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Mixing Time in a Bilingual Program: When Science Time is English Time

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Abstract

The setting of this study reflects a common approach for teaching science to K-5 bilingual/ multilingual learners combining science time with English-only language instruction. While programs that use both languages to teach bilingual students are more effective in preparing K-5 Latin@ students in science, instruction in science in K-5 classrooms remains largely taught in English. The **author** examines how a recurring classroom routine, *Community Circle* time, exposes the academic and behavioral expectations of a 3rd **grade** classroom composed of bilingual/multilingual students learning science. The **article** presents analysis of classroom interactions and teacher interviews connected to "science time" which is also English-only time in this school. Several types of activities and participation structures emerge from observations of Community Circle time. During this time, students talk about sharing, planning, and doing activities related to science. This study finds that, while there are productive opportunities for all students to learn a range of academic language and content knowledge during science time, a more expansive approach to language and literacy is needed for teaching and learning science.

*Keywords***:** language of science, sharing time, bilingual science, Latin@ students, language policy

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Introduction

This study has implications for teachers, administrators, and researchers interested in improving the science teaching contexts of bilingual/multilingual students. In this **article**, I draw from collaborative research activities focused on science literacy development in diverse elementary school classrooms to examine how a recurring classroom routine, *Community Circle* time, shapes the learning context for bilingual/multilingual students learning science. Classroom routines are ever-present in the classroom and are a means for orienting students to focal pedagogical language goals and socializing cultural knowledge. In a previous study, I collaborated with a team of researchers that implemented an intervention study examining the ways that teachers integrated language and science content in linguistically diverse elementary classroom settings including Latin@, African-American, and Chinese-American students (Solis, Kattan, & Baquedano-López, 2009).

This study finds that, while there are productive opportunities for all students to learn a range of academic language and content knowledge during science time, a more expansive and dynamic approach to language and literacy development is needed in teaching science beyond dichotomous "English only" or "BICS/CALP" approaches (Bunch, 2014; Canagarajah, 2013; García & Wei, 2014). The setting of this study reflects a common approach for teaching science to K-5 bilingual/multilingual learners combining science time with English-only language instruction. However, a more dynamic use of language and literacy in science teaching would not only enhance the use of students' literacy repertoires but also significantly transform how language and literacy repertoires are used to perform authentic scientific practices (Gutiérrez & Rogoff, 2003; Lee, Quinn, & Valdés, 2013). Regrettably, science is a subject frequently deprioritized in K-5 grade levels when it's not part of accountability measures and when taught, science is often treated a language-free subject or at least an "English-only" subject; this last perspective both minimizes the role of language in science and dismisses the potential bilingual/multilingual synergies with learning science.

Science learning contexts are rich sociocultural contexts for developing biliteracy/multiliteracies and scientific practices when students' full cultural and linguistic repertoires are activated and leveraged (Bruna & Gomez, 2009; Civil, 2016; Lee et al., 2013; Martínez-Álvarez, Cuevas, & Torres-Guzmán, 2017; Reyes, 2009; Solis, 2017; Varelas, Pappas, & Rife, 2006; Warren, Ballenger, Ogonowski, Rosebery, & Hudicourt-Barnes, 2001). Moreover, a

recent analysis of statewide bilingual programs with the most number of 4th grade Hispanic English learners in the United States (i.e., Texas, California, Arizona, New Mexico, and Colorado) indicates that 4th grade Hispanic English learners fare better in science achievement tests if part of strong bilingual programs (one-way and two-way dual language programs) compared to students only exposed to weaker bilingual programs (transitional bilingual programs) or English immersion programs (McEneaney, López, & Nieswandt, 2014). Yet, research and pedagogical attention to science instruction in K-5 classrooms remains largely focused on science instruction in English even in additive bilingual programs including dual language programs. The major theme explored in this paper revolves around understanding and drawing out classroom routines and interactions at La Paz Elementary School during classroom routines when science is taught. La Paz Elementary School had an established bilingual education program that endured a decade after the passage of Proposition 227 when this study took place.

Theoretical Framework: Mediating Science Time through Classroom Routines

This study uses a sociocultural theoretical framework to examine the mediating role of language in the organization of learning contexts, cultural practices, and social interaction (Baquedano-López, Mangual Figueroa, & Hernández, 2011; Donato, 2004; Gutiérrez & Rogoff, 2003; Mehan, 1998; Vygotsky, 1962; Wertsch, 1991). To understand how science-related activities are cast in classrooms with emergent bilinguals, it is important to note that classroom interaction often involves collaborative engagement related to language development, social identity, and building community (Donato, 2004). Within the context of learning science, science-learning expectations also intersect with the socialization of classroom rules and cultural knowledge that are used to express and structure classroom routines. Everyday classroom interactions are opportunities for engaging in collaborative activities, lesson transitions, and peer mediated interactions (Baquedano-López et al., 2011). That is, classroom routines are productive sites of learning activity and are part of the context of learning sociocultural knowledge and developing and using academic language. Gutiérrez (2002) succinctly presents the study of *classroom practices* as the endeavor of "developing a language to describe what happens in learning environments" (p. 314). The use of classroom rules or "regulative discourses" by teachers as classroom practices is a specific way to describe how

student competence of classroom routines and activity structures are negotiated and assessed. Moreover, it is through regulative teacher discourses that we come to understand academic, social, and cognitive expectations for students that mark academic routines in the classroom.

