ENACTING RESPONSIVE RESEARCH STRATEGIES IN MATHEMATICS EDUCATION: ANSWERABILITY AND ACTION IN CLOSE-TO-THE-CLASSROOM ETHNOGRAPHIC WORK

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Researchers in education broadly, and in mathematics education in particular, have made progress in defining culturally responsive or relevant pedagogies and have documented a variety of contexts where these pedagogies have supported the mathematical learning of various groups of non-majority children. However, little attention has been paid to examining research practices in light of the demand to become culturally relevant. The purpose of this paper is to examine the impact of our conscious choice to make our methodological work responsive to the children involved.

In the last two decades, researchers in education broadly, and in mathematics education in particular, have made progress in defining *culturally relevant pedagogies* (Erickson & Mohatt, 1982; Ladson-Billings, 1995; 1997) and have documented a variety of contexts where these pedagogies have supported the mathematical learning of various groups of non-majority children (e.g., Brenner, 1998; Gutstein, Lipman, Hernandez, & de los Reyes, 1997; Ladson-Billings, 1994). As researchers concerned with equity issues within mathematics education, we share the goal of "helping students to accept and affirm their cultural identity while developing critical perspectives that challenge inequities that schools (and other institutions) perpetuate" (Ladson-Billings, 1995, p. 467). However, in addition to asking what pedagogies might meet this goal for children, we want our own research projects to work toward these goals. In addition, we would like to move beyond producing findings that are aimed at helping children to affirm their identities – in relation to both culture and mathematics—toward ensuring that our moment-to-moment engagements with our student participants also work toward these equity commitments. In response to this desire, we have begun to ask ourselves the following researchable questions:

- In what ways are our own research strategies responsive to the participants in our study?
- What tensions arise when we, as mathematics education researchers, make data collection decisions based on our desire to be responsive?

Purpose

The purpose of this paper is to explore the questions above within the context of a three-year ethnographic research project. The project's goal is to document the mathematical strengths of young children attending a rural school that serves a predominantly African American community. To do this work, we are following a cohort of children from preschool to first grade and collecting data about their mathematical learning in a variety of contexts (e.g., formal lessons, play, parent involvement events, assessment interviews) using videotape and fieldnotes as our primary data collection tools. As we approach the end of our second year of data collection, we find ourselves thinking a great deal about the responsibility we have as researchers, mathematics educators, and adults toward the children we visit each week and find that more and more of our actions during data collection are guided by our perceived responsibilities toward these particular children rather than toward the research project more broadly. For this presentation, we would like to closely examine three critical sites during our weekly data collection efforts where we have chosen to alter our actions within the school context out of a desire to be responsive our student participants.

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Literature Review

In defining culturally relevant pedagogy, Ladson-Billings (1995) differentiated her work from previous scholarship concerned with the cultural differences by arguing that previous work treated these differences as neutral. She posited that it was not enough to teach children the dominant communicative practices used in schools, but said that students must also be given opportunities to critically examine schooling practices. More specifically, through ethnographic analysis of successful teachers of African American students, she argued that culturally relevant pedagogies include a commitment to students' academic success, cultural competence, and critical sensibilities (Ladson-Billings, 1994, 1995).

Broadly, both within and outside of mathematics education, work focused on culturally relevant or responsive teaching has focused on ethnically homogenous classrooms, primarily in African American or Latino/a contexts (Morrison, Robbins, & Rose, 2008). As Morrison, Robbins, and Rose (2008) note in their meta-analysis of 45 research studies about culturally relevant pedagogy, this focus on ethnically monolithic classrooms is problematic because the knowledge base may not help teachers who want to teach in culturally responsive ways in diverse classrooms. But it is also problematic because it can contribute to an assumption that all children who claim similar ethnic or racial identities find the same schooling practices to be productive. Following Schmeichel (2012), we were wary of essentializing the students we work with by suggesting that particular pedagogies and practices were directly related to students' cultures and ethnicities, rather than, for example, individual temperaments, schooling histories, community norms, gender, class, etc. Scholars have dealt with this challenge in a variety of ways. For example, Ladson-Billings (1997) used footnotes to temper claims about the universality of certain features of African American culture. Civil and Khan (2001) dealt with this challenge by grounding claims about parent knowledge in a Latino/a community by emphasizing the hyper-local nature of that knowledge and the ethnographic investigation that had led to the understandings.

