FACILITATING EMERGENT BILINGUALS' PARTICIPATION IN MATHEMATICS: AN EXAMINATION OF A TEACHER'S POSITIONING ACTS

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by

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LIST OF ABBREVIATIONS

ACCESS – Assessing Comprehension and Communication in English State-to-State for English Language Learners

EB – Emergent bilingual

MTE – Mathematics teacher educator

NA – Not available

WIDA – World Class Instructional Design and Assessment

ABSTRACT

This study examined the mathematical learning opportunities provided to Latinx emergent bilinguals (EBs) in an elementary classroom. I used positioning theory (Rom Harré & van Langenhove, 1999b) to examine the acts of one third-grade teacher, Ms. Bristow, over two years to identify the ways she interactively positioned Latinx EBs in whole-class settings through spoken and written acts. An examination of the data revealed Ms. Bristow positioned EBs in five ways: inviting EBs to co-construct mathematics, revoicing EBs' mathematical contribution, acting as an intermediary between EBs and peers, valuing EBs' mathematical contributions, and recording EBs' mathematical thinking. These positioning acts provided multiple opportunities for EBs to use spoken mathematical discourse—a critical component to mathematical learning. The positioning acts also fostered the storylines: EBs are mathematically competent, EBs can explain their mathematical thinking to others, and EBs are contributors to the co-construction of math. The findings from this study have implications for teacher education and mathematics educators.

CHAPTER 1: INTRODUCTION

Emergent bilinguals (EBs) are a diverse group of students who represent an increasing demographic within U.S. public schools (National Center for Educational Statistics, 2016). Given EBs unique educational goals of simultaneously learning mathematics and English language, teachers must enhance instruction to increase access and create opportunities to learn (Harper & De Jong, 2004; Lucas, Villegas, & Freedson-Gonzalez, 2008). However, elementary teachers have been historically unprepared to teach mathematics to this growing population (Ballantyne, Sanderman, & Levy, 2008). As a result, EBs have been marginalized and positioned inequitably in classroom contexts (Gutiérrez, 2008; Pappamihiel, 2002; Yoon, 2008). Such positionings can restrict EBs' mathematical and linguistic development due to limited opportunities to participate in and learn from classroom discourse (Esmonde & Langer-Osuna, 2013; Inagaki, Hatano, & Morita, 1998; Moschkovich, 2002; Reeves, 2009).

Since people learn through discourse, engagement in discourse is critical to learn mathematics (National Council of Teachers of Mathematics, 2014) and the English language (Lightbrown & Spada, 2013). Thus, EBs must participate in classroom discourse if they are to have access to opportunities to learn (Esmonde & Langer-Osuna, 2013; Inagaki et al., 1998; Moschkovich, 2002). However, classroom discourse is a powerful tool that can either empower or repress students (Turner, Dominguez, Maldonado, & Empson, 2013). Therefore, those who control the classroom discourse also control the classroom and subsequent opportunities to learn (Gee, 2008). Discourse that is used to control or silence EBs ultimately diminishes opportunities to learn mathematics and acquire English while maintaining the status quo (Battey & Leyva, 2016; Yoon, 2008). Thus, teachers must not only understand the importance and influence of their own discourse in the mathematics classroom, but also have ways to use their discourse strategically to facilitate mathematical and linguistic learning.

Stereotypes, narratives, and storylines of mathematical competence permeate U.S. culture (Nasir, 2016). Stereotypes, narratives, and storylines related to EBs have historically been deficit-oriented, focusing solely on their English language deficiencies and the added challenges they pose to over-worked teachers (de Araujo, Smith, & Sakow, 2016; Gandara, Maxwell-Jolly, & Driscoll, 2005; Pettit, 2011). Such stereotypes, narratives, and storylines can be circulated in classrooms and determine ways teachers and students interact with EBs (de Araujo et al., 2016; Turner et al., 2013; M. B. Wood, 2013; Yamakawa, Forman, & Ansell, 2009; Yoon, 2008). For instance, if teachers position EBs in deficit storylines, they diminish EBs' opportunities to access, learn, and achieve in mathematics. In contrast, when teachers position EBs in ways that call attention to and value their mathematical competencies and diverse cultural assets and experiences, they foster a storyline of mathematical competence (Khisty & Chval, 2002; Pinnow & Chval, 2015). Too frequently, however, EBs do not experience such storylines and experiences (Brenner, 1998; Gutiérrez, 2008). Thus, it is critical for teachers to establish and foster storylines of mathematical competence for EBs in the classroom. Yet, to do this, teachers must be strategic in their use of discourse to position EBs in identified and desired storylines.

Positioning theory (Rom Harré & van Langenhove, 1999b) provides a useful theoretical lens to examine classroom discourse. Positioning theory foregrounds discourse and proffers a way to analyze the dynamic nature of classroom interactions.

More specifically, positioning theory provides a framework to guide the examination of how teachers' positioning of EBs influences student access to classroom discourse and, subsequently, to mathematics and second language (L2) learning opportunities.

This study examined how one teacher used discursive practices to position EBs in ways that facilitated their participation and acquisition of mathematical discourse and fostered narratives of competence on the part of the EBs. More specifically, this study investigated specific positioning acts the teacher used to create opportunities for EBs to use mathematical discourse in whole-class discussions and the narratives that were created because of these positionings. Overall, this study investigated, *What spoken and written acts did an elementary teacher employ to facilitate the participation of EBs during whole-class mathematics instructional episodes?*

Theoretical Framework

The theoretical assumption that guided this study was derived from a situated sociocultural perspective (Lave & Wenger, 1991; Moschkovich, 2002; Wenger, 1999). A situated sociocultural view builds on the perspective that mathematical learning derives from discursive activity between teachers and students that occurs in a community of practice (Lave & Wenger, 1991; Moschkovich, 2002; Wenger, 1999; Young & Miller, 2004). Moreover, it asserts EBs diverse backgrounds, experiences, and linguistic resources are valuable and should be drawn from in learning communities (Moschkovich, 2002). Thus, a situated sociocultural perspective supports the examination of discursive practices between teachers and EBs in mathematics classrooms.

Positioning Theory

Positioning theory assumes social phenomena exist in, and are a product of discursive practices (Rom Harré & van Langenhove, 1999b). Moreover, it assumes all social interactions occur in distinct, sequential, and historically situated episodes, which are "defined by their participants, but at the same time they shape what participants do and say" (Rom Harré & van Langenhove, 1999b, p. 5). In this vein, this study employed positioning theory (van Langenhove & Harré, 1999) as a conceptual and methodological framework to examine the discursive practices between an elementary mathematics teacher and Latinx EBs. More specifically, I examined one teacher's interactive positioning of EBs in relation to EBs participation in mathematical discussions over time. In the next section, I briefly outline positioning theory and highlight the importance of positioning for EBs' mathematical participation and learning.

Positioning Theory Triad

Positioning theory is composed of three central components: acts, storylines, and positions (Rom Harré & van Langenhove, 1999b). *Acts* refer to the social meaning(s) of people's intended actions, which, in any situation, may have multiple social meanings (Rom Harré, Moghaddam, Cairnie, Rothbart, & Sabat, 2009; Moghaddam, Harré, & Lee, 2007). In line with the revolution of positioning theory, I use *acts* in place of Harré and colleagues' (1999a) initial *speech-acts* since *acts* captures a broader range of social actions (e.g., gestures) (Rom Harré, 2012).

Storylines are "strips of life [that] unfold according to local narrative conventions" (Rom Harré, 2012, p. 198) that are constituted and reconstituted through social interactions. In positioning theory, strips of life are defined as "lived stories for which told stories already exist" (Rom Harré, 2012, p. 198). Storylines can be used to refer to the multiple categories, stereotypes, or cultural values (e.g., smart/dumb, boy/girl) people draw on in social situations that are used to define the expectations and conventions of interactions in that setting (Herbel-Eisenmann, Wagner, Johnson, Suh, &

Figueras, 2015). For example, a teacher in a classroom may draw on the storylines of reform/traditional instruction and right/wrong mathematics answers simultaneously to motivate her/his interactions with students. Hence, within each social interaction there may be multiple storylines at play, all drawn from and on participants' cultural, historical, and political backgrounds and experiences.

The ways individuals enact storylines are or become socially recognizable. For instance, if a teacher employs a storyline that contradicts historical or culturally shared narratives (e.g., incorrect answers are just as valuable as correct answers), this storyline may not initially be conceived as socially recognizable; however, over time, through various acts, new storylines can be shaped and become socially recognizable in the local moral order.

Positions refer to one's "moral and personal attributes as a speaker" (Rom Harré & van Langenhove, 1991, p. 395) and the "momentary clusters of rights and duties to speak and act in a certain way" (van Langenhove, 2011, p. 67) in social interactions. Said another way, one's social position determines the social expectations and range of available acts of participants/people. Positions are relational, and the range of available acts are contingent upon the unfolding storyline and the competencies of the participants. This range is further restricted in institutional settings, such as schools, where rights and duties are socially prescribed.

Positions are also dynamic—each act can result in a re-positioning of oneself and others. In this way, acts have the "power to shape certain aspects of the social world" (Rom Harré & van Langenhove, 1999b, p. 6). *Reflexive positioning* refers to the way individuals position themselves, intentionally or unintentionally, in "unfolding personal stories told to oneself" (Tan & Moghaddam, 1995, p. 389) through acts that are intelligible and relatively determinate in the local moral order. For example, if someone begins with the utterance, "I'm a doctor," and then proceeds to offer medical advice, the contribution may be considered credible given their "expert" knowledge. However, in that same situation if someone begins with, "I'm a chef," and proceeds to give medical advice, their recommendations may not be taken up given the lack of "expert" knowledge and social standing. *Interactive positioning*, on the other hand, refers to the way individuals position others, intentionally or unintentionally, through acts. For example, if in a medical emergency, a bystander points and states, "He's a doctor." The bystander interactively positions the doctor as someone who may have the skills and training to offer medical advice and whose contributions could be considered valid. Alternatively, in that same situation, if a person begins to offer medical advice, and another exclaims, "He's just a chef." Now, that person interactively positions the chef as one whose medical recommendations could be considered invalid given the knowledge and social standing of her/his job. Although these represent extreme examples, they highlight how positioning could impact the credibility of one's current and future social acts. Furthermore, the example highlights the interdependence of acts, positions, and storylines in a dynamic relationship; continually influencing and influenced by each other in an iterative process (Herbel-Eisenmann et al., 2015).

Rights and Duties of the Teacher

Positioning theory holds that power is dynamically co-constructed through positioning (Rom Harré, 2012). To be considered powerful, one has specific rights and duties in a given situation that are not available to others (Berman, 1999; Fairclough, 2010). In a classroom, for example, the teacher—not the students—has rights and duties conferred upon her/him which can be observed in various discursive practices (e.g., giving directions, providing instructions, disciplining students) and in the performance of specific actions (e.g., assign grades, discipline students). Thus, within any local moral order there are a "cluster of collectively located beliefs about what it is right and good to do and say" (Moghaddam & Harré, 2010, p. 10), which shapes classroom interactions.

In this vein, teachers and students continually co-construct positions; both reflexively positioning themselves and interactively positioning others. Positioning is dynamic and positions can shift at any one time along a continuum rather than a binary (e.g., powerful/powerless, competent/incompetent) (Anderson, 2009; Pinnow & Chval, 2015). In this way, not all positioning results in positions of power.

Within institutional contexts such as schools, teachers' conferred rights and duties can expand or restrict students' ability to exercise agency, participate, and learn. For example, if a teacher constructs a storyline of mathematical competence for an EB that is supported through her/his acts (e.g., calls on student to share her/his mathematical thinking, invites student to take on rights and duties traditionally reserved for the teacher, allows student to control the mathematical tools), then the social expectations and opportunities to co-construct mathematics would be different compared to an EB whose storyline was of mathematical incompetence. However, the repercussions of teacher positioning do not end here, but are further magnified by the appropriation of positions and storylines by EBs' peers (Martin-Beltrán, 2010; Turner et al., 2013; M. B. Wood, 2013; Yoon, 2008). Thus, student positions and storylines can affect students' abilities to participate, contribute, and learn. As a result, teachers have obligations given her/his position in the institutional setting to position EBs in ways that facilitate their participation to ensure they have access to equitable mathematics education.

The storylines constructed by teachers can also act to counter or reinforce storylines for individuals through group associations. All too often, teachers sideline Latinx and EB students in mathematics classrooms or situate them as incapable of mathematical challenge (Brenner, 1998; de Araujo et al., 2016; Gutiérrez, 2008). However, when teachers' storylines counter these deficit narratives, they facilitate opportunities to reshape who can be mathematically successful.

Storylines are created, fostered, resisted, circulated, and challenged by individuals in a dynamic, on-going process. Consequently, the responsibility to establish and foster storylines so that all students have access to positions that foster the mathematical and English language competencies rests with the teacher. Thus, teachers must position EBs in ways that call attention to and highlight their unique cultural backgrounds and knowledge bases in order to have opportunities to participate and learn (Turner et al., 2013; M. B. Wood, 2013).

Given the dynamic, interdependent relationship of acts, positions, and storylines, positioning theory provides a valuable theoretical and conceptual tool to examine, draw out, and call attention to classroom practices that facilitate student participation and learning.

Significance of Study

This study contributes to the existing body of research in mathematics education in four main ways. First, this study answers a call by researchers for "more research on effective teaching and learning environments" for EBs and "richer descriptions of those environments" (Gutiérrez, 2008, p. 362). Second, this study contributes to the growing body of research that employs positioning theory as a theoretical and conceptual framework and confirms the importance of the teacher in positioning students. More specifically, this study provides examples of how teacher positioning can be used to create opportunities for EBs to learn mathematics by increasing access to and participation in mathematical discourse through interactive positions. Moreover, it illustrates how these interactive positions can establish and foster storylines that challenge deficit-oriented stereotypes and narratives for EBs in mathematics classroom contexts. Therefore, the findings from this study offer a counter-story to historical narratives of EBs in mathematics. Third, the teacher of focus in this study was a white, monolingual, female who resembles a sizable portion of the demographic of elementary school teachers in the U.S. As a result, other monolingual teachers can employ the positioning acts demonstrated by the teacher in this study. Finally, findings from this study interactively position the mathematics education community to think more deeply about the nuances of teacher rights and duties in mathematics classrooms and how teachers may need to retain these rights and duties so that access and equity are achieved for each student. Hence, this study promotes further discussion and suggests a need for additional research.

CHAPTER 2: LITERATURE REVIEW

In this study, I investigated how one teacher's spoken and written acts facilitated the participation of EBs during whole-class mathematics instructional episodes. Therefore, in this chapter I synthesize the existing literature to situate my study. I begin with a discussion of studies in education that have drawn on positioning theory to identify teacher positioning acts that facilitate EBs' participation and mathematical and English language learning. Next, I describe the rights and duties of the mathematics teacher. To conclude, I define discourse broadly and mathematical discourse specifically to highlight the importance of mathematical discourse to EBs if they are to be positioned productively in classroom settings and achieve mathematical and language success.

Positioning Theory in Mathematics Education

Positioning theory has been used to analyze social interactions in mathematics education at the individual (Pinnow & Chval, 2015; Yamakawa et al., 2009) and class (Anderson, 2009; Esmonde & Langer-Osuna, 2013; Turner et al., 2013) scales. However, much of this work focuses on student-to-student interactions. In this section, I present teacher positioning moves that have been identified in the literature to increase EBs' academic and language success.

Positioning Acts for EBs

Researchers (Hawkins, 2005; Turner et al., 2013) have used the term *positioning moves* to describe the ways individuals are reflexively and interactively positioned in social interactions. In this study, I use the term *positioning acts* to refer to the spoken or written acts employed by a teacher to interactively position students (i.e., EBs) in similar ways.

Teachers as Mediators

As EBs acquire English language, they may face challenges articulating their mathematical ideas. In such cases, teachers have a right and duty to mediate interactions between EBs and peers. If teachers ignore this responsibility, prior research has found that peers who have difficulty understanding EBs' mathematical contributions may discredit EBs' future contributions as a consequence (Adler, 1997). In these cases, EBs' position in the classroom is affected in unproductive ways (i.e., they are positioned in deficit-oriented storylines and future opportunities to participate will be reduced as a result; Martin-Beltrán, 2010; Turner et al., 2013; M. B. Wood, 2013; Yoon, 2008). Thus, it is necessary for teachers to mediate interactions between EBs and peers to ensure EBs' mathematical contributions are positioned as valuable (Gorgorió & Planas, 2001; Secada & De La Cruz, 1996).

As a mediator of interactions, teachers can leverage a range of acts to call attention to and highlight the mathematical contributions of EBs and position them for success. Prior research has found that eliciting EBs' thinking, revoicing to position, and shifting teachers' rights and duties to students have been found to increase access to mathematics for EBs. When these positioning acts are employed in whole-class settings, EBs are given access to mathematics and their interactive positions are made visible to every classmate. In the remainder of this section, I describe these positioning acts and the ways they have been found to benefit EBs' mathematical and English language.

Eliciting Student Thinking

Elicitations can be used in several ways by teachers to create connections to students' prior knowledge, clarify student thinking, provide opportunities to engage in the mathematical discussion, or advance lessons, among others. In addition, elicitations that require extensive use of language can foster second language development since students are provided opportunities to practice and to use the target language (Gibbons, 1992, 2008). However, research has found that elicitations requiring extensive use of language are often not employed in classrooms generally and, in particular, with EBs (Iddings, 2005; Planas & Gorgorió, 2004; Weiss, Pasley, Smith, Banilower, & Heck, 2003). One reason for this may be teachers' perceptions that EBs are unable to participate in conversations due to their second language development. However, research has found that EBs can participate when developing language (Gibbons, 2015; Moschkovich, 2002; Setati, 2005; Yoon, 2008). For example, in Yoon's (2008) study she examined classroom interactions between teachers and EBs across contexts and found that language proficiencies did not explain inequitable classroom participation, but teacher perspectives about their own role in relation to EBs and how they positioned EBs did.

Not only do elicitations draw out student thinking and provide opportunities for language development, they also simultaneously position students (Gibbons, 2008; Turner et al., 2013). Said another way, when teachers employ acts to elicit student ideas, they also interactively position the student in particular ways. For example, if a teacher asks a student, "what do you think?" this act interactively positions the student as a person who is/was thinking mathematically, had a mathematical idea worth sharing with the class, and could contribute to the discussion at hand. Moreover, such positioning moves can solidify community membership, foster storylines of mathematical competence, and reinforce that students are co-constructors of mathematical knowledge in the class. If elicitations are not used with EBs, they not only miss out on opportunities to practice and use English but are concurrently positioned in unproductive ways (e.g., as spectators; Brenner, 1998; Gibbons, 2008). Thus, given their position as mediator, teachers should incorporate elicitations as positioning acts that can provide access to mathematics and second language acquisition for EBs.

Revoicing to Position

Revoicing is the practice of "re-uttering (oral or written) of a student's contribution by another participant in the discussion" (O'Connor & Michaels, 1996, p. 90). Most commonly, when teachers revoice they restate, recast, or expand on a student's contribution (i.e., act). Revoicing can serve multiple functions, such as preserving a student's idea as the focus of discussion, indicating student competencies, providing linguistic models, and amplifying speech, among others. Revoicing has been widely studied in the literature (e.g., Cazden & Beck, 2003; Enyedy et al., 2008; Forman, Larreamendy-Joerns, Stein, & Brown, 1998; Moschkovich, 1999; Shein, 2012) and has been found, in some cases, to facilitate EBs participation through positioning. This type of positioning is called, *revoicing to position*, which is used to describe acts that revoice and position students in relation to an idea, task, or others (Enyedy et al., 2008). When used in this way, revoicing to position "explicitly attributes authorship to the students, can be seen as an epistemic device that shares the intellectual authority with the students, and helps establish their role as one of contributing to the construction of knowledge" (Enyedy et al., 2008, p. 137).

Revoicing to position has been found to serve multiple purposes, as Enyedy and colleagues (2008) found. In their study of a multilingual classroom with a bilingual teacher, revoicing to position was most commonly used to position students as mathematically competent (e.g., valid ideas or related to the task) or acting in desirable ways (e.g., in line with classroom norms). When employed in this way, revoicing to position can advance storylines of mathematical competence for students. I define mathematical competence as the ways individuals engage in mathematical practices that are culturally and socially identified, accepted, and negotiated as representative of academic success (Gresalfi, Martin, Hand, & Greeno, 2009). Interestingly, Enyedy and colleagues (2008) did not find evidence of the teacher in their study use revoicing to juxtapose student ideas against each other, as Turner and colleagues (2013) did. In their work, Turner and colleagues (2013) examined an after-school program led by a bilingual teacher-researcher who used revoicing to position EBs in agentive problem-solving roles, such as possessing mathematical justifications or ideas worth investigating further. When this occurred, the EB's idea remained at the center of the discussion. When EBs were positioned in these ways, they took on agentive roles. Even though there are benefits of revoicing, in classrooms where EBs are a minority and their teacher is monolingual, revoicing can restrict access to ideas if they are made only in English (Enyedy et al., 2008). Moreover, revoicing can be problematic if a teacher's revoicing suggests an EB's initial utterance is unclear and requires the teacher to clarify the student's ideas, thereby positioning the EB as less competent. Furthermore, teachers who are unfamiliar with positioning may not understand the influence of their acts on student positioning and storyline development. Consequently, although revoicing to position shows promise of facilitating EBs' mathematical learning and status in the classroom, *how* teachers employ revoicing to position is critical. Currently, it is not yet known how teachers can effectively use revoicing to position in classrooms where EBs are a minority.

Shifting Teachers' Rights and Duties to Students

The research literature indicated that in institutional contexts some individuals hold greater rights and responsibilities in discourse than others (Baker, 1992a; Mehan, 2000). In schools, teachers have institutional rights and duties and, as such, make decisions—intentional or spontaneous—that create the interactional structure of the classroom. This structure occurs across content areas and determines not only physical configurations, but also the ways teachers and students interact with each other, such as who is called on by the teacher, what kinds of questions the teacher asks, and how the students make sense of these interactions (and their expectations). Consequently, this structure can either facilitate or restrict students' learning. For instance, research has found that teachers—when compared to students—have a greater number of turns than students, have more variability in the types of actions in their turns, have within turn pauses, select speakers, and initiate repairs (Heap, 1992; Markee, 2005; McHoul, 1978; Mehan, 1979; Sinclair & Coulthard, 1975). Students, on the other hand, have fewer options for turns and turn types, their turns are often invited by the teacher, and their responses are often limited to questions posed (Markee, 2005; McHoul, 1978).

Teachers as co-constructors. Historically, teachers have been positioned as the person that content is disseminated through. However, for these rights and duties to be shifted onto students, this historic position of the teacher must change. One way to do this is to employ acts that act to (re)position the teacher (Engle & Conant, 2002; Ju & Kwon, 2007). For instance, teachers can use the term "we" as a way to position the classroom as a community of learners, shift authorship and ownership of ideas onto students, and foster the storyline of mathematics as co-constructed (Ju & Kwon, 2007). Alternatively, teachers can position themselves as co-learners in interactions with students and establish expectations that all students will contribute to conversations, support and challenge each other's ideas, and engage in mathematical arguments (Engle & Conant, 2002). In such classroom settings, EBs benefit (Gibbons, 1992). It is important to note that regardless of the degree that teachers' traditional rights and duties are shifted onto students, teachers will always have more power in the classroom (compared to students) given their position.

Agentive roles. Mathematics educators have advocated for discourse communities where students take on more active roles in mediating classroom interactions (National Council of Teachers of Mathematics, 2014). When this occurs, teachers' authoritative position in the classroom is lessened, which can create opportunities for students to express agency, as Mesa and Chang (2010) found. In their study, two teachers' acts were compared to identify differences in student opportunities to exercise agency. Their findings indicate that teachers who are more authoritative limit opportunities for students to take on agentive positions. In contrast teachers who relinquished aspects of their power (e.g., sought explanations from students as opposed to giving them) provided greater opportunities for students to be positioned in agentive ways.

To position students in agentive ways, mathematics educators argue students be active in "defining, addressing, and resolving" mathematics problems (Engle & Conant, 2002, p. 404). When this occurs, the teacher's position as the disseminator of content knowledge is reduced and shifted onto students as students take on greater roles of authorship, production, and ownership of mathematical knowledge (Engle & Conant, 2002; Hufferd-Ackles, Fuson, & Sherin, 2004; Ju & Kwon, 2007). Such learning environments can open doors for EBs by allowing them to be co-constructors of mathematics and can foster storylines of mathematical competence (Brenner, 1998; Gibbons, 1992, 2003; Turner et al., 2013). Moreover, students are given opportunities to use varied forms of language—a critical component to second language acquisition (Lemke, 1990; Lightbrown & Spada, 2013; Seedhouse, 2004). Thus, to ensure mathematical and language success for EBs, teachers must be strategic in their development of learning environments that shift rights and duties to students.