Rules in Community Circle time activities function in two distinct and important ways. First, rules primarily mediate student participation and their use of various tools and resources like space, language and the body. Rules for participation are necessarily part of every activity system working in conjunction with other mediating tools and processes. Secondly, classroom rules are an expression or demand for the enactment of particular interactional norms and practices (turn-taking procedures, language choice, etc.), which is how teachers and students talk about rules. Classroom rules function like guiding instructional guides and are constructed as problem-solving methods/procedures for avoiding potential breakdowns in participation and/or anticipating potential breakdowns in student participation.

My account of Community Circle time is based on data collected through classroom observation data and ethnographic fieldnotes. Accordingly, descriptions of classroom activities and interactions attempt to reflect the local discourse that members of this classroom use to orient their interactions and make sense of their experiences. A salient and recurring observation in the interactions during circle time activities is the creation, enactment, and dialogue surrounding the rules in terms of both 1) general classroom conduct and 2) how to perform particular activities and roles. The use here of *rules* to refer to the construction of norms and practices is appropriate because rules mirror the local language used in the classroom between the teacher and students. The focal teacher in this study (Mrs. Torres[1]) and students spend a considerable amount of time talking about rules during two months of observing Community Circle time, which indicates that rules play a vital role in classroom interactions. Classroom rules function as general behavioral guides that anticipate or prevent breakdowns from preferred or sanctioned student conduct, participation, and dispositions. Inevitably, rules are codes for describing the desired roles of students in the classroom. According to the teacher, rules regulate student participation and give students a certain kind of needed structure. In the words of Mrs. Torres, the role of students is to "facilitate their learning, so that they know where to be and when to be and how to be." In effect, rules are the

[1] Names of schools, participants, and district are pseudonyms.

means by which the teacher seeks to establish the desired roles and participation of students in the classroom.

The way the teacher and students use classroom rules differs from how I use the concept of rules as mediating elements of any activity system. For the participants in the classrooms, rules are public signposts that express and remind participants of expected norms of behavior and obligations for membership in the class. From a cultural-historical perspective, such as Engeström's (2001) model of emerging activity systems, rules themselves, as symbolic resources, represent a key component that mediate actions aimed at achieving collective objectives. That is, whether implicitly or explicitly, rules tend be part of any kind of collaborative activity. Rules in Engeström's model mediate and are mediated dynamically by the local community, divisions of labor, mediating artifacts, and the subject. In other words, rules are part of every activity system, and they are locally structured to mediate actions. Rules, however, have particular meanings in classroom contexts and part of particular systems of social relations, and rules carry special meanings that mediate actions just like tools mediate actions (Leont'ev, 1981). Rules in activity systems like Community Circle time activities necessarily possess a dual and contrasting quality of both facilitating and restricting collective activities and individual participation. In the context of science time, classroom rules are mediating resources used to express and negotiate shared knowledge and attention in the classroom.

The Research Context

My Role

This **article** draws from classroom data part of a larger study. The broader study was a longitudinal project that involved twelve schools in the greater San Francisco Bay Area referred to in the literature as either Science Instruction For All (SIFA) or Science Instruction for Grade Schools (SIGS) (Baquedano-López, Solís, & Kattan, 2005; Ku, Bravo, & García, 2004; Reyes, 2009; Solis et al., 2009). My involvement in the SIFA project allowed me to collaborate with reform-minded teachers and researchers over the course of four years. My role in the larger study was to qualitatively and quantitatively document how classrooms organized and implemented science lessons and engaged students from a variety of educational backgrounds.

La Paz Elementary School

La Paz Elementary School is a small school of barely over four hundred students, and one of seventy-seven elementary schools in a large metropolitan school district. Of the forty-three languages represented in the district, 38.1% spoke Spanish and 37.8% spoke Cantonese as native languages. These figures indicate that Spanish-speaking and Chinese-speaking students compose similar proportion of school aged students districtwide. La Paz Elementary School reflects the increasing percentage of bilingual students in the district with almost half of all students schoolwide classified as English Learners (ELs).

This analysis focuses on the practice of doing Community Circle activities during the teaching of more expository-based science literacy activities in a linguistically diverse third-grade classroom. These activities are reflective of the pedagogical habitus present in this classroom (Grenfell, Bloome, Hardy, Pahl, Rowsell, & Street, 2013). I focus here on Community Circle time activities because it brings to light the structuring of language and cultural expectations through common, everyday classroom routines, which is a defining aspect of the pedagogical habitus of this classroom. The discourse of Community Circle time activities during "PM" science class is examined through participant observation and the collection of other ethnographic data (i.e., video recordings, lesson artifacts). "PM" Class denotes that the class meets in the afternoon. I observed the focal teacher (Mrs. Torres) 1-2 times per month over the course of two years while teaching science to 3rd graders during PM Time.

The Classroom: PM Time, Science Time, and Community Circle Time

Over the course of my observations in Mrs. Torres' PM class, I noted the repeated and routine practice of a common elementary school activity often called "Community Circle time." In a review of the literature on classroom discourse, Cazden (2001) notes that "sharing time," similar to PM class Community Circle activity, has received a great deal of attention as a common activity where students are asked to "share" individual perspectives and opinions about ordinary questions posed by the teacher. Sharing time is an activity that varies across classrooms but often structures longer turns to talk and special opportunities for recounting non-school experiences at home and social life in school. Recent attention to sharing time notes the use of this classroom practice internationally with particular cross-cultural differences. In his discussion of *La Ronda* (sharing time), Poveda (2001) notes the productive use

of sharing time as an affective space, a normative space, and in the construction of shared knowledge. My observations of Community Circle time interactions reflect a recurring and consistent classroom participation structure. Figure 1 displays the spatial and corporeal configuration of Community Circle time in Mrs. Torres' classroom.

