



# IDENTITY AND (MATH) LEARNING



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Why should we study identity?

+ How should we define identity  
and what analytic methods can  
we use?



## Who I am shapes and is shaped by how and what I learn

Learning is “an expansion of one's action possibilities” (Roth & Lee, 2007, p. 187).

Learning is a shift in identity within a community of practice (Wenger, 2003).



# + Identities are practice-linked

- Practice-linked identities

- “the identities that people come to take on, construct, and embrace that are linked to participation in particular social and cultural practices.” (Nasir & Hand, 2008, p. 147)
- About *participation with others in practices*
  - Therefore, shifting, relational, contextual and also enduring, stabilizing, thickening



## Who I am shapes and is shaped by how and what I learn

“ethnicity, race, and language use ... have long-standing influences on the cultural practices in which people have the opportunity to participate, often yielding shared circumstances, practices, and beliefs that play important and varied roles for group members. People do not just choose to move in and out of different practices, taking on new and equal participation in cultural communities” (Gutiérrez & Rogoff, 2003, p. 21)

Candie: Backgrounds, if our backgrounds are too different we don't get along. ...I don't know, [the teacher] always seats me with people she knows I'm gonna get into it with.

Interviewer: Who do you get into it with?

Candie: I don't know... most of the White people in the class.

– *Candie, a 10th-grade, lesbian, African American girl*

# + Identities reflect broad social categories

## ■ Social identities

- “social categories—including, but not limited to race, ethnic, or gender categories—that are often imposed on people within a particular context. We use the phrase to refer to identities that are self-imposed as well as those identities that one imposes on others.” (Esmonde, Brodie, Dookie, & Takeuchi, 2009, p. 20)
- Can be more nuanced than a simple statement of social category (e.g., a “leader-ish girl,” a teacher who was “not really White”)
- Need for intersectional analysis

# + Characteristics of practice-linked and social identity

Both types of identity are

- Contextual
- Relational
- More about what people do than who they are
- Shifting *and* stable

They have different

- Connections to academic histories and disciplines
- Methods of analysis

# + Analyzing practice-linked identities

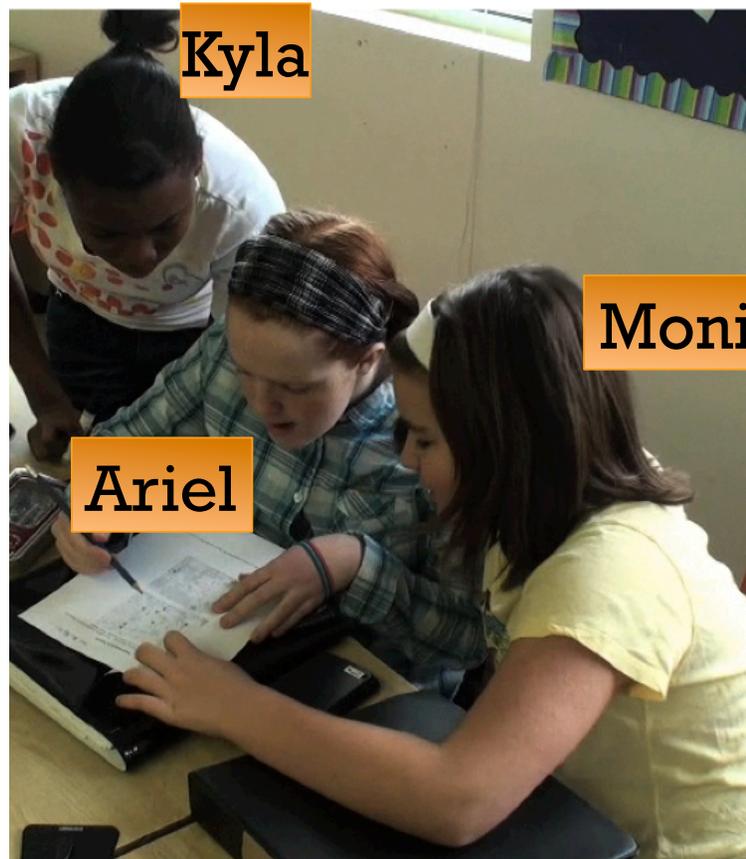
- Characteristics of a practice that support engagement and development of positive identities (Nasir & Cooks, 2007):
  - Identity resources made available to participants
  - Importance of inbound identity trajectories
- Ethnographic methods
  - Participant observation
  - Interviews



