A Case Study Examining the Microdynamics of Social Positioning within the Context of Collaborative Group Work

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Abstract: During collaborative group work, students from non-dominant social groups can be positioned by classmates in ways that hinder their opportunities to learn and become successful mathematics students. Drawing from an episode of videotaped collaborative group work, this qualitative case study examines the microdynamics of positioning and, using a stimulated recall interview technique, explores how a girl who was working with a group of boys identifies, interprets, and explains these moment-to-moment acts of positioning. The findings point to the strength of this methodological triangulation by further elucidating verbal and non-verbal forms of positioning. Specifically, the results illustrate how the focal student was prevented access to shared learning artifacts and group discussion due to her group members' (likely unintended) 'exclusive talk' and 'physical blocks'. Whether and how the observed acts of positioning are associated with social categories (i.e., gender) are discussed and implications for the implementation of collaborative learning activities are raised.

Becoming successful in mathematics class is a challenging feat that is more attainable for some students than others. There is a growing body of work arguing that *who* students are influences their access to learning opportunities and the quality of their interpersonal interactions within the classroom (Gee, 2000). That is, women and students of color are negatively stereotyped and historically marginalized within the mathematics domain and research documents the ways in which mathematics learning is racialized and gendered (Esmonde & Langer-Osuna, 2012; Langer-Osuna, 2011; Martin, 2006). Within mathematics classrooms, collaborative learning activities wherein girls and/or students of color work with students from dominant social groups have been documented as being rife with issues of power and inequity (e.g., Esmonde & Dookie, 2012; Langer-Osuna, 2011; Leander, 2004). Given the trending reform movements in mathematics education that endorse meaning-making through collaborative learning opportunities (e.g., Gutiérrez, 2002), there is a push for equity focused research to understand not only the sociohistorical systems of power that underlie these collaborative learning contexts, but also how this power is constructed through moment-to-moment interactions between students. This understanding can help further elucidate the subtle yet pervasive ways in which students from non-dominant social groups are hindered from becoming successful in mathematics class.

Theoretical Perspectives

Understanding Learning and Identity

This work is grounded in sociocultural conceptualizations of learning and identity. Learning, according to sociocultural theory, is mediated by interpersonal interactions and the use of artifacts (i.e., objects that have become meaningful over time as a result of their repeated use in goal-directed human activity, Cole, 1996; Vygotsky, 1986). Sociocultural theorists link the process of learning with identity development (Wortham, 2006), positing that learning is not merely about acquiring knowledge and mastering skills, but includes shifts in identity (Lave & Wenger, 1991) and 'becoming' (Nasir, 2002).

From this theoretical standpoint, identity is a social construct that is fluid in nature (Nasir, 2002), emerges through interpersonal interactions (Holland, Lachiocotte Jr., Skinner & Cain, 2001), and evolves as one constucts a notion of self within the context of particular practices such as mathematics learning (Nasir & Hand, 2008). Nasir and Hand (2008) use the term *practice-linked identity* to describe, "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). There is an imaginative component to this process of identitiy development in that, over time and repeated experiences, students in mathematics classrooms, for example, may come to see themselves in ways that incorporate mathematics (Lave & Wenger, 1991; Nasir, 2002). For example, drawing from the principles of learning and identity developed by Nasir (2002), when a student comes to learn a new mathematical concept, this can offer them new ways to participate in collaborative activities which can allow them to further develop their identities relative to the mathematics community. By providing opportunities for meaningful participation, engagement, and self-expression, practices can support the development of positive practice-linked identities and thus faciliate learning (Nasir & Hand, 2008). At the same time, however, experiences that deny these opportunities and limit students to marginal forms of participation can lead to the development of negative practice-linked identities and hinder learning. With this in mind, the present study seeks to better understand the social processes that serve to marginalize students within the context of collaborative group work.