Figure 1. Community circle time activity

Several types of activities and participation structures emerge from observations of Community Circle time. Community Circles for the purposes of this study are defined spatially, discursively, and corporeally as those interactions and activities where students sit with their legs crossed on top of a carpet located in the front part of the classroom and talk about sharing, planning, and doing activities. This metadiscourse about academic work provided for flexible and repeated opportunities to collectively think about classroom tasks, rules, and learning. Community circle activities primarily arranged students in a circular fashion around the rectangular carpet positioning their bodies in a multi-directional gaze frame. Sometimes, however, students needed to break the circle formation and shift their bodies and gaze toward the teacher in lecture-style fashion while still bounded by and sitting on the carpet space.

Community Circle activities function both as initial and concluding sequences of PM class activities lasting between 15-20 minutes per circle activity.

Classroom work is commonly discussed during Community Circle activities as well as planning and doing classroom "jobs."[2] Locating classroom interactions as work not only resonates with the construction of individual purposeful activity but also collective responsibilities in the classroom (Wertsch, 1991). Classroom work here is akin to any goal-oriented action mediating available cultural resources like tools and signs (Vygotsky, 1962). My focus on Community Circle time includes several types of classroom work. While the official purpose of PM time is science instruction, other types of classroom work is carried out related to eliciting students' prior knowledge, managing classroom tasks, and collective problem-solving. Therefore, science topics are sometimes the focus of Community Circle time activities, but not always. The varied classroom work is discussed further in the observation and analysis section.

PM Time Classroom Rules

This paper concentrates broadly on understanding a classroom routine that constructs and attends to social and academic expectations. In this analysis of classroom rules in routine Community Circle activities, students are socialized to particular ways of dealing with emerging and familiar knowledge. Describing interactions in classrooms is a continual and complex challenge but sustained observation provides varied opportunities to capture individual and group changes in participation over time. Documenting how classroom rules are discussed and talked about provides us with a window into how teachers and students view their learning situations. Moreover, an analysis of how rules are constructed, enacted, and transformed provides evidence for how teachers and students negotiate shared understandings and expectations of academic tasks and roles. That is, students learn curricular content and how to manage interactions in the classroom (Philips, 1983). In this way, classroom experiences like Community Circle time are coherent and expedient. Participation in the classroom involves the

[2] Students and the teacher use the term job to refer 1) to student classroom roles in specific classroom activities such as the rotating roles of pencil getter, group leader, workbook getter, cleaner etc., and also refer 2) to student responsibilities and norms when conducting themselves in classroom activities such as observing classroom rules and knowing the tasks of different activities.

appropriate coordination and display of sociocultural resources across similar and distinct contexts and situations (Civil, 2016; Rodriguez, 2013).

District Policies Connected to PM Time

The legal and historical background linked to the implementation of PM time at La Paz Elementary School offers us a glimpse into local administrative perspectives on the teaching of science during this time. This observation is important because classroom activities do not occur in isolation from larger mediating social, political, cultural, and historical forces from which they originate (Cole, 1996; Gutiérrez, Baquedano-López, Alvarez, & Chiu, 1999; Lave & Wenger, 1991; Mehan**,** 1998; Moll, 2000; Rogoff, 1990). District and administrative decisions drove the coordination of when science instruction took place at the focal school because it was related to a broader state mandated desegregation policy. The school had complied with third grade integration requirements by purposefully mixing students during designated scheduling blocks including "PM class" (similar to a home room). The purpose of PM time from the school's perspective is to bring students together normally not grouped together for any other part of the day. Each PM class is carefully arranged to represent an equal number of students from each third-grade classroom in the school or about three to five students from each of the four classrooms schoolwide. PM classes, as opposed to AM classes (normal class designation), meet four times a week for one hour from Monday through Thursday. Each PM class is designed to represent 25% of the third-grade student classroom of the Spanish Bilingual class (led by the case study teacher), Chinese bilingual class, and each of the English immersion classes.

Prior to the study, this practice had occurred the previous six years ranging from using PM class for physical education and other kinds of hands on activities. However, during the SIFA study, all four third-grade teachers in the school opted to teach science inquiry during designated PM class days. Science inquiry was introduced to the school through the initiation of the Science Instruction For All Project (SIFA) project, which was a collaborative longitudinal research project between the district and East Bay University funded by the National Science Foundation. Students and teachers then referred to this classroom arrangement a number of ways such as "PM class" or "PM time." Another term used by students is "mixing class," and teachers generally refer to PM class to other teachers as "integration time" or "PM time."

Teacher Perspectives of PM Time

Teacher perspectives regarding the goals of PM class range from promoting student interaction/friendship across diverse racial/ethnic and linguistic student identities to socializing cooperative student habits and of course, to teaching science concepts and inquiry. Mrs. Torres,[3] the third-grade case study PM teacher, likewise reiterates the perspective that the goals of PM science class comprise a widespread set of practices and activities dictated by school and district goals. This teacher is the only Spanish bilingual teacher in the third grade and one of four total third-grade teachers at La Paz Elementary School. Mrs. Torres is a White, bilingual teacher with a bilingual credential who had been teaching for five years in the district when she participated in the study.