Summary

Educational research has identified the importance of teachers' positioning of students on students' mathematical and second language learning, storyline formation, and access to mathematics. In addition, it has established that teachers' positioning plays a key role in determining *who* has the right and duty to participate and learn in classroom contexts. This body of research has also uncovered a small set of teacher acts that can be used to increase EBs' academic and language success, however, this body of research is limited and has not yet identified what positioning acts can be employed by teachers verbally and in writing to facilitate the participation of EBs during whole class mathematics lessons. Moreover, it has not yet identified what storylines are established and fostered for EBs in such circumstances. Therefore, it is critical to further examine teachers' acts to better understand how EBs are positioned in ways that expand or limit opportunities to participate in and use mathematical discourse—a requirement for mathematical success.

Rights and Duties of the Mathematics Teacher

The teacher's position in the classroom is one of a more experienced other (Lave & Wenger, 1991; Vygotsky, 1978), who has the right and duty to use specific kinds of language practices (e.g., give directions, be authoritarian) and perform specific actions (e.g., assign grades, discipline students). Moreover, the teacher is traditionally positioned as the individual who determines how the discipline of mathematics is introduced, discussed, and learned. In this position, the teacher's duty is to teach mathematics content that U.S. society has deemed necessary and worthy. However, mathematics knowledge is political and has been used as a gatekeeper to restrict access to higher education and certain career paths as evidenced by its presence on standardized assessments required to enter college and the current cultural narrative that one is either good or bad at mathematics (Gutiérrez, 2013; Martin, Gholson, & Leonard, 2010). As a result, mathematics is not strictly a body of knowledge, but intricately rooted in a governance system of social, historical, and cultural influences that affect students at micro- (e.g., task, interaction), meso- (e.g., classroom, school) and macro-levels (e.g., cultural group, society) (Anderson, 2009; Valero, 2004). Consequently, mathematics is a powerful form of U.S. cultural and global knowledge that teachers have a duty to make accessible. Moreover, teachers—given their position—also determine who can have access to mathematical knowledge (Baker, 1992b; Gee, 2014; Gorgorió & Planas, 2001; Gutiérrez, 2013; Moschkovich, 2002).

All social practices are situated within existing power structures and, subsequently, people in all situations are positioned on a continuum of power (Lerman, 2001). For instance, teachers are often positioned as having greater power compared to students. However, one's positioning is contingent upon their unique socio-cultural histories. As such, one never walks into a situation (e.g., a classroom) with a clean slate, since there are always fragments of prior experiences and storylines. For example, Latinx EBs have historically been underserved in mathematics and positioned in storylines that they are in need of remediation and support as opposed to challenging mathematics (Brenner, 1998; de Araujo et al., 2016; Gutiérrez, 2002b, 2008). In the classroom, these storylines can be created, instituted, and circulated through acts and, consequently, influence how teachers and students interact with each other (de Araujo et al., 2016; Kayi-Aydar, 2014; Turner et al., 2013; M. B. Wood, 2013; Yamakawa et al., 2009; Yoon, 2008). For instance, Wager (2014) found that teachers who did not consider race, language, or culture in their teaching took a less critical view of student participation and did not notice structures that limited participation and learning opportunities for EBs. Moreover, research has found that students who employ acts and position themselves in storylines of the cultural majority are frequently privileged in classroom conversations (Lubienski, 2002; Nasir, Rosebery, Warren, & Lee, 2006). Frequently in U.S. classrooms, the cultural majority are white, middle-class, monolingual English speakers (Esmonde, 2009). Consequently, teachers must consider storylines along various scales (e.g., classroom, community, national, global) that already exist for EBs and take those into account when they interact all with students since how the teacher positions EBs will influence how their peers position them as well (Yoon, 2007, 2008).

An inequitable perspective of mathematical success exists in the U.S. and is characterized by speed and accuracy (Battey & Leyva, 2016). This perspective restricts opportunities for students to be positioned as mathematically competent since the number of students who can be the fastest to correctly answer is limited. To circumvent this inequity, teachers need to construct storylines of mathematical success that diverge from speed and accuracy to valuing mathematical thinking and problem solving. For example, teachers may position mathematical explanations and justifications just as or more important than accuracy. However, for these equitable storylines to take hold, teachers must create spaces for students to demonstrate their mathematical competencies (e.g., asking students to explain their problem-solving strategy; Esmonde, 2009).

In their position, teachers are responsible for building and sustaining the learning environment (Gutiérrez, 2008; Khisty & Chval, 2002). However, this work is highly complex given that teachers' acts position students in ways that contribute to their storylines as mathematics students. For instance, when teachers position EBs in ways that value their mathematical competencies and diverse cultural assets and experiences, storylines of mathematical competence and academic success can be fostered. In contrast, teachers who foster deficit-oriented storylines via their acts influence the development of students' mathematical identities (Søreide, 2006; Turner et al., 2013; M. B. Wood, 2013; Yamakawa et al., 2009), opportunities to learn (Pinnow & Chval, 2015; Tait-McCutcheon & Loveridge, 2016; Yoon, 2008), and reify the status quo (Battey & Leyva, 2016). Thus, the ability to position EBs in ways that call attention to and highlight their unique cultural and linguistic backgrounds and knowledge bases is critical.

Teachers also have a duty to establish and maintain classroom norms that allow for every student to participate (Yackel & Cobb, 1996). Norms established by the teacher contain implicit and explicit messages that convey the culture of mathematics, it's social characteristics (Gorgorió & Planas, 2001; T. Wood, 1998), and what are acceptable ways of participating and behaving (Lappan, 1997; Moschkovich, 2002). Consequently, teachers ultimately decides who can be and what counts as mathematically competent ways of being (Moschkovich, 2002). This is further evidenced by research (Martin-Beltrán, 2010; Turner et al., 2013; M. B. Wood, 2013; Yoon, 2008), which has found peers reinforce positions and storylines designated by the teacher. Thus, teachers must position EBs in productive ways (e.g., valuing diverse cultural and linguistic backgrounds, fostering storylines of mathematical competence, facilitating English language acquisition) if they are to participate and achieve mathematical and second language success (Howie, 1999).

Discourse

The social world is constituted in a "continuous, ongoing way" through discourse (L. A. Wood & Kroger, 2000, p. 4). I draw from Fairclough's (2010) orders of discourse and Gee's (2011) d/Discourse, to define *discourse* as the ways people act to represent who they are (identity) in socially recognizable ways. These ways of acting, representing, and being are dynamic and influenced by moment-to-moment interactions, the social world, culture, and history. Subsequently, *discourse* simultaneously shapes and enables reality (Jager & Maier, 2009). Thus, discourse represents a powerful social, cultural, and political tool that is used in complex ways by teachers and students (Gorgorió & Planas, 2001; Setati, 2005; Valdes, Bunch, Snow, & Lee, 2007).

When individuals employ discourse, they use acts to position themselves or others in specific storylines. Said another way, when individuals use discourse they are communicating (verbally or non-verbally) to "engage in actions and activities" (Gee, 2014, p. 2) in socially recognizable ways (e.g., teacher, student, mechanic, etc.) (Fairclough, 2010; Gee, 2014). To illustrate this, consider a mathematics teacher who asks her students, "How can I make a table?" With this act the teacher reflexively positions herself in the storyline of a "teacher" (i.e., a person who has the power to ask questions that students are expected to answer) and interactively positions students in the storyline of "students" (i.e., individuals who listen and attend to teacher's talk and respond when asked). Importantly, the positions and storylines drawn on by the teacher and students are highly contextualized. If this question were asked in a different context—a workshop, for example—it would be interpreted differently and influence what actions and responses were acceptable. Moreover, if this question were asked in a context that did not include students and teachers, the speaker would act as a different kind of person (e.g., computer user, data analyst, woodworker, child, etc.). In other words, the speaker would position themselves in a different storyline (than a teacher). Consequently, the context of discourse is inextricable and integral for interpretation. Since discourse is used for a particular purpose on a particular occasion, it must be considered in the context that it occurred (Wodak & Meyer, 2009; L. A. Wood & Kroger, 2000). Additionally, when people use discourse they inevitably make assumptions about their own and others lived experiences (Gee, 2011). In the case of the teacher, many assumptions were made prior to asking her question, such as what students knew, how the question would be interpreted, who was likely to respond, and what possible answers would be accepted.

Through discourse, learners construct their mathematical knowledge (through meaning making) while simultaneously exerting and negotiating power (Gee, 2004; Gorgorió & Planas, 2001; Valdes et al., 2007). When students participate in classroom discourse, they are given opportunities to learn—regardless of their language statuses (Esmonde & Langer-Osuna, 2013; Inagaki et al., 1998; Moschkovich, 2002). However, those who control classroom discourse, control the learning environment (Gee, 2008). Therefore, teachers and students can use discourse to either empower or repress others and, in turn, affect the opportunities that others have to learn (Turner et al., 2013). Yet, a problematic situation is created in the classroom for EBs who are developing their language proficiencies. When EBs are unable to utilize the power of discourse, their position in the classroom and community at large is affected. This is particularly important in classrooms where teachers and students position EBs in unproductive ways and use discourse to exert power over EBs. As a result, mathematics teachers must strategically use discourse to create and sustain equitable learning environments that position EBs in productive ways (Khisty & Chval, 2002).

Mathematical Discourse

In mathematics classrooms, researchers have identified specific kinds of discourse that is characteristic of and socially recognizable. This discourse is called *mathematical discourse*. Mathematical discourse has been defined in multiple ways in the literature. For example, it has been described as the use of specialized vocabularies and registers or specific language practices (e.g., justification, argumentation; Celedón-Pattichis & Turner, 2012; Halliday, 1978; Moschkovich, 2007; Schleppegrell, 2007; Sfard, 2008). However, strict definitions of mathematical discourse can be limiting in that they restrict opportunities to capture non-formalized discursive practices, such as the use of colloquial language to describe mathematical thinking or ideas, and do not take into account the social constructive nature of classroom interactions to (re)define mathematical discourse (Moschkovich, 2003). This is important for EBs since they may draw on other language resources to supplement or augment their mathematical discourse as they acquire English. Thus, to define mathematical discourse I use Moschkovich's (2003) broad definition of "talking and acting in the ways that mathematically competent people talk and act when talking about mathematics" (p. 326). This broad definition allowed me to capture specialized ways of speaking and writing mathematically (e.g., use of specialized syntax or vocabularies) and more informal ways (e.g., use of everyday or colloquial language).

For example, a student may call the representation in Figure 1 an “array,” while another may describe it as a “long rectangle with slash lines on it.”

Figure 1. An array.

The ability to capture a broad range of mathematical discourse was essential given the students under investigation were acquiring a second language.

The Importance of Mathematical Discourse for EBs

The acquisition of mathematical discourse is critical to EBs’ academic success because learning mathematics is often equated to an ability to employ mathematical discourse (Schleppegrell, 2007). For example, the ability to be precise in mathematical discourse is one way to demonstrate mathematical knowledge and competence. I define mathematical competence as the ways individuals engage in mathematical practices that are culturally and socially identified, accepted, and negotiated as representative of academic success (Gresalfi et al., 2009). However, for EBs to develop mathematical discourse, they must be given plenty of opportunities to use the discourse, such as being asked questions or debating with peers, and teachers must make the acquisition of mathematical discourse a learning objective (Harper & De Jong, 2004; Kayi-Aydar, 2014; Khisty, 1995). Teachers who prioritize the acquisition of mathematical discourse for EBs create opportunities for them to develop fluency and competency in their classrooms (Celedón-Pattichis & Turner, 2012; Khisty & Chval, 2002). For instance, Khisty and Chval (2002) found differences in EBs use of mathematical discourse across two teachers. In one classroom, the teacher was attentive to her own discourse, while in the other the teacher was not. As a result, the EBs in the former teacher’s classroom acquired rich mathematical discourse, whereas the EBs in the latter classroom did not.

These findings highlight not only the importance of participation for EBs, but the prioritization of second language acquisition in mathematics classrooms.

CHAPTER 3: METHODOLOGY

This chapter describes the procedures used to answer the research question: *What spoken and written acts did an elementary teacher employ to facilitate the participation of EBs during whole-class mathematics instructional episodes?* Guided by a situated sociocultural perspective (Lave & Wenger, 1991; Moschkovich, 2002; Wenger, 1999) and rooted in positioning theory (Rom Harré & van Langenhove, 1999b), this study examined data collected from one third-grade teacher over a two-year period to capture the positioning acts she employed and refined to facilitate EBs' participation in whole-class mathematics lessons. This chapter details the research design, data sources, participants, analyses, as well as the researcher's positionality and subjectivities.

Research Design

Qualitative methods were best aligned with the research question under investigation. Qualitative research allows for a detailed, in-depth exploration and analysis of social phenomena (Patton, 2015). In particular, "qualitative researchers are interested in understanding how people interpret their experiences, how they construct their worlds, and what meaning they attribute to their experiences" (Merriam, 2009, p. 5). Because I was interested in understanding how a teacher and EBs interpreted and made sense of their interactions in a mathematics classroom context, qualitative research was the most appropriate methodology.

As described by Merriam (2009), qualitative research has four primary characteristics. First, the researchers focus on meaning and understanding. To achieve this, I took an emic perspective to understand how a teacher and EBs themselves made sense of social phenomena. Second, the researcher is the analyst. Third, the research process is inductive. To this end, I began with a coding scheme that was refined to describe—in an inductive fashion—how one teacher positioned EBs and how these positions influenced EBs' spoken mathematical discourse. Finally, I provide rich descriptions, which are included in chapter 4.

The research question that guided this study sought to explain a phenomenon in a classroom context from an emic perspective and was framed as a "what" question. Such research can best be explored with case study methodology (Stake, 1995). Case study methodology allows for intensive investigation of a social phenomenon over time, which was necessary given the longitudinal nature of second language acquisition (Lightbrown & Spada, 2013). As indicated in the research question, the unit of analysis was a single teacher.

As described in chapter two, there are limited studies that examine and identify effective teacher positioning for EBs. Moreover, the literature is scant with teacher positioning acts that facilitate EBs' participation in whole-class mathematical interactions. Consequently, this limited body of research highlights the challenges teachers face adapting and enhancing instruction to meet the dual learning goals of EBs in content classrooms. To expand the existing literature, this study focused on one teacher, Courtney[1], whose practice I was familiar with and had studied for more than three years as a graduate research assistant under the direction of Dr. Kathryn Chval. I chose Courtney—as opposed to a teacher whose practice I was unfamiliar with—because she was unique in that the EBs in her classroom were active and regular participants in the co-construction of mathematics even though they were a minority in her classroom, both racially and linguistically (i.e., they were the only Latinx students and the only EBs).

[1] All names are psuedonyms.

In this way, Courtney offered a unique case as a unit of analysis that had potential to "maximize what we can learn" (Stake, 1995, p. 4). Thus, this study contributes to the existing literature of studies that use positioning theory and provides rich descriptions of teacher positioning in classrooms where EBs were a minority group and active participants.

Larger Study

Data for the present study were drawn from a large, longitudinal professional development intervention study that spanned three years and included four third-grade elementary teachers[2]. The teachers were female monolingual-English speakers with a range of teaching experience. In each class in each year, there were 1–6 Latinx EBs. The professional development focused on supporting EBs' development of mathematics and language, enhancing mathematics curriculum materials, and orchestrating productive classroom interactions (Chval, Pinnow, & Thomas, 2014). More detailed information on the research project can be found in: Chval, Pinnow, and Thomas (2014); Estapa, Pinnow, and Chval (2016); and Pinnow and Chval (2015).

Data collected during the larger study included: classroom video and audio recordings from the teacher and student perspectives, audio recordings of professional development interventions (9-12 debrief and 9-12 planning sessions each year per teacher), selected student and teacher artifacts, mathematics pre and post assessments in English and Spanish, and parent interviews. Baseline data were collected in the first month of the study. Thereafter, each class was generally recorded biweekly in the first 12

[2] This material is based upon work supported by the National Science Foundation under Grant Number DRL-0844556. Any opinions, findings, and conclusions or recommendations expressed in this material are those of the author and do not necessarily reflect the views of the National Science Foundation.

weeks of the school year and then at the end of the school year for two more weeks (Estapa et al., 2016). Data from classroom video-recordings were obtained from one tripod mounted camera and multiple students with head-mounted cameras (i.e., EBs and selected, rotating peers). In addition, back up audio-recordings were made that corresponded with each video recording. Data for the present study were restricted to classroom video and audio recordings.

The Case of Courtney

The present study examined one teacher, Courtney. Courtney taught in a Midwestern city with an approximate population of 115,000 in a school that was predominately white (>70%) with less than 10% of the student population Latinx. In addition, over half of students received free and reduced lunch. At the start of the intervention, Courtney had two years of elementary teaching experience with no prior education in pedagogy for EBs or experience teaching EBs. Thus, the first year of the study coincided with her first opportunity to teach EBs. In each year of the study, Courtney had 1-3 Latinx EBs.

Over the course of the intervention, Courtney developed specialized knowledge for teaching EBs. This included an increase in: noticing skills of EBs' mathematical learning (Estapa et al., 2016); the ability to create classroom activities to facilitate mathematical discourse and learning (Chval et al., 2014); and opportunities for EBs to engage and participate in classroom discourse (Pinnow & Chval, 2015). Although these prior studies show evidence of Courtney's ability to facilitate mathematical and language learning for EBs, to date a more in-depth analysis has not examined the extent of Courtney's positioning acts and the storylines that were constructed and maintained as a result. In particular, more research was needed to identify the ways she interactively positioned EBs and how these positions influenced EBs' participation in whole-class mathematical interactions.

Data Selection, Refinement, and Analysis

To understand the ways Courtney positioned and established expectations for her EBs, I analyzed a subset of the data from the larger study. Data was restricted to the first two years of the study due to the number and retention of EBs. In each of the first two years Courtney had three Latinx EBs for the duration of the school year. In the third year, however, Courtney had one Latina EB who left partway through the school year. To further refine the data, I selected four focus students from the first two years.

Focus Students

I selected four students to be the focus of Courtney's positioning practices, Alonzo, Lea, Bryce, and Samuel. A summary of demographics are provided in Table 1. The four students were selected to provide a robust picture of the range of interactions that occurred between Courtney and EBs of various mathematical and language competencies. (Further in this section is a detailed description of the EBs' mathematical and language competencies.) As illustrated in the table, I selected one student from the first year and three students were selected in the second year. This decision was made for two reasons. First, Courtney began to learn about positioning and its importance to classroom interactions at the start of study in year one. In this way, the acts of positioning she employed in the first year may have been perceived as easier to implement and of greatest importance. Second, after one year in the intervention, Courtney had developed a greater knowledge base and mastery of positioning. Thus, I sought to capture the acts of positioning she initially implemented (in year one) and sought to master (as evidenced by their presence in year two).

Table 1

Demographic Information for the Emergent Bilinguals

EB	Year in Study	Birthplace	ACCESS Composite Score	ACCESS Listening Score	ACCESS Speaking Score	ACCESS Writing Score	ACCESS Reading Score
Alonzo	1	Mexico	4.6*	5*	5.4*	4.2*	5*
Lea	2	USA	NA	NA	NA	NA	NA
Bryce	2	USA	3.8	3.8	2.9	3.7	5
Samuel	2	USA	4	5	3.5	4.2	3.6

Note. NA = not available.
*ACCESS scores were only available in the year following the study. NA is not available.

Mathematical competencies. The EBs in this study represented a range of mathematical competencies.

Alonzo. In a one-on-one meeting with the researcher, Courtney described Alonzo as a “pretty strong student in all academic areas” who was uncomfortable sharing publicly. However, Courtney stated that “if he knows the right answer he is really willing to participate.”

Lea. Courtney described Lea to the researcher as a “pretty strong math student” who possessed some mathematical “misconceptions.” In addition, Lea was a student who was willing to share, stating “she’s, I think, happy to share. I th—she’ll share her ideas in lots of academic areas and other things.”

Bryce. Courtney described Bryce as a student who “[did] a lot of mental math,” possessed “some number sense,” and “[needed] to be assured that he’s right.” In addition, Bryce was a student Courtney was academically concerned about. Courtney also described Bryce as who was not confident in his mathematical work and was often found erasing work when approached (by Courtney). Moreover, Bryce was not comfortable sharing his mathematical ideas publicly and faced challenges communicating that thinking, stating "he has a tough time really like communicating how he's thinking about things."

Samuel. Courtney described Samuel as a student who "has a lack of confidence" in his mathematical thinking, was "very, um, reluctant to share his thinking with anybody" and "like[d] to be in the background." Moreover, Courtney stated, "he very rarely asks a question of an adult, you know, he doesn't raise his hand and really ask[s] if he's confused." Samuel was also found copying from peers early in the school year and appeared to face challenges reading mathematical problems.

Language competencies. All four focus students were classified as English language learners by the school district based on their scores on the Assessing Comprehension and Communication in English State-to-State for English Language Learners (ACCESS) assessment. Based on their ACCESS composite scores, the focus students were considered to be at an "intermediate" level of English language proficiency based on the ACCESS's 6-point scale.

Alonzo. Alonzo's ACCESS composite scores place him at the "expanding" performance level as specified by the World Class Instructional Design and Assessment (WIDA). When talking with the researcher, Courtney described Alonzo as a student whose reading was close to grade level and, as a result, a student who was "pretty willing to participate in other areas like writing or reading." Courtney hypothesized this was a result of his reading comprehension, stating "I think he can read the directions and understand them and so he is not hung up on some of the things." Alonzo was further described as a student who was "pretty good at expressing himself through writing" and one who got "hung up on knowing the right word and making sure it's the right word," which Courtney believed would "get him stuck" while writing.

Lea. Lea's ACCESS scores were not available from the school district. However, in conversations with the researcher, Courtney described Lea as a student who had different comfort levels with public speaking and writing, stating "there's some disconnect between what she's willing to say and what she's willing to put on paper." In the first month of the study, Courtney provided no other information on Lea's English language competencies. Courtney explained "I don't know her [Lea] as well as I feel like I know [Samuel and Bryce]" because she had been gone for two of the first five weeks of the school year.

Bryce. Bryce's ACCESS composite score placed him at the "developing" performance level as specified by WIDA. In conversations with the researcher, Courtney described Bryce as facing challenges with comprehension, stating, "oral directions that are multi-step are really hard for him." Moreover, Courtney stated, "it's really hard for him to tell you [what he's doing]," which was likely a result of his English language competency. Lastly, Courtney stated, "reading is tough for him," however this conflicted with his ACCESS reading score of a 5. It is unclear why Courtney perceived this modality to pose challenges for Bryce.

Samuel. Samuel's ACCESS composite score placed him at the "expanding" performance level as specified by WIDA. In discussions with the researcher early in the school year, Courtney did not mention or refer to Samuel's English-language competencies beyond what I reported above (in the section Mathematical competencies).

Whole Class Interactions

I refined the data to whole-class interactions between Courtney and the focus students. This decision was based on the importance and influence of the teacher on the establishment and maintenance of positions and storylines for students that have the potential to be appropriated by peers. Thus, the ways Courtney positioned Alonzo, Lea, Bryce, and Samuel in the context of whole-class interactions represented one of the most powerful ways she established and maintained their respective positions and storylines.

Lessons

Typically, Courtney's lessons were structured with an initial whole-class discussion at the carpet, individual or group seat work, and a closing whole-class discussion. Across the two years, there were a total of 45 lessons, each approximately one hour long, that were video and audio recorded. To identify the specific classroom interactions for analysis, I watched all the classroom video-recordings sequentially from the tripod mounted camera. In instances where the talk or actions were indiscernible, or students were unseen, I reviewed the head-mounted cameras and, if necessary, the audio-recordings.

In year one, there were 27 lessons recorded and 22 of them included a whole class interaction with Alonzo. Five were excluded from the data set because: two had no whole class interactions, one was a test day, and two did not include a whole class interaction with Alonzo. In year two, there were 18 lessons recorded and all of them included a whole class interaction with at least one of the three focus students. Next, I identified all interactional episodes that occurred in a whole class setting where an EB was positioned, either reflexively or interactively (i.e., the student participated, was asked to participate, or was positioned by the teacher or a peer). (See Figure 2 for an illustration of the data refinement.)