To account for the ways positive or negative practice-linked identities can develop over time through moment-to-moment interpersonal interactions, I draw on the notion of *positional identities*. Holland and her colleagues (2001) assert that moment-to-moment interpersonal interactions position individuals in the social world in ways that provide them with differential access to spaces, conversations, and overall participation in a practice. Moment-to-moment acts of positioning can be implicit or explicit and intentional or unintentional. To demonstrate the microdynamics of positioning and how it unfolds through interaction, Leander (2002) analyzed talk and traced the physical organization of students, including their eye gaze and bodily orientation. Through this microanalysis, Leander was able to demonstrate how one girl was 'silenced' by a group of boys during a classroom interaction. Within the context of collaborative mathematical group work, the ways in which students are positioned through their moment-to-moment interactions with classmates can have a profound impact on their opportunities to learn. For example, Esmonde and Dookie (2012) engaged in a microanalysis of student interactions within the context of collaborative group work to demonstrate the mechanics of marginalization and the ways in which one student was negatively positioned by her group members through both verbal and non-verbal means. Similarly, through the application of their *Differential Influence* framework, Engle, Langer-Osuna and McKinney de Royston (2008) demonstrated how students become influential in collaborative group work in part through their differential access to interactional spaces and the conversational floor. Dookie and Esmonde (2012) build on this work by demonstrating how the construction of power and influence is also shaped by students' access to shared learning artifacts within the context of collaborative group work, with greater access to artifacts facilitating more central forms of participation in the group activity.

Taken together, there is a growing body of work investigating the construction of power and the mechanics of positioning within collaborative learning contexts. This research is also beginning to reveal the ways in which positioning is tied to *social identity* (i.e., social categories such as race and gender). For example, empirical studies demonstrate how students from dominant racial and gender groups have greater access to learning opportunities within collaborative group work while the participation of students from non-dominant social groups is constrained (Langer-Osuna, 2011; Kurth, Anderson, & Palinscar, 2002).

Student Voice as a Critical Research Perspective

What is less understood is how moment-to-moment acts of positioning are experienced and interpreted by students from non-dominant racial and gender groups. Based on the tenets of critical race theory (Ladson-Billings & Tate, 1995), it is important to employ interview methods in research involving individuals from non-dominant social groups in order to provide them with voice. This perspective is essential in truly understanding the lived experiences of those who are marginalized and oppressed by society and is particularly important within the context of group work among culturally and racially heterogeneous students wherein marginalization may be routinely experienced by students from non-dominant social groups (e.g., Kurth et al., 2002; Langer-Osuna, 2011). Furthermore, in the endeavor to better understand how acts of positioning are associated with social identity, it is important to gain an understanding of how these acts are interpreted by those who are on the receiving end. For example, *microaggressions* (i.e., "brief and commonplace daily verbal, behavioral, and environmental indignities, whether intentional or unintentional, that communicate hostile, derogatory, or negative racial slights and insults to the target person or group" Sue, Capodilupo, Torino, Bucceri, Holder, Nadal, & Esquilin, 2007, p. 273) can be conceptualized as forms of marginalization that are tied to particular social categories. Microaggressions manifest in everyday interracial and/or intersexual interactions and are subtly delivered verbally and non-verbally. Particular facial expressions, gestures, tones, and utterances can be microaggressions depending on the context (Solórzano, Ceja, & Yosso, 2000). For example, within a workplace, if a male addresses a female subordinate as 'sweetie', she may experience this interaction as a microaggression. Researchers who investigate microaggressions assert that these marginalizing experiences are subjective in nature, can only be identified by those who experience them, and are therefore best investigated through interview methods (Solórzano et al., 2000; Sue et al., 2007).

Previous research investigating the mechanics of positioning involves video recorded observations of student collaboration as well as microanalyses of this data. This work is limited to only what can be seen in video data. As third party observers, there is danger in making assumptions about students' interpretations and experiences (e.g., Leander, 2004). The present study aims to extend previous work by adding a layer of analysis that considers a focal student's reaction to verbal and non-verbal forms of positioning. Specifically, focusing in on a segment of video recorded collaborative group work and using stimulated recall interview techniques, this case study seeks to investigate: (1) the microdynamics of positioning within the context of collaborative group work and (2) whether and how a focal student from a non-dominant social group identifies, interprets, and explains these acts of positioning. This methodological triangulation can offer further insight into the microdynamics of positioning and provide a more nuanced understanding of how students from non-dominant social groups experience collaborative group work.