Nonetheless, teacher perspectives of PM science class suggest a more cautious and conflictive view of science and language learning. Mrs. Torres indicates that a major purpose of PM science class is to add and develop students' academic English language skills. She indicates that the linguistic mix of students requires extensive modification of science lessons so as to make activities more "hands on" because for ELs "hands on [learning] is better because then they don't have to be worrying about listening." Also, hands on modifications provide students the opportunity to be "figuring out the language sort of as they're doing something." Making activities and interactions more "hands on" was identified by Mrs. Torres as a primary strategy for making the material and context more accessible to EL students. In spite of recognizing the linguistic needs of students, Mrs. Torres discourages the use of Chinese or Spanish between students in the classroom to ensure unity of purpose and fairness in moment-to-moment interactions. Mrs. Torres hesitates translating concepts or ideas in Spanish because she can't also translate material to her Chinese-speakers during mixing time.

Despite the explicit goal of promoting academic science language through PM class[4] activities, Mrs. Torres explains that several emergent bilingual students had difficulty overcoming the anxiety of not knowing English whereas "if it had been in their own language, they wouldn't have had that anxiety so they could have just focused on learning whatever the material was." Mrs. Torres is expressing here the dual challenge of promoting science literacy

[3] Mrs. Torres is also a pseudonym.

[4] Science lessons are primarily based on SIFA materials focused on developing science inquiry and literacy skills through the teaching of matter and measurements concepts.

during PM class to emergent bilinguals. According to Mrs. Torres, not only does she have to organize scientific inquiry activities but she also has to guide several bilingual students in learning academic English (science) discourse with little or no background in the English language. This recurring theme, voiced repeatedly by Mrs. Torres and other bilingual teachers, includes the challenge of making the classroom context comprehensible to all students, promoting academic English, and science literacy while conducting PM class almost entirely in English despite the presence of untapped valuable bilingual/multilingual resources (Civil, 2016; González, 2008). Mrs. Torres articulates a particular vision of wanting students to teach each other classroom structures so that they *know* "where to be and when to be and how to be" in class that appear like antecedents or at least foundational structures for participating in learning. Expression and demonstration of these behavioral structures are viewed, in effect, as prerequisite competencies for functional learning that encompass all students including monolingual students. The management of student behavior (appropriate conduct, attention, etc.) while promoting collaborative student participation is another prominent teacher theme set that appears intimately connected to the competing goals of PM science class. From this standpoint, Community Circle activities might be viewed as the primary mechanism by which student roles and classroom structures are learned and negotiated.

Mrs. Torres provides a vivid, albeit multiple and conflicted vision of the learning process, and what her students need to know to be knowledgeable participants in her classroom. She sees interactional competence as the fundamental expectation and possibly most indispensable set of skills for her students to know in order to transcend and meet both behavioral and academic expectations. Her vision of knowledgeable or competent participants matches prevailing perspectives of interactional competence. According to Mehan (1983), *interactional competence* is a pragmatic skill tied to speaking and thinking. Mehan (1983) similarly describes interactional competence as students learning that "certain ways of talking and acting are appropriate on some occasion and not others, knowing with whom, when, and where they can speak and act…which involves relating behavior to different classroom situations by interpreting classroom rules that are often implicit" (p. 79). Cazden (2001) moreover refers to this process as students being socialized into management and activity structures, which are minimized in importance over time and are open for improvisation and evolution (p. 101).

Cazden (2001) similarly makes a distinction between students learning the choreography of activities and the academic content that is possible after the initial skills are mastered.

Interactional competence and behavior management are intertwined in this classroom by the teacher when it comes to supporting students into expected forms of participation in the classroom and for performing grade-appropriate science inquiry activities. Both are part of familiar discourse practices that aim to regulate students into learning and into membership of classroom communities. This familiar discursive theme is in effect the mechanism by which inter-subjective transitions are expressed and reproduced. Inter-subjective transitions, meaning the changes and moves that mark student shifts in interactional competence and participation, however are negotiated and not already determined by the teacher's regulative discourse. That is, while the teachers' regulative practices are part of their institutional role to monitor and ratify legitimate knowledge, teachers' power over the unfolding of classroom activities are inevitably shared and often contested by students. For example, Candela (2005) in her study of Mexican schoolchildren conducting science experiments has repeatedly found that students co-author what appear to be typical teacher-controlled practices of regulation. While the regulation of classroom norms is not limited to specific academic subjects, science knowledge is often perceived as wholly objective and closed to varied perspectives perhaps contributing to the notion that English language instruction is less demanding in this context and that science is less language dependent. However, work in the classroom fundamentally involves negotiating intersubjectivity through language for the purposes of mutual coordination or understanding, collective perspective-taking, and making-sense of the natural world (Duranti, 2010). These negotiations are built into the social architecture of classrooms through everyday routines of communication and co-authoring. For this reason, I focus on the Community Circle time routine of this classroom that exposes how intersubjectivity, under the guise of promoting interactional competence and science learning, orients participants to each other and to the local context.