Theoretical Framework

In thinking about how to apply the body of work on culturally relevant teaching practices to research methods, we faced a number of challenges. Most importantly, teaching and research are quite different endeavors so it was difficult to think about how recommendations for teaching practice might translate for us as researchers. We, for example, had little control over what children experienced in the classroom moment-to-moment and thus had few opportunities to either work to align classroom experiences with at-home communication practices or to introduce opportunities for children to critically examine their school and classroom.

Second, little explicit direction on what constituted culturally relevant research practices existed and what we did find felt like an uncomfortable fit given our own subject positioning. For example, in discussing her own research methods, Ladson-Billings (1995) drew on the work of Collins (1990), a black feminist theorist, to articulate a research stance based on four big ideas: concrete experiences as central to meaning, dialogue as central to assessing truth claims, caring as central to the research endeavor, and personal responsibility as critical. While we felt drawn to these precepts, we felt we could not unproblematically take them up. A central idea in Collins' (1990) work is that it presents a "Black women's standpoint," informed by living as an "outsider-within" (p. 16). As white women working with primarily African American students we did not want to assume that we could fully comprehend this research stance only from reading published work. This is not to say that communication across lines of difference is impossible, only that it is important to be careful in these moments. Finally, we wanted to be sensitive to the two broad issues raised by our review of literature on culturally relevant or responsive pedagogies: the occasional sidling of critical perspectives and the danger of essentializing groups of children, again especially considering our own outsider status in the community.

To meet all of the above challenges, we decided to draw on the ideas of a theorist commonly used by our colleagues in literacy, Mikhail Bakhtin. In particular, we took up Bakhtin's notion of *answerability* as a guiding principle for our own in-the-moment decisions in the field as well as a framework for analyzing the extent to which our project was meeting Ladson-Billing's goals of helping children to both affirm their

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identities and develop a critical stance toward schooling. In a small collection of work (Bakhtin, 1990, 1993), Bakhtin articulated the ethical stance of answerability wherein "I myself – as the one who is actually thinking and who is answerable for his act of thinking – I am not present in the theoretically valid judgment" (Bakhtin, 1990, p. 4). Here Bakhtin rejects a priori ethical standards and argues that it is only in the moment with other human beings that we can determine what it means to be ethical or responsive to them. We cannot, Bakhtin argues, draw on alibis from other places to justify our behavior, although we may be informed by them, whether those alibi's come from state curriculum standards, NCTM guiding principles, culturally relevant practices, or commonly accepted research norms. Rather, we must be responsive to the demands of the people before us. Hicks (1996) writes about this stance as "more similar to faithfulness, even love, than adherence to a set of norms" (p. 107). We felt this stance captured the heart of culturally relevant pedagogy while addressing the concerns raised above. Following Bakhtin, we were not constrained by a set a principles and practices that better described the work of classroom teachers than our own work, and we could view our responsiveness to the children in front of us in light of their many legitimate demands for consideration including, but not limited to, culture, developmental stage, economic status, gender, and temperament.

Modes of Inquiry

As mentioned above, this project is situated within a larger three-year ethnography following a cohort of students from preschool to first grade. The data collection is primarily based on weekly visits that include video taping and writing fieldnotes about informal mathematical play, formal mathematics lessons, parent activities, and assessment interviews with the researcher. Our student participants include 16 children attending a rural, low-SES school. Thirteen of the 16 students are African American; one is European American; one is a recent Indian immigrant; and one is Hispanic. The children are currently in kindergarten. The research team includes two European American women (one the PI), one Asian American woman, and one Korean woman. Each week, three members of the team visited the school, with two researchers collecting data in the classroom.

During the first year of data collection, we took up relatively traditional participant observer roles (Erickson, 1986) video taping the classroom during math lessons while frequently speaking to students. The Pre-K teacher included little formal mathematics in the day, which meant that a great deal of our data collection occurred during play. Students handled manipulatives and engaged in mathematical thinking during unstructured activities. We loaded fieldnotes and video clips into a qualitative data analysis program, which we used to code the data for both mathematical content (such as problem solving and cardinality) and social features of the classroom (such as peer play and teacher interaction).

