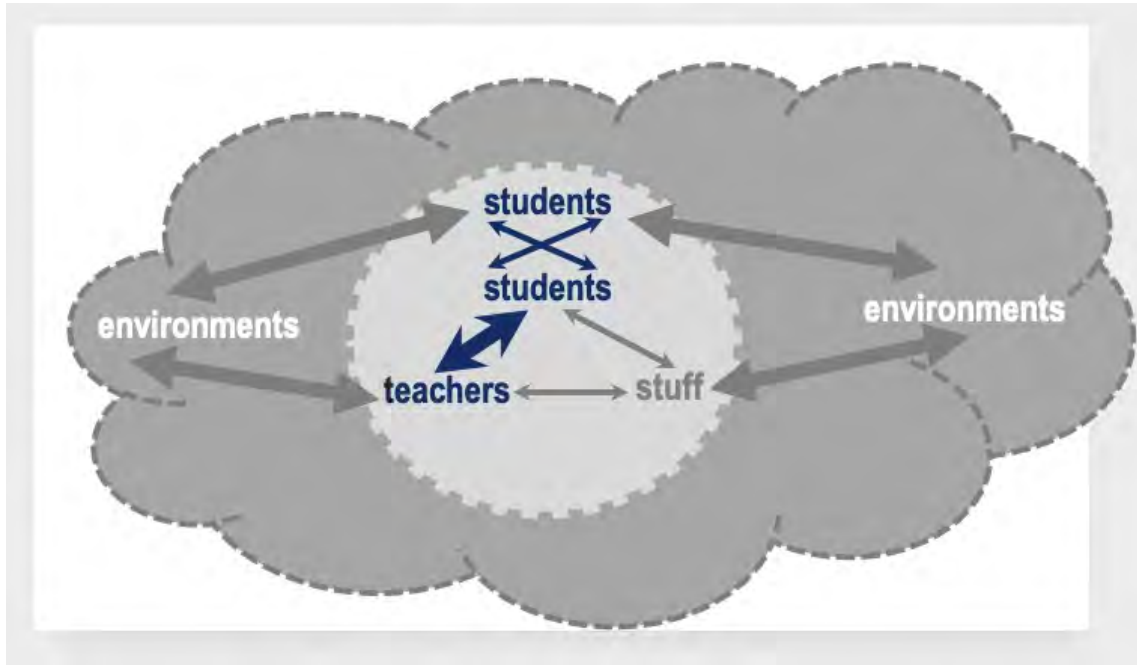
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Other children	Laying on arms	7. Deciding whether to comment
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Students in class	Looking at them.	
Teacher	Looking at that person.	9. Responding to students
Teacher	Um-huh?	10.aving up an individual student question
Anyah	You want me to write it?	
Teacher	You're trying to mark what you think this number is and explain how you figured it out.	11. Clarifying task
Teacher	Listen closely and see what you think about her reasoning and her answer. (Anyah writes 79 by the orange line)	12. Setting task for the other students
Anyah	(put one-seventh because there's-	
Tom	Did she say one-seventh?	13. Responding to student
Anyah	(turns to Tom) Yeah... (continues to draw) Because there's seven equal parts, has one, two, three, four, five, six, and then seven... (Uses her fingers to count the parts on the number line).	
Teacher	Before you agree or disagree, I want you to ask questions if there's something you don't understand about what she did. No agreeing and disagreeing. Just... All you can do right now is ask Anyah questions. Who has a question for her?	14. Setting task for responding to student explanation
Teacher	Okay, Tom, what's your question for her?	15. Selecting student to speak
Dante	You did not!	16. Responding to student speaking across room
Tom	Why did... (laughs at another student who says something to her from across the room)	17. Responding to student laughing
Teacher	Go ahead, it's your turn.	
Tom	Why did you pick one-seventh?	
Dante	You did not!	18. Responding to student speaking across room
Teacher	Let's listen to her answer now. That was a very good question.	19. Setting task for class 20. Responding to student