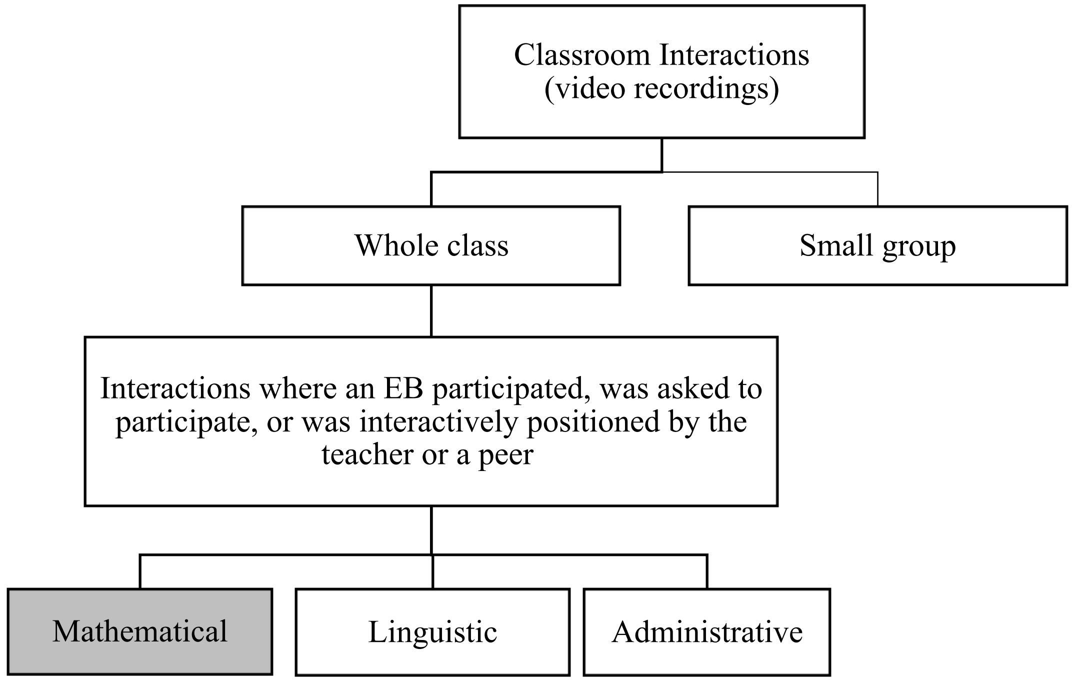

Figure 2. Data refinement of whole class interactions with EBs.

Mathematical Interactions

To understand how Courtney's positioning acts facilitated the focus students' participation in mathematical interactions, I only included interactions related to or in the context of mathematics. Thus, I excluded any non-mathematical or administrative talk (e.g., assigning duties, distributing papers, etc.) from the data set. The frequencies of interactional episodes for each EB across the school year are shown in Table 2.

Table 2

Frequency of Interactional Episodes for each Emergent Bilingual in their Respective School Year

Emergent Bilingual	Number of interactional episodes
Alonzo	43
Lea	32
Bryce	27
Samuel	20

I summarized each episode in a table and included: the date, time stamp, physical location of students and teacher, lesson topic, how the focal student participated or was asked to participate, what opportunities were provided to use mathematical discourse, how the focal student was positioned and by whom, and any researcher notes. Next, I transcribed all episodes in the data set in MAXQDA and included verbal and non-verbal (e.g., gestures) acts along with images of the interaction when relevant (e.g., instances when an EB's idea was publicly documented). In some instances, transcripts already existed, which I reviewed, and corrected any errors.

Coding

I coded transcripts iteratively at the utterance and turn taking levels in MAXQDA (see Figure 3 for an example of coded text). The initial coding scheme (see Appendix) was developed from Turner and colleagues' (2013) findings to identify: teacher positioning acts and peer interactive positions. After each coding iteration, I refined the coding scheme. Teacher positioning acts were initially defined as instances where the teacher: invited an EB to share their mathematical thinking; invited an EB to respond to a peer's mathematical idea, strategy, or solution; directed a peer to an EB's mathematical thinking; assigned or reified ownership of a strategy or idea to an EB; revoiced an EB's mathematical discourse; evaluated an EB's strategy or idea; encouraged or allowed for multiple modes of communication (e.g., gestures, drawings, etc.); and disregarded or failed to acknowledge an EB's contribution.

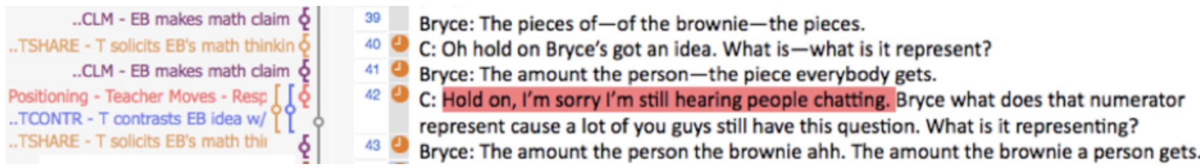

Figure 3. An example of a coded transcript in MAXQDA.

Positioning Acts

Through iterative analysis, some positioning acts were collapsed. In these cases, the teacher interactively positioned EBs in similar ways and storylines via distinctly different acts. For example, the positioning act of *recording EBs' mathematical thinking* is composed of two different acts: (1) recording EBs' mathematical contributions on the board/easel and (2) inviting EBs to record their own mathematical contributions on the board/easel. Since these two acts served the same purpose of publicly recording EBs' mathematical contributions they were considered together to represent a single positioning act. It is important to note that not all positioning acts were collapsed as some occurred in isolation (e.g., the teacher encouraged or allowed for multiple modes of communication), however the frequency of these isolated acts across the data were minimal in comparison to those that were collapsed.

To highlight Courtney's most prevalent acts of positioning, I describe only those that occurred at least 20 times across the two years and were present in both years. This resulted in five positioning acts: invitations to co-construct mathematics, revoicing EBs' mathematical contributions, acting as an intermediary between EBs and peers, valuing

EBs' mathematical contributions, and recording EBs' mathematical thinking. To illustrate Courtney's acts of positioning, I selected multiple classroom excerpts to analyze in detail (see chapter 4) because they epitomized and illustrated the nuances of each respective practice. In this way, I provide a detailed and rich picture to the reader to highlight the complexities of the classroom interactions and how they served to interactively position EBs in particular ways. In addition to these excerpts, I include two vignettes to further elucidate the complexity of classroom interactions and the ways they worked in concert with one another.

Trustworthiness

To ensure trustworthiness of findings, data was collected over a prolonged period of time, thick descriptions are provided, and triangulation protocols were employed (Lincoln & Guba, 1985; Stake, 1995). To triangulate findings, I employed data source triangulation to ensure the phenomena remained across time. I also employed investigator triangulation and had my advisors and colleagues in mathematics education examine data and analyses (Stake, 1995). To further ensure trustworthiness, preliminary findings were presented to colleagues across disciplines and in all of these conversations, assumptions and alternative interpretations were discussed. In addition, I created analytical memos and maintained an audit trail. I have also included a statement of my positionality in the latter portion of this chapter. All of these serve to establish the trustworthiness of the research findings.

Limitations

Overall, this study has the potential to influence how teachers interact with EBs in whole-class settings to facilitate EBs participation in mathematical conversations. Moreover, the case provides a collection of positioning acts that can be employed by other classroom teachers to interactively position students in particular storylines. That said there are limitations to this study.

This study is highly contextualized, which can be perceived as a limitation. However, I claim that by analyzing Courtney's classroom in depth and detail, I was able to identify the positioning acts Courtney employed and examined how these acts influenced EBs' participation in mathematics. Generally speaking, the findings may be useful for other monolingual teachers who are in classrooms with small numbers of EBs to consider as they reflect on their own practice and whole-class interactions with EBs. For teachers who are bilingual or in classrooms where EBs represent a greater proportion of the class, the findings may not be applicable.

An additional limitation of this study was that Courtney was a teacher at the beginning of her career who had learned about positioning. This situation is highly unique and may have affected Courtney's ability to be successful. It is unknown if teachers who are at other stages in their teaching career who have not learned about positioning would see comparable results.

A further limitation of this study was that data was collected prior and not specific to my research question. Although the data provides a rich, longitudinal picture of one classroom, I was unable to capture classroom interactions from other classrooms.

Positionality and Subjectivities as a Researcher

As a researcher who employed positioning theory (Rom Harré & van Langenhove, 1999b) as a theoretical framework, I recognize my own positioning. More specifically, through my analysis and writing, I have reflexively and interactively positioned the participants and myself. Since text is unilateral, the participants are not afforded the opportunity to contest their positionings. However, throughout the study, I have remained conscious of my role and the power my writing possesses.

Given this consciousness of my own positioning, I find it necessary to describe my subjectivities. I am a white, monolingual English-speaking woman and a former mathematics and English language teacher of EBs in English as a Foreign Language (EFL) and English as a Second Language (ESL) in international contexts. These experiences living and working in foreign countries forced me to critically reflect on the interactions I had that crossed racial, cultural, and linguistic lines. Moreover, I noticed that, over time, my ability to be an effective teacher deteriorated as I succumbed to deficit-oriented storylines that were perpetuated both locally and globally. Furthermore, I began to realize that my failure to confront power dynamics in my own classroom restricted student access to high-quality instruction. As I reflected on my practice, I realized I was not the best teacher I could be, which drove me to learn how to confront the issues I saw in my own classroom head on to increase access and combat inequities in education. Thus, these experiences are the lens from which I view and analyze classroom interactions.

CHAPTER 4: FINDINGS

The purpose of this study was to understand how a teacher's acts and interactive positions facilitated EBs' participation in whole-class mathematics discussions. This chapter begins with a discussion of the ways Courtney employed a collection of acts that served to position EBs in and foster specific storylines (e.g., mathematically competent, contributors to the co-construction of mathematics). These positioning acts included inviting EBs to co-construct mathematics, revoicing EBs' mathematical contribution, acting as an intermediary between EBs and peers, valuing EBs' mathematical contributions, and recording EBs' mathematical thinking. These positioning acts often worked in concert with one another and, as such, I present two vignettes to illustrate this complexity. As with all research that employs positioning theory (van Langenhove & Harré, 1999), attention to storylines must be made. Thus, I include a description of the storylines Courtney fostered for EBs through her acts of positioning.

Teacher Positioning Acts

In my analysis, I identified five positioning acts across the data, with some composed of multiple acts of positioning. In Table 4 below, I summarize the positioning acts and the storylines fostered via these acts.

Table 3

Summary of Courtney's Acts of Positioning and EBs' Storylines

Act of Positioning	Composed Positioning Acts	Storylines for EBs
Inviting EBs to co-construct mathematics	Invitations to share mathematical thinking or problem-solving strategy Invitations to clarify or justify mathematical thinking	Mathematically competent Explainers Community members Contributors
Revoicing EBs' mathematical contribution		Mathematically competent Community members Contributors
Acting as an intermediary between EBs and peers	Responding to mathematical contributions Solicit peers to respond to an EB contribution Solicit an EB to comment on a peer's mathematical contribution Connecting mathematical ideas Connecting mathematical ideas with peers Connecting EBs' ideas with mathematics	Mathematically competent Explainers Community members Contributors Teachers Experts
Valuing EBs' mathematical contributions		Mathematically competent Teachers Experts
Recording EBs' mathematical thinking		Mathematically competent Community members Contributors Teachers Experts

Note. EB = emergent bilingual.

Inviting EBs to Co-construct Mathematics

The most common positioning practice Courtney employed across the data was to invite EBs to participate in the co-construction of mathematics. This practice most commonly entailed Courtney inviting students to share their mathematical thinking or problem-solving strategies with the class or Courtney asking students to further clarify or justify previously stated mathematical thinking (see Table 5 for a summary of selected data). Thus, this practice preceded immediate opportunities for EBs to engage in spoken mathematical discourse.

Table 4

Summary of the Positioning Act: Inviting EBs to Co-Construct Mathematics

Positioning Acts	Selected Data
Invitations to share mathematical thinking or problem-solving strategy	"What did you do?" "What is it representing?"
Invitations to clarify or justify mathematical thinking	"What's that mean?" "Why would that be 24?" "How did you figure that out?"

Note. EB = emergent bilingual.

Invitations to share mathematical thinking or problem-solving strategy. Courtney primarily used questions to invite EBs to share their mathematical thinking or problem-solving strategy with the class. Although there was a range of possible questions Courtney could ask, she predominately posed questions that required use of mathematical discourse beyond simple or short answers. For example, she frequently asked EBs questions such as, "what'd you do?" or "what is it representing?" as opposed to questions that required minimal speech. As a result, her enactment of this practice engendered opportunities for EBs participation through the extensive use of spoken mathematical discourse and interactively positioned EBs as mathematical thinkers and doers.

To illustrate how she employed this practice, consider the following example from October 6 (Year 2 [Y2]). (See Appendix for transcript conventions.) In this interaction, the class sat at the carpet after they had completed problems individually. As the students worked, Courtney selected three student strategies to share with the class for the problem: Kaylie had 19 shirts. Janie had 28 shirts. How many does Kaylie need to have the same amount as Janie? Samuel was the first student selected to share his work (Figure 4).

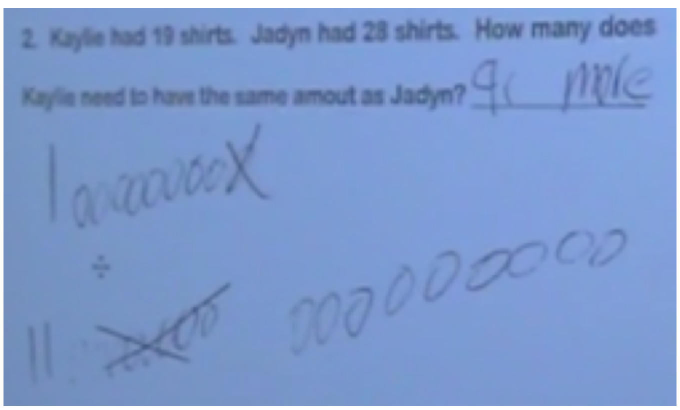

Figure 4. Samuel's scanned mathematical work.

Courtney[3] (C): I've got three friends who are going to share a strategy that they figured um—that they used to figure out number two. [Administrative talk] Ok the first person I'd like to share (pulls up scanned work on board) is uh Samuel. [Administrative talk] Can you go on up and explain how you solved number two. Shh.

Samuel: (gets up to come to board, then stands at edge of board, perpendicular to the class)

C: I need your um papers on the ground and your eyes up at Samuel. What'd you do?

Samuel: Well, I thought um 19 and 28 and I took 9 away. (8.0)

C: Ok so hold on, you've got 19 here and 28 down here?

Samuel: (nods) Uh-huh

C: Ok. And then what did you do to figure it out how much difference there was between the amount of shirts Kaylie had and Jadyn had?

Samuel: (20.0)

C: (moves to board) What it looked like to me, was when you had 19 (points to top left representation) and 28 (points to bottom left representation). It looked (points to center representation) to me like you took the 19 and you were, (gestures drawing circles in center representation) //maybe//

Samuel: //Making// nine (quietly)

C: Making nine more til you got to how many? (3.0)

Samuel: To 28 (quietly)

[3] Transcript conventions can be found in Appendix.

C: To 28 (quietly). So he had 19 he started off there (gestures to representation of 19), then he added nine more circles that represented the shirts (gestures to center circles) and then you got to

Samuel: nine—28 (quietly)

C: 28. So the difference he found between Kaylie's shirts and Jadyn's shirts was what?

Samuel: Nine

C: Nine shirts. Nice job Samuel. (claps)

Students: (clapping)

C: Drawing a picture can sometimes really help you. Thank you very much for sharing.

In this excerpt, Courtney asked Samuel to describe his problem-solving strategy with the class (lines 4-5), which was a common way Courtney invited students to share their thinking. Courtney's invitation to "explain how you [Samuel] solved number two" positioned Samuel as a co-constructor of mathematics and required the use of spoken mathematical discourse. Courtney could have explained Samuel's work entirely herself or only asked Samuel the answer. However, Courtney expected Samuel to describe his thinking with the class.

After Samuel reached the board, Courtney asked, "What'd you do?" (lines 8-9). Samuel responded (line 10) that he used subtraction to solve the comparison problem and then paused. Courtney then questioned Samuel about his mathematical representation and how he determined the value of nine. This act provided extended talk time, reinforced the expectation that students would explain their representations, positioned Samuel as a student who could articulate his thinking, signaled his idea was worthy of further consideration and that he still controlled the conversational floor. However, Samuel did not respond (line 15) and after 20 seconds, Courtney moved to the front of the room to explain her interpretation of Samuel's strategy (lines 16-19). As Courtney explained, Samuel spoke quietly (line 20). Courtney continued by asking Samuel to further explain his thinking (line 21) and waited for him to respond (3 second pause). After Samuel stated "28" quietly (line 22), Courtney revoiced this and his strategy (lines 23-25). While she did this, Samuel interjected quietly again (line 26). Courtney continued and asked Samuel what the answer was (lines 27-28), to which he responded (line 29). As evidenced in the transcript, Samuel was hesitant to speak publicly. To facilitate Samuel's explanation of his problem-solving strategy, Courtney used questions throughout. This was important given that she did not take over the explanation or allow Samuel to "give up," but continued to softly push him to explain his thinking. In this way, Samuel was provided continued opportunities to use mathematical discourse.

In general, this interaction illustrates how Courtney would invite students to share their mathematical thinking. When employed with EBs, this invitation acted to position them as mathematical thinkers, provided immediate opportunities to use mathematical discourse, and allowed them to control the conversational floor. In this instance specifically, it also illustrates how Courtney used questions to facilitate EB's explanations when they were hesitant or faced challenges describing their thinking in English publicly.

Invitations to clarify or justify mathematical thinking. The second way Courtney invited EBs to co-construct mathematics was to clarify or justify previously stated mathematical thinking. This type of invitation always followed an instance when Courtney invited an EB to share their mathematical thinking or a problem-solving strategy with the class. Thus, this invitation was used in conjunction with the previously described invitation (to share mathematical thinking or problem-solving strategy). The invitation to clarify or justify mathematical thinking occurred in the form of a question and most often began with what, why, or how (e.g., "what's that mean?" "why would that be 24?" or "how did you figure that out?"). These types of invitations required extensive use of mathematical discourse as opposed to simple or short responses. I provide two examples below that illustrate the ways Courtney used this invitation with EBs.

On September 22 Y2 the class discussed selected student solutions for the number of rolls and loose ones (i.e., tens and ones) in different values at the carpet following a discussion of the book, *Grandma Eudora's T-Shirt Factory* (Fosnot, 2007). In this interaction, Ray (a monolingual student) noticed that a student identified four tens and two loose ones in 42, which he questioned. Courtney then turned to the class to solicit their ideas about Ray's thinking.

C: Ray

Ray: I see on the 42 the four's be—before the two.

C: Ok.

Ray: And the two's supposed to be before the four.

C: Ok you think that in 42 that maybe it should be two rolls and four loose ones.

Ray: (nods yes)

C: What do you guys think? What do we think?

Bryce: That'd be 24

C: Bryce says that would be 24. Why would that be 24?

Bryce: Cause (2.0) you need four tens that equals: (2.0) four (2.0) an:d two ones: would make two.

C: Yeah. Thank you for thinking about what Ray's thinking. So he said, you know for to make—represent 40 that would be four rolls or four groups of ten to represent the forty and then I would need the two loose ones. Thanks Bryce.

Courtney solicited the class for their thoughts on Ray's thinking (lines 2 and 4), shifting from "what do you guys think?" to "what do *we* think?" (line 8). This act signaled two things. First, students should attend to what peers are saying and think critically about it ("what do you guys think?"). Two, the class was a collective or community of learners ("what do *we*[4] think?"). Bryce proffered his ideas by calling out (and did not raise his hand) (line 9). Importantly, Courtney did not let Bryce off the hook with only his idea "that'd be 24" (line 9), but probed him to justify his thinking, "Why would that be 24?" (line 10). In this way, Courtney communicated her expectation that Bryce had a reason why he thought "two rolls and four loose ones" would be 24. Moreover, it allowed Bryce to retain the conversational floor and continue to use mathematical discourse. As Bryce justified his thinking (lines 11-12), Courtney provided him the space and time to formulate his ideas. Courtney responded by first stating, "yeah" (line 13)—which affirmed Bryce's ideas—then thanked him for "thinking about" Ray's thoughts (line 13). This positioned Bryce as a student who was listening to and thinking about others' mathematical ideas. Courtney then revoiced Bryce's contribution (lines 13-15), which acted to amplify and clarify it. Courtney may have felt this was necessary given the pauses and overall pace of Bryce's contribution and/or a concern that peers may not have fully understood or appreciated the mathematical value of it. Overall, this interaction illustrates one way Courtney used invitations with EBs that subsequently provided opportunities to use mathematical discourse. Moreover, it also indicates how Courtney did not allow students to stop short by only stating their idea but pushed students to

[4] Italicized text is used to emphasize aspects of speech to the reader.

justify those ideas thereby providing extensive opportunities to use mathematical discourse.

When prompted to clarify or justify their mathematical thinking, the EBs in Courtney's class did not always employ mathematical discourse in response. For example, on October 28 (Year 2 [Y2]), the class sat at the carpet with Courtney in a circle and discussed the number of rolls (of ten) would be in a box if there were a hundred total shirts–a conversation was built off the story, *Grandma Eudora's T-Shirt Factory* (Fosnot, 2007).

C: How many rolls do you think I should put into a big box? Alonzo, what do you think?

Alonzo: I think 10.

C: Why do you think 10 big rolls–10 of these rolls would be good? (1.0) Not sure, ok. But he thinks 10 might be a good number. Why do you think 10 might be a decent number to choose? Why do you think 10 would be a good number to choose to put into the box? Ian, what do you think?

… [Courtney solicits other student ideas for 3 minutes]

C (standing in front of board): Ok. Alright. Well you know what I think we've got ten shirts in one roll and, you know, we—our place value blocks, if we're going to use those because we don't have enough of these (holds up rolls of ten shirts). I mean I don't have enough shirts for all of us to have ten rolls of ten, do I? I don't have enough shirts at home and if we're going to use the place value blocks. I'm kind of thinking, you know we've got the, the rolls represented by the rods that have 10 and then the flats, they have a hundred on them, those flat ones, they have 10 groups of 10, so that's a hundred and so if, if you guys are going to work with those I kind of like Alonzo's idea that there's gonna be a hundred shirts in a box because then, if we wanted to, we could just pretend that that was one box, if we wanted to. So, I think that I, I like Alonzo's idea, and your other ideas were great, but I think we'll go with Alonzo's idea about having a hundred in a box, a hundred shirts in a box.

At the start of this except, Courtney invited Alonzo to share his mathematical thinking of how many rolls of t-shirts should go in a big box (lines 1-2). This act positioned Alonzo as a student who had a mathematical idea that was worth sharing with the class and provided an opportunity for Alonzo to co-construct mathematics via spoken mathematical discourse. Alonzo stated his idea, "I think 10" (line 3) and then, in Courtney's next turn, two things occurred. First, Courtney re-voiced Alonzo's claim (line 4), which amplified his response to ensure all students heard it and, subsequently, reinforced his position as a student with (valuable) mathematical ideas. Second, Courtney invited Alonzo to justify his idea of 10 (line 4), which indicated he still held the floor. This occurred regardless of the limited wait time that was provided for Alonzo to respond (1.0 second pause; line 4). Courtney then continued and provided Alonzo an out, "Not sure, ok. But he thinks 10 might be a good number" (lines 4-5). This act allowed Alonzo to retain his position in the class as a student with a mathematical idea worth discussing and signaled that it was acceptable to be unable to articulate a mathematical justification. As a result, Courtney facilitated a space in the classroom where taking mathematical risks was acceptable and moved to normalize "not knowing."

Next, Courtney turned the request for a mathematical justification for Alonzo's idea to the class (lines 5-7). This act signaled Alonzo's idea was worthy of further consideration by positioning it at the heart of the class discussion (i.e., Courtney used footing to create this link (Goffman, 1981)). After Courtney fielded different student responses, she revisited Alonzo's idea (lines 16-17) and included a hedged evaluation, "I *kind of like* Alonzo's idea," which placed ownership of the idea with Alonzo. Courtney then re-asserted her value judgment of Alonzo's idea without the hedge (line 19) and used her position of power to select his idea as the one the class will use, “I *like* Alonzo’s idea, and your other ideas were great, but *I think we’ll go with Alonzo’s idea*.” These combination of statements (lines 17-18, 20, 21), further reinforced Alonzo’s interactive positioning as a student with a mathematical idea worth sharing and using. Moreover, it signaled that even though Alonzo was unable to fully justify his mathematical idea, it did not invalidate it.

In conclusion, this interaction illustrates another way Courtney used invitations with EBs to clarify or justify their mathematical thinking, provide opportunities to use spoken mathematical discourse, and, in this case, what she did when they were unable to articulate this justification. It also illustrates—as the previous example does—that Courtney established and fostered the expectation that mathematical ideas were to be justified by the idea generator and his/her peers.