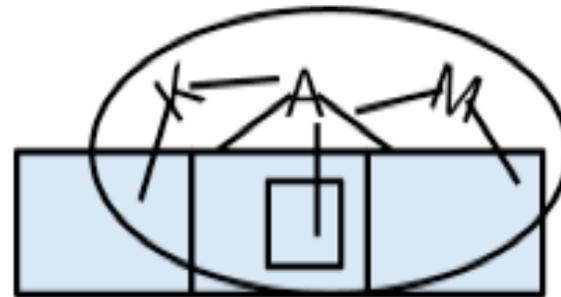
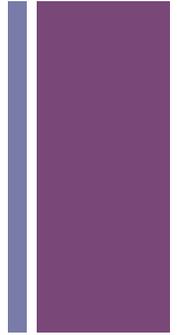
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# + Analyzing practice-linked identities

- Example: 7<sup>th</sup> grade mathematics class (Esmonde & Dookie): How was one student consistently marginalized?
  - Analysis of talk
    - Whose ideas were taken up?
    - “Rock at math,” “suck at English”
  - Spatial analysis (Leander)
- Micro-analysis of moments of ‘positioning’



# + Spatial analysis



# + Practice-linked identities in Physics Education?

- Consider school (k-12, college, graduate school, lab) and out-of-school (hobbies, after-school, 'everyday' like cooking, building, playing sports)

# + Analyzing social identities

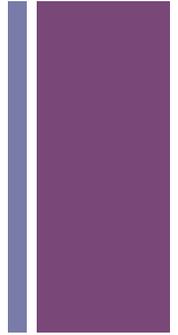
- Interview methods, retrospective storytelling
- Critical Race Theory (e.g., Zamudio et al, 2011):
  - Center the voices of people of color to describe daily experiences of race
- Queer Theory (e.g., Butler):
  - Gender identity as performative
- Sociology:
  - Body work (Gimlin, 2007)



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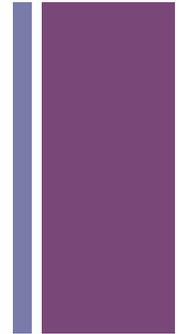
# Analyzing social identities in mathematics practices



- Spencer (2009) study of African American students and their teachers
  - Teacher: “If I go out there (in the hallway), if I’m listening and I hear a couple of kids slamming each other into the lockers, running full speed through a crowd of people, I don’t really have to look through the people to see what’s going to happen. It’s like we only have 20% Black population, but it’s like an 80% chance those are Black kids. It’s the self-expectation. “Oh, I’m expected to run around and bounce off something.” That’s my view.” (p. 220)



# Analyzing social identities in mathematics practices



- Esmonde (2011) discussion of gender(ism) in mathematics classrooms
  - Gender differences are constructed and reinforced through math activities (e.g., comparing body measurements), teaching practices (e.g., groups of 2 boys and 2 girls)
- Mathematics is associated with qualities that are also associated with White masculinity (logic, reason, speed, certainty) (Mendick, 2006)

# + Social Identities in Physics Education?

- Consider school (k-12, college, graduate school, lab) and out-of-school (hobbies, after-school, 'everyday' like cooking, building, playing sports)

## How are practice-linked and social identities related?



In other words, how do broad systems of oppression play out in different practices, through moment-to-moment interaction and in long-term trajectories?

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# Combining analysis of practice-linked and social identities

- PLI analysis benefits from considering power and broad systems of oppression that extend beyond the practice
  - Sports are gendered, racialized, classed
  - Mathematics fits into racialized hierarchies

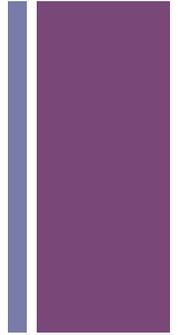


- SI analysis benefits from considers how social categories are invoked in specific practices
  - E.g., gender and leadership in math class (“leaderish girls”)

## + In closing...

- Identity is central to learning
- Identity can be understood in multiple ways; here, practice-linked and social
  - Both of these forms are relational, and both shifting *and* enduring
  - Studies that combine analysis of both forms of identity are stronger, but analytic methods are still being developed
- My question: How do these ideas resonate with research being conducted in Physics Education?

+ Thank you!



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