# WHAT REGULARLY FILLS THE DISCRETIONARY SPACES IN TEACHING?



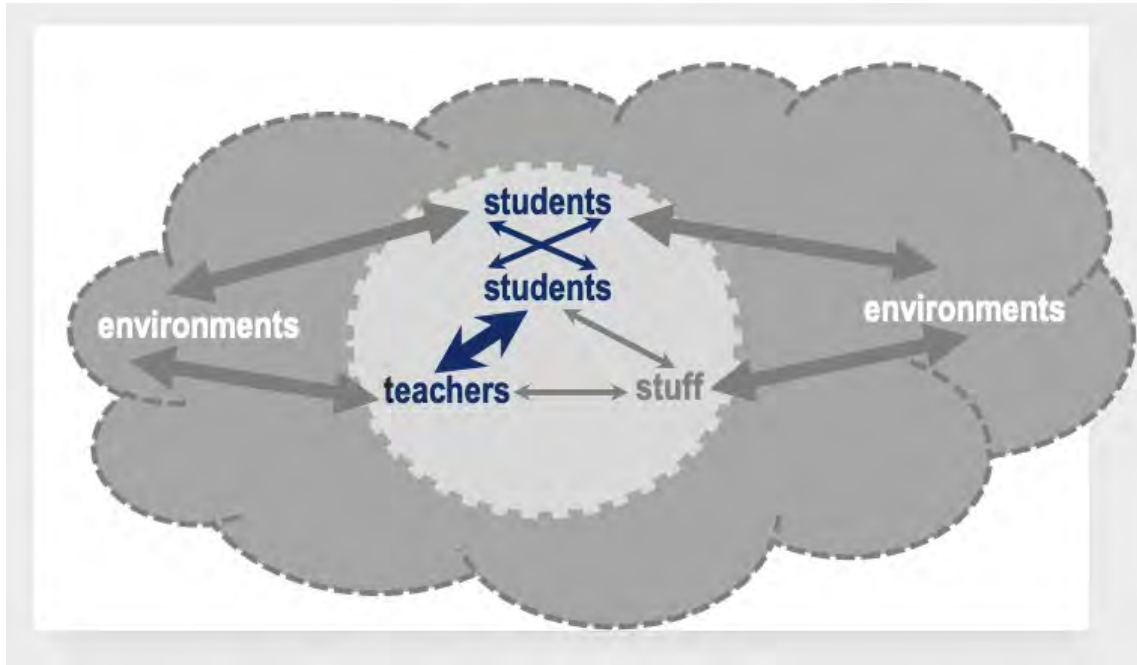
# WHAT REGULARLY FILLS THE DISCRETIONARY SPACES IN TEACHING?



1. Teachers' experiences in a society filled with racism and oppression.

Lortie (1975), Banks, Grant and Koskela, Moll

# WHAT REGULARLY FILLS THE DISCRETIONARY SPACES IN TEACHING?



1. Teachers' experiences in a society filled with racism and oppression.
2. Normalized practices in schooling that institutionalize dominant values and habits.

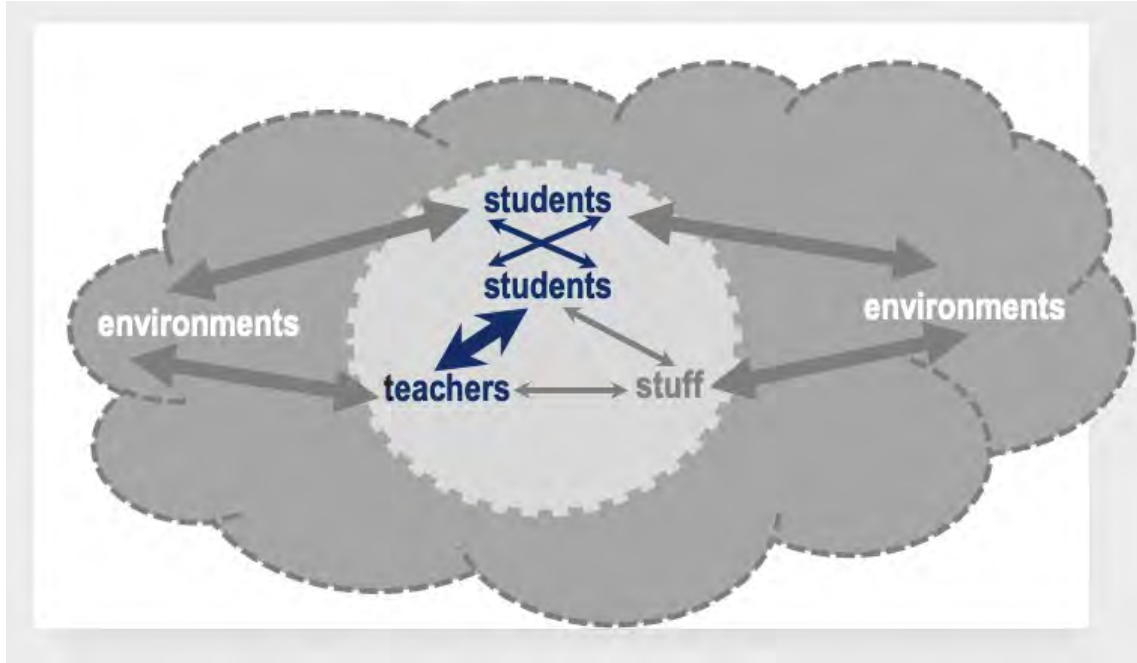
Lortie (1975), Banks, Grant and Koskela, Moll  
Anyon (1981), Heath, Martin, Tuck

# WHAT REGULARLY FILLS THE DISCRETIONARY SPACES IN TEACHING?

Professional education does not effectively intervene on these.