Findings: The Work of Community Circle Time during Science Time

Observations of Community Circle time reflect a range of pedagogical purposes for sustaining this practice during PM class and science time. Three salient themes emerged from classroom data collected during Community Circle time including classroom work supporting:

1) the use of problem-solving rules and metadiscourse as legitimate academic work and 2) collective orientations toward learning, and 3) the language of affect and academic identities. In the context of teaching science during English-only time, these themes counter notions of language-free science learning contexts. More importantly, these themes underscore the potential and urgency for expanding language and literacy practices during science instruction. The following section describes each theme.

Problem-Solving Rules and Metadiscourse as Legitimate Academic Work

Community Circle time allows for the use of future or predictive conditional semantic structures especially from the teacher. These conditional constructions allow students to practice a range of epistemic stances related to degrees of probability (Celce-Murcia & Larsen-Freeman, 1999). Excerpt 1 below introduces how the first Community Circle activity unfolded for PM class where students are asked to share their name and how they are feeling on the first day of PM science class.[5] The teacher (Mrs. Torres) provides a visual guide and oral list of possible responses for students to use while they take their turn going around the circle sharing their response. As students rotate taking turns sitting on the carpet in a circle, students are also asked by the teacher to point to the expression of a set of five cartoon faces or expression contained in a "tribble" card that indicates how they could be feeling during PM time (see Figure 2).

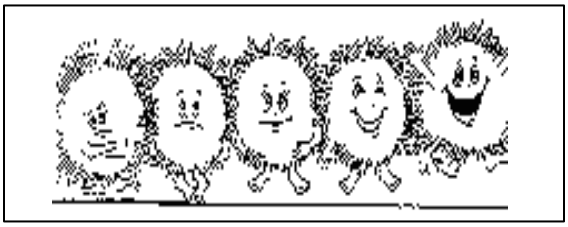


Figure 2. Tribbles card

[5] See Appendix A for transcription conventions.

Excerpt 1

Teacher	1	You might feel (1) really excited
		((holds tribbles card with both hands starting with rightmost icon))
	2	You might feel .. happy about it
	3	You might feel .. happy but a little bit
		((moves right hand toward cheek))
	4	Nervous or a little bit scared or
	5	A little bit feeling not so sure (1)

Conditional sentential constructions are therefore discursive strategies used to facilitate and guide potential participation structures in the classroom. Given that this was the first PM time meeting of the school year, the activity allowed for greater regulation on the part of the teacher and the students over their interactions. Students are given a script on how to respond to the first and subsequent Community Circle questions, which may support student engagement and a particular kind of turn-taking practice. While students may already be familiar with these grammatical constructions and turn-taking practices framing Community Circles, Schieffelin and Ochs (1996) keenly note that all cultural practices and communicative resources are intricately allied with "the features of the situation and cultural contexts which that practice invokes" and the preferred or expected competences in those settings (p. 257). That is, students are learning how to participate in PM science class while acquiring affective and culturally specific mindsets for being in the classroom and in learning environments (Rogoff, 2016; Solis et al., 2009).

In addition to promoting the sharing of turns around the circle, the teacher also voiced breaches to classroom rules (even yet unspoken ones here). Students have the option to pass and speak later around the rotation or completely not share a response. Martín (Excerpt 2) takes his turn after eight students have taken their turns. He is a bilingual student whose parents are from Nicaragua and who has been designated as both having a speech impediment and "hyper deficit attention disorder." Martín takes his turn initially in Spanish clearly understanding the activity by following the topic and sequence of the activity. This setting, while familiar to Martín because the physical classroom and teacher are normally part of his homeroom Spanish-English bilingual class, ceases to be so during PM Time. Yet, there is a

temporal adjustment occurring here that is signaled by contrasting understandings between the teacher and student of which language is expected during *this* activity and *this* class time.

Excerpt 2

Santiago	1	My name is Santiago (1)
	2	Pass (1)
Martín	3	Me llamo Martín
		My name is Martín
Teacher	4	Sh::::: ((looking at other students))
	5	We're speaking in English during pm class-
		((looking at Martín))
Martín	6	Aha yo creía que español
		oh I thought in Spanish
	7	My name is (1.5) a:h Martín and I feel ha:ppy
		((pointing at his tribble Fig. 2))
	8	Because we won the game

Figure 3. Martín with a tribbles card

In this excerpt, Martín follows the teacher's script by giving his name and expressing that he feels happy to be in PM class. The teacher interjects in Line 5 while Martin is completing his turn asserting three mechanisms by which classrooms rules are inscribed with the phrase "we're speaking in English during PM class." This interjection discursively marks PM time and all activities during this time, like Community Circle time, as a bounded space where specific interactional norms and expectations need to be observed. First, Mrs. Torres clearly prohibits the use of Spanish and other non-English languages by Martín and other students during PM class. Second, she does it while using the plural pronoun of "we" to support this normative goal as a collective PM time practice. Finally, another mechanism imbedded in this plural construction is that the teacher mediates Martín's turn re-inscribing a classroom rule attached to Martín's turn while still mitigating a direct correction. Instead of using a more direct "you" correction for addressing Martín, Mrs. Torres mitigates and lessens a direct correction where responsibility for performing appropriate rules rests on the collective use of new classroom norms. This mitigation may be due to the apparent tension perceived by the teacher of promoting a collaborative classroom context and an equitable participation structure. Yet, Martín continues his turn in Spanish (in line 6) after the teacher prohibits Spanish in the classroom perhaps because Martín recalls that the teacher is in fact bilingual (she's his AM teacher) and that almost half the students in PM class understand Spanish fluently.