Methodology

Participants and Research Context

The data for this qualitative case study were collected as part of a larger study investigating the role of social identity in mathematical group work. This case study is focused on the experiences of Heather (all names are pseudonyms), a multiracial girl, as she engaged in a collaborative learning activity with three White boys. Heather was 16 years old and enrolled in an 11th grade Advanced Functions mathematics class at a private school in a Canadian city. Heather identified herself as a White/Asian girl. The analysis is focused on a session of group work wherein Heather worked with Allen, Walter, and Paul on a set of word problems involving the use of advanced functions. The students were given a shared worksheet listing the three word problems as well as access to a whiteboard to record their calculations and solutions. The group membership was assigned by the classroom teacher and the students were encouraged to collaborate. For the purposes of this case study, the analysis was focused on a segment of video wherein the students were solving a word problem involving statistical probability and the use of a Venn diagram.

Methods and Data Sources

The group work activity was videotaped and brief fieldnotes were taken to complement the video footage. Immediately following the observation, the video was processed and a minute-by-minute content log of the footage was created. The fieldnotes and video were used to identify five moments of interest in the group work activity, including times when Heather appeared to be marginalized (i.e., prevented access to the conversational floor and/or shared learning artifacts) or during intergroup interactions that were deemed interesting by the researcher.

A day following the group work observation, an audio-recorded stimulated recall interview (SRI) was conducted with Heather. Using the video footage of the group work as a prompt, she was invited to watch the video, stop it at any time, and share her reactions, interpretations, feelings and so forth. If Heather did not independently stop the video to comment, the researcher did so after the segment ended and invited Heather to respond to the footage. Heather watched the five segments of video that were pre-selected by the researcher. These video segments ranged in length from about 30 seconds to 2 minutes and 30 seconds.

Approximately one week following the SRI, Heather was interviewed a final time to determine her more general feelings and experiences with group work as well as her knowledge of and experiences with mathematical achievement stereotypes. Heather was encouraged to draw on personal experiences, including the observed episode of group work.

Analysis

A *context analysis* (Erickson, 2006) focusing on talk, gesture, body positioning, and artifacts (i.e., the shared worksheet and whiteboard) was conducted on the five video segments of interest using Studiocode video analysis software. Drawing from Erickson's (2006) *whole-to-part* procedure for analyzing video, each segment of interest was played in its entirety, multiple times with and without sound. To further section the video, major transitions in the bodily configuration of students was marked on a video timeline. Each of these smaller sections of video was then analyzed at a micro-level with a specific focus on both verbal and physical forms of positioning in relation to Heather. These instances were marked on the video timeline and, drawing from the analysis of Esmonde and Dookie (2012), Heather's subsequent verbal and non-verbal actions were coded. After an initial pass of marking these instances of interest on the video timeline, a system of codes was developed. The development of this coding system was an iterative process involving repeated viewing of the video segments, multiple passes of coding, and the refinement of codes.

A full description of the codebook is beyond the scope of this paper, however, in general, the codes were used to identify verbal and non-verbal acts of positioning in relation to Heather as well as her observed responses. Particular attention was paid to the participants' bodily orientations and movements in space relative to Heather and whether/how they impacted her access to the interactional space and the learning artifacts. A transcription of the students' talk was used to analyze whether and how Heather was given opportunities to participate in the group discussion (note that in the selected segment of video presented in this case study, Heather did not make any utterances and hence her talk was not part of this analysis). Examples of positioning codes used in this analysis include 'physical block' (any time a group member physically blocked Heather's access to the worksheet or whiteboard) and 'exclusive talk' (any time members of the interaction physically oriented themselves to talk to another member of the group or verbally addressed a group member by name to participate in the activity). An example of a code that was used to characterize Heather's 'responses' to acts of positioning includes 'strain' (any time Heather had to lean or contort herself, while keeping the trunk of her body stationary, to better see and access the shared artifacts). Codes such as 'access to worksheet' and 'writing' were used to identify Heather's access to the shared learning artifacts.