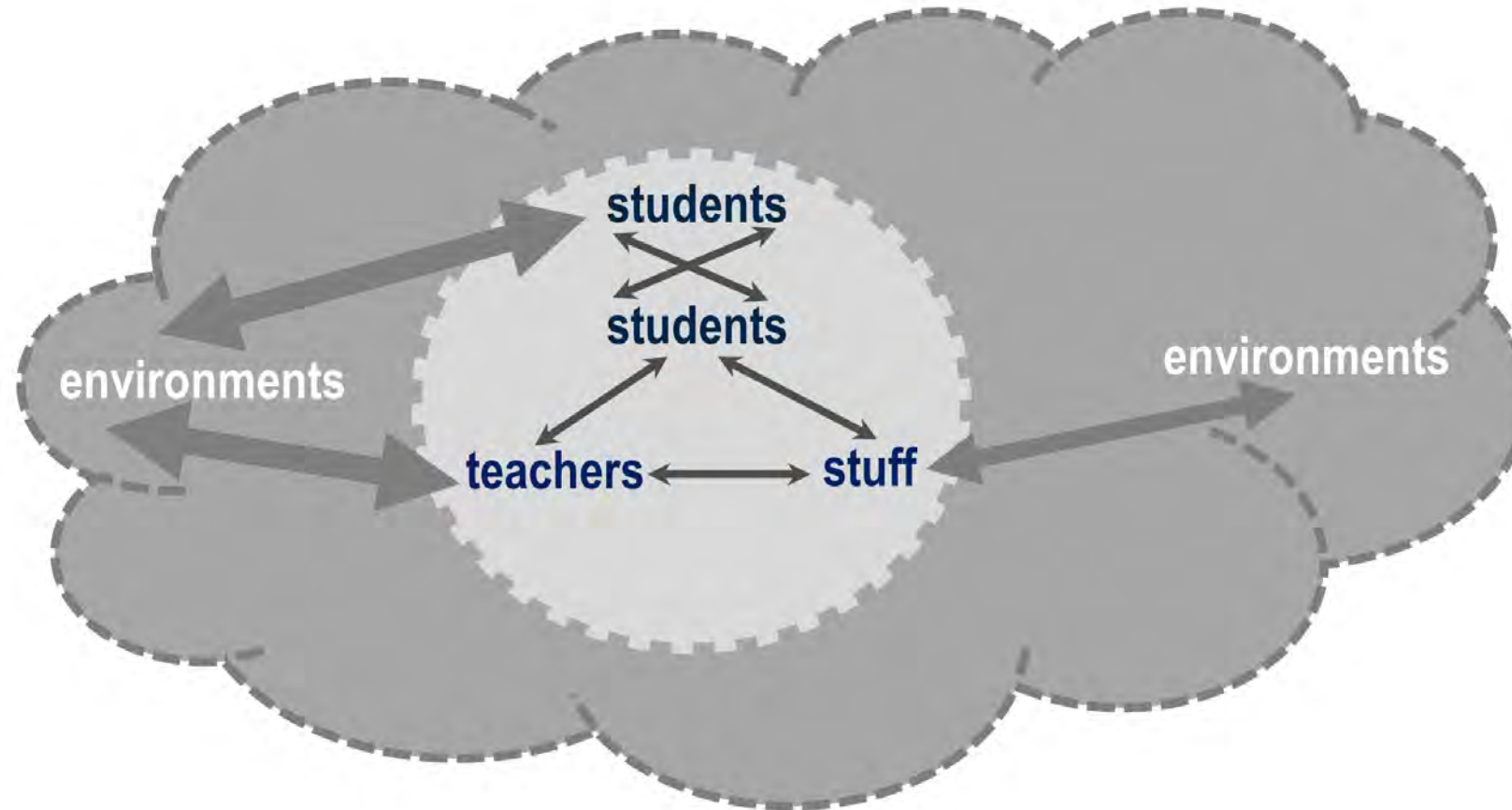
1. Teachers' experiences in a society filled with racism and oppression.
2. Normalized practices in schooling that institutionalize dominant values and habits.

Professional education and teaching experience often teach these.