Summary. The most common positioning act Courtney employed across the data was to invite EBs to share and justify or clarify their mathematical thinking via spoken mathematical discourse. In this way, Courtney positioned EBs in her classroom as possessing agency in the sense that they had a choice whether they could contribute to the co-construction of mathematics. Thus, Courtney requested *their* participation through invitations. Overall, Courtney used this act of positioning 134 times across the two years with EBs, occurred more frequently in year two (due to the number of EBs), and was seen throughout lessons (i.e., beginning, middle, and end).

This positioning act extends beyond “good teaching” due to the multiple functions it served for EBs in particular. First, this practice acted to solidify EBs’ status as community members and contributors in the mathematics classroom and did not allow them to remain on the sidelines as other researchers have found (Brenner, 1998; Yoon, 2008). Second, it fostered storylines of mathematical competence by signaling to the class that EBs had mathematical ideas worthy of sharing, considering, and discussing. Third, it reinforced the classroom norm that every student—including EBs—would be thinking mathematically and would share those thoughts and justifications or clarification publicly. Therefore, this practice not only served to position EBs in productive ways mathematically and foster storylines of community membership and mathematical competence, it also engendered multiple opportunities for EBs to participate and use mathematical discourse.

Revoicing EBs' Mathematical Contributions

The second most common positioning act Courtney employed across the data was to revoice an EB's mathematical contribution. This occurred in three ways (see Table 6). First, Courtney revoiced the EB's mathematical contribution to clarify or amplify the originally stated idea. Second, Courtney revoiced as a way to reconceptualize (Cazden, 2001)—or build on—the EB's contribution. Third, Courtney revoiced an EB's mathematical action that did not include an accompanying oral statement (e.g., writing a value on the board and not saying anything).

Table 5

Summary of the Positioning Act: Revoicing EB's to Mathematical Contributions

Positioning Acts	Selected Data
Revoice to clarify or amplify initial EB utterance	Samuel: 21. Courtney: You thought 21.
Revoice to reconceptualize (Cazden, 2001)—or build on—the EB's contribution	Samuel: Ones Courtney: Or we call them loose shirts, right?
Revoice an EB's mathematical actions	Bryce: (comes to board and writes "6x4 as shown in Figure 5) Courtney: Oh so Bryce says six times or six groups of four

Note. EB = emergent bilingual.

Overall, this act of positioning was used 101 times across the two years with EBs, was closely split across the years, and was seen throughout lessons (i.e., beginning, middle, and end).

The act of revoicing to position has been thoroughly explored within the literature (e.g., Enyedy et al., 2008; Moschkovich, 1999; Shein, 2012; Turner et al., 2013) with regard to EBs' mathematical learning and findings from this study—albeit in a different context—confirm these earlier studies. What is unique about Courtney's use of this act was to revoice EBs' mathematical actions. This act of revoicing physical actions was not present in the literature and may be based on the conception that revoicing is frequently used with verbal speech.

When Courtney revoiced EBs' mathematical actions, the EB did not orally utter their mathematical thinking, but illustrated it through action, such as writing an idea on the board or using a tool in a particular way. Consider the example from October 22 (Y2). In this interaction, a monolingual student, Caleb, had just shared his strategy of using repeated addition to find the total value of four die each showing six. Next, Courtney invited Bryce to share his strategy:

C: Alright, Bryce what did you do?

Bryce: (comes to board and writes “6x4” as shown in Figure 5)

C: Oh so Bryce says six times or six groups of four

Bryce: Is…equals twenty-eight (writes “=28”). It’s four (points to “4” in equation).

C: What’s four hun?

Bryce: (points to “4” in equation)

C: Hold on, so you say six groups of four is 28?

Bryce: (grabs marker)

C: You and Caleb have=

Bryce: =Ahh! (picks up eraser)=

C: =different numbers. What do you think it’s

Bryce: It’s 24. (begins to erase “8” in “28”)

C: Oh well what made you think that?

Bryce: I messed up the answer. (begins to write “8”) Ahh. (then writes “4” over top of it)

C: That marker just wants to do what it wants to do right? (laughs) It’s just trying to write that eight. Ok so you thought that six times four is a way to solve it and that was 24. Thanks Bryce.

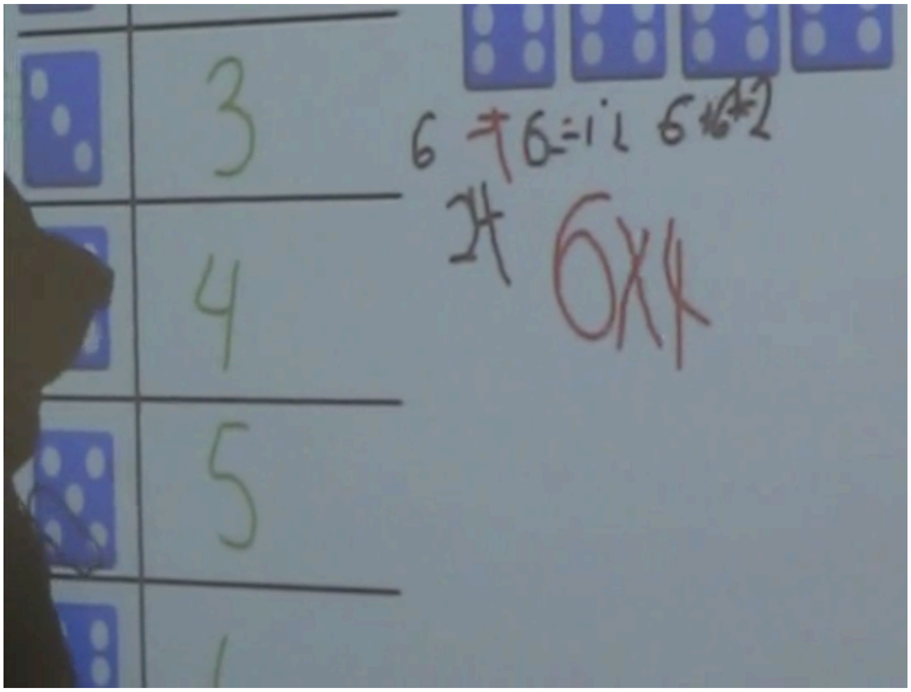

Figure 5. Bryce's written work of "6x4" in red.

After Courtney invited Bryce to the board, he wrote his strategy to calculate the total value of the die (via multiplication) (line 2). Bryce did not orally communicate his ideas in accompaniment to his mathematical action of writing a number sentence. Next, Courtney revoiced Bryce's action, but framed it as Bryce's statement, stating "Oh so Bryce *says* six times or six groups of four" (line 3). In this way, Courtney's act amplified the action and positioned Bryce as a contributor to the mathematical conversation *even though* he did not make a verbal contribution. As the interaction continued, Bryce began where Courtney left off and completed the statement, "is…equal twenty-eight. It's four" (lines 4-5). Then, Courtney revoiced a part of Bryce's act, "four," in a clarifying question that appears to help him notice an error in his statement (line 6). Bryce gestured in response (line 7). Courtney revoiced Bryce's mathematical contributions in the form of a clarifying question (line 8), which caused Bryce to notice an error in his equation (e.g., that 6x4 was not 28) and correct it (lines 9, 11, 13, 15-17). At this same time, Courtney stated the differences between Caleb and Bryce's values (lines 10 and 12) and then probed Bryce to explain why his thinking changed (line 14). Courtney concluded the interaction by revoicing Bryce's overall strategy once more (lines 18-19).

Broadly, the above interaction illustrates how Courtney used revoicing with EBs' mathematical actions and, in turn, signaled that multiple modes of mathematical communication were acceptable. Such moves are important for EBs who are developing their mathematical discourse and English language competencies. In this way, this positioning act facilitated EBs participation through the amplification of EBs non-verbal mathematical contributions. In addition, this act fostered storylines of mathematical competence and solidified membership status by positioning EBs as contributors to the co-construction of mathematics and as possessing ideas worthy of hearing, sharing, and discussing.

Acting as an Intermediary Between EBs and Peers

The third most common acts of positioning Courtney employed was to serve as an intermediary between an EB and his/her peers. This occurred 46 times across the two years, was predominately split between each year, and was seen throughout the school year and in lessons (i.e., beginning, middle, end). Most often, this act took the form of a directive and occurred in two main ways, responding to mathematical contributions and connecting mathematical ideas, as summarized in Table 7.

Table 6

Summary of the Positioning Act: Acting as an Intermediary Between EBs and Peers

Positioning Acts	Selected Data
Responding to mathematical contributions	
Solicit peers to respond to an EB contribution	"Any comments about Lea's strategy?"
Solicit an EB to comment on a peer's mathematical contribution	"Lea, can you go up there and explain what Emily did?"
Connecting mathematical ideas	
Connecting mathematical ideas with peers	"So any questions for Jake, Samuel (EB), Keri about their strategy?
Connecting EBs' ideas with mathematics	"Alonzo did an array, too, even."

Note. EB = emergent bilingual.

Responding to mathematical contributions. One way this act of positioning was employed was through solicitations to an EB, a peer, or to the class to respond to a mathematical contribution. More specifically, Courtney would either ask a peer or peers to respond to an EB's mathematical contribution or ask an EB to respond to a peer's mathematical contribution. This occurred most often through solicitations to explain or offer comments, questions, or compliments on the student's (EB or non-EB) mathematical contribution. When enacted, this positioning act reinforced the classroom norm that students should be attending and listening to each other's contributions and thinking critically about them. Moreover, it indicated that individual students were accountable to explain, question, comment, and compliment others' ideas, including EBs.

Solicit peers to respond to an EB contribution. Courtney solicited peers to respond to an EB's mathematical contribution by asking for explanations, comments, questions, or compliments after an EB shared their problem-solving strategy. The following transcript from October 22 (Y2) illustrates this practice. At the close of the lesson, Courtney selected three students to share their strategy to the problem, "Clayton rolled 8 dice. Each landed on 4. What was Clayton's total? How do you know that is Clayton's total?" Lea was the second student to share and her work that was shown on board (Figure 6).

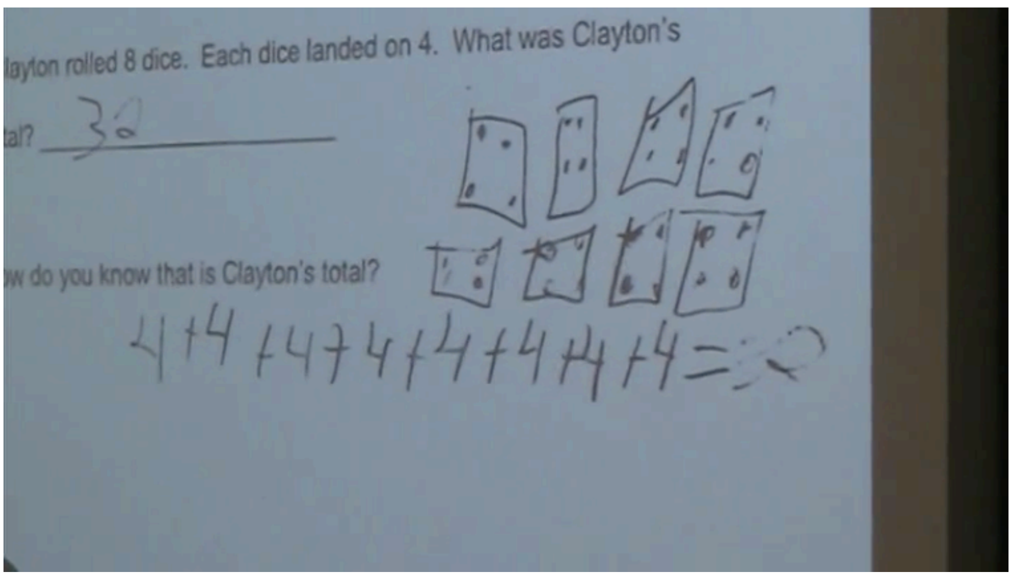

Figure 6. Lea's written mathematical work.

C: Alright the next person to share is Lea. Lea will you get up.

Lea: (gets up and comes to board)

C: [administrative talk]

Lea: First um I added four and then um I added four plus four plus four plus four. First I drew a picture of eight dice and then added four plus four plus four plus four plus four plus four plus four plus four equals 32.

C: So why did you—how many four—how many times did you need to count up by four?

Lea: Well I needed to count um I needed to count eight times so I could get (inaudible)

C: Ok so when she—when she—what'd um—any comments about Lea's strategy?

Lea: Janie.

Janie: Nice work an:d I like your strategy.

Lea: Carl

Carl: I like the way how you like, drew a picture of this stuff (gestures across work)—numbers.

Lea: Ok. Laura

Laura: Um I think the way that you drew your picture of the four plus four plus four kind of (inaudible) but I still think you did a great job.

C: Alright so she wrote a number sentence and she wrote up a picture to go along with that. I like—I like your strategy a lot. Nice job Lea. (clapping and cheers)

Prior to inviting responses from peers, Courtney first provided Lea an opportunity to explain her problem-solving strategy. To do this, Courtney invited Lea to the front of the room and provided her work as a visual referent for her explanation. These acts physically positioned Lea in the role of the teacher (at the board), metaphorically positioned her as an expert who had a problem-solving she could explain and peers could learn from, and provided an opportunity to be an active classroom participant. Lea described her strategy for calculating the sum of 32 (lines 4-6), which included drawing a representation of the dice rolled (Figure 6). In this way, Lea attended to the problem context as evidenced by her mathematical representations and explanation—a desirable approach to problem solving (Carpenter, Fennema, & Franke, 1996). Next, Courtney asked Lea for clarification of the number of times she added four (lines 7-8), which enabled Lea extended talk time and to maintain control of the conversational floor. In Lea's response (line 9), she further clarified her thinking and connected her mathematical representations to the problem context. Next, Courtney asked the class if they had any comments for Lea (lines 11-12). This act reinforced the classroom norm that students would attend to and think about each other's mathematical thinking, signaled that Lea's ideas were worthy of further consideration, and kept Lea's mathematical thinking at the center of the conversation. Courtney then allowed Lea to control the conversation of peer comments on her problem-solving strategy, a practice that is often reserved for the teacher (Lemke, 1990; McHoul, 1978; Mehan, 1979). Lea then fielded comments on her mathematical thinking from Janie, Carl, and Laura (lines 14, 16-17, and 19-20). Lea's peers had many comments they could make, however, in each comment there is evidence of their attention to Lea's mathematical thinking, particularly her problem-solving strategy and mathematical representation. Moreover, each peer comment included praise (e.g., "I like your strategy"), although Laura's was back-handed, "but I still think you did a great job" (line 20). Courtney did not allow the conversation around Lea's ideas to end on this note, but re-stated Lea's strategy (line 21) and provided a positive evaluation, "I like your strategy a lot" (line 22).

Overall, this excerpt illustrates how Courtney solicited peers to respond to an EB's mathematical contribution. It also illustrates how Courtney interactively positioned EBs in the role of the teacher, both physically and metaphorically, which allowed opportunities to participate in the co-construction of mathematics, have extended talk time in the target language, and control of the conversational floor. Notable, Courtney remained seated at the side of the classroom and did not move to the front for the duration of the above interaction, which reinforced Lea's position as the teacher. Lastly, this transcript also displays how Lea's peers viewed her position and storyline in the classroom regarding mathematics.

Solicit an EB to comment on a peer's mathematical contribution. Another way this act was employed was through questions posed by Courtney to an EB to comment on a peer's mathematical thinking or problem-solving strategy. Such acts of positioning enabled opportunities for EBs to engage in mathematical discourse use. For instance, on October 27 (Y1), after students had created a book of stamps in an array with values they selected and found the total value, Courtney selected a few students to share. One of those students was Emily who had described her strategy for calculating a 3x6 array of 5 cent stamps. See Figure 7 for an image of Emily's written work that was projected on the board.

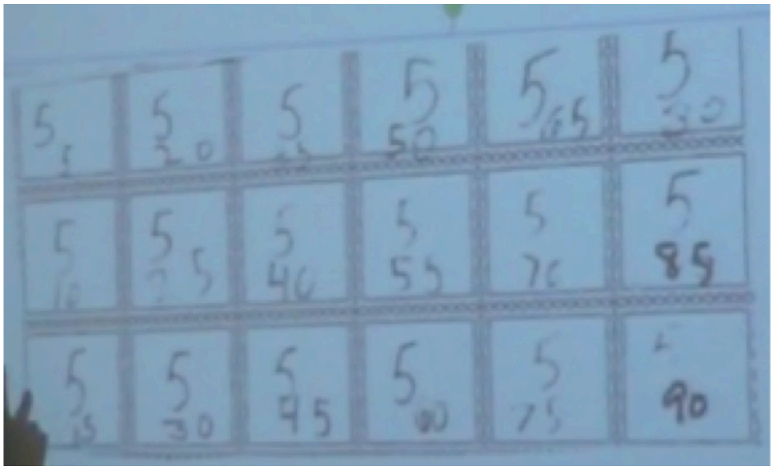

Figure 7. Emily’s book of stamps and written mathematical work.

Emily: I counted by 5s and 10 and (inaudible) instead of going like this (gestures horizontally indicating a row), I got, and then I did 5 times 18.

C: Ok um, can someone else explain her strategy?

Lea: (hand raised)

C: Lea, can you go up there and explain what Emily did?

Lea: She did like (gets up and moves to board) (5.0)

C: Shhh.

Lea: She did like, she counted by fives and go like 5, like 10, 15, all the way to 90 (points to 90).

C: [Administrative talk] Thank you Lea for explaining her strategy you must've been paying close attention.

After Emily explained her strategy, Courtney asked the class for someone else to explain the strategy (line 3). Courtney noticed Lea's hand (line 4) and called on her to explain Emily's strategy in her own words stating, "Lea, can you go up there and explain what Emily did?" (line 5). This act provided Lea an opportunity to use mathematical discourse to restate a peer's ideas, a discourse practice often reserved for the teacher. Moreover, it positioned Lea as a student who was attending to and thinking about a peer's mathematical thinking and could articulate those thoughts publicly. Next, Lea moved to the board and began to explain Emily's strategy (line 6). After a pause, Courtney moved to silence the class (line 7) which positioned Lea as a student who should be respected, had an idea everyone should be able to hear, and given the conversational floor. Lea continued (line 8) and supported her explanation with gestures to the visual referent (line 9). In this way, Lea was given an opportunity to restate a peer's problem-solving strategy in her own words. Lea's explanation evidenced she understood Emily's strategy of repeated addition of the array by columns. Next, Courtney thanked Lea for her explanation and then positioned her as a student who followed the classroom norms of paying attention, stating "you must've been paying close attention" (lines 10-11).

Overall, this interaction represents another way Courtney provided opportunities for EBs to use mathematical discourse and positioned EBs as mathematically competent students who had ideas worthy of consideration and could explain those ideas to others. In addition, the above excerpt illustrates how Courtney allowed EBs to take on the rights and duties of the teacher, such as when Lea described Emily's strategy and take up the physical space of the teacher.

Connecting mathematical ideas. Another way Courtney employed this positioning act was to connect an EB's mathematical thinking or strategy with a peer or peers or, less often, with mathematics. This positioning act did not immediately result in EBs' use of mathematical discourse, but it did precede or follow such opportunities. Although, this move was not exclusively employed with EBs, it was a powerful act given the deficit-oriented stereotypes of Latinx and EBs in mathematics and their historical marginalization in mathematics classrooms (Brenner, 1998; Gutiérrez, 2002a, 2002b).

Connecting mathematical ideas with peers. Courtney created connections between an EB and his/her peers by positioning the EB as a student who possessed similar mathematical thinking as their peers. Such positionings fostered storylines of mathematical competence and community membership for EBs. When enacted, Courtney did this in three ways: select a student or group of students (including EB) who used a strategy to collectively share; ask if peers used a similar strategy as an EB and then stated explicit connections between the peer(s) and EB; and position the EB as a representative of the group of students who used a specific strategy. To illustrate this practice, I describe two excerpts below.

Courtney frequently leveraged similarities between an EB's mathematical thinking and peers to create explicit connections. Moreover, she used these instances as opportunities to develop mathematical discourse and foster storylines of mathematical competence and community membership. For example, on May 13 (Y2), after students had solved the problem of sharing seven brownies with four friends equally, Courtney asked three students—Jake, Samuel, and Keri—who used the same problem-solving strategy to come to the board and share collectively. With this initial request, Courtney interactively positioned Samuel, an EB, as possessing similar mathematical ideas and approaches as peers—particularly Jake and Keri—thereby creating connections between their mathematical ideas. Moreover, this request positioned Samuel as a student who could present and explain his mathematical ideas to the class. This request also allowed Samuel—who was frequently seen to be resistant and uncomfortable with public speaking—with (a) a chance to use mathematical discourse to explain his thinking, (b) peer support (as the group was collectively going to share), and (c) an out if he chose not to speak.

A second way Courtney connected mathematical ideas between students was to ask if peers used a similar strategy as an EB and then state explicit connections between the peer(s) and EB. One example of this occurred immediately after Jake, Samuel, and Keri had shared their problem-solving strategy described above in the lesson. Courtney stated,

> Ok so any questions for Jake, Samuel, Keri about their strategy? Did anyone else try this strategy? (some students raise hands) Caleb did this strategy, Laurence did this strategy. I think it's a really effective way of doing it because you always know you're going to have a fair share if you're cutting it into one-fourth pieces and you know that there's four people, you know you're going to be able to share it fairly. Nice job guys.

In this statement, Courtney first placed ownership of the strategy on the three students and directed peers to consider their strategy (line 1). Then, she moved to create connections between mathematical ideas by asking if other students used the strategy (lines 1-2). Next, Courtney publicly named the two peers who also used the strategy (lines 2-3), thereby expanding the mathematical connections in the classroom. Courtney capitalized on this moment further with her evaluation of the group's strategy, stating "I think it's a really effective way of doing it" (line 3). In this way, she used her position of power to publicly indicate the mathematical quality of the strategy and situate Samuel as a student who used an effective strategy for solving the problem. As a result, in the above statement Courtney made explicit connections between Samuel and his peers' mathematical ideas while publicly validating the mathematical quality of his strategy.

The final way Courtney created connections with peers was to position an EB as a representative of a group of students who used a particular strategy. In this way, Courtney provided an immediate opportunity to use mathematical discourse and positioned the EB as a strong speaker in the target language who was the conduit of ideas for the group. Consider the following example from April 4 (Y2). After students had answered questions about a pictograph that illustrated a hypothetical class's favorite fruits, they moved to the carpet to discuss their responses. In this interaction, the pictograph was shown (Figure 8) and the class discussed how they determined the difference between the number of students whose favorite fruit was apples versus oranges.

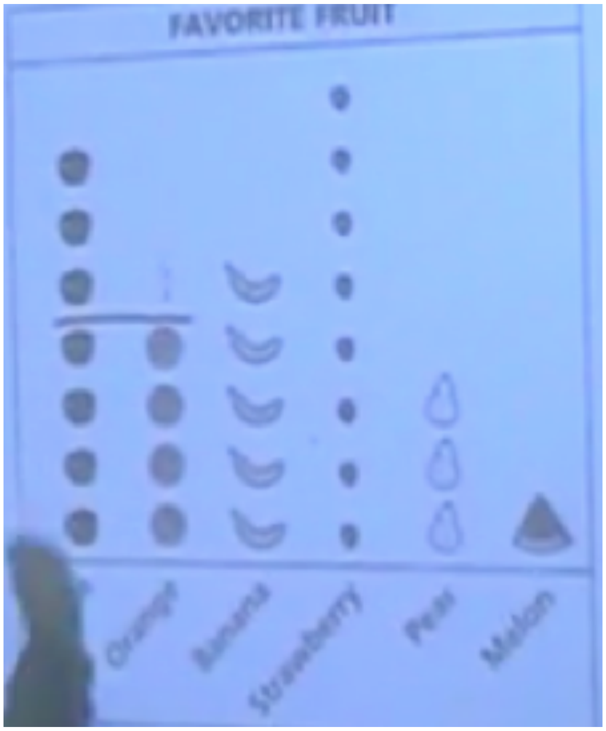

Figure 8. The pictograph and the line Bryce drew.

C: Bryce you told me

Bryce: I draw a picture.

C: Yeah, you used a picture. And

Student 1: I used a picture

C: You used a picture [to Student 1]. Show us how you [to Bryce] used the picture. Cause some people used the picture and some people used numbers, so we'll, we'll do both. He used pictures and I think Lea, when I talked to you you used pictures.

Lea: (nodding)

Levi: I did

C: Levi used pictures. You used picture [to a student]. […]

Bryce: (draws a line on the pictograph see Figure 8)

C: OK so what's that line represent, what's that mean Bryce.