The teacher uses a range of resources for regulating student participation during Community Circle time that attend to body positioning, taking-turns to speak, listening to other speakers, and ways of addressing potential problems. These mechanisms again support Community Circle time norms. Understanding and appropriate performance of classroom rules is constructed as a sign of a competent third grade identity and doing science. Moreover, following rules is constructed as a sign of a moral, caring, and responsible student. Students are expected to "appreciate" each other when other students follow classroom protocols. This rule serves a dual function of also explicitly promoting shared monitoring responsibility of student behavior with teachers.

Excerpt 3 shows an interaction where the Community Circle activity is transitioning to a new activity. In instances where PM class held Community Circle sharing activity, the subsequent transition activity usually led to a planning activity where students would discuss goals and procedures to be used in subsequent activities. This kind of planning activity show

how students learned how to regulate their talk, enact a particular kind of cooperative discursive practice, and use cooperative problem-solving discursive methods to participate in activities.

Excerpt 3

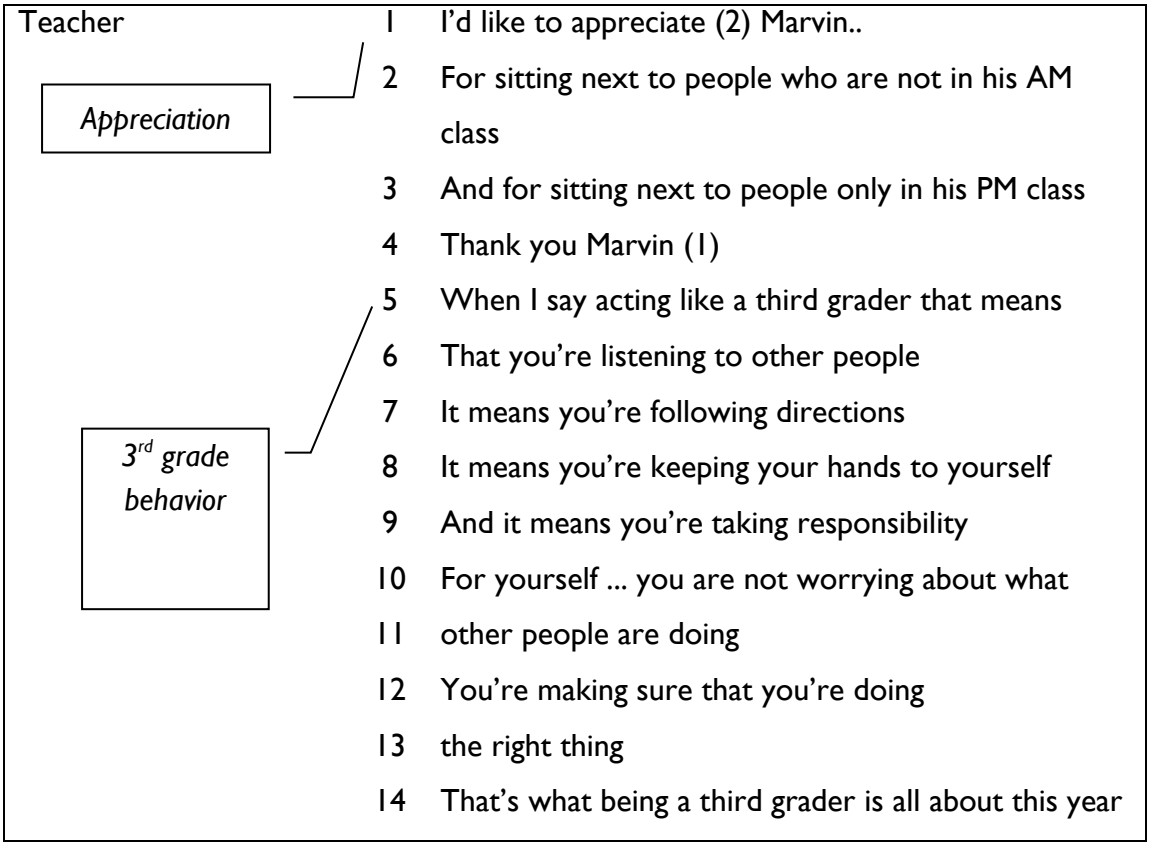
Teacher	11	It means listening to each other
	12	You know what else it means it means
	13	Not always getting your way
	14	Sometimes you won't get what you want
	15	You have to say "well this time I won't get
	16	What I want but another time I will"

In this instance, the teacher lists the rules of working in groups, which means "taking turns," "sharing," "listening to each other," and "not always getting your way" (line 13). The teacher constructs a temporal aspect to these rules to enforce grade-appropriate academic conduct and participation. The observation here occurred at the start of the school year for these third-grade students and with students that are also new to this teacher as some normally are not with her during the day but in other third-grade classrooms. Contained within Excerpt 3 are several rule-bound constructions that express how students should listen, take turns, and take on a problem-solving stance when problems arise. The whole sequence provides a space for students to practice thinking collectively (metadiscourse) through the use of language about potential pitfalls and desired responses (i.e. line 16. "well this time I won't get what I want but another time I will") (Hyland, 2017; Razfar & Leavitt, 2011).