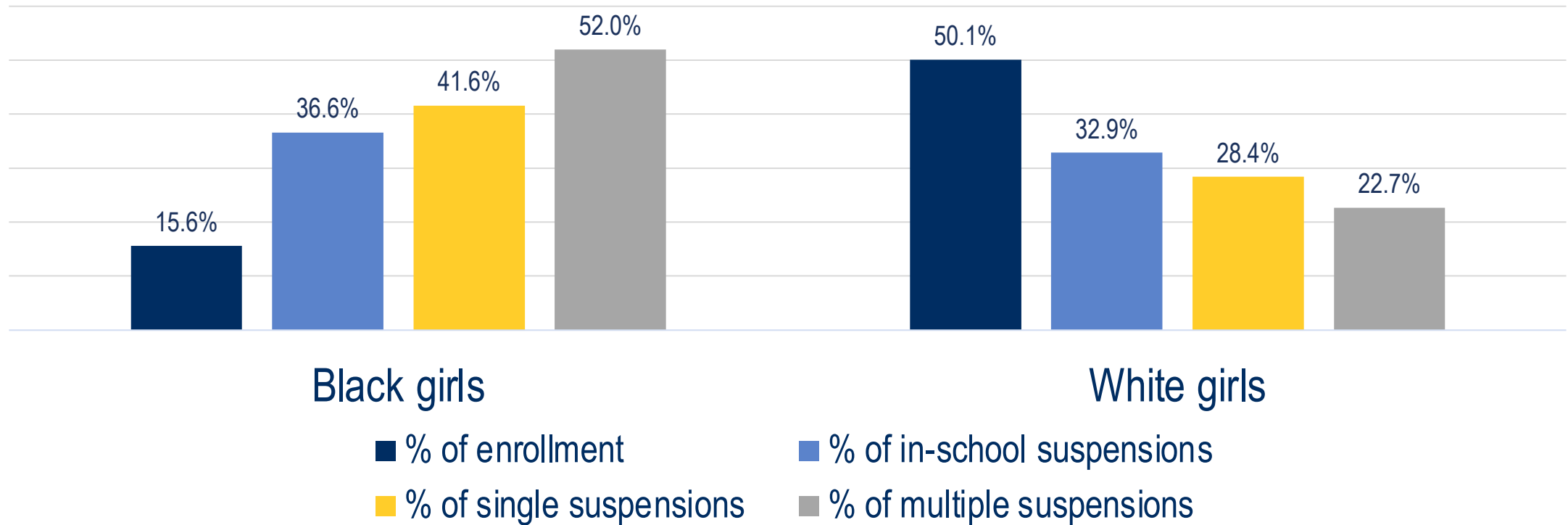
Lortie (1975), Banks, Grant and Koskela, Moll  
Anyon (1981), Heath, Martin, Tuck

# STUDENTS' EDUCATIONAL EXPERIENCES: CONNECTING THE MACRO AND MICRO



# SYSTEMIC PATTERN #1

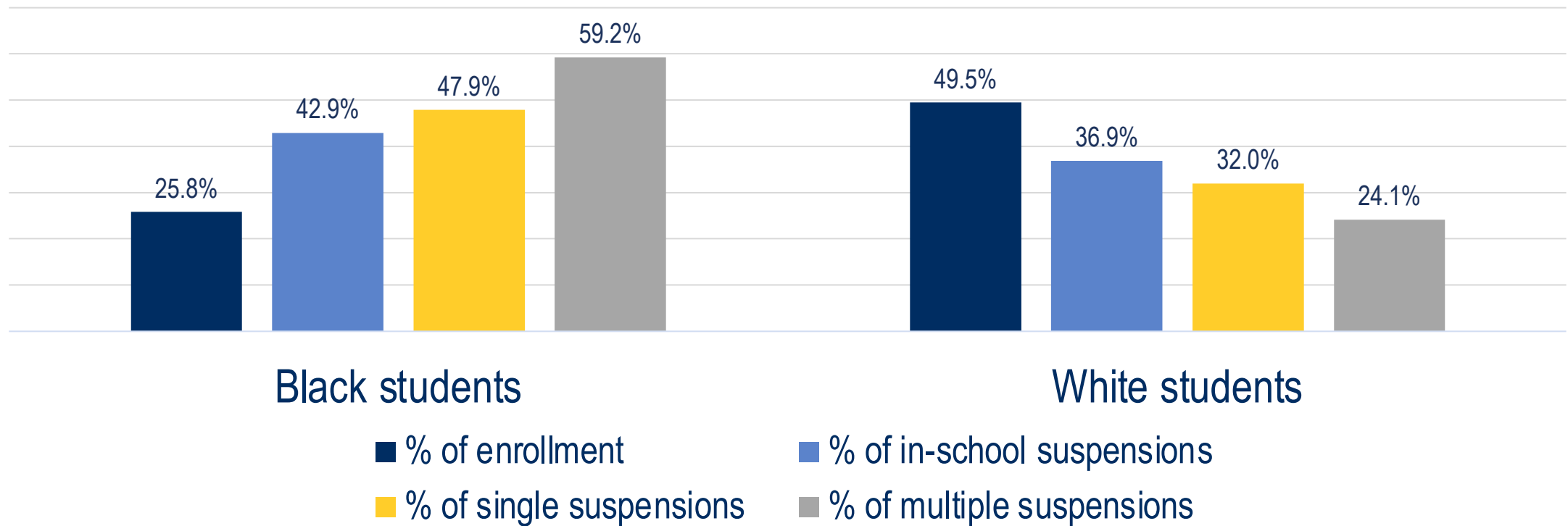
## THE DISPROPORTIONATE PUNISHMENT OF BLACK GIRLS