The Studiocode software facilitated an analysis of the frequency of codes used as well as the timing in which they were applied. This information was used to write an analytic memo for each of the five video segments of interest. In the results section below, I will share the detailed findings pertaining to one of the video segments of interest as well as Heather's response to this video segment. The video segment was 2 minutes and 30 seconds in length and was selected because it was representative of the group work episode and depicted several examples of both verbal and non-verbal forms of positioning.

Together, the interviews and video data informed one another. In addition to providing the participant perspective and voice, the interviews provided further context to the episode of group work. Drawing from Anderson (2009), a limitation of traditional analyses of positioning is that they employ an *imminentist ontology* (i.e., "the premise that positioning is contextually tied to the moment of interaction in which it occurs and not across interactions or scales of activity" (p. 292) and she calls for the need to consider meso-level influences (i.e., "neither from a solely micro- nor a solely macro-social perspective"; p. 293). As such, in addition to considering the moment-to-moment acts of positioning and broad sociohistorical forces such as gender, this study used the interview data to facilitate the investigation of some the meso-level influences (e.g., Heather's relationship with the group members) that came to bear on the episode of group work.

The interviews were transcribed and exposed to descriptive followed by thematic passes of coding. While talk involving social identity, marginalization, and stereotypes was a primary focus, themes (e.g., friendship, dispositional characteristics of group members) also emerged from constant comparison between data and the gradual elaboration of open codes (Glaser & Strauss, 1967). An analytic memo was written for both interviews and the themes were elaborated.

Results

To begin, a vignette is presented to illustrate the ways in which Heather was physically and verbally marginalized in the group work activity. The microanalysis of the selected video segment is then juxtaposed with the narrative interpretation of the experience provided by Heather after she viewed the same segment of video and engaged in the SRI. Following this micro-level discussion about the acts of positioning, Heather's interpretations and feelings about the experience are reviewed.

Part I. Microanalysis of a Segment of Group Work

Vignette: Observed Positioning

Heather, Allen, Walter, and Paul assembled as a group and began the first of three word problems. Allen held the worksheet and he and the other members of the group physically oriented themselves towards the shared worksheet as well as the whiteboard (see Figure 1, image on the left). The initial configuration of the group was semi-circular with Heather slightly on the outskirts. This physical position left her with only moderate access to the worksheet meaning she would have had to significantly lean and contort herself to read the word problem. She had relatively clear access to the whiteboard space wherein the problem was being solved.

Allen began the collaborative group work by reading the word problem aloud. He and Walter discussed the given information and how they would construct the Venn diagram while Paul and Heather watched on. Allen instructed Paul to begin drawing the Venn diagram and from this moment onward, each time Paul went to write something on the whiteboard, he created a physical barrier that made it more challenging for Heather to access the whiteboard (i.e., the central space for the group work activity; see Figure 1, image on the right).

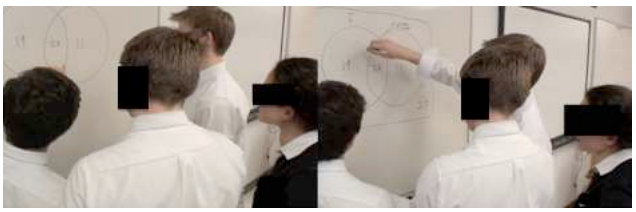

Figure 1.The left image illustrates the original configuration of the group, depicting, from left to right: Allen, Walter, Heather, and Paul. The right image illustrates how Paul blocks Heather each time he writes on the board.