Bryce: (continues to face board) Um the three. (turns head to look at Courtney while keeping body facing the board, then turns to look at board again)

C: Yeah, why'd you put that line there, what's that mean? (3.0)

Bryce: (turns head to Courtney, keeps body facing board) It's talking about compared the oranges to the apple. How (2.0)

C: Sure.

Bryce: (body and head facing board) How they are (4.0)

C: And so when you put that line there that tells you=

Bryce: =it's (turns body to Courtney) the same amount. (Turns to face board)

C: Yeah, you're right.

Bryce: (walks to side of board, then faces corner between board and easel with back to class)

C: And so then all of the apples that are above the line are what? (to the class)

Student: The answer

Student: The answer

C: Well, what's the answer? What do they represent? (to the class)

Bryce: (turns body halfway to see students behind him)

Student: The apples

Student: How many more apples.

C: How many more apples. Is that—that's a smart way of thinking about it. I like thinking about it like that, I'm a visual person. Thanks Bryce.

Initially in this interaction, Courtney aligned Bryce's strategy with his peers by pulling in other students who used a similar strategy, thereby explicitly connecting Bryce's general strategy of drawing with his peers (lines 3 and 5). Then, Courtney asked Bryce to share his strategy with the class (line 5-7) and reiterated how peers also used a similar strategy (i.e., of drawing a picture; lines 7-8). This act reinforced the connection between Bryce and his peers. As Bryce drew on the board, Courtney continued to make explicit connections between Bryce's mathematical thinking and his peers (line 11). Then, Courtney asked Bryce to explain what his drawn line represented (line 13), which gave him the conversational floor and allowed him to use mathematical discourse to explain his thinking. Courtney was unsatisfied with Bryce's response (lines 14-16) and she continued to push Bryce to articulate the meaning of the line drawn (line 16). Bryce continued to use mathematical discourse (line 16-17) but paused. Bryce continued (line 20) after Courtney reaffirmed his ideas (line 19)). After a longer pause (line 20; 4.0 seconds), Courtney began to aid Bryce's explanation (line 21), however he interjected and took over (line 22). To conclude, Courtney stated, "that's a smart way of thinking about it. I like thinking about it like that" (line 33-34). In this final statement, Courtney evaluated Bryce's overall thinking which interactively positioned him as a student with desirable mathematical thinking and one who was "smart." This act also may have been used to further bolster Bryce's self-confidence given his uncomfortableness at the board as evidenced by his body language.

Overall, this interaction illustrates how Courtney positioned Bryce as a representative of a group of students who used a picture to solve the problem, created explicit public connections between Bryce and his peers' mathematical thinking, used questions to provide space for Bryce to refine his mathematical thinking and discourse use, and leveraged her power position to indicate Bryce's mathematical thinking was socially valued (e.g., "smart"). Moreover, it illustrates how Courtney fostered storylines of mathematical competence, an explainer, an expert, and a presenter in front of peers.

Connecting EBs' ideas with mathematics. Courtney also connected EBs' mathematical thinking or strategy with the discipline of mathematics. More specifically, Courtney positioned the EB as a student whose mathematical thinking or strategy was directly related to a previously discussed mathematical concept, tool, or model (e.g., arrays). For instance, on December 16 (Y1), after Alonzo had shared the multiple strategies he used to find the total number of puppies in three baskets with 19 puppies each, Courtney stated, "Alonzo did an array, too, even." In this statement, Courtney explicitly connected one strategy Alonzo used to solve the problem with the mathematical model of arrays. In this way, Courtney created a direct and explicit connection between Alonzo's mathematical thinking and mathematics. Such types of connections solidified EBs' mathematical thinking as desirable and fostered storylines of mathematical competence.

Summary. Courtney leveraged her position to act as an intermediary between EBs' and their peers, which occurred in two main ways. First, Courtney would solicit a peer, or the class, to respond to an EB's mathematical contribution or vice versa (i.e., Courtney would ask the EB to respond to a peer's mathematical contribution). Second, Courtney would create intellectual connections between an EB and a peer or peers (e.g., stating an EB and peer used the same problem-solving strategy). Although this act of positioning did not always result in the participation of EBs via spoken mathematical discourse, it did precede or follow such opportunities. Moreover, this positioning act represented a powerful way Courtney positioned EBs in the classroom and fostered storylines of contributors, community members, explainers, experts, and mathematically competent students. Furthermore, this practice challenged stereotypes of who is capable of doing mathematics (Battey & Leyva, 2016; de Araujo et al., 2016) and became a way to construct counter-stories of who can do mathematics.

Valuing EBs' Mathematical Contributions

The next most common act of positioning Courtney employed across the data was to state value judgments of or evaluate an EB's mathematical contributions. When enacted, this positioning most often took the form of statements by Courtney that called attention to specific aspects of an EB's mathematical contribution or, less often, were direct evaluations (e.g., "that's right") (see Table 8 for a summary). Across the two years, this practice was used 37 times with EBs, occurred more frequently in year two (potentially due to the number of EBs), preceded or followed opportunities to use spoken mathematical discourse, and was seen throughout lessons (i.e., beginning, middle, and end). To illustrate this act of positioning, I describe multiple examples below.

Table 7

Summary of the Positioning Act: Valuing EBs' Contributions

Positioning Acts	Selected Data
State value judgment of or evaluate EB contribution	"Really cool idea" "Really smart thinking Bryce"

Note. EB = emergent bilingual.

The most common way Courtney employed this positioning act was to state value judgments of the EB's mathematical contribution. Courtney did this in several ways, such as commenting on the overall quality of their mathematical idea or identifying what aspects of the idea or strategy embodied desirable mathematical thinking. Importantly, these acts publicly distinguished the speaker from his/her peers, positioned the speaker as an individual who possessed desirable ways of thinking mathematically, signaled the idea or strategy was worthy of public consideration, and a student who could learn from.

Most frequently, Courtney openly commented on the overall quality of an EB's mathematical idea or strategy. To illustrate this practice, consider the example from September 29 (Y2). On this day, Courtney stopped the class as they worked individually at desks to come over to Lea's table to hear her strategy. After students were situated around the table, Courtney stated, "Ok, so, Lea had a *really cool idea*, can you explain your idea?" In this act, Courtney publicly evaluated Lea's mathematical idea ("really cool idea") and then invited her to share it with the class, which provided an opportunity for Lea to publicly participate and use mathematical discourse. This act interactively positioned Lea as a mathematically competent student who possessed valuable ideas that peers could learn from and simultaneously set the stage for Lea to speak. Courtney may have also used this act to highlight the overall importance of Lea's idea and, given the space for sharing (all students standing around the kidney bean table), increase the likelihood peers would fully attend to and consider it.

Another example of this positioning act occurred on September 13 (Y2). In this lesson, students spent time solving multi-digit addition word problems using two different strategies. In this interaction, Bryce explained his strategy (see Figure 9) for solving the problem, "Jake has 66 crayons and Ray has 15 crayons. How many crayons do they have altogether?" However, Courtney sandwiched his explanation with evaluative statements of his thinking.

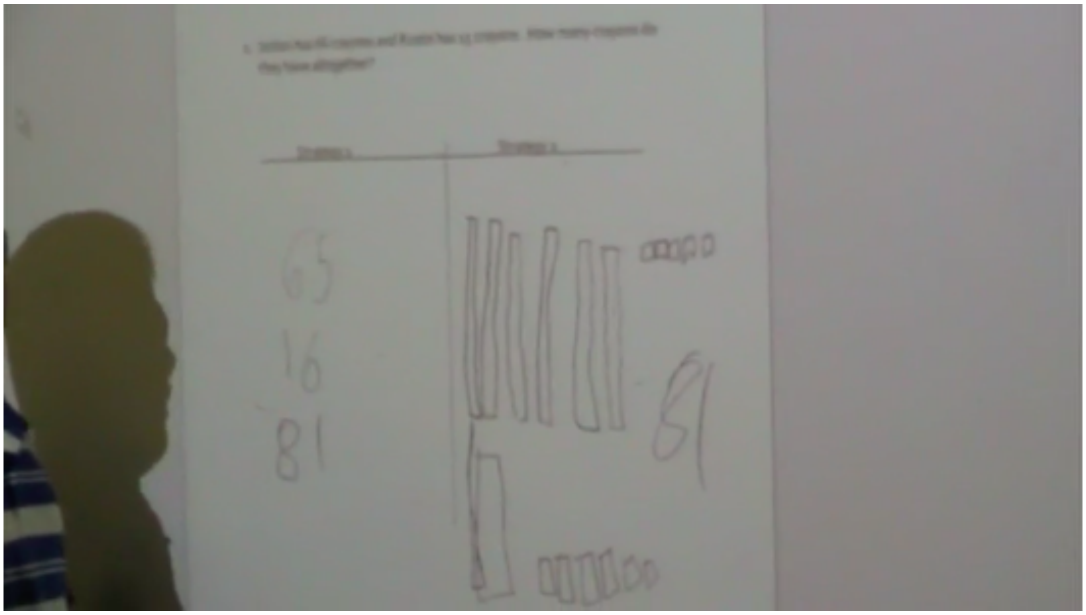

Figure 9. Bryce's written work.

C: Alright. We have a couple different strategies we're going to share. Bryce um wanted to share a strategy he did with drawing a picture. Do you want to come up and show us what you did? So I saw really smart strategies on problem number one. [administrative talk] Ok so Bryce can you explain kind of what you did?

Bryce: This one (very quietly; gestures to rods in picture)

C: So, yeah, so the problem was Jake has 66 crayons, Ray has 15 crayons, how many crayons did they have altogether? So what did you do?

Bryce: (looks at paper in hands as he faces the board diagonally with back to majority of class) I forgot how I did it (4.0). There's si—six tens and…five because…I switch, the five to…66 I switch the (5.0) (looks at paper and board)

C: It looks like you switched it to=

Bryce: =switched the last, the last six of the 66

C: 66 to 65, right?

Bryce: Six and I took the, the 16 off 15 switched it (gestures to algorithm)…and…then I add one more ten and it's seven tens…equals…seventy (10.0; looking at paper) and I (10.0; looking at work on board and gestures between the two representations) and I—no I added the six and that made it to 81.

C: Wonderful. (clapping) Ok so I…well how do we show respect to Bryce? (class claps) Yeah. So Bryce thank you so much for sharing. It looked like Bryce said you know 66 is a, is a not so kind number, I'm going to change that to 65 and

I'm just going to add 16 crayons to it and so he counted up by tens and then counted the ones and got 81. Did anyone else get 81 too?

Students: (raise hands)

C: Really smart thinking Bryce.

In this example, Courtney introduced Bryce as a student who “wanted to share a strategy he did with drawing a picture” (line 1-2). This called attention to Bryce’s desire to share his mathematical thinking and representation with the class, which was different then her typical approach of selecting speakers (based on aspects of their mathematical thinking she wanted to highlight). In this way, Bryce was interactively positioned as a student who had mathematical ideas that he thought were worthy of sharing with the class, which Courtney agreed with. Courtney continued by extending a formal invitation to Bryce to come up (lines 2-3) and then stated, “So I saw some really smart strategies on problem number one” (lines 3-4). This evaluative statement of student strategies is important and, given its situated context, acted to simultaneously evaluate Bryce’s strategy as “really smart.” In this way, Courtney not only called attention to Bryce’s desire to share his thinking but indicated to the class that this desire was valid given his “smart” strategy. This evaluation was not superficial considering Bryce’s use of an invented algorithm to solve a story problem. Hence, Courtney’s introduction acted to set the stage for Bryce’s peers to listen as he explained his strategy. After Bryce’s explanation, Courtney concluded the interaction by publicly evaluating Bryce’s thinking again, stating “really smart thinking” (line 27). This act solidified Bryce’s position in the community as a member who was mathematically competent. Moreover, it re-positioned him as a student who was an expert that could explain his thinking to others. Overall, this excerpt illustrated how Courtney leveraged her position in the classroom to evaluate EBs’ mathematical thinking to foster storylines of mathematical competence.

Across the data Courtney fostered storylines of mathematical competence for EBs through value judgments or evaluations. These findings confirm what other research has identified in different contexts, that evaluation is a common type of pedagogical discourse and, even more so, for novice teachers (Cazden, 2001; Kawanaka, Stigler, & Hiebert, 1999; McHoul, 1978; Sinclair & Coulthard, 1975). However, Courtney's use of this move is notable in the ways that her acts positioned EBs as students who possessed desirable ways of thinking mathematically (e.g., "really smart thinking Bryce"), signaled EBs mathematical ideas or strategies were worthy of public consideration (e.g., "Bryce um wanted to share a strategy he did with drawing a picture"), and indicated EBs were students who could explain their thinking to others (e.g., "Bryce can you explain kind of what you did?"). Consequently, this positioning act called attention to specific aspects of an EB's mathematical contributions (e.g., "really smart strategies"), reinforced classroom norms of desirable mathematical thinking, and fostered storylines of mathematical competence for EBs. Moreover, when used to introduce EBs, these acts also served to set the stage for the presenter. Overall, this act of positioning was powerful for EBs in the ways it called attention to the EBs' mathematical thinking in front of peers and acted to counter deficit-oriented storylines of EBs in mathematics.

Recording EBs' Mathematical Thinking

The final most common positioning act Courtney employed across the data was to publicly record EBs' mathematical contributions on the board. Overall, this act of positioning was used 22 times across the two years with EBs, occurred more frequently in the second year (potentially due to the number of EBs in year two), and was seen throughout lessons (i.e., beginning, middle, and end).

Table 8

Summary of the Positioning Act: Recording EBs' Mathematical Thinking

Positioning Acts	Selected Data
Teacher records EB's contribution on board	Notates on board "Yellow, white, green pattern-Alonzo"
EB records their contribution on board	Courtney: You [Alonzo] thought 21. Alright, go stick it up there. Alonzo: (writes "21" on board)

Note. EB = emergent bilingual.

The most frequent way Courtney enacted this positioning act was to record EBs' mathematical contributions on the board or easel, which positioned EBs as possessing ideas that were worthy of public documentation (that all could see). For instance, on May 25 (Y1) the class sat on the carpet in a circle and discussed the total value of a quarter, dime, nickel, and penny that was shown on the easel (see Figure 10).

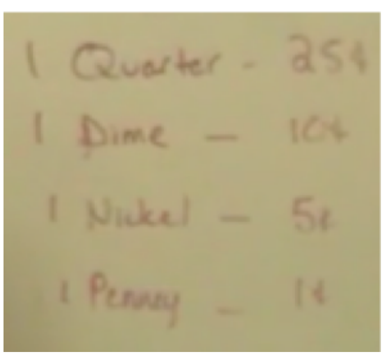

Figure 10. Image on easel at start of interaction.

C: Ok, so how much money did we have? Alright, Alonzo what are you thinking?

Alonzo: 41.

C: How did you figure that out?

Alonzo: Um, so a quarter's 25 cents and then I put the 10 and 35.

C: Like that (writes on board; see Figure 11).

Alonzo: Then I put the 5, the 5 with the 35 and that equals 40 and then I put the 1 and it equaled 41.

C: Ok, did you see how Alonzo did that?

Class: Yep.

C: So, he, um, so he, he took the greatest value, which was the quarter and added from there. Ok.

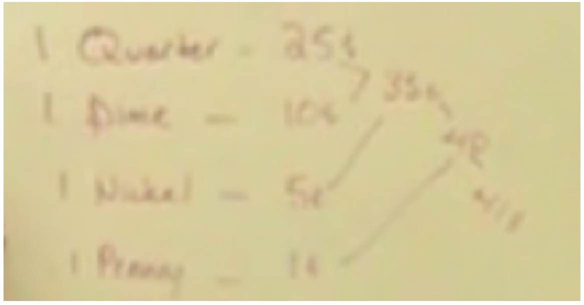

Figure 11. Image of easel at end of interaction.

In this excerpt, Courtney began by asking Alonzo for his thinking (lines 1-2). As Alonzo used mathematical discourse to explain his mathematical thinking (lines 3, 5, 7-8), Courtney documented his explanation on the easel and confirmed its accuracy (turn 6). As a result, Courtney's notation interactively positioned Alonzo's idea as worthy of documenting. Additionally, it created a mathematical representation of the idea, which may have been designed to serve as a model to students. As Alonzo continued to describe his approach for calculating the total value of the coins (lines 7-8), Courtney continued to document it on the easel. Courtney's next act, "Did you see how Alonzo did that?" (line 9), indicated her expectations that peers should be listening and following the recording of Alonzo's idea. Interestingly, Courtney did not refer to Alonzo's oral explanation in her question, but the record of his explanation.

Another example of this practice occurred on Nov. 18 (Y1). In this lesson, the class sat at the carpet and discussed the multiples of 2 and 4 shown highlighted on a hundreds chart in yellow and green, respectively (see Figure 12). As students shared, Courtney documented their ideas in a text box on the right side of the screen.

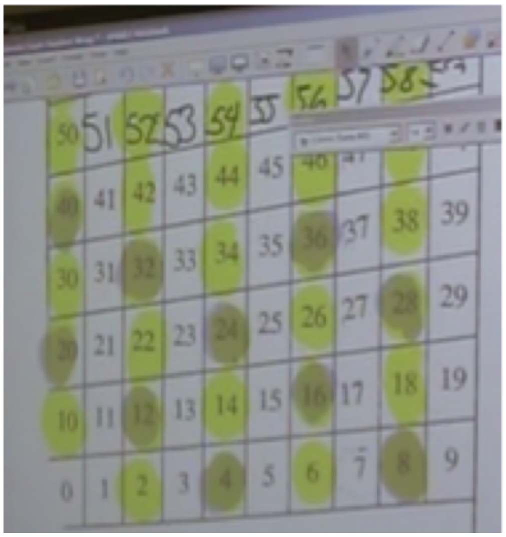

Figure 12. Hundreds chart shown on the board with factors of 2 and 4 shaded.

C: Um, Alonzo.

Alonzo: Um it's like every um yellow white um   green

C: Ok, so yellow (typing "Yellow, white, green pattern-Alonzo"). Alright.

After calling on Alonzo to share his observations, Courtney recorded his ideas in a text box that contained other peers' ideas. In the record, Courtney placed ownership of the idea with Alonzo by including his name for all to see. This act created a public record that placed ownership of the idea with Alonzo, situated him and his ideas alongside peers on the board, and advanced the storylines of mathematical competence and a classroom contributor.

Although Courtney was primarily responsible for recording EBs' mathematical contributions, she also allowed EBs to record their own ideas. In this way, EBs were invited to take up a responsibility traditionally reserved for herself. On April 4 (Y2) after students had answered questions analyzing data obtained from their class, Courtney asked students to share their ideas.

C: Let's talk about our data, so I was surprised about this and I—and I saw a lot of you guys found some different things that you, that were interesting to you about the data that we found about our class, so we'll talk about those. Um, how many students are in our class today [reads from worksheet projected on board]? Uh, Samuel what'd you think, bud?

Samuel: 21.

C: You thought 21. Alright, go stick it up there. So, tell us

Samuel: (gets up and goes to board)

C: some strategies that you guys used to figure out how many kids were in the class today. Alright, so Emma what was a strategy you used?

Samuel: (writes "21" on board)

Emma: //I—I//

C: //Thanks bud// [referring to Samuel]

Emma: I looked at the graph—the graph and counted.

C: So you looked at the graph and counted and when I talked to Samuel he said he looked at the graph and you counted and what did you count on the graph?

Samuel: Post its

C: You counted the post its on the graph. So we can put Samuel and Emma counted (types "Samuel and Emma counted post-its on the graph" in the worksheet projected on board). Ok so, several of you guys used that strategy.

In this interaction, Courtney began with the first question on the worksheet and asked Samuel to share his thinking (lines 4-5). In this way, Courtney positioned Samuel as a student who had answered this question and had an idea worthy of sharing, thereby fostering a storyline of mathematical competence. After Samuel responded (line 6), Courtney invited Samuel to the board to write the value in the worksheet for all to see. In this act, Courtney allowed Samuel to take up the physical space often reserved for the teacher in her classroom and perform duties often assigned to the teacher (i.e., writing on the board). Shortly thereafter, Courtney revoiced Emma's strategy and connected it to a conversation she had with Samuel where he told her "he looked at the graph" and counted (lines 15-16). By publicly sharing this information, Courtney indicated Samuel had a strategy to determine the value of 21 (that he wrote on the board) and had shared that information with Courtney in a mathematical conversation. Moreover, Courtney signaled that this information was important to share with the class, which further positioned him as a student with mathematical ideas. Next, Courtney asked Samuel to elaborate on what specifically he had counted in the graph (lines 16-17) to which he responded, "post its" (line 18). Courtney then made connection between Samuel and Emma, stating "Samuel and Emma counted" (lines 19-20), which she recorded on the board. This record served to make a visual and explicit connection between Samuel and Emma regarding their mathematical ideas. Overall, this interaction illustrates another way Courtney created records of EBs' mathematical contributions.

The positioning act of recording EBs' mathematical thinking was another way Courtney facilitated EBs' participation, mathematical learning, and status in the classroom. By documenting their mathematical contributions, Courtney positioned EBs as co-constructors of mathematics, community members, and students who possessed mathematical ideas that deserved to be publicly recorded. Moreover, such acts fostered EBs' storylines of mathematical competence, membership, and contributor. Thus, this positioning act was important for EBs as it evidenced their participation even though it did not directly result their use of mathematical discourse. Furthermore, the act of providing visual referents for EBs (through their recorded work) has been found to facilitate mathematical and linguistic learning (Moschkovich, 2002; Raborn, 1995).

Orchestration of Positioning Acts

Throughout the data, the positioning acts Courtney employed were often found to occur in concert with one another. Said another way, the acts of positioning were frequently employed together rather than in isolation. To illustrate Courtney's ability to carefully orchestrate these positioning acts together, I describe two vignettes below.

Vignette 1. On November 3 (Y2), after students had solved problems individually, Courtney closed the lesson by discussing the need to draw efficient mathematical representations. To do this, she first drew an inefficient representation (i.e., a drawing that was highly detailed and took an extensive amount of time) and then transitioned to have three students share their efficient mathematical representations. Lea was the first student to share her strategy (see Figure 13).

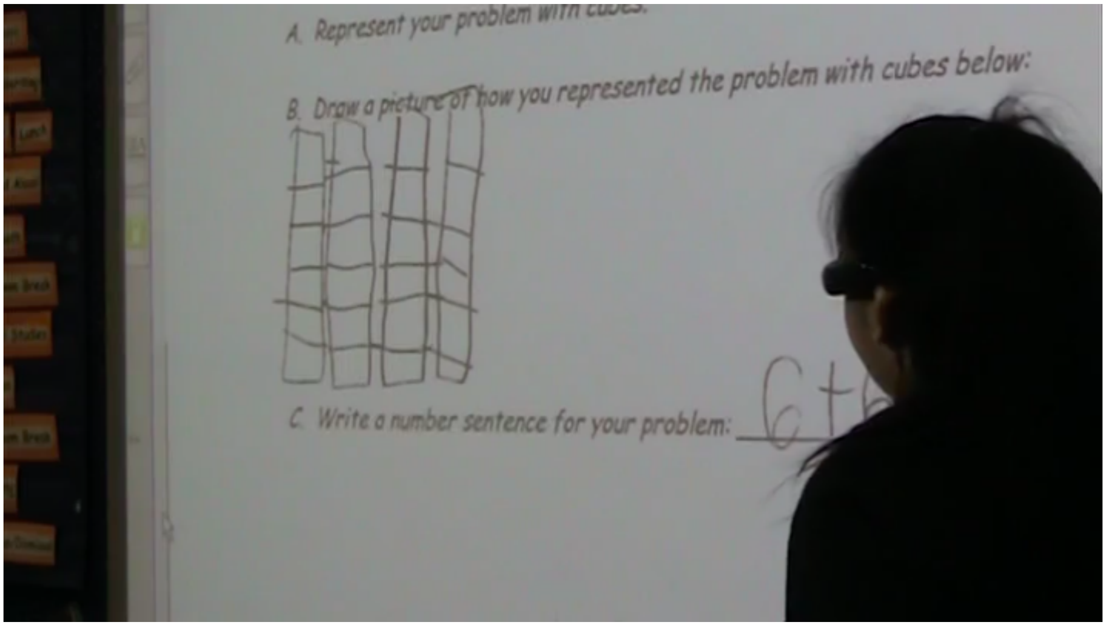

Figure 13. Lea's efficient mathematical representation.

C: You know I saw some kids who did a much better job than I did drawing efficient pictures so I wanted to talk to you, I wanted a few of those kids to come up. Um, Lea you're my first friend to come and share, we're going to talk about number two. Ms. Bristol gave 6 pieces of candy to Janie, Alice, Carl, and Erica. How much candy did she give out altogether? Tell us about your picture.