Epstein, R., Blake, J., & González, T. (2017). *Girlhood interrupted: The erasure of Black girls' childhood*. Washington, DC: Georgetown Law Center on Poverty and Inequality.

# SYSTEMIC PATTERN #1: NORTH CAROLINA

## THE DISPROPORTIONATE PUNISHMENT OF BLACK STUDENTS



U.S. Department of Education Office for Civil Rights. (2020). 2015–16 Discipline Estimations by Discipline Type.



# SYSTEMIC PATTERN #2

## DISPROPORTIONAL ASSIGNMENT TO SPECIAL PROGRAMS BASED ON “ABILITY”

- Black students: 16.7% of student population; 9.8% of those selected to programs for academically talented students
- Latino/Latina students 22.3% of student population; 15.4% of those selected to these programs
- 6.2% of all students are assigned to these programs for “talented” students; 10% of Asian students, 7.5% of White; 3.6% of Latino/Latina; 3% of Black
- Black students are 2x as likely to be classified as having learning or emotional problems
- Exclusion from class reduces opportunity to learn
- Exclusion from rigorous content; long-term effects of labeling
- Lack of access to accelerated and enrichment programs

Grissom, J. & Redding, C. (2016). Discretion and disproportionality: Explaining the underrepresentation of high-achieving students of color in gifted programs. *AERA Open*, 2(1), 1–25.

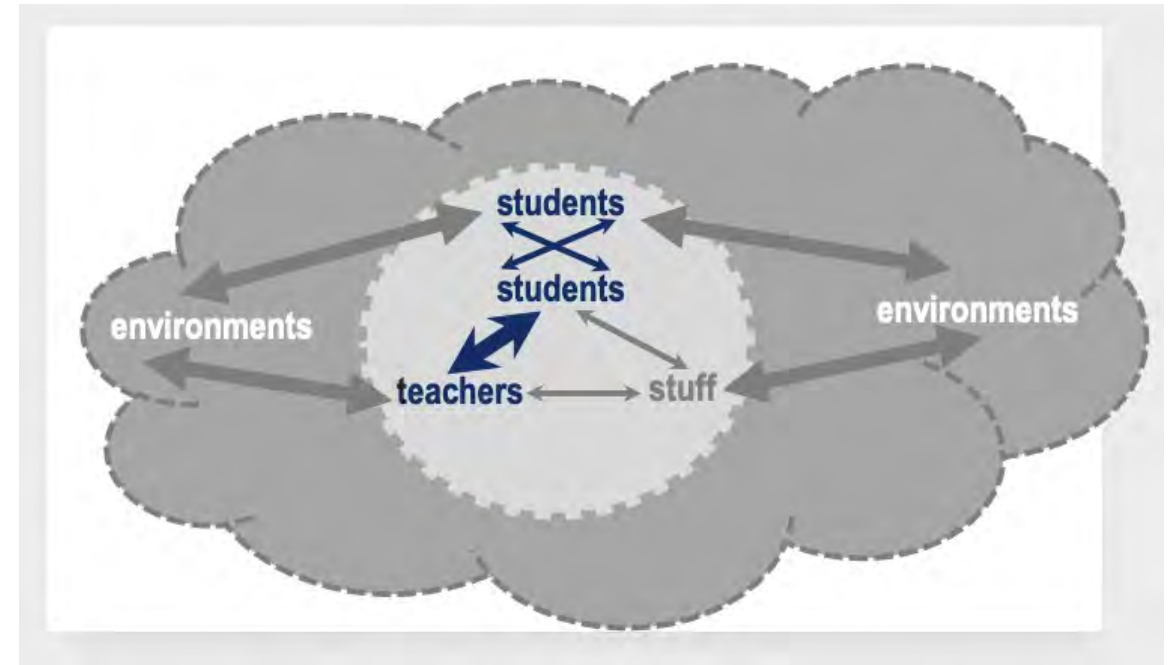
# SYSTEMIC PATTERN #2: NORTH CAROLINA DISPROPORTIONAL ASSIGNMENT TO SPECIAL PROGRAMS BASED ON “ABILITY”

- Black students: 25.8% of student population; 10.2% of those selected to programs for academically talented students; 31.7% of those served under the Individuals with Disabilities Education Act (IDEA)
- White students: 49.5% of student population; 72.3% of those selected to programs for academically talented students; 46.9% of those served under the Individuals with Disabilities Education Act (IDEA)
- Lack of access to accelerated and enrichment programs
- Exclusion from class reduces opportunity to learn
- Exclusion from rigorous content; long-term effects of labeling

U.S. Department of Education Office for Civil Rights. (2020). [2015–16 Discipline Estimations by Discipline Type](#).