Allen and Walter continued to reread the problem aloud as Paul filled in the given information on the Venn diagram. Once the given information was plotted and the discussion about how to solve the problem became the focus, Walter gradually positioned himself more square in line with the whiteboard and thereby further blocked Heather from the center of the group work activity. Together, the body positioning and physical movements of Paul and Walter served to physically box Heather out of the activity (see Figure 2, image on the left).

Towards the latter half of the video segment, once the physical blocking became most prominent, Heather appeared to strain herself (i.e., lean in, angle her head) to better see the worksheet and what was being

written on the board. After a few moments, Heather walked to a new position in the group wherein she was closer to the whiteboard yet further from the worksheet and the intermittent discussion between Allen and Walter (see Figure 2, image on the right).

Figure 2. The image on the left depicts the physical blocking by both Walter and Paul. The image on the right depicts Heather's new spatial position in the group.

The microanalysis of body positioning during this video segment revealed that Heather was on the physical periphery of the activity with limited access to the interactional space. As the physical barriers created by her group members became more prominent and stable, she strained herself to better see the information on the worksheet as well as what was being written on the whiteboard and eventually she moved to a new spatial location in the group. Although this move positioned Heather closer in proximity to the whiteboard, it further distanced her from the center of the group discussion (i.e. between Allen and Walter) and the shared worksheet.

During this video segment, Allen was the only person to hold the worksheet and Paul was the only member of the group to write on the board. In the analysis of talk, five clusters of conversations were identified, primarily involving either Allen, Walter, and Paul or only Allen and Walter. Furthermore, three out of five of these conversations were characterized as 'exclusive talk', meaning that members of the conversation either explicitly addressed one another in the conversation or physically positioned themselves towards another person thereby excluding other(s) (i.e., mainly Heather) from participation. Heather did not make a single utterance during this video segment (and said very little as they solved the subsequent two word problems).

From the theoretical and analytical lens of the researcher, this microanalysis reveals the ways in which Heather was negatively positioned by her group members. The question remains as to whether these physical blocks and exclusive conversations between the male members of the group were a salient part of the experience for Heather. Let us now turn to the interview data to investigate whether and how Heather identified, interpreted, and explained these acts of positioning.

Part II. Using Interview Data to Explore Heather's Experience

Identifying Acts of Positioning

The video segment described in the previous section was played for Heather during the SRI and she was then asked to respond to the footage and describe what she was thinking and feeling during that point in the activity. She began by explaining that she did not enjoy the word problem because the people in her group were "taking charge". She went on to describe how she was physically blocked and had difficulty seeing the worksheet and the whiteboard:

> They didn't- I couldn't really see the question, so I didn't really *know* what was happening and then I was trying to look at the board and then [Paul] decides to like stand right there in front of me. So I'm like, "oh, ok!"

A few moments later, she went on to say:

> Well also like, [Paul] is like blocking my view so I can't really see what's going on. And they're just like...and those- [Allen] and [Walter] or- those people, they like-they like taking charge and that's what they're doing! …And also like, I didn't know what the question was cause I couldn't see it cause they're holding it [the worksheet] like *that*, so I didn't- couldn't really contribute anything.

Heather's narrative clearly illustrates the impact of physical marginalization. Here and throughout the SRI, she repeated the fact that she was being physically blocked by Paul. In contrast to the microanalysis of the video that revealed the physical blocks of both Walter and Paul, in her narrative, Heather solely focused on the blocking actions of Paul. To further build on the findings of the video microanalysis, Heather attributed her inability to access the worksheet as a result of the way in which Allen was holding the paper and angling it towards himself:

Heather: Just like- I don't really know what's going on cause I haven't heard the question.
Researcher: Yeah. Cause you didn't hear the question being read?
Heather: Yeah and like, he's [pointing to Allen] hoarding the question.