Moving into the second year of the study, we did not plan to change data collection methods. We began by recording and taking notes about the kindergarten math lessons, which were whole group. Many of the students who had expressed excitement and accomplishment the previous year were visibly upset during the math lessons. For example, over a period of three weeks, we observed five children crying during mathematics. In response to this situation, we made two significant changes to the project. First, we made an offer to the teacher, which was accepted, to have one member of the research team take a small number of students out of the classroom to work each week with the goal of both addressing mathematical needs and reducing unhappiness and anxiety for these students and their classmates. Second, we began to note, collect data about, and specifically code for our interactions in the classroom that were designed to be responsive.

For the first time in the 18 months of data collection, we began to intentionally video record interactions between the children and the other researcher in the room. Initially, we coded these moments as *researcher interaction*, but as our coding and theory became more sophisticated we also coded using the word *answerability*. For this presentation, we more closely analyzed data collected in relation to the small group of students we removed from the classroom and from video and fieldnote episodes marked with the codes *researcher interaction* and *answerability*. Following ethnographic (Emerson, Fretz, & Shaw, 1995; Erickson, 1986) analysis strategies, we searched these episodes for common themes, significant disparities,

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and social meaning. The following section describes three key sites we identified where our answerability as researchers was most apparent.

Critical Moments for Answerability

Removing Students from the Room

Our choice to tutor three students each week is perhaps the clearest, most systematic example of our enactment of answerable, or responsive, research methods. This practice was not a part of the original research plan and initially we did not know how data would be collected because the researcher working with the children could not teach and operate a video camera at the same time and a stand-alone camera proved too distracting. In addition, data collection was complicated by the inclusion of one child whose parents had not agreed to video taping; however, we included this child in the group because we believed it would be a positive experience for him. Ultimately, we relied on researcher journals and audio taping.

At the request of the classroom teacher, the focus of the small group was counting. In making recommendations for the small group, the classroom teacher expressed anxiety about the selected students' scores on benchmark tests and a desire to see these scores go up. Although the researcher working with the children was not unconcerned with their performance on assessments, she made a conscious choice to emphasize positive interactions with mathematics in the small group rather than tasks strictly related to the benchmark assessments on counting.

For example, during one session the researcher disregarded her plan to work on counting skills in favor of measuring objects because students said they had been studying measurement in class, but when asked what objects they had measured, responded "nothing." The students had listened to their teacher talk about measuring, had watched her measure, but they had not yet had the opportunity to measure themselves. In the small group that day, students chose objects to measure with various non-standard units. Although students practiced some counting during the measurement activity, the researcher leading the session felt some discomfort in abandoning the goals set by the teacher. However, in the moment, providing the children with an engaging experienced connected to their immediate learning seemed more responsive. Although the small group did give selected students opportunities to engage in more hands-on experiences in mathematics, it presented a few problems as well. First, students not chosen for pull out regularly begged to be included. Second, previous data collection plans for the researcher who worked with the small group had to be abandoned.

Introducing Mathematics to the End of the Day

The classroom moments most frequently coded for researcher interaction and answerability occurred during the last twenty minutes of the school day. Routinely, the mathematics lesson ended well before students needed to line up for the bus. The teacher and paraprofessional's typical practice was to pass out backpacks and folders throughout the last twenty minutes of the day while the children sat quietly at their desks. Typically, the researchers would sit near children during this time and chat quietly.

However, on one occasion after a geometry lesson in which students identified solid figures on a worksheet but did not handle any figures themselves, the PI got a box of solid figures down off the shelf and passed it around to the students at the table where she was sitting. Students immediately grabbed for the shapes, some stacking up multiple figures, some experimenting to see which figures would roll. During this interaction, the children and the PI both used quite a bit of geometric vocabulary from the lesson, including "cylinder," "cone," "cube," "circle," and "face." After a few moments, the children started to become loud and the PI shushed them. She also intervened on several occasions to ensure that all children at the table had access to at least one figure when one little girl tried to collect them all.