# LEARNING TO SEE AND USE THE DISCRETIONARY SPACES IN OUR PRACTICE

- Become aware of the density of taken-for-granted and normalized practices that reflect whiteness and oppression
- Notice and understand how much of our practice is based on these, and that these are habits
- Work on breaking habits that are rooted in racism and oppression (Noel, 2018)
- Develop new repertoires of practice and new habits and learn to scrutinize these critically

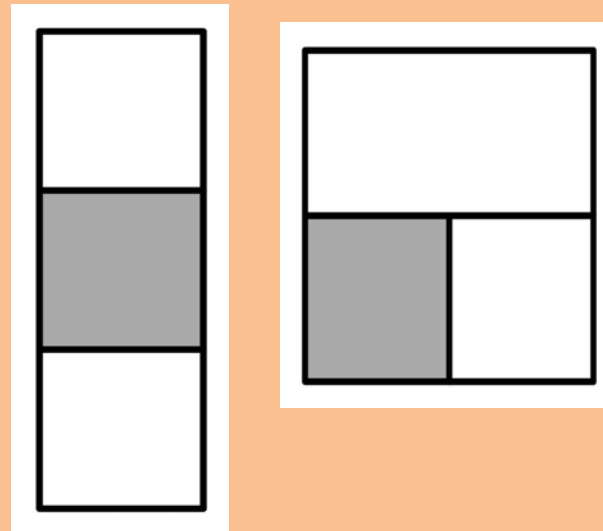


# SPECIFIC INCLUSIVE PRACTICES TO DISRUPT COMMON PATTERNS THAT MARGINALIZE

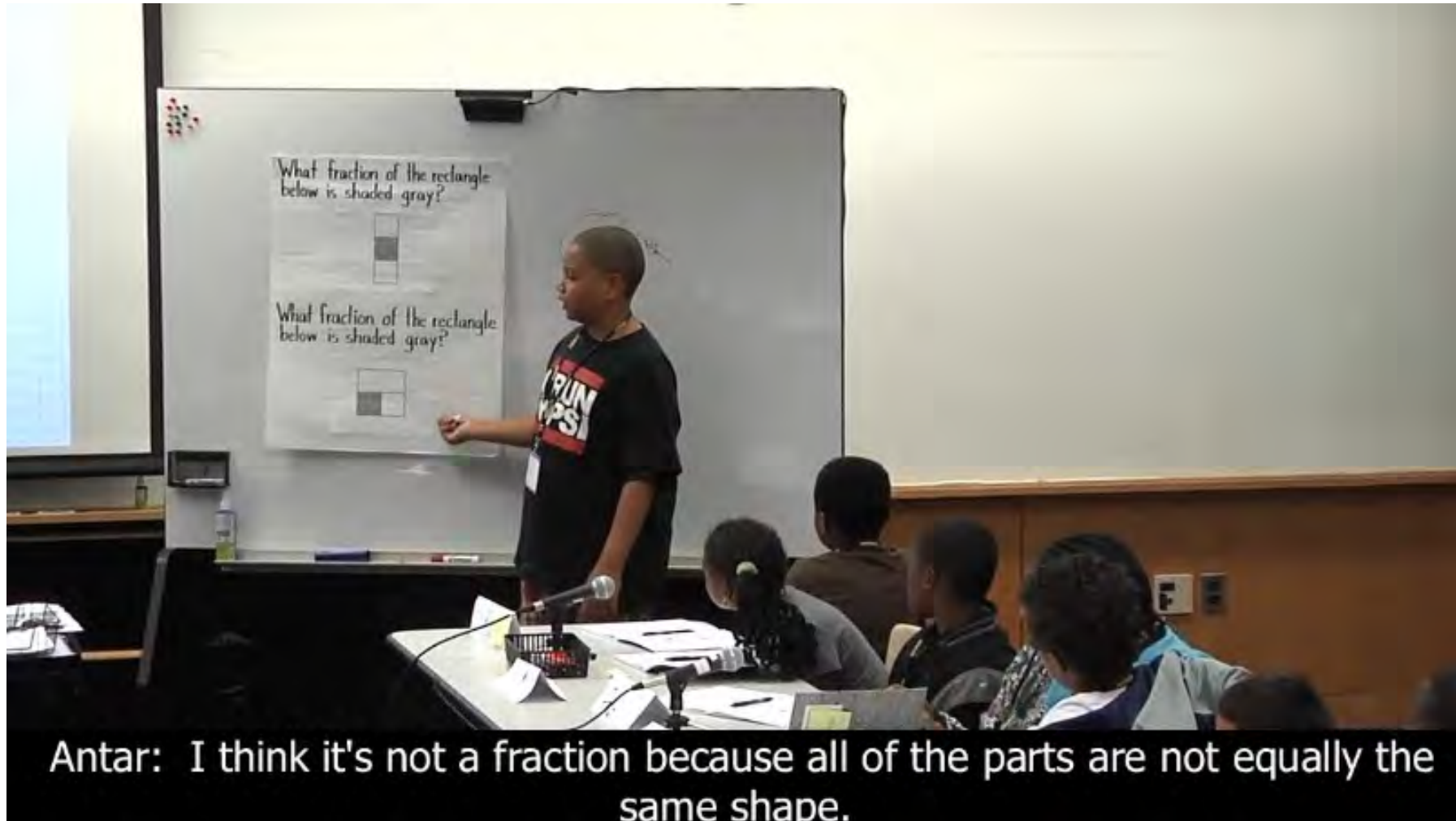
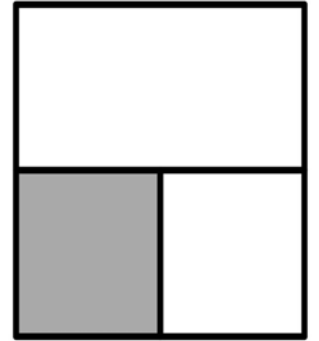
1. Broadening what it means to “participate”
2. Acknowledging competence
3. Reframing “error”