Lea: Well, first I made, like, I did, um (4.0) four groups that, like, four groups that have, like six, that have, oh I did, I did 6 plus 6 plus 6 plus 6 equals 12, I mean 24. And then because I added, like, I had to draw a picture of 6 and then I added them and (4.0)

C: So, um, your picture—did it take very long for you to draw that picture?

Lea: ((shakes head no)) uh-oh

C: No. Um and you were able to quickly count that there were 24 of them?

Lea: ((nods)) Yeah.

C: Wonderful. That's very efficient. Do you guys have comments or compliments for Lea?

Lea: Laura.

Laura: Like some people I've seen they draw big circles and then maybe little (inaudible), but that's just squares and you—like you could just draw a very quick square and just um slash lines on it and then you have your picture.

C: It kind of reminds me of our arrays that we have been talking about.

Laura: Yeah and it's very easy to read too=

C: =yeah so anyone looking at that could see that that was six, four groups of six.

Laura: Instead of all the fancy, cause sometimes we try to do that as well.

C: Yeah. Keri did you have something else to add for Lea?

Keri: Um, (3.0) I like how you, (4.0) I forgot what I was going to say.

C: Oh that's ok it flew out of your brain.

Lea: Kacey.

Kacey: I like that you did something unique, like you didn't actually draw squares, you just drawed um place value blocks to answer and I like it.

C: Wonderful. Thank you Lea. ((claps))

Student: Woo ((clapping))

In this interaction, Courtney began by introducing the student presenters as peers "who did a much better job than I did drawing efficient pictures" (lines 1-3). In this act, Courtney metaphorically distanced herself from the presenters, evaluated the presenters' mathematical ideas, and positioned the presenters as experts who possessed mathematical proficiencies that surpassed hers—the expert in the institutional space—and as teachers who students could learn from. Next, Courtney explained her desire to have a few of these students share their efficient representations with the class and then some students, Lea and two others, to co-construct mathematics (lines 2-3). This interactive position was important for Lea—the only Latina in the classroom—as her mathematical proficiencies were highlighted, she was positioned as a teacher and expert, and allowed an opportunity to use mathematical discourse to share her mathematical representation with the class. Lea then explained her strategy constructing an efficient representation and calculating the sum (lines 7-10), which was supported by her scanned written work. Next, Courtney asked targeted questions to highlight the efficiency of Lea's representation (lines 11 and 13), which intentionally drew the class' attention to the aspects of Lea's image that were germane to the discussion (i.e., its efficiency) and how the efficient picture allowed Lea to quickly calculate the solution (line 13). Courtney then praised and evaluated Lea's strategy, stating "Wonderful. That's very efficient" (line 15), which acted to solidify her status as a mathematical competent student who used a desirable mathematical approach. Next, Courtney acted as an intermediary between Lea and her peers by inviting the class to make comments or compliments (lines 15-16), a conversation Lea partially controlled (lines 17 and 30). The first peer to comment was Laura, who contrasted Lea's representation with peers (lines 18-20). Courtney took the next turn (line 21), stating "It kind of reminds me of our arrays that *we* have been talking about." With this act, she explicitly connected Lea's representation with arrays—content the class was familiar with. Moreover, Courtney's use of "we" reinforced the position of the class as a community that Lea was a member of. Next, Laura complimented Lea's representation as "easy to read" (line 22), which Courtney supported, stating "so anyone looking at it could see that that was six, four groups of six" (line 23). In her next turn, Courtney continued to act as an intermediary by inviting Keri to share (line 25) who ultimately "forgot" (line 26). It is unclear why Courtney called on Keri rather than allowing Lea to solicit Keri's ideas. Lea then called on Kacey (line 28), who also publicly evaluated her representation in a positive way. Although there were a range of comments or compliments Laura and Kacey could have said, it is important to note their comments fostered the storyline of mathematical competence for Lea.

Overall, this vignette illustrates how Courtney orchestrated an array of positioning acts that served to foster multiple storylines for EBs. In this interaction, Courtney invited Lea to co-construct mathematics by sharing her problem-solving strategy; acted as an intermediary between Lea and her peers by asking peers to respond to Lea's mathematical contributions and connected Lea's representation with mathematics; and evaluated Lea's mathematical representation. Additionally, this interaction provides evidence of the ways peers perceived Lea and interactively positioned her as a result.

Vignette 2. On October 27 (Y2), students created a book of stamps in an array, select a value for one stamp, and then calculate the total value of their book of stamps. After students had worked on this task, Courtney selected some students to share their book of stamps and the strategies they used for finding the total value of the book. Bryce was the first student selected to share his book of stamps shown in Figure 14.

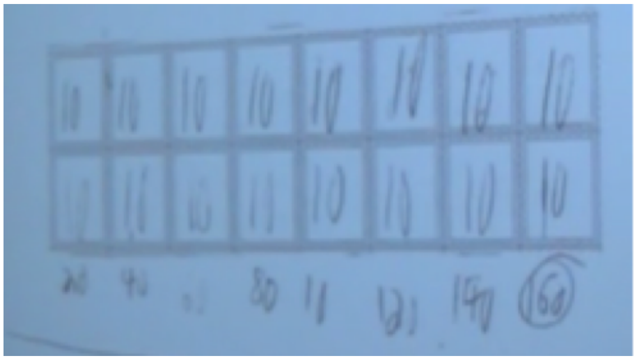

Figure 14. Bryce's book of stamps and his written work.

C: Bryce, you're my first fellow to share. Why don't you go on up. [Administrative talk] Ok Bryce is going to share how he figured this problem out. [Administrative talk].

Student: Hey, that's the same thing I did.

C: Shh.

Student: He did the same thing I did.

C: Alright, make sure your voices and eyes are showing respect for your presenter

Bryce: I //counted down by twos// (gestures down the columns)

C: //Shh. Carl//

Bryce: I got 20, 40, 60, 80, 100, 120, 140, 160. A 160 is my answer.

C: Ok, so um questions, comments for Bryce about his strategy for figuring out the value of his book?

Bryce: (looks at students on carpet) (4.0)

C: You can call on

Bryce: What's up (looking at student)

Student: Um you did—you had a great strategy and great work.

C: Ok, //any other// of comments on his strategy?

Bryce: //Janie//

Janie: Um instead of putting 10, 20, 30, 40 all the way to um the answer he just did it like, added the, you know 10 plus 10 is 20 so he said 20, 40, 60, 80, 100, 120, 40, 60 and then he.

C: Yeah so he was being very efficient, right? So he was doing a quick way of counting. Greg something else?

Greg: Nice job.

C: Alright well we are all pleased with your work. Thank you very much for showing us how you figured out the value of your stamps. (class claps)

As with the previous vignette, Bryce the first student to share his problem-solving strategy with the class. In her invitation to co-construct mathematics, Courtney stated "Bryce, you're my first fellow to share. Why don't you go on up" (line 1). Courtney continued, stating "Bryce is going to share how he figured this problem out" (lines 2-3), which indicated Bryce had the capability to share and successfully solved the problem. In this way, Courtney interactively positioned Bryce in the role of a teacher before he began to speak and as a mathematically competent student (who "figured out" the problem), thus setting the stage for his turn. As Bryce moved to the front of the room, peers expressed the similarities between Bryce's strategy and their own (lines 4 and 6). These reflexive positions made by peers acted to connect their own thinking with Bryce's. Bryce then explained his strategy of counting by 20s (line 11) and gestured to his work (line 9) that was a visual referent. Courtney then acted as an intermediary between Bryce and his peers when she asked for questions or comments on Bryce's strategy (lines 12-13). This act also indicated the expectation that peers would be listening to and thinking about Bryce's ideas and promoted the storyline of mathematical contributor. Courtney also indicated to Bryce that he could control this conversation (line 15), which re-positioned him as taking on the rights and duties as the teacher. Bryce took up this responsibility (lines 16 and 19) and fielded comments on his mathematical work. The first peer positively evaluated Bryce's work, stating "you had a great strategy and great work" (line 17), which acted to foster the storyline of mathematical competence for Bryce. Next, Courtney asked if there were other comments, but Bryce had already begun to call on a peer (line 19). It is unclear why Courtney began to take over the conversation. Then, after Janie revoiced Bryce's strategy Courtney evaluated it as an efficient strategy (lines 23-24). In this way, Courtney indicated Bryce's strategy was mathematically desirable (i.e., being efficient), which reinforced the storyline of mathematical competence. Next, Courtney called on another student to share his comment (line 24), which continued to position herself as an intermediary between EBs and peers. Courtney concluded this discussion, stating "*we* are all pleased with your work" (line 26). This final act is important in multiple ways. First, the use of "we" indicated the class was a community and Bryce was a member. Second, Courtney positioned herself as a speaker for the community. Third, the community was satisfied with Bryce's mathematical thinking and respective explanation. This is important given that teachers traditionally reserve the right to evaluate student thinking.

In general, this vignette further illustrates the ways Courtney orchestrated multiple acts of positioning in single interactions that fostered storylines of EBs as mathematically competent, teachers, and contributors. In this interaction, Courtney: invited Bryce to co-construct mathematics by sharing his problem-solving strategy, acted an intermediary between EBs and peers through solicitations of peers to respond to Bryce's mathematical contributions, and evaluated Bryce's mathematical thinking. As with Vignette 1, this vignette also illustrates some of the ways peers interactively positioned EBs and how these positioning fostered EBs storylines in the context of mathematics.

Summary. As evidenced in the two vignettes, Courtney frequently orchestrated multiple acts of positioning in one interaction or, in some cases, in one turn. In this way, the data provides evidence that the positioning acts were often found to work in concert with one another rather than in isolation. Moreover, the two vignettes illustrate how deftly Courtney implemented multiple acts of positioning that served to promote productive storylines of EBs (e.g., mathematically competent, explainers, co-constructors of mathematics).

Storylines

Across the data, Courtney constructed and fostered multiple storylines for EBs in many ways. The three main storylines she promoted through her acts and interactive positions were: EBs are mathematically competent, EBs can explain their mathematical thinking to others, and EBs are contributors to the co-construction of math (see Table 10 for selected evidence). These storylines were promoted across each respective year and EB and, at times, overlapped. To complement the previous analysis and further elucidate the ways these storylines were advanced across Courtney's positioning acts, additional examples are described below.

Table 9

Storylines of EBs and Selected Evidence

Storyline	Selected Evidence
EBs are mathematically competent	"that's a smart way of thinking about it [Bryce]. I like thinking about it like that, I'm a visual person." Apr. 4 (Y2) "I think it's a really effective way of doing it" May 13 (Y2) Peer compliments (e.g., "I like the way how you like, drew a picture of this stuff [gestures across work]—numbers" Oct. 22 [Y2])
EBs can explain their mathematical thinking to others	"I scanned in Alonzo's work because I thought that he did a *nice job* of explaining this a few different ways" Dec. 16 (Y1) "Ok, so, Lea had a *really cool idea*, can you explain your idea?" Sept. 29 (Y2) "Can you go on up and explain how you solved number two" Oct. 6 (Y2)
EBs are contributors to the co-construction of mathematics	Asked to share their mathematical thinking with the class (e.g., "what'd you do?") Selected to share problem-solving strategy at board "Bryce um wanted to share a strategy he did with drawing a picture" Sept. 13 (Y2)

Note. EB = emergent bilingual. Y1 = year 1. Y2 = year 2.

EBs are Mathematically Competent

Across the data, Courtney advanced the storyline of EBs are mathematically competent through the positioning acts of inviting EBs to co-construct mathematics, revoicing EBs' mathematical contributions, connecting mathematical ideas, evaluating EBs' mathematical contributions, and creating records of EBs' thinking. Through these acts, Courtney identified desirable ways of acting in the class that were indicative of mathematical competence (i.e., mathematically successful). I define mathematical competence as the ways individuals engage in mathematical practices that are culturally and socially identified, accepted, and negotiated as representative of academic success (Gresalfi et al., 2009). This storyline is powerful for Latinx and EBs as it challenges dominant narratives of mathematical competence. To further illustrate the ways Courtney fostered this storyline, I describe additional examples below.

Courtney called attention to students who demonstrated desirable ways of being mathematically successful to foster storylines of EBs as mathematically competent. For instance, on Dec. 16 (Y1), Courtney had selected some students to share their problem-solving strategies at the end of the lesson. To introduce Alonzo—one of the students who was selected to share—Courtney stated, “I scanned in Alonzo’s work um because I thought that he did a nice job of explaining this a few different ways.” This act called attention to an EB’s mathematical ideas in front of his peers *before* he began to speak. More specifically, Courtney emphasized which aspect of Alonzo’s mathematical thinking were notable, what peers should attend to in his presentation, and *why* he was a mathematically competent student that could explain his ideas and teach his peers. Thus, she positioned him in the role of an expect, which set the stage for him as a speaker and advanced the storyline (of EBs as mathematically competent).

Another way Courtney fostered the storyline of mathematical competence was through suggestions to think or be like an EB. As a result, Courtney called attention to students who were mathematically competent and could be role models. Consider the excerpt from Dec. 16 (Y1), where Alonzo shared multiple strategies for finding how many puppies were in three baskets with 19 puppies in each basket. After he shared, Courtney began:

C: Alonzo, I was curious about this. Why didn't you um, why didn't you do this and do (11.0) How come you chose to add the three groups of 19 like that instead of 19—3+3+3+3+3?

Alonzo: Take me a long time.

C: That would take you kind of a long time to add all the threes? Some of us did do that. How many friends you know did that? That's a really—that's a fine thing if you wanted to add up all the threes. But sometimes, if you wanted to be more efficient, you might think about it like Alonzo did and he kind of thought, you know that writing out all those threes by hand might be a little tired, it might take me awhile so maybe I'll just do 19—I'll add 19 three times or I'll draw three—I'll draw a picture of three groups of 19, too. So that's another way to do it. Um nice job Alonzo, I like that.

In her turn, Courtney asked Alonzo why he chose not to add threes successively (lines 1-3) when solving the problem. Although Alonzo had a range of possible responses, such as referring to the story situation, he replied that it would take him a "long time" (line 4). Courtney connected this "fine" (line 6), albeit inefficient, strategy with peers who selected it, stating "some of *us* did do that" (lines 5-6). In this way, she metaphorically distanced Alonzo's approach with other peers in the community who may have selected an inefficient way. Next, Courtney suggested students may want to "think about it like Alonzo did" (line 8) if they want to be "more efficient" (line 8). This act interactively positioned Alonzo as a mathematically competent who acted in ways that were valued by Courtney. It also created connections between Alonzo and his peers by suggesting they "think about it like" him (line 8). Overall, in this interaction Courtney used different positionings to promote the storyline of Alonzo as a mathematically competent student, such as asking him to share his problem-solving strategy and suggesting peers be (more efficient) like Alonzo.

EBs can Explain their Mathematical Thinking to Others

Courtney cultivated the storyline of EBs as explainers throughout the data via the positioning acts of inviting EBs to co-construct mathematics by sharing problem-solving strategies and acting as an intermediary between EBs' and peers. In these positionings, Courtney allowed EBs to explain their ideas, a specific problem-solving strategy, or peers' thinking. Up to this point, I have provided multiple examples of the ways Courtney interactively positioned EBs to foster the storyline of EBs as explainers. For example, Courtney had EBs share their problem-solving strategies with the class to position and foster the storyline of EBs as students who can explain their mathematical thinking to others. To complement these examples, I describe one additional example below.

Courtney frequently restated students' explanations during whole-class discussions. Less common was Courtney explicitly asking students to take on this instructional practice. For example, on Oct. 27 (Y2), Courtney asked the class for someone to explain a peer's strategy for calculating the total value of her book of stamps (see Figure 7).

Emily: I counted by 5s and 10 and (inaudible) instead of going like this (gestures across a row), I got, and then I did 5 times 18.

C: Ok um, can someone else explain her strategy?

Lea: (hand raised)

C: Lea, can you go up there and explain what Emily did?

Lea: She did like (gets up and moves to board) (5.0)

C: Shhh.

Lea: She did like, she counted by fives and go like 5, like 10, 15, all the way to 90 (points to 90).

C: Alright. Laura. Thank you, Lea, for explaining her strategy you must've been paying close attention.

In this interaction, Lea was provided an opportunity to explain her interpretation of Emily's mathematical thinking, which had required Lea to listen and think critically about. Courtney's interactive position of Lea as a student who can a peer's mathematical work is significant in this classroom, given Courtney's frequent use of this act herself. Moreover, this position served to bestow on Lea some rights and duties Courtney claimed as the teacher. Although mathematics education research advocates for a regular use of such acts to create a more dialogic learning environment (e.g., Hufferd-Ackles et al., 2004), this was not a highly frequent occurrence in Courtney's classroom. As a result, this act of asking Lea to explain Emily's strategy was powerful in this classroom context and served to foster the storyline that EBs can explain their thinking to others.

In summary, across the data Courtney promoted the storyline of EBs as students who can explain their mathematical thinking to others through the positioning acts of inviting EBs to co-construct mathematics by sharing problem-solving strategies and acting as an intermediary between EBs' and peers. Overall, this storyline is in opposition to dominant narratives of Latinx in mathematics and, as a result, represents a powerful way Courtney elevated Alonzo's, Bryce's, Lea's, and Samuel's status in the classroom.

EBs are Contributors to the Co-Construction of Mathematics

Another storyline Courtney fostered was EBs as contributors. To do this, Courtney most commonly invited EBs to co-construct mathematics by sharing their mathematical thinking or problem-solving strategy with the class—practices I have already described in detail. However, Courtney used other interactive positions to cultivate this storyline that I have not yet discussed. To further elucidate this, I describe two additional examples below.

One more way Courtney advanced the storyline of EBs as contributors to the co-construction of mathematics was to interactively position them as students who had relayed information to the collective class. For instance, on May 13 (Y2) the class discussed the meaning of the numerator and denominator in the fraction seven-fourths in the context of a problem of sharing seven brownies with four people.

C: What does that top number represent the numerator?

Student: Brownies

C: Whole brownies?

Student: Yes

Bryce: The pieces of—of the brownie—the pieces.

C: Oh hold on Bryce's got an idea. What is—what does it represent?

Bryce: The amount the person—the piece everybody gets.

C: Hold on, I'm sorry I'm still hearing people chatting. Bryce, what does that numerator represent cause a lot of you guys still have this question. What is it representing?

Bryce: The amount the person the brownie ahh. The amount the brownie a person gets.

C: So the amount of pieces

Bryce: Yeah

C: That the person gets, right? Then what is that four on the denominator representing? What's that representing Callie?

Callie: How many people you're sharing the brownie with.

C: Ok so or how many pieces you cut the brownie into. So Bryce is telling us the numerator represents the number of pieces that the person gets and the denominator represents the number of pieces you cut that whole into.

In this interaction, Courtney posed the mathematical question under consideration to the class (line 1). After an exchange between Courtney and a peer, Bryce offered his interpretation of the numerator (lines 5, 7, 10). Following a peer's idea (i.e., Callie) of the meaning of the denominator, Courtney combined Bryce's and Callie's ideas into one statement (lines 16-18). However, Courtney was strategic in how she began, stating, "Bryce's telling *us*" (line 18). This act served multiple purposes. First, it positioned the class as a community and indicated Bryce was a member of it. Second, it positioned Bryce as a contributor to the mathematical conversation at hand. Third, Courtney reflexively positioned herself within "us," thereby taking on the identify of a learner. Fourth, Bryce was a student who others can learn from—including Courtney—since he knew the answer to a question many peers had. Consequently, Courtney conferred expertise on Bryce, an EB, which simultaneously served to advance the storyline of EBs as contributors.

A final way Courtney interactively positioned EBs in the storyline of contributors to the co-construction of mathematics was through invitations to correct a peer's error. On Apr. 26 (Y2), the class discussed two representations of 97 cents, "\$0.97" and "¢97," written on the board and agreed "¢" was to be written on the right-hand side of the value (e.g., 97¢). Courtney stated,

> Alright so the 97 cents, oh instead of having the 97 cents at the back of the cents sign it's in the front of this one isn't it. Alright, so how can we fix that? So, who can fix that up for me? Who can fix it? Who wants to? You want to fix it, Samuel? Yeah go fix it, fix somebody's work for me. You're their editor. You're going to fix up what somebody did.

In this turn, Courtney invited a student to come to the board to correct the error—a duty commonly reserved for the teacher. Courtney picked Samuel, who she asked to be an "editor" for the peer. Courtney's act allowed Samuel to take up the physical space of the teacher (by coming to the board), positioned him as a student who can correct peers' mathematical errors, and was an active participant in the co-construction of mathematics (i.e., the mathematical conversation at hand). Courtney went further by naming Samuel as an "editor," which was a powerful title for him in a class full of native English-speaking peers.

Summary

As evidenced in the data, Courtney was strategic in her use of acts to foster storylines that EBs are mathematically competent, EBs can explain their mathematical thinking to others, and EBs are contributors to the co-construction of math. Notably, these storylines were frequently found to occur simultaneously in interactions, which attest to their complexity and ability to be at play in any given interaction. Such findings provide further evidence of the nuanced ways teachers interact with students and how teachers can use these interactions to position students—particularly those who have been historically underserved in mathematics—in storylines that offer counter-stories to dominant narratives that perpetuate inequities.

CHAPTER 5: DISCUSSION AND CONCLUSION

In this study, I sought to answer the research question, *What spoken and written acts did an elementary teacher employ to facilitate the participation of EBs during whole-class mathematics instructional episodes?* To answer this question, I conducted a case study (Stake, 1995) of Courtney, a white, female, monolingual third-grade teacher who had developed specialized knowledge for teaching EBs through a multi-year professional development experience. More specifically, I analyzed whole-class interactions between Courtney and four EBs over the course of two school years to identify her positioning acts and how these facilitated EBs' participation. The analysis resulted in the identification of five acts of positioning (i.e., inviting EBs to co-construct mathematics, revoicing EBs' mathematical contributions, acting as an intermediary between EBs and peers, valuing EBs' mathematical contributions, and recording EBs' mathematical thinking) that Courtney employed across two years that created opportunities for EBs to participate and use spoken mathematical discourse. Across the data, the positioning acts were frequently found to occur in combination with each other rather than in isolation. As a result, Courtney carefully orchestrated classroom interactions with EBs that made use of multiple acts of positioning in single interactions.

In alignment with positioning theory (Rom Harré & van Langenhove, 1999b), I also identified the storylines that were constructed and fostered for EBs through Courtney's interactive positions. These storylines were: EBs are mathematically competent, EBs can explain their mathematical thinking to others, and EBs are contributors to the co-construction of math.

Lastly, to answer the research question the findings indicate that when employed, the acts of positioning provided opportunities for EBs' to participate in mathematics instructional episodes as evidenced by their use of written and spoken mathematical discourse—a critical component to mathematical learning and academic success. Thus, the findings illustrate that the positioning acts provided multiple instances for EBs to use spoken and written mathematical discourse. In the remainder of this chapter I discuss the implications and significance of these findings and describe how the positioning acts connect to and build on prior research.

Positioning Acts

Invitations to Co-construct Mathematics

The most common positioning act employed across the data was to invite EBs to participate in the co-construction of mathematics. When employed, this act most often took the form of invitations to share mathematical thinking or a problem-solving strategy or to clarify or justify a previously stated mathematical contribution, which required an extensive use of mathematical discourse. The prevalence of these types of invitations across the data set contrast findings from other studies (e.g., Iddings, 2005; Planas & Gorgorió, 2004; Weiss et al., 2003), in which teachers infrequently asked such questions of EBs even though they are recommended by research (Hufferd-Ackles et al., 2004; National Council of Teachers of Mathematics, 2014). As a result, these findings contribute to the growing body of research (e.g., Moschkovich, 2002; Setati, 2005) that illustrate EBs can participate in the co-construction of mathematics as they develop their language proficiencies.

The invitations Courtney employed are like elicitations since they intended to draw out EBs' mathematical thinking. However, these invitations go further because they served EBs in multiple ways. First, Courtney interactively positioned EBs as students with agency, active participants, and who possessed mathematical ideas worthy of sharing and considering, which contrast the common positionings of EBs documented in the literature (e.g., Brenner, 1998; Yoon, 2008). Thus, Courtney did not allow EBs to be spectators in her class. Second, the acts fostered storylines for EBs as mathematically competent, explainers, and contributors. Third, Courtney reinforced the expectation that every student—EBs included—would share their mathematical thoughts publicly, thus promoting a dialogic classroom environment. Lastly, these invitations provided extensive opportunities for EBs to participate in the mathematics lessons through the use and practice of mathematical discourse (as the they shared their mathematical thinking). Hence, EBs were provided regular opportunities to use mathematical discourse, as advocated by research (Moschkovich, 2002; Sfard, 2002). If EBs are to develop their competencies in mathematical discourse and English language, teachers must provide opportunities to practice language. As the findings illustrate, the incorporation of invitations is one way teachers can provide opportunities to EBs to facilitate the acquisition of mathematical discourse.