In Excerpt 4, the teacher elaborates on what it means to be a third-grade student and ties those expectations to students being able to perform a series of classroom habits and practices. In essence, students who can learn and perform those rules are legitimate third-grade students and ready for the responsibilities that come with being in the third grade. This interaction occurs at the inception of PM time. The teacher walks into the circle and "appreciates" four students and goes on to explain why she is appreciating those students to the rest of the class. Appreciations can be given and received by anyone but usually are given by the teacher to students for conducting themselves a particular way like when students sit in a

circle with their legs crossed and hands folded. Those students appreciated by the teacher are acknowledged as following the rules while those students not yet appreciated are confirmed as being delinquent and not yet following the rules or not yet ready to participate.

Excerpt 4



The metadiscourse in Excerpt 4 is charged with multiple intentions and goals of Community Circle time. Appreciations here are used as a regulatory device for classroom norms in the mixing of students from AM and PM classes. In addition, Mrs. Torres' listing rules for "acting like a third grader" (line 5) are expressed in the form of regulations and prescriptions for conduct ("keeping your hands to yourself"), participation norms ("listening to other people"), and problem-solving principles ("making sure you're doing the right thing").

Collective Orientations toward Learning

Previous excerpts describe how classroom rules are an expression of academic expectations for students in their participation of Community Circle time activities. Moreover,

classroom rules work in concert with sociocultural resources in shaping student use of academic and scientific discourse. Taken as a whole, what do classroom rules tell us about local perspectives of learning, scientific inquiry, and academic expectations? The following excerpts illustrate that classroom negotiation of rules are windows into the learning process and that rules are essentially pre-emptive responses to impending conflict, anticipatory scripts, and problem-solving heuristics. Problem-solving activities support participant structures in which children can use academic registers in a meaningful fashion "to engage in logical arguments, to share their ideas, and to work together in the pursuit of common goals" (Forman & McPhail, 1993, p. 226). Classroom rules work together with moment-to-moment goals in framing student participation in problem-solving interactions.

The Community Circle sequence in Excerpt 5, takes place in the third week of observations, and unfolds as the class starts with an immediate confrontation between students that escalates into a two-minute verbal altercation. Upon observing this conflict, the teacher expresses her disappointment and directs all the students to instantly vacate the classroom. Once the students re-enter the classroom and are sitting in a circle around the carpet again, the teacher reframes the subject of the interaction from a problem between individual students to a problem implicating the whole class, which then requires the attention of the whole class to problem-solve. The teacher strategically describes the reason for the conflict as rooted in a problem that requires collective problem-solving and opens up the floor for ideas on how to solve the problem of entering the "classroom properly" (line 8). This problem-solving activity materializes into the Community Circle subject for the day. The teacher explains the classroom goals of being safe and sitting in a circle when doing Community Circles and expresses that as "only one" person she needs help from others (line 3). Mrs. Torres uses the characteristic terms used in mathematical and scientific practices where "problems" (line 3) are identified and "solutions" (line 6 and 17) are sought to answer them in this one sequence that is repeated in several other observations sometimes involving science content.

Excerpt 5

Teacher	1	Right.. because I need to make sure that people safe
	2	are being and sitting on the circle
Joint Problem-Solving	3	I need help with this problem because there's
	4	Only one of me
	5	Does anyone have any ideas of how
	6	We can solve that problem.. where people can be safe on
	6	The carpet a:::nd people can (1) come IN the
	8	Classroom properly
Nicolás	9	()
Teacher	10	Nicolás what's your idea
Nicolás	11	Um you could just stand out there
	12	Look at 'em then.. quickly look back in-inside the room
	13	Then you could look back ou⇑t
Teacher	14	That's what I was trying to do today
	15	And I still missed the problem
	16	Because the problem was happening right here
	17	So that is exactly the solution that I came up with
	18	But it's still not working

By redirecting the subject of the activity into an apparent collective problem-solving scenario regarding student behavior and PM time norms, the teacher positions students into the role of rule-makers of their own and the teacher's actions. Nicolás' solution is "exactly the solution" (line 17) that the teacher had apparently drawn beforehand which still is not working. The implication here is that students need to come up with better solutions or adjust their behavior.

In contrast to Excerpt 5, where the teacher and students might have been looking for one absolute answer to a problem, Excerpt 6 depicts students problem-solving in the context of multiple possible answers with the explicit goal of promoting discussion of why students arrive at different solutions when using non-standard measuring tools. Students had previously worked in groups to measure the length of a piece of paper using 1) paperclips and 2) pieces of

straw (a tube of waxed paper) of different lengths. This discussion takes place in the Community Circle carpet and students share answers from the activity that took place previously at their desks. It is agreed that most everyone works out the same length measuring the piece of paper using the paperclips, but there was disagreement with the answers using the pieces of straw as a measurement tool. The teacher starts by repeating the different solutions shared by the student groups involving the pieces of straw.