## The mathematics task

What fraction of each rectangle below is shaded gray?



# VIDEO: ANTAR, GABRIELLE, GABI, VIRSHAWN, MARQUIS, KASSIE



# BROADENING WHAT IT MEANS TO “PARTICIPATE”

1. What are the different forms of “participating” you see in this video?
2. How are these typical or different from common ways of participating?
3. What is valued and afforded by specific different forms of participating?

# ACKNOWLEDGE STUDENTS' COMPETENCE

A set of practices that deliberately deploy the power of teaching to:

1. Broaden and label what being competent in mathematics or science means and includes
2. Intervene on status hierarchies to position who (and what) is seen as competent in class
3. Support individual mathematical and academic identities and competence

Sources: E. Cohen and R. Lotan, complex instruction; J. Boaler's work; Smarter Together: Collaboration and Equity in the Elementary Mathematics Classroom (Featherstone, Crespo, et al., 2011);



# WHAT DOES “ACKNOWLEDGING COMPETENCE” REQUIRE IN TEACHING?

- Broaden and label what being competent in mathematics or science means and includes
- Intervene on status hierarchies to position who (and what) is seen as competent in class
- Support individual mathematical and academic identities and competence
- Be able to see and hear the competence in math and science reflected in students' contributions, thinking, work
- Have techniques for making these moves to intervene on status hierarchies
- Strategically using these techniques with particular students in authentic and well-timed ways

# USING TECHNIQUES AND STRATEGIES FOR ACKNOWLEDGING COMPETENCE

- Identify the competence to be highlighted. Consider how to disrupt hierarchies of status in class by which student is to be “called out” as competent.
- Call out an individual student’s competent move or contribution publicly (“\_\_\_ just shared a very important idea”)
- Ask a student to explain another student’s contribution that the teacher highlights
- Ask the class to identify things that were part of an important contribution by one of the students
- Write something publicly that a student came up with or contributed that is important
- Accord expertise to students through assigning roles explicitly in a group

# DISTINGUISHING ACKNOWLEDGING COMPETENCE FROM PRAISE

## PRAISE

- “Good job!”
- “You’re working so well today.”
- “Nice work!”
- “I am proud of you.”
- “You’re working like such good mathematicians.”
- “You made so much progress on the problems today.”

**Praise** – verbal feedback with the purpose of evaluating what a student says or does

**Acknowledging competence** – intentional identifying, naming, and highlighting specific mathematical or learning competencies of what a student says or does

## ACKNOWLEDGING COMPETENCE

- ★ “It was particularly clear how you used your drawing to explain your thinking.”
- ★ “Belin gave a clear and specific mathematical explanation.”
- ★ “You solved that in a really interesting way. Can you tell us more about your thinking?”
- ★ “Ibn used a very interesting method to show that there are no more solutions. Who can say what Ibn did?”
- ★ “It is clear how closely you are following other people’s thinking and connecting it to the idea you had.”
- ★ “One thing that was really important about what Laken did was to use the definition we developed.”