The decision to pass out these materials, even in the moment, felt uncomfortable because this action violated both the norms of the classroom—materials are not taken out during the last twenty minutes of the day – and the norms of ethnographic research—the participants define the social rules and ethnographers try to adopt them in the least intrusive way possible. However, informed by the theoretical language of culturally relevant pedagogy, which called for adopting a critical stance toward dominant schooling

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practices, and answerability, which called for a responsiveness to the children in the moment, the PI made the decision to do something uncomfortable. The result was an opportunity as a researcher to see what sense students were able to make of these figures, which features they noted and talked about, and what they found interesting. It was also an opportunity for an experienced classroom teacher to model what it might look like to engage students in geometric thinking in a more hands-on way and to give students the opportunity to experience mathematics in ways that felt engaging and fun. On the video, students' faces are far more animated during these moments than while completing the worksheet.

However, this moment also created complications. While passing out shapes to the table the PI was sitting with seemed possible, passing out shapes to the entire classroom felt like too much of an intrusion. As a result, a little more than half of the children did not get to participate. In addition, because she initiated the activity, the PI became responsible for the behavior of the children in her group, which shifted her role in relation to them not just in the moment but in future interactions.

Putting Down the Camera

The PK teacher who we began the project with was a 20-year veteran of the classroom. As a result, few lessons spiraled out of control and those that did were quickly adjusted. Although we had our own opinions about the teaching, we never felt that the PK teacher was in need of our help. In contrast, as a third-year teacher, the kindergarten teacher occasionally found herself in the midst of lessons that were not going the way she intended. During these lessons, as part of our orientation toward responsiveness, we began to move around the room as classroom helpers, sitting with small tables of children and directing their progress.

For example, in one activity, students were asked to roll a number on a die, write the numeral, write the number word, and color the correct number of spaces on a tens frame. Most students were able to do each of these tasks, but had a great deal of difficulty interpreting where on the sheet they were supposed to write each component. Both researchers in the classroom began to help groups of children. Some of the video clips show wavering footage as the researcher tried to continue taping while pointing and explaining. In other cases, the video simply shuts off as the researcher attended to the children in front of her. Over the course of the semester, this switch from researcher to teacher occurred during three lessons in significant ways. Again, this move demonstrated a responsiveness to the children in the room that helped them to feel successful and academically accomplished in mathematics in ways that probably would have been unlikely with out the researchers' intervention. Additionally, although we don't yet have evidence, these sorts of interactions may help to build relationships that will make parents more comfortable with us and our questions during parent events.

However, these moves were not without consequences for us as researchers. For example, in a lesson during the week following the one described above, the PI is repeatedly interrupted by a little girl saying "Can you help me now? Can you help me now?" while videotaping a boy who is completing a task independently. Similarly, although the total amount of time when we chose to stop taping was small, there were some moments we lost that later we wished we had on tape.

Discussion

Asking ourselves whether our research strategies were culturally responsive led us to a point where we felt obliged to continually ask ourselves whether our practice as researchers was answerable to the children in the room and as a result toward stances in the classroom that we would not have adopted if we had only been considering our roles as researchers. In many ways, the dilemmas described in this report are related to long-standing conversations in the field of qualitative research, where a number of scholars have argued that researchers, who are privileged in many ways, have ethical obligations to positively impact the people with whom they work (e.g., Duneier, 1999; Weis & Fine, 2000). However, as others point out (Bogdan & Biklen, 2003), decisions to involve oneself change what is possible in the research relationship. We believe that the historical failure of schools, in mathematics and beyond, to include and to educate all children places the same ethical burden on researchers as on classrooms teachers—to provide opportunities for children to experience academic success, cultural competence, and critical engagement (Ladson-Billings,

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1994, 1995). We also believe Bakhtin's notion of answerability provided a way of framing research decisions with an appropriate emphasis on the children in the room. At the same time, there are possibly unresolvable tensions involved in making an ethical stance such a large part of one's work. Through inviting children (even implicitly) to critique classroom practices, we risked our unproblematic relationship with the classroom teacher, which is essential to gaining the access necessary to doing this work. Similarly, by engaging with children during lessons we lost our status as objective observers.

These tensions need to be explored in both philosophical and empirical ways. For example, we continue to question each other's decisions in the classroom and to ask each other to articulate the ethical principles by which we are making these decisions. Empirically, we are seeking to document our own roles in the classroom (a practice supported by the presence of multiple researchers) and to code, analyze and theorize these interactions as we would any other classroom episode. In putting this forward, we hope to launch a conversation with other researchers about the ways we can use our mathematical and pedagogical knowledge to support children while also carrying out research on current schooling practices.

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