As a result of this limited access to the shared learning resources, Heather indicated that she "couldn't really contribute anything". Heather went on to explain her movement to the new spatial location in the group as "an attempt to see the board" as a result of being blocked by Paul. Consistent with the microanalysis of the video segment, Heather indicated that although the move allowed her to see the board better, "that was about it" and it did not increase her participation in the group activity.

In addition to discussing the physical aspect of the marginalization, Heather acknowledged the way Allen and Walter dominated the discussion and essentially took charge of the group work. She also noted that Paul did the writing for the group and served as the "scribe" for Allen and Walter. Taken together, Heather's narrative points to the subtle ways in which marginalization occurred through verbal and nonverbal means and provides further nuance into the experience of this marginalization.

Interpreting and Explaining Acts of Positioning

Drawing from the full episode of video recorded group work, the SRI, and the final interview, the focus of the analysis is now broadened to consider some of Heather's general interpretations and explanations. At the end of the SRI, Heather was asked to describe her general feelings about the group work activity:

> Well, I did not particularly enjoy it, but I think for people like [Allen] and [Walter]- like people who really dominate- that was helpful for them cause they could like bounce ideas off each other. But personally, I did not really benefit from that cause I couldn't see the questions and then I didn't really know what was going on and then…yeah.

Based on Heather's appraisal, the physical marginalization seemed to be a salient aspect of the overall group work experience. A microanalysis of video segments obtained across the entire group work footage revealed that the physical blocks, 'hoarding' of the worksheet, and exclusive conversations were not isolated events. Heather also explained that she was often grouped with these same students within the mathematics class and they characteristically tended to take charge of the group work. When asked how this group work experience could have been improved, Heather suggested having the group "work in a circle instead of a line" so that all members could see the worksheet and the whiteboard. Heather also advocated having students select their own group members: "I know like you're not supposed to work with your friends, but I actually would prefer working with my friends cause then they would actually let me *see* the question and then we could actually find out what's going on." Taken together, the importance of the physical dimension of the collaborative activity was emphasized throughout Heather's narrative description of the experience.

Although Heather identified various forms of marginalization and provided insight into how it made her feel, she did not offer as many clear explanations to account for these actions. During the SRI, she did, however, use the dispositional characteristics of her group members to account for their actions. For example, with respect to Allen 'hoarding' the worksheet she stated that, "he loves his paper" and described him as being "controlling with math". She also indicated that Allen and Walter were, "people who really dominate" and "enjoy taking charge" and so they tended to do so during the activity. During the final interview, when asked about whether race or gender had an impact on the group work dynamic, she stated:

> I don't think race comes into play. Especially not at [my school] cause [my school] is a very nice and diverse school. But maybe gender a little bit. Like I don't even think it's necessarily gender, it's more like who you're friends with. Cause the guys, they were all friends.

This quote reveals Heather's perception of the school culture as a "nice and diverse" place devoid of issues of race. It also suggests the underlying importance of friendship for Heather within group interactions. Although she only alludes to the role of gender in the group work interactions, her reference to the boys in the group all being friends suggests that these friendships are gendered in nature.

Discussion and Implications

This case study provides a snapshot of how one student became a marginal member of a group through the ways she was positioned by her group members. Whether or not Heather was proficient with the mathematical content or had ideas to contribute to the group, the exclusive exchange of talk that took place between her group members as well as the ways in which they oriented their bodies, prevented her from accessing the interactional space and conversational floor. Together, this limited her to peripheral participation in the activity. Reinforcing the work of Dookie and Esmonde (2012), this study also demonstrates the significance of shared learning artifacts in collaborative learning contexts. Not being able to see the whiteboard or access the shared worksheet

were central concerns highlighted across the analyses and contributed to the ways in which Heather was restricted to participating in the margins of the activity.