# WHAT (NOT) TO SAY?

- Be authentic
- Be sensitive to context and student
- Name specific and valuable aspects of a student's contribution or way of doing/learning
- Say things designed to make the student feel affirmed and seen, and that other students will notice and value

## Some frames:

*“I want to highlight something valuable that \_\_\_ just did.”*

*“What was especially important about what \_\_\_ just contributed to our discussion?”*

*“Could you say/show that again? That is very important to our discussion.”*

# ACKNOWLEDGING COMPETENCE

Antar, Gabrielle, Gabi, Virshawn, Marquis, Kassie

- What competences do you notice?
- What might you **say** to acknowledge this competence and how could it affect the **positioning of this student** *and* **what is seen as competent** in this class?

# FOREGROUNDING AND USING “ERRORS”

Deliberately inviting or featuring “stuck” or “wrong” solutions

- Asking students to share and analyze “wrong” interpretations, answers, methods
- Posing incorrectly solved problems and asking students to explain what is wrong and why someone might do this
- Designing problems that entail appraisal of a solution

# HOW WE TALK ABOUT “ERROR” MATTERS

- Making the environment “safe” is not all there is
- “Errors” are a necessary part of mathematical work
- Being “meta” about mathematical work is an important mathematical competence
  - Dwelling on things that go wrong or make you stuck
  - Analyzing solutions or methods that do not work, are not right

# WHAT IS INVOLVED FOR THE TEACHER IN SEEING AND BUILDING ON STUDENTS' STRENGTHS?

- Listening carefully to what they say, reading attentively what they write
- Making deliberate choices about how to see and interpret students
- Both of these involve using what you know, but also suspending what you assume



# There is no neutral.

\*Imani Goffney, Ibram X. Kendi



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# TEACHING IS POWERFUL

Teaching either reinforces/reproduces *or* it can avert and disrupt patterns.

## 1. AWARENESS OF PATTERNS

- Becoming critically conscious of the patterns of interpreting and responding
- Understanding one's own identity and how that shapes one's assumptions and interpretations
- Understanding that these patterns are historical and embedded in our institutions and systems

## 2. AVERTING/DISRUPTING PATTERNS

- Consciously NOT following or reproducing the patterns
- Developing specific new habits and practices that counter the patterns
- Strengthening your own content knowledge for teaching





**NOTICE:**  
VOTERS ARE REQUIRED TO WEAR MASKS  
PRACTICE SOCIAL DISTANCING,  
AND BE MINDFUL OF THE OTHER PEOPLE  
IN YOUR COMMUNITY  
6 FEET



**This is our work.**  
**To build STEM teaching as a force for justice.**

Our power is in our collective efforts to make STEM teaching work. . . . .

. . .to learn, to grow, to share, and to push forward with the fight.



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# THANK YOU!

dball@umich.edu

Slides will be available on my website

<https://deborahloewenbergball.com/>

(“Google” Deborah Ball)



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Photo from “Protest erupts in Phoenix after viral video shows police fatally shooting man in parked car,” by Allyson Chiu, The Washington Post  
Retrieved from <https://www.washingtonpost.com/nation/2020/07/06/phoenix-protest-police-shooting/>

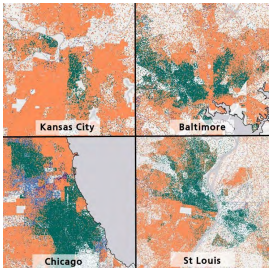


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Graphic from “Why don't black and white Americans live together?,” by Rajini Vaidyanathan, BBC News  
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Graphic from “Housing Segregation In Everything” by Code Switch, National Public Radio.  
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Graphic from "The Criminal Justice Reform Plans of 2020: And Why Kamala Harris' is the Best," by Mia Brett, Medium Retrieved <https://medium.com/@miabrett/the-criminal-justice-reform-plans-of-2020-and-why-kamala-harris-is-the-best-e764db85c728>

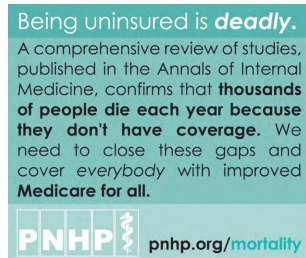


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Graphic from "Lack of health insurance and U.S. mortality," PNHP Retrieved from <https://pnhp.org/news/lack-of-health-insurance-and-u-s-mortality/>



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Photo from “Trump Rioters Storm U.S. Capitol (photos),” Variety

Retrieved from <https://variety.com/gallery/trump-rioters-storm-us-capitol-photos/congress-electoral-college-8/>



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