Revoicing

The second most frequent positioning act Courtney employed was revoicing. Traditionally, revoicing is defined as a "re-uttering (oral or written) of a student's contribution by another participant in the discussion" (O'Connor & Michaels, 1996, p. 90). When implemented, Courtney used revoicing primarily to amplify and clarify EBs' spoken mathematical contributions—findings that confirm earlier studies (e.g., Cazden & Beck, 2003; Enyedy et al., 2008; Forman et al., 1998; Moschkovich, 1999; Shein, 2012), albeit in a different context. Moreover, the findings show that Courtney's acts of revoicing positioned EBs in relation to mathematics and peers. Lastly, in some cases it was unclear why Courtney revoiced an EB's contribution at all given the volume and clarity of the initial utterance. These findings highlight the challenge and complexity of revoicing to (interactively) position EBs in productive ways, particularly for novice teachers, and indicate further research in facilitating this practice among classroom teachers is necessary.

Courtney also used revoicing to give voice and call attention to EBs' mathematical actions. This occurred in cases when an EB did not verbalize their mathematical thinking, but demonstrated it through mathematical actions, such as writing an idea on the board or using a tool in a particular way. When Courtney revoiced mathematical actions, she indicated that multiple modes of communication were acceptable ways to relay mathematical thinking—an important ability for EBs who are developing competencies in mathematical discourse and English language. Although this type of revoicing did not immediately result in EBs' participation, it did foster storylines of mathematical competence and solidified membership status by positioning EBs as contributors to the co-construction of mathematics and as possessing ideas worthy of hearing, sharing, and discussing.

Acting as an Intermediary Between EBs and Peers

Courtney acted as an intermediary between EBs and peers. When enacted, this was either a directive to respond to EBs' mathematical contributions or statements that explicitly connected EBs' thinking with a peer or peers. This act of positioning reinforced EBs' membership in the classroom community; positioned EBs as possessing mathematical ideas worthy of peer consideration; indicated peers should be attending to, listening to, and thinking critically about EBs' mathematical contributions; and aligned EBs' mathematical thinking with peers. In addition, this positioning act fostered the storylines of EBs as: mathematical competent, explainers, contributors, community members, experts and teachers.

Courtney act of being an intermediary between EBs and peers aligns with the perspective of teachers as mediators of classroom interactions (Khisty & Chval, 2002; Vygotsky, 1978). In this way, Courtney upheld the classroom expectation that peers would attend to and think about EBs' mathematical contributions, interactively positioned EBs' mathematical contributions as valuable as advocated by research (e.g., Gorgorió & Planas, 2001; Secada & De La Cruz, 1996), and challenged dominant narratives of who does and can be successful in mathematics (Battey & Leyva, 2016; de Araujo et al., 2016; Nasir, 2016). As a result, the learning environment Courtney advanced through this positioning created opportunities for EBs to be active co-constructors of mathematics.

Findings from this study extend the literature base by proffering specific positioning moves that teachers can employ to call attention to and value EBs' mathematical thinking. For instance, teachers can make direct and explicit connections between EBs' mathematical thinking and their peers, such as asking if peers used a similar strategy as an EB or asking an EB to explain a peer's mathematical thinking in their own words. Alternatively, teachers could hold peers accountable for attending to and explaining EBs' mathematical thinking in their own words.

Valuing EBs' Mathematical Contributions

Research has found that evaluating student responses is a common type of pedagogical discourse, particularly for novice teachers (Cazden, 2001; Kawanaka et al., 1999; McHoul, 1978; Sinclair & Coulthard, 1975). The findings from this study provide further evidence of this, albeit in a different context. That said Courtney's implementation of this positioning act was notable in the ways her interactive positions publicly distinguished EBs from his/her peers, positioned EBs as students who have desirable ways of thinking mathematically, signaled EBs' mathematical ideas or strategies were worthy of public consideration, and indicated EBs were students who could be learned from. Moreover, when used to interactively position EBs as speakers before they presented, this act set the stage for peers' uptake of EBs' mathematical contributions. Lastly, when enacted this positioning acted to counter the deficit-oriented storylines of EBs in mathematics as students who are in need of remediation or are ill-prepared for school mathematics.

Recording EBs' Mathematical Thinking

The last positioning act evidenced in the data was to publicly record EBs' mathematical thinking. This act of positioning often took the form of Courtney recording EBs' mathematical contributions on the board. Less frequently, Courtney would invite EBs to record their mathematical ideas on the board. In either case, this positioning act served to publicly document EBs' mathematical contributions and acted as a visual referent to facilitate future mathematical contributions (e.g., explanations, justifications; Moschkovich, 2002; Raborn, 1995). Consequently, this positioning benefited EBs in multiple ways. First, recording EBs' mathematical contributions served to connect written and oral language with mathematical representations (Chval, Chavez, Pomerenke, & Reams, 2009; Raborn, 1995). Second, the visual referents could be used to facilitate EBs' mathematical explanations through the reinforcement of verbal messages and concepts, emphasis of meaning, and alternative ways to communicate (e.g., non-verbal forms; Alibali, Nathan, & Fujimori, 2011; Chval et al., 2009). Third, EBs were interactively positioned as co-constructors of mathematics, community members, and students who possessed mathematical ideas that deserved to be publicly recorded. Lastly, this practice fostered the storylines of EBs as mathematically competent student, community members, contributors, experts, and teachers. Consequently, this positioning act was critical for EBs as it facilitated the acquisition of mathematical discourse and offered a counter-story to dominant narratives of EBs in mathematics.

Summary

The field of mathematics education has long advocated for the implementation of teaching practices that have been found to increase access to mathematics (National Council of Teachers of Mathematics, 1991, 2000, 2014), but many of these practices have historically failed to account for the dual learning objectives of EBs. To complicate this situation further, teachers have traditionally been unprepared to teach EBs mathematics (Ballantyne et al., 2008). As a result, the findings of this study proffer positioning acts that can be used to facilitate EBs participation in mathematics and the dual learning goals of mathematics and second language acquisition. In this way, the practices extend beyond “just good teaching” since they take into account the dual learning objectives of EBs and attend to the ways other individual attributes (e.g., race, language, culture) can affect classroom interactions. In addition, they demonstrate how teachers can leverage their power in the classroom to shift the storylines of EBs and use multiple positioning acts together to reframe who can be mathematically successful. Although some of the positioning acts have been described in prior research, this study illustrates how these positionings have been used with EBs by a novice teacher and how they can facilitate the participation of EBs and the acquisition of spoken mathematical discourse—a critical component to students’ mathematical learning. Thus, the findings extend the field's understanding of the role of the teacher and positioning to advance EBs' spoken mathematical discourse.

Shifting Rights and Duties

Across the data, Courtney retained many of her rights and duties to mediate interactions between EBs and peers. For instance, Courtney—as the content expert—was found to publicly evaluate EBs' mathematical ideas to highlight their intellect, stating "really smart thinking Bryce" or "I like your strategy a lot [Lea]." Consequently, Courtney's positioning acts challenge recommendations from literature to shift traditional teacher rights and duties to students (Hufferd-Ackles et al., 2004; National Council of Teachers of Mathematics, 2014) and reduce reliance on the teacher as the disseminator of knowledge. Thus, I argue, the field of mathematics education needs a more nuanced view of teacher rights and duties. More specifically, teachers may need to retain their duty to mediate interactions between EBs, and other historically underserved students, to facilitation participation, advance the acquisition of mathematical discourse, and challenge dominant narratives of who can be mathematically successful. I anticipate that if Courtney had shifted a greater amount of her duties onto students it is unlikely similar learning opportunities would have been afforded to EBs. This can be attributed to third-grade students' inability to carefully orchestrate classroom conversations to position peers in productive ways and a lack of knowledge of the complexity of inequities that have historically permeated mathematics education (or mathematics schooling). Consequently, I argue that it is unrealistic to expect elementary students would have the ability and foresight to deftly use acts to productively position and create learning opportunities for their historically underserved peers when they have only been exposed to public education (or formal schooling) for up to four years (i.e., kindergarten to third-grade). Moreover, I argue elementary students may not have the insight and understanding of the implications of positioning on peers' learning and identity development.

Community of Learners

In her classroom, Courtney fostered a community of learners though positioning acts that valued EBs as mathematical contributors and situated them as community members. Consequently, Courtney positioned EBs' diverse backgrounds, experiences, and linguistic resources are valuable competencies for learning that should be drawn on in the community (Moschkovich, 2002). Other teachers can learn from Courtney and implement similar acts to position the classroom as a community of learners. For example, a teacher could refer to the class collectively as "us" or "we" as Courtney did (e.g., "Bryce is telling *us*" or "*we* are all pleased with your work"). In this way, the teacher can reflexively position themselves as a learner and confer membership status on students, such as EBs.

Another way Courtney fostered a community of learners was structure her mathematical lessons around students' thinking as advocated in the literature (Carpenter, Fennema, Franke, Levi, & Empson, 2014; National Council of Teachers of Mathematics, 2014; National Research Council, 2001). In this way, the EBs in Courtney's class were given access to quality mathematics and participated in its co-construction (as opposed to being periphery participants).

Courtney as a Case Study

Courtney—a white, monolingual, elementary teacher—characteristically represents many elementary teachers in the U.S. (Grissom, Kern, & Rodriguez, 2015; Sleeter, 2001). As such, her case is common, yet unique. She not only represents most elementary teachers in the U.S., but her success in teaching mathematics to EBs situates her in the unique position to offer insight into the ways teachers can use their discursive practices to facilitate EBs' acquisition of spoken mathematical discourse. Thus, there is much to learn from Courtney's classroom that other monolingual teachers who teach in similar contexts can integrate into their practice. Most notably, other teachers can use the positioning acts to facilitate EBs' participation, EBs' acquisition of mathematical discourse and English language, foster productive storylines for EBs, and challenge dominant narratives of who is and can be mathematically successful. For teachers who may not yet have EBs in their classroom, the positioning acts are still useful. Given that every classroom inequities exist (e.g., differences in students racial, economic, or cultural backgrounds), the positioning acts can be used to created equitable classroom environments and facilitate students' mathematical learning. In this way, the positioning acts are important for every student who has been positioned inequitably in classrooms and for Latinx and EBs in particular since they have been historically underserved in mathematics classrooms and allowed to sit on the sidelines (Brenner, 1998; Gutiérrez, 2008).

Although an examination of the data revealed Courtney implemented the positioning acts frequently in concert with one another, it may be unrealistic to expect teachers to integrate all the acts at once. As a result, teachers may find it beneficial to employ the acts of positioning one by one as they begin to make changes in their teaching. For instance, a teacher may begin by first connecting an EB and peers' mathematical thinking when acting as an intermediary (i.e., a teacher could ask "who else used [an EB's] this strategy?" and then publicly name the peers). If employed, this act interactively positions EBs as students who possess similar mathematical thinking as their peers and fosters storylines of mathematical competence for EBs. Moreover, such positionings can challenge stereotypes of who is capable of doing mathematics (Battey & Leyva, 2016; de Araujo et al., 2016) and are a way to actively construct counter-stories of who can do mathematics.

Mathematics teacher educators (MTEs) and future teachers can both benefit from the integration of the positioning acts into their pedagogic (i.e., methods) curriculum. For example, MTEs and future teachers can benefit from understanding how their acts can position others in particular ways and specific storylines. Moreover, MTEs and future teachers can begin to recognize how their own and others' positionings affects their opportunities to engage in classroom discourse. That said I anticipate that before MTEs and future teachers can fully understand the power of acts and positions, they must first recognize how these affect their own lived experiences. To do this, teacher education programs can begin by introducing positioning theory to future teachers and then use it as a lens to examine interactions in and out of school settings. Next, future teachers can begin to think critically about ways to leverage their acts to challenge dominant narratives of who can be, who is, and what counts as mathematically successful.

Conclusions

In this study, I focused attention on teacher and student discursive practices. This lens allowed me to identify a collection of positioning acts that were used across two school years to facilitate EBs' participation in whole-class mathematics lessons. Findings from this study contribute to the literature in multiple ways. First, the findings further illustrate the relationship between teachers' positioning and students' mathematical contributions, despite the contextualized nature of the study. Since EBs continue to represent a growing student demographic in U.S. public school it is imperative that teachers know of and employ positioning acts, such as those identified herein, to promote EBs' mathematics participation. To further understand how the positioning acts are employed across contexts, I recommend future research examine: teachers' appropriation of the acts of positioning over time and across contexts; how teachers employ the positioning acts in different contexts and their influence on student participation in those contexts; and the ways teachers begin to implement the positioning acts over time.

Second, findings from this study contribute to the growing body of literature of positioning theory. More specifically, this study contributes to our understanding of "what, why, and how" (Herbel-Eisenmann et al., 2015, p. 201) teachers draw on and from classroom interactions to interactively position and foster storylines for EBs. Additionally, this study further confirms the importance of teacher positioning on students—particularly EBs—mathematical learning. Moreover, this study illustrates how teachers can wield interactive positions in classroom interactions to create opportunities for EBs to learn mathematics (by increasing participation and access to mathematical discourse). Furthermore, the findings identify how teachers' interactive positions can establish and foster storylines that challenge deficit-oriented stereotypes and narratives for EBs in mathematics classroom contexts, thereby offering counter-stories (to historical narratives). Despite this, unanswered questions remain, such as how does knowledge of positioning theory support teachers' understanding and integration of the previously described positioning acts? Future research may wish to answer this question.

Lastly, this study fulfills a call by researchers to provide "more research on effective teaching and learning environments" for EBs and "richer descriptions of those environments" (Gutiérrez, 2008, p. 362) and interactively positions the mathematics education community to think more deeply about the nuances of teacher rights and duties in mathematics classrooms. In this way, this study contributes to the national conversation of teachers' rights and duties in U.S. mathematics classrooms and argues for more research to identify how teachers exercise their rights and duties in settings where EBs are minoritized.

The discourse of mathematics education for EBs has primarily focused on remediation and support (de Araujo et al., 2016). Such approaches to mathematics education reflect a national perspective of EBs as students who are ill-prepared for the mathematics advocated by the field (i.e., NCTM, 2014; Fairclough, Mulderrig, & Wodak, 2011). Although research has proffered instructional practices to facilitate EBs' mathematical and linguistic learning (e.g., Chval & Khisty, 2009; Chval et al., 2014; Khisty & Chval, 2002; Moschkovich, 1999; Pinnow & Chval, 2014), they are absent in the national discourse. Moreover, the integration of these research recommendations into teacher preparation programs and in-service teacher professional development have not kept pace with the historic changes to school demographics (Ballantyne et al., 2008; National Council of Teachers of Mathematics, 2008). Consequently, teachers of EBs continue to lack the skills and resources necessary to effectively teach the dual educational goals of mathematics and language. Despite this, researchers must continue to publish counter-stories and research findings of effective mathematics pedagogy for EBs if progress is to endure (Delgado, 1989; Nasir, 2016). Thus, case studies—such as Courtney—highlight not only how specific teachers have effectively facilitated EBs' mathematics and linguistic learning but offer specific acts of positioning teachers can integrate into existing pedagogy.

REFERENCES

Adler, J. (1997). A participatory-inquiry approach and the mediation of mathematical knowledge in a multilingual classroom. *Educational Studies in Mathematics*, *33*, 235–258. http://doi.org/10.1023/A:1002976114883

Alibali, M. W., Nathan, M. J., & Fujimori, Y. (2011). Gestures in the mathematics classroom: What's the point. In N. L. Stein & S. W. Raudenbush (Eds.), *Developmental cognitive science goes to school* (pp. 219–234). New York, NY: Routledge.

Anderson, K. T. (2009). Applying positioning theory to the analysis of classroom interactions: Mediating micro-identities, macro-kinds, and ideologies of knowing. *Linguistics and Education*, *20*, 291–310. http://doi.org/http://dx.doi.org/10.1016/j.linged.2009.08.001

Baker, C. D. (1992a). Description and analysis in classroom talk and interaction. *The Journal of Classroom Interaction*, *27*(2), 9–14.

Baker, C. D. (1992b). Description and analysis In classroom talk and interaction. *The Journal of Classroom Interaction*, *27*(2), 9–14. http://doi.org/10.2307/23869835

Ballantyne, K. G., Sanderman, A. R., & Levy, J. (2008). *Educating English language learners: Building teacher capacity. National Clearinghouse for English Language Acquisition & Language Instruction Educational Programs*. Washington, D.C.: National Clearinghouse for English Language Acquisition.

Battey, D., & Leyva, L. A. (2016). A framework for understanding whiteness in mathematics education. *Journal of Urban Mathematics Education*, *9*(2), 49–80.

Berman, L. (1999). Positioning in the formation of a "national" identity. In R. Harre & L. van Langenhove (Eds.), *Positioning theory: Moral contexts of intentional action* (pp. 138–159). Malden, MA: Blackwell Publishers Inc.

Brenner, M. E. (1998). Development of mathematical communication in problem solving groups by language minority students. *Bilingual Research Journal*, *22*, 149–174.

Carpenter, T. P., Fennema, E., & Franke, M. L. (1996). Cognitively guided instruction: A knowledge base for reform in primary mathematics instruction. *The Elementary School Journal*, *97*(1), 3–20. Retrieved from http://www.jstor.org/stable/1001789

Carpenter, T. P., Fennema, E., Franke, M. L., Levi, L., & Empson, S. B. (2014). *Children's mathematics: Cognitively guided instruction* (2nd ed.). Postmourth, NH: Heinemann.

Cazden, C. B. (2001). *Classroom discourse: The language of teaching and learning* (2nd ed.). Portsmouth, NH: Heinemann.

Cazden, C. B., & Beck, S. W. (2003). Classroom discourse. In A. C. Graesser, M. A. Gernsbacher, & S. R. Goldman (Eds.), *Handbook of discourse processes* (pp. 165–197). Mahwah, NJ: Lawrence Erlbaum Associates, Inc.

Celedón-Pattichis, S., & Turner, E. E. (2012). "Explícame tu respuesta": Supporting the development of mathematical discourse in emergent bilingual kindergarten students. *Bilingual Research Journal*, *35*(2), 197–216. http://doi.org/10.1080/15235882.2012.703635

Chval, K. B., Chavez, O., Pomerenke, S., & Reams, K. (2009). Enhancing mathematics lessons to support all students. In D. Y. White & J. S. Silva (Eds.), *Mathematics for every student: Responding to diversity PK-5* (pp. 43–52). Reston, VA: National Council of Teachers of Mathematics.

Chval, K. B., & Khisty, L. L. (2009). Latino students, writing, and mathematics: A case study of successful teaching and learning. In R. Barwell (Ed.), *Multilingualism in Mathematics Classrooms: Global Perspectives* (pp. 128–144). Clevedon, UK: Multilingual Matters.

Chval, K. B., Pinnow, R. J., & Thomas, A. (2014). Learning how to focus on language while teaching mathematics to English language learners: A case study of Courtney. *Mathematics Education Research Journal*, *27*(1), 103–127.

de Araujo, Z., Smith, E., & Sakow, M. (2016). Reflecting on the dialogue regarding the mathematics education of English learners. *Journal of Urban Mathematics Education*, *9*(2), 33–48.

Delgado, R. (1989). Storytelling for oppositionists and others: A plea for narrative. *Michigan Law Review*, *87*, 2411–2441.

Engle, R. A., & Conant, F. R. (2002). Guiding principles for fostering productive disciplinary engagement: Explaining an emergent argument in a community of learners classroom. *Cognition and Instruction*, *20*, 399–483. Retrieved from http://www.jstor.org.proxy.mul.missouri.edu/stable/3233901

Enyedy, N., Rubel, L., Castellón, V., Mukhopadhyay, S., Esmonde, I., & Secada, W. (2008). Revoicing in a multilingual classroom. *Mathematical Thinking and Learning*, *10*, 134–162. http://doi.org/10.1080/10986060701854458

Esmonde, I. (2009). Ideas and identities: Supporting equity in cooperative mathematics learning. *Review of Educational Research*, *79*, 1008–1043. http://doi.org/10.3102/0034654309332562

Esmonde, I., & Langer-Osuna, J. M. (2013). Power in numbers: Student participation in mathematical discussions in heterogeneous spaces. *Journal for Research in*

Mathematics Education, *44*, 288–315.

Estapa, A., Pinnow, R. J., & Chval, K. B. (2016). Video as a professional development tool to support novice teachers as they learn to teach English language learners. *The New Educator*, *12*(1), 85–104.

Fairclough, N. (2010). *Critical discourse analysis: The critical study of language* (2nd ed.). Harlow, UK: Pearson Education.

Fairclough, N., Mulderrig, J., & Wodak, R. (2011). Critical discourse analysis. In T. A. van Dijk (Ed.), *Discourse studies: A multidisciplinary introduction* (pp. 357–378). Thousand Oaks, CA: Sage.

Forman, E. A., Larreamendy-Joerns, J., Stein, M. K., & Brown, C. A. (1998). "You're going to want to find out which and prove it": Collective argumentation in a mathematics classroom. *Learning and Instruction*, *8*, 527–548. http://doi.org/http://dx.doi.org/10.1016/S0959-4752(98)00033-4

Fosnot, C. T. (2007). *The t-shirt factory: Place value, addition, and subtraction*. Portsmouth, NH: Firsthand Heinemann.

Gandara, P., Maxwell-Jolly, J., & Driscoll, A. (2005). *Listening to teachers of English language learners: A survey of California teachers' challenges, experiences, and professional development needs*. *Policy Analysis for California Education, PACE (NJ1)*. Santa Cruz, CA: The Center for the Future of Teaching and Learning.

Gee, J. P. (2004). Language in the science classroom: Academic social languages as the heart of school-based literacy. In E. W. Saul (Ed.), *Crossing borders in literacy and science instruction: Perspectives on theory and practice* (pp. 13–32). Newark, DE: International Reading Association.

Gee, J. P. (2008). *Social linguistics and literacies: Idealogy in discourses* (3rd ed.). London, UK: Routledge.

Gee, J. P. (2011). Discourse analysis: What makes it critical? In R. Rogers (Ed.), *An introduction to critical discourse analysis in education* (2nd ed., pp. 23–45). New York, NY: Routledge.

Gee, J. P. (2014). *An introduction to discourse analysis: Theory and method* (4th ed.). New York, NY: Routledge.

Gibbons, P. (1992). Supporting bilingual students for success. *Australian Journal of Language and Literacy*, *15*(3), 225–236.

Gibbons, P. (2003). Mediating language learning: Teacher interactions with ESL students in a content-based classroom. *TESOL Quarterly*, *37*, 247–273. http://doi.org/10.2307/3588504

Gibbons, P. (2008). "It was taught good and I learned a lot": Intellectual practices and ESL learners in the middle years. *Australian Journal of Language & Literacy*, *31*(2), 155–173.

Gibbons, P. (2015). Scaffolding language and learning. In *Scaffolding language, scaffolding learning: Teaching English language learners in the mainstream classroom* (2nd ed., pp. 1–22). Portsmouth, NH: Heinemann.

Goffman, E. (1981). *Forms of talk*. Philadelphia, PA: University of Pennsylvania Press.

Gorgorió, N., & Planas, N. (2001). Teaching mathematics in multilingual classrooms. *Educational Studies in Mathematics*, *47*, 7–33.

Gresalfi, M., Martin, T., Hand, V., & Greeno, J. (2009). Constructing competence: an analysis of student participation in the activity systems of mathematics classrooms.

Educational Studies in Mathematics, *70*, 49–70. http://doi.org/10.1007/s10649-008-9141-5

Grissom, J. A., Kern, E. C., & Rodriguez, L. A. (2015). The "representative bureaucracy" in education. *Educational Researcher*, *44*, 185–192.

Gutiérrez, R. (2002a). Beyond essentialism: The complexity of language in teaching mathematics to Latina/o students. *American Educational Research Journal*, *39*(4), 1047–1088. http://doi.org/10.3102/000283120390041047

Gutiérrez, R. (2002b). Enabling the practice of mathematics teachers in context: Toward a new equity research agenda. *Mathematical Thinking and Learning*, *4*, 145–187. http://doi.org/10.1207/S15327833MTL04023_4

Gutiérrez, R. (2008). A "gap-gazing" fetish in mathematics education? Problematizing research on the achievement gap. *Journal for Research in Mathematics Education*, *39*, 357–364.

Gutiérrez, R. (2013). The sociopolitical turn in mathematics education. *Journal for Research in Mathematics Education*, *44*(1), 37–68. http://doi.org/10.5951/jresematheduc.44.1.0037

Halliday, M. A. K. (1978). *Language as social semiotic: The social Iinterpretation of language and meaning*. London, UK: Edward Arnold.

Harper, C., & De Jong, E. (2004). Misconceptions about teaching English-language learners. *Journal of Adolescent & Adult Literacy*, *48*, 152–162.