By considering both observed and experienced positioning, this case study makes a unique research contribution. It offers a nuanced understanding of how a student from a non-dominant social group experienced collaborative group work and provides further insight into the microdynamics of positioning. Although they foregrounded different dimensions of marginalization, the analysis of both the video and the SRI yielded insight into how Heather was marginalized through verbal and non-verbal means. For example, the findings of the microanalysis highlighted Heather's limited access to the shared worksheet while her narrative provided further detail and described that it was the way in which Allen was holding the worksheet that made it difficult for her to access it. The video footage alone (and the constraints associated with using a single video camera) could not provide this kind of detail and nuance. Similarly, while the findings of the video microanalysis emphasized the way Heather was physically blocked by multiple members of the group, Heather's narrative focused specifically on the physical blocks of one group member. These findings are similar to those of Leander (2004), who was surprised to find that although his analysis of a video recorded interaction was centered around student-student positioning, a posthoc interview with a focal student, Latanya, instead revealed her focus on her relationship to the classroom teachers (who were not captured in the video footage). Leander (2004, p. 207) states, "While Latanya and I watched the same videotape of the interaction, she appears to have attended primarily to [the classroom teachers] who were, for the most part, off camera." These findings point to the potential for misinterpretation when we rely too heavily on the sole perspective of researchers in these microanalyses of social interaction and highlight the importance of considering the perspective of the participants involved.

This study intentionally focused on the account of one focal student. It is important to acknowledge that reflective perspectives of an event may often differ from the complex ways in which actions are collaboratively organized in the moment. Positioning is an interactional dance that is co-constructed by the participants involved. This study focuses on the ways in which a student from a non-dominant gender group was restricted access to participation. Heather's moves in this interactional dance were limited by the moves of her group members. By straining her body and moving to a new physical location in the group, however, Heather made physical bids to be included. One could imagine a number of other ways in which Heather could have pushed back. Future studies should further examine the ways in which a person can be restricted from demanding access to central participation and whether and how this is tied to social identity.

It is also important to note that an interview provides a subjective perspective of an event and, in addition, is always a conversation between two people, rather than insight into all the participant's private thoughts. This is particularly important in reference to the interpretations and explanations provided by Heather in her response to the video footage. From the theoretical and analytical lens of the researcher, Heather was working with three boys and their physical blocks and exclusive talk could be conceptualized as microaggressions. However, Heather did not vocally explain these acts of positioning as such and essentially dismissed the notion of race and gender playing a role. Instead, her talk about gender was implicit in nature and came about through her indirect reference to the gendered nature of friendships within the classroom. Without undermining Heather's interpretation of the experience, this does not necessarily mean that gender and/or race were irrelevant in this collaborative learning activity. In her work examining *colormuteness*, Pollock (2004) demonstrates that there is a general propensity for students to resist talking about race in school in certain situations, despite its omnipresence. There are numerous reasons to account for why Heather may not have made explicit mention of taboo topics. For example, like many, Heather may have been motivated to appear 'egalitarian' which is particularly likely given the way she described the culture of the school as being "nice and diverse". One of the goals of this case study was to foreground the experience and voice of a student from a non-dominant social group and the intent here is not to discount her narrative but to instead draw attention to the subtle ways in which students may resort to talk about taboo issues as a result of school culture and so forth.

In her interview, Heather talked about gender implicitly by making an indirect reference to the gendered nature of friendships. In the endeavor to create more equitable learning contexts that provide students with opportunities to thrive and develop positive mathematics identities, it is important to understand the ways in which students experience and talk about their group work experiences. This includes the ways in which they talk about race and gender. Furthermore, it is important to investigate and understand the microdynamics of positioning so that educators can work towards better organizing collaborative learning activities so that all students have equitable access to learning opportunities. The classroom teacher in this case study had equity-focused intentions for the collaborative group work activity and it is likely that the acts of positioning performed by Heather's group members were unintentional and unconsciously delivered. However, students from non-dominant social groups can become marginalized in very subtle and unintended ways during collaborative learning activities. Over time and repeated experience, this can have a profound impact on their evolving mathematics identities. Bringing discussions about the microdynamics of positioning and marginalization into mainstream teacher discourse and professional development may be one way to work towards ensuring that all students have the opportunity to become successful mathematics students.

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