Harré, R. (2012). Positioning theory: Moral dimensions of socio-cultural psychology. In J. Valsiner (Ed.), *The Oxford Handbook of Culture and Psychology* (pp. 191–206). New York, NY: Oxford University Press.

Harré, R., Moghaddam, F. M., Cairnie, T. P., Rothbart, D., & Sabat, S. R. (2009). Recent advances in positioning theory. *Theory & Psychology*, *19*(1), 5–31. http://doi.org/10.1177/0959354308101417

Harré, R., & van Langenhove, L. (1991). Varieties of positioning. *Journal for the Theory of Social Behaviour*, *21*, 393–407.

Harré, R., & van Langenhove, L. (Eds.). (1999a). *Positioning Theory*. Malden, MA: Blackwell Publishers Inc.

Harré, R., & van Langenhove, L. (1999b). The dynamics of social episodes. In R. Harré & L. van Langenhove (Eds.), *Positioning theory: Moral contexts of intentional action* (pp. 1–13). Malden, MA: Blackwell Publishers Inc.

Hawkins, M. R. (2005). Becoming a student: Identity work and academic literacies in early schooling. *TESOL Quarterly*, *39*(1), 59–82. http://doi.org/10.2307/3588452

Heap, J. L. (1992). Seeing snubs: An introduction to sequential analysis of classroom interaction. *The Journal of Classroom Interaction*, *27*(2), 23–28.

Herbel-Eisenmann, B., Wagner, D., Johnson, K., Suh, H., & Figueras, H. (2015). Positioning in mathematics education: Revelations on an imported theory. *Educational Studies in Mathematics*, *89*, 185–204.

Howie, D. (1999). Preparing for positive positioning. In R. Harré & L. van Langenhove (Eds.), *Positioning theory: Moral contexts of intentional action* (pp. 53–59). Malden, MA: Blackwell Publishers Inc.

Hufferd-Ackles, K., Fuson, K. C., & Sherin, M. G. (2004). Describing levels and components of a math-talk learning community. *Journal for Research in Mathematics Education*, *35*, 81–116. http://doi.org/10.2307/30034933

Iddings, A. C. D. (2005). Linguistic access and participation: English Language Learners in an English-dominant community of practice. *Bilingual Research Journal*, *29*(1), 165–183. http://doi.org/10.1080/15235882.2005.10162829

Inagaki, K., Hatano, G., & Morita, E. (1998). Construction of mathematical knowledge through whole-class discussion. *Learning and Instruction*, *8*, 503–526.

Jager, S., & Maier, F. (2009). Theoretical and methodological aspects of Foucauldian critical discourse analysis and dispositive analysis. In R. Wodak & M. Meyer (Eds.), *Methods of critical discourse analysis* (2nd ed., pp. 34–61). Thousand Oaks, CA: SAGE Publications.

Ju, M.-K., & Kwon, O. N. (2007). Ways of talking and ways of positioning: Students' beliefs in an inquiry-oriented differential equations class. *The Journal of Mathematical Behavior*, *26*, 267–280. http://doi.org/http://dx.doi.org/10.1016/j.jmathb.2007.10.002

Kawanaka, T., Stigler, J. W., & Hiebert, J. (1999). Studying mathematics classrooms in Germany, Japan and the United States: Lessons from the TIMSS videotape study. *International Comparisons in Mathematics Education*, *11*, 86.

Kayi-Aydar, H. (2014). Social positioning, participation, and second language learning: Talkative students in an academic ESL classroom. *TESOL Quarterly*, *48*(4), 686–714. http://doi.org/10.1002/tesq.139

Khisty, L. L. (1995). Making inequality: Issues of language and meanings in mathematics teaching with Hispanic students. In W. G. Secada, E. Fennema, & L. B. Adajian (Eds.), *New directions for equity in mathematics education* (pp. 279–297). New York, NY: Cambridge University Press.

Khisty, L. L., & Chval, K. B. (2002). Pedagogic discourse and equity in mathematics: When teachers' talk matters. *Mathematics Education Research Journal*, *14*, 154–168.

Lappan, G. (1997). The challenges of implementation: Supporting teachers. *American Journal of Education*, *106*, 207–239. http://doi.org/10.2307/1085679

Lave, J., & Wenger, E. (1991). *Situated learning: Legitimate peripheral participation*. New York, NY: Cambridge University Press.

Lemke, J. L. (1990). *Talking science: Language, learning, and values.* Norwood, NJ: Ablex Publishing Corp.

Lerman, S. (2001). Cultural, Discursive Psychology: A Sociocultural Approach to Studying the Teaching and Learning of Mathematics. *Educational Studies in Mathematics*, *46*(1), 87–113. http://doi.org/10.1023/A:1014031004832

Lightbrown, P. M., & Spada, N. (2013). *How languages are learned* (4th ed.). Oxford, U.K.: Oxford University Press.

Lincoln, Y. S., & Guba, E. G. (1985). Establishing trustworthiness. In *Naturalistic Inquiry* (p. 416). London: SAGE Publications.

Lubienski, S. T. (2002). Research, reform, and equity in U.S. mathematics education. *Mathematical Thinking and Learning*, *4*(2–3), 103–125. http://doi.org/10.1207/S15327833MTL04023_2

Lucas, T., Villegas, A. M., & Freedson-Gonzalez, M. (2008). Linguistically responsive teacher education: Preparing classroom teachers to teach English language learners. *Journal of Teacher Education*, *59*, 361–373. http://doi.org/10.1177/0022487108322110

Markee, N. (2005). Conversation analysis: Second language acquisition research. In E. Hinkel (Ed.), *Handbook of research in second language teaching and learning* (pp. 355–374). Mahwah, NJ: Lawrence Erlbaum Associates, Inc.

Martin-Beltrán, M. (2010). Positioning proficiency: How students and teachers (de) construct language proficiency at school. *Linguistics and Education*, *21*, 257–281.

Martin, D. B., Gholson, M. L., & Leonard, J. (2010). Mathematics as gatekeeper: Power and privilege in the production of knowledge. *Journal of Urban Mathematics Education*, *3*(2), 12–24.

McHoul, A. (1978). The organization of turns at formal talk in the classroom. *Language in Society*, *7*, 183–213.

Mehan, H. (1979). *Learning lessons: Social organization in the classroom*. Cambridge, MA: Harvard University Press.

Mehan, H. (2000). Beneath the skin and between the ears: A case study in the politics of representation. In B. A. Levinson, K. A. Borman, M. Eisenhart, M. Foster, A. Fox, & M. Sutton (Eds.), *Schooling the symbolic animal: Social and cultural dimensions of education* (pp. 259–279). Plymouth, UK: Rowman and Littlefield England.

Merriam, S. B. (2009). *Qualitative research: A guide to design and interpretation*. San Francsico, CA: Jossey-Bass.

Mesa, V., & Chang, P. (2010). The language of engagement in two highly interactive undergraduate mathematics classrooms. *Linguistics and Education*, *21*(2), 83–100. http://doi.org/http://dx.doi.org/10.1016/j.linged.2010.01.002

Moghaddam, F. M., & Harré, R. (2010). Words of conflict, words of war: How the language we use in political processes sparks fighting. In F. M. Moghaddam & R.

Harré (Eds.), . Santa Barbara, CA: Praeger.

Moghaddam, F. M., Harré, R., & Lee, N. (Eds.). (2007). *Global conflict resolution through positioning analysis*. New York, NY: Springer.

Moschkovich, J. (1999). Supporting the participation of English Language learners in mathematical discussions. *For the Learning of Mathematics*, *19*(1), 11–19.

Moschkovich, J. (2002). A situated and sociocultural perspective on bilingual mathematics learners. *Mathematical Thinking and Learning*, *4*, 189–212.

Moschkovich, J. (2003). What counts as mathematical discourse? In *International Group for the Psychology of Mathematics Education* (Vol. 3, pp. 325–332). ERIC.

Moschkovich, J. (2007). Examining mathematical discourse practices. *For the Learning of Mathematics*, *27*(1), 24–30. Retrieved from http://www.jstor.org/stable/40248556

Nasir, N. S. (2016). Why should mathematics educators care about race and culture. *Journal of Urban Mathematics Education*, *9*(1), 7–18.

Nasir, N. S., Rosebery, A. S., Warren, B., & Lee, C. D. (2006). Learning as a cultural process: Achieving equity through diversity. In R. K. Sawyer (Ed.), *The Cambridge handbook of: The learning sciences* (pp. 489–504). New York, NY: Cambridge University Press.

National Center for Educational Statistics. (2016). *English language learners in public schools*. Washington, DC: Author.

National Council of Teachers of Mathematics. (1991). *Professional standards for teaching mathematics*. Reston, VA: Author.

National Council of Teachers of Mathematics. (2000). *Principles and standards for school mathematics* (Vol. 1). Reston, VA: Author.

National Council of Teachers of Mathematics. (2008). Teaching mathematics to English language learners: A position of the National Council of Teachers of Mathematics. Reston, VA: Author.

National Council of Teachers of Mathematics. (2014). *Principles to Action*. Reston, VA: Author.

National Research Council. (2001). *Adding it up: Helping children learn mathematics*. (J. Kilpatrick, J. Swafford, & B. Findell, Eds.). Washington, D.C.: National Academies Press.

O'Connor, M. C., & Michaels, S. (1996). Shifting participant frameworks: Orchestrating thinking practices in group discussion. In D. Hicks (Ed.), *Discourse, learning and schooling* (pp. 63–103). New York, NY: Cambridge University Press.

Pappamihiel, N. E. (2002). English as a second language students and English language anxiety: Issues in the mainstream classroom. *Research in the Teaching of English*, *36*(3), 327–355. http://doi.org/10.2307/40171530

Patton, M. Q. (2015). *Qualitative research & evaluation methods: Integrating theory and practice* (4th ed.). Thousand Oaks, CA: SAGE Publications.

Pettit, S. K. (2011). Teachers' Beliefs About English Language Learners in the Mainstream Classroom: A Review of the Literature. *International Multilingual Research Journal*, *5*(2), 123–147. http://doi.org/10.1080/19313152.2011.594357

Pinnow, R. J., & Chval, K. B. (2014). Positioning ELLs to develop academic, communicative, and social competencies in mathematics. In M. Civil & E. Turner (Eds.), *Common core state standards in mathematics for English language learners: Grades K-8* (pp. 21–34). Alexandria, VA: TESOL International Association.

Pinnow, R. J., & Chval, K. B. (2015). “How much you wanna bet?”: Examining the role of positioning in the development of L2 learner interactional competencies in the content classroom. *Linguistics and Education*, *30*, 1–11.

Planas, N., & Gorgorió, N. (2004). Are different students expected to learn norms differently in the mathematics classroom? *Mathematics Education Research Journal*, *16*(1), 19–40. http://doi.org/10.1007/BF03217389

Raborn, D. T. (1995). Mathematics for students with learning disabilities from language-minority backgrounds: Recommendations for teaching. *New York State Association for Bilingual Education Journal*, *10*, 25–33.

Reeves, J. (2009). Teacher investment in learner identity. *Teaching and Teacher Education*, *25*, 34–41. http://doi.org/http://dx.doi.org/10.1016/j.tate.2008.06.003

Schleppegrell, M. J. (2007). The linguistic challenges of mathematics teaching and learning: A research review. *Reading & Writing Quarterly*, *23*(2), 139–159. http://doi.org/10.1080/10573560601158461

Secada, W. G., & De La Cruz, Y. (1996). Teaching mathematics for understanding to bilingual students. In J. LeBlanc Flores (Ed.), *Children of la frontera: Binational efforts to serve Mexican migrant and immigrant children* (pp. 285–308). Charleston, WV: ERIC Clearinghouse on Rural Education & Small Schools.

Seedhouse, P. (2004). Conversation analysis methodology. In *Language Learning* (Vol. 54, pp. 1–54). Blackwell Publishing Inc. http://doi.org/10.1111/j.1467-9922.2004.00268.x

Setati, M. (2005). Teaching mathematics in a primary multilingual classroom. *Journal for Research in Mathematics Education*, *36*, 447–466. http://doi.org/10.2307/30034945

Sfard, A. (2002). There is more to discourse than meets the ears: Looking at thinking as communicating to learn more about mathematical learning. *Educational Studies in Mathematics*, *46*, 13–57. http://doi.org/10.1007/0-306-48085-9_1

Sfard, A. (2008). *Thinking as communicating: Human development, the growth of discourses, and mathematizing*. Cambridge, MA: Cambridge University Press.

Shein, P. P. (2012). Seeing with two eyes: A teacher's use of gestures in questioning and revoicing to engage English language learners in the repair of mathematical errors. *Journal for Research in Mathematics Education*, *43*, 182–222. http://doi.org/10.5951/jresematheduc.43.2.0182

Sinclair, J., & Coulthard, M. (1975). *Towards an analysis of discourse: The language of teachers and pupils*. London, UK: Oxford University Press.

Sleeter, C. E. (2001). Preparing teachers for culturally diverse schools. *Journal of Teacher Education*, *52*, 94–106.

Søreide, G. E. (2006). Narrative construction of teacher identity: Positionig and negotiation. *Teachers and Teaching*, *12*, 527–547. http://doi.org/10.1080/13540600600832247

Stake, R. E. (1995). *The art of case study research*. Thousand Oaks, CA: Sage.

Tait-McCutcheon, S. L., & Loveridge, J. (2016). Examining equity of opportunities for learning mathematics through positioning theory. *Mathematics Education Research Journal*, *28*(2), 1–22. http://doi.org/10.1007/s13394-016-0169-z

Tan, S., & Moghaddam, F. M. (1995). Reflexive positioning and culture. *Journal for the Theory of Social Behaviour*, *25*, 387–400.

Turner, E., Dominguez, H., Maldonado, L., & Empson, S. (2013). English learners' participation in mathematical discussion: Shifting positionings and dynamic identities. *Journal for Research in Mathematics Education*, *44*, 199–234.

Valdes, G., Bunch, G., Snow, C., & Lee, C. (2007). Enhancing the development of students' language(s). In L. Darling-Hammond & J. Bransford (Eds.), *Preparing teachers for a changing world: What teachers should learn and be able to do* (pp. 126–168). San Francsico, CA: Jossey-Bass.

Valero, P. (2004). Postmodernism as an attitude of critique to dominant mathematics education research. In M. Walshaw (Ed.), *Mathematics education within the postmodern* (pp. 35–54). Greenwich, CT: Information Age Publishing.

van Langenhove, L. (2011). Conversation as the primary social reality. In L. van Langenhove (Ed.), *People and Societies: Rom Harré and Designing the Social Sciences* (pp. 65–68). New York, NY: Routledge.

van Langenhove, L., & Harré, R. (1999). Introducing positioning theory. In R. Harre & L. van Langenhove (Eds.), *Positioning theory: Moral contexts of intentional action* (pp. 14–31). Malden, MA: Blackwell Publishers Inc.

Vygotsky, L. S. (1978). *Mind in society: The development of higher psychological processes*. Cambridge, MA: Cambridge University Press. http://doi.org/10.1007/978-3-540-92784-6

Wager, A. A. (2014). Noticing children's participation: Insights Into teacher positionality toward equitable mathematics pedagogy. *Journal for Research in Mathematics Education*, *45*, 312–350. http://doi.org/10.5951/jresematheduc.45.3.0312

Weiss, I. R., Pasley, J. D., Smith, P. S., Banilower, E. R., & Heck, D. J. (2003). *Looking inside the classroom: A study of K-12 mathematics and science education in the*

United States. Chapel Hill, NC.

Wenger, E. (1999). *Communities of practice: Learning, meaning, and identity*. Cambridge, UK: Cambridge University Press.

Wodak, R., & Meyer, M. (2009). Critical discourse analysis: History, agenda, theory, and methodology. In R. Wodak & M. Meyer (Eds.), *Methods of critical discourse analysis* (2nd ed., pp. 1–33). Thousand Oaks, CA: SAGE Publications, Inc.

Wood, L. A., & Kroger, R. O. (2000). *Doing discourse analysis: Methods for studying action in talk and text*. Thousand Oaks, CA: Sage Publications.

Wood, M. B. (2013). Mathematical micro-identities: Moment-to-moment positioning and learning in a fourth-grade classroom. *Journal for Research in Mathematics Education*, *44*, 775–808.

Wood, T. (1998). Alternative patterns of communication in mathematics classes: Funneling or focusing. In H. Steinbring, M. G. Bartolini Bussi, & A. Sierpinska (Eds.), *Language and communication in the mathematics classroom* (pp. 167–178). Reston, VA: National Council of Teachers of Mathematics.

Yackel, E., & Cobb, P. (1996). Sociomathematical norms, argumentation, and autonomy in mathematics. *Journal for Research in Mathematics Education*, *27*, 458–477.

Yamakawa, Y., Forman, E., & Ansell, E. (2009). Role of positioning: The role of positioning in constructing an identity in a third grade mathematics classroom. In *Investigating Classroom Interaction: Methodologies in Action.* (pp. 179–201). Rotterdam, Netherlands: Sense Publishers.

Yoon, B. (2007). Offering or limiting opportunities: Teachers' roles and approaches to English-language learners' participation in literacy activities. *The Reading Teacher*, *61*(3), 216–225. http://doi.org/10.1598/RT.61.3.2

Yoon, B. (2008). Uninvited guests: The influence of teachers' roles and pedagogies on the positioning of English language learners in the regular classroom. *American Educational Research Journal*, *45*, 495–522.

Young, R. F., & Miller, E. R. (2004). Learning as changing participation: Discourse roles in ESL writing conferences. *The Modern Language Journal*, *88*, 519–535.

APPENDIX

Transcription key

Symbol	Key
=	Adjacent speech
?	Rising intonation as with a question
,	Natural break/pause in speech
—	Abrupt change in speech
…	Longer pause in speech (~2 natural pauses)
:	Elongated sound
(#)	Pause length in seconds
TWO	Louder speech
// //	Overlapping speech
!	Said with excitement

Initial Coding Scheme

What	Content	Category	Code Brief	Description	Elaboration or exar
Math discourse - Agentive			CLM	EB makes a math claim	
Math discourse - Agentive			JUS	EB justifies a mathematical claim or explains a solution strategy	
Math discourse - Agentive			CON	EB makes a math connection	
Math discourse - Agentive			EVAL	EB evaluates math idea of a peer	
Math discourse - Non-agentive			AG/DISAG	EB provides one word agreement/disagreement	
Positioning	Mathematical	Invitations	TSHARE	Teacher solicits EB's math thinking, noticing, or observation	Teacher calls on EB to re prompt (e.g., What did yo notice? Why is that?) Teacher could also state E name to indicate the invit respond to a previously a: question (to the class).
Positioning	Mathematical		TJUS	Teacher asks EB to clarify, justify, or explain math claim or solution	Teacher asks EB to clarif justify thinking related to math claim or solution (e. did you figure that out? V you think …? How do yo know?). AKA, follow-up question.
Positioning	Mathematical		TCLAR	Teacher invites EB to clarify idea or claim	
Positioning	Mathematical		TDEMO	Teacher invites EB to demonstrate strategy	
Positioning	Mathematical		TSTRGY	Teacher invites EB to provide sol strategy	
Positioning	Mathematical	Interactions with Peers	TDIRCLM	Teacher directs peers to consider EL's math claim	
Positioning	Mathematical		TDIRJUS	Teacher directs peers to consider justification for EB claim	
Positioning	Mathematical		TRESP	Teacher invites EB to respond to peer math claim, strategy, or solution	
Positioning	Mathematical		TCONTR	Teacher contrasts EB idea with a peer's	

Positioning	Mathematical		TDOCPR	Teacher invites peers to document EB strategy	
Positioning	Mathematical		TSTRAT	Teacher directs peers to consider EB strategy	This could be a question o statement. It may also occur alongsid alignment (e.g., did anyon strategy like X?).
Positioning	Mathematical		TPAT	Teacher instructs peers to be patient with EB	May be a directive to put down or to wait when EB floor.
Positioning	Mathematical		TPRSTGY	Teacher invites EB to comment on peer's strategy	
Positioning	Mathematical		TRESPPR	Teacher directs peers to respond to EB comment on strategy	This may occur after TPR
Positioning	Mathematical	Ownership	TOWN	Teacher assigns ownership of strategy or idea to EB	
Positioning	Mathematical		TOWN2	Teacher restates assigned ownership of EB strategy or idea	This would occur *after* th or a peer initially assigne ownership of a strategy o
Positioning	Mathematical	Revoicing	TREVCLM	Teacher revoices EB math claim or solution	
Positioning	Mathematical		TREVJUS	Teacher revoices EB justification, explanation, or solution strategy	
Positioning	Mathematical		TREVNOT	Teacher revoices EB noticing	
Positioning	Mathematical		TREVACT	Teacher revoices EB math actions	
Positioning	Mathematical		TREVCON	Teacher revoices EB math connection	
Positioning	Mathematical		TREVEVAL	Teacher revoices EB evaluation of peer's idea	
Positioning	Mathematical		TREVEBJUDG	Teacher revoices EB judgment of peer strategy	

Positioning	Mathematical	Building	TBLDCLM	Teacher builds on EB claim	This would occur after th made a math claim. This may not be in alignment w what the EB initially said The teacher's statement sh extend or build on the stu idea.
Positioning	Mathematical		TBLDJUS	Teacher builds on EB justification or explanation	This would occur after th made a justification or explanation. This may or be in alignment with wha initially said. The teacher's statement sh extend or build on the stu idea.
Positioning	Mathematical		TBLDCOM	Teacher builds on EB comment of peer strategy	This would occur after th made a comment of a pee strategy. This may or may in alignment with what th initially said. The teacher's statement sh extend or build on the stu idea.
Positioning	Mathematical	Aligning	TALGN	Teacher aligns EB math claim or strategy with a peer	Teacher could either align EB's claim or strategy wi or a peer's claim or strateg the EB. This could be a q to the class soliciting han who used a similar strateg teacher could say the stra similar to X's.
Positioning	Mathematical	Offering	TOFFJUS	Teacher justifies or offers explanation for EB math claim	The critical piece is the te offers a justification or explanation, as opposed t building on student's thin
Positioning	Mathematical		TOFFSTRG	Teacher offers explanation of EB strategy	
Positioning	Mathematical	Value Judgments	TVALCLM	Teacher makes value judgment on EB math claim	
Positioning	Mathematical		TVALJUS	Teacher makes value judgment on EB justification or explanation	
Positioning	Mathematical		TVALNOT	Teacher makes value judgment on EB math thinking, noticing, or observation	
Positioning	Mathematical		THEDG	Teacher hedges	
Positioning	Mathematical		TCOR	Teacher states EB is correct	
Positioning	Mathematical		TVALSTR	Teacher makes value judgment of EB strategy	
Positioning	Mathematical	Knowledge	TKNOWCN	Teacher confirms EB knowledge	

Positioning	Mathematical		TKNOW	Teacher states EB has math knowledge or ideas	
Positioning	Mathematical	Representative	TREP	Teacher positions EB as representation of a group	EB could be representatio group of peers or a peers thought in a similar way (shared strategy).
Positioning	Mathematical	Communication	TMMCOM	Teacher encourages or allows multiple modes of communication	
Positioning	Mathematical		TSPKS	Teacher speaks for EB (conduit for ideas)	
Positioning	Mathematical	Documenting	TSCAN	Teacher scanned EB work	
Positioning	Mathematical		TDOC	Teacher publicly documents EB math idea or claim	
Positioning	Mathematical	Correction	TCORR	Teacher corrects EB in response to math claim	
Positioning	Mathematical	Acknowledgement	TFAIL	Teacher fails to acknowledge EB claim	This could be a result of s out of turn or violating th classroom norms of speak
Positioning	Linguistic	Aligning	TALGNDEF	Teacher aligns EB linguistic definition with a peer's	
Positioning	Linguistic		TBLDDEF	Teacher builds on EB linguistic definition	
Positioning	Linguistic	Communication	TCOM	Teacher acknowledges EB ability to communicate	
Positioning	Linguistic	Invitations	TLINGDEF	Teacher invites EB to provide linguistic definition	
Positioning	Linguistic		TREAD	Teacher invites EB to read aloud	
Positioning	Linguistic	Knowledge	TLINGKNOW	Teacher solicits EB linguistic knowledge	
Positioning	Linguistic		TVALKNOW	Teacher makes value judgment on EB linguistic knowledge	
Positioning	Linguistic	Revoicing	TREVDEF	Teacher revoices EB linguistic definition	
Positioning	Linguistic		TREVEXP	Teacher revoices EB linguistic example	
Positioning	Linguistic	Value Judgments	TVALDEF	Teacher makes value judgment of EB linguistic definition	
Positioning	Linguistic		TVALEXP	Teacher makes value judgment of EB linguistic example	

VITA

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