Figure 4. Teacher introducing measurement activity with paperclips and straw

Excerpt 6

Teacher	1	But some people got two straws
	2	Some people got threes
	3	Some people got fours
	4	Some people got five
	5	Does anybody have any idea raising their hand quietly
	6	Why:: (.5) everybody got the same answer for paperclips
	7	But different answers for the straws-
	8	Jonah what you-
Jonah	9	Cuz uh paperclip is all uh short and the same and the
	10	And the straws like uh some are small and some are long
Student	11	Uh?
Teacher	12	Interesting idea

In this interaction, the goal of the activity is to explore the concept of standard measurements of length. While sharing their solutions, students participate in a joint problem-solving exercise comparing the difference between using paperclips and pieces of straw for measuring a piece of letter-sized paper. Jonah shares his perspective on why different solutions were offered when using straws referring to the problem that in the case of straws "some are small and some are long" (line 10) while paperclips are "short and the same." Interestingly, the entire sequence is framed by a kind of indefinite and non-specified problem where the teacher does not directly point out individual student answers after students share their responses to the rest of the group, as in "somebody" (lines 1-4), "anybody" (lines 5), and "everybody" (line 6). Not everyone had the same answer using paperclips but the teacher chooses to initially frame the problem as one that had too many different solutions. This recurring attention toward collective problem-solving talk during Community Circle time therefore allowed for the engagement of classroom rules (Excerpt 5: proper conduct in the classroom) and of central science literacy concepts (Excerpt 6: standard measurement units).

Expressing Affect and Academic Identities during Community Circle Time

Interactions in Community Circle time are also examples of students attempting to create coherence of academic participant structures, academic identities, and scientific discourse while they learn to regulate their participation in class. In Excerpt 7, three students (Nicolás, Diana, and Evelyn) demonstrate how students learn and practice taking the floor in vastly different ways. Nicolás, having mastered the preferred turn-taking script, manages to translate, challenge, and adapt his participation. Nicolás, who had previously asked about how to express feeling "sleepy" and "tired" (line 2), continues with the same theme when it was his turn to speak despite not (and perhaps because) there exists no apparent match of a "sleepy" tribble. In this way, Nicolás expands the activity and the potential for collective student responses through his appropriation of the activity to fit his individual communicative intentions.

Excerpt 7

Nicolás	1	-Nicolás and my tribble isn't on there
	2	but I'm tired ((looking at tribble card))
Teacher	3	((*giggling, moves head forward*))
Diana	4	My name is Diana (dal-æna) and I feel like
Student	5	I didn't hear I-
Teacher	6	-Put (1) your hand right here Diana (djá-na)
		((*folds hands in front of her knees*))
	7	Do you want me to call you
	8	Diana (dal-æna) or Diana (djá-na)?
Diana	9	You can call me anything
Teacher	10	Either one? (1) ok
	11	Can you share again? (1) ((*looking at Diana*))
Diana	12	I feel happy 'cuz I like mixing class (2)
Evelyn	13	My name is Evelyn
Eric	14	Can you speak louder please
Teacher	15	Thank you Eric ((*looking at Eric in far right hand side of circle*))

	16	Can you speak louder ((*whispering and looking at Evelyn*))
Evelyn	17	My name is Evelyn

Diana (line 4) follows Nicolás and is cut off by an unknown student (line 5), but this is followed by the teacher's ensuing interjection that focuses on both Diana's corporeal and verbal participation. Students are expected to sit with their legs crossed on the carpet. Diana's turn is restarted through an exchange where the teacher positions Diana (line 8) as needing to choose between the Spanish (djá-na) or English (daI-æna) phonetic version of her name as in "Diana (daI-æna) or Diana (djá-na)?". Diana chooses to not express a preference although she had initially chosen the English pronunciation of Diana (daI-æna) (line 3); hence, her initial English pronunciation of her name is set aside with the question posed by the teacher. This kind of reckoning of student participation is prevalent during Community Circle time yet contrasts with Martín's exchange where he is not given an option of speaking English or Spanish during PM class. Proper recognition of student names in linguistically diverse classrooms remains a concern as indicated by a recent national online initiative promoting "belonging and positive relationships" through appropriate naming practices in bilingual/multilingual classrooms (https://www.mynamemyidentity.org/). In the subsequent turn, Evelyn also initially interrupted (line 18) but continues with her turn, sharing her name and completing her turn with an ambivalent response of feeling "tired?" (line 19) re-voicing Nicolás' earlier utterance of feeling tired (line 2).

Excerpt 7 reveals the range of student experiences during Community Circle time where some students demonstrate their oral language skills to adapt preferred participant structures (Nicolás), while other students (Diana and Evelyn) struggle to obtain the floor and are sometimes cast as less capable co-participants. Access to the classroom language and procedures are unmistakably produced and enabled collectively (e.g. incorporation of Nicolás' and the teacher's words by Evelyn and Diana), but this does not preclude abundant individual student differences regarding academic language proficiency, comprehension of less explicit classroom norms (e.g. bodily posture), and distribution of power asymmetries of student status (e.g. Spanish Diana). Excerpt 7 illustrates that familiarity with U.S. schooling procedures and the language of instruction are inextricably associated with how participation structures are interpreted, enacted, and transformed individually and jointly in classrooms.

Another example of students reshaping the interactional structure of an activity occurred during Community Circle time activities focused directly on science related themes. The Community Circle question on this day is about sharing thoughts and ideas connected to the word "scientist." The teacher phrases the focus of this Community Circle activity with the following question depicted in Excerpt 8.

Excerpt 8

Teacher	1	Our question today is (1) when you think of the word
	2	Scientist (1) what do you think of… what do you think
	3	of when you think of the wo::rd… Scientist

The teacher repeatedly mentions ideas connected to stereotypical images associated with scientists as people "working in a lab with white coats on…thinking of things they want to find out…doing experiments to find answers to things they want to find out"[6] (transcribed recording JS). Students begin taking turns sharing their responses in usual rotation fashion, with some students passing, and then coming back to students who wanted to share after initially passing. Several students echo the idea of "white coats," and others make new connections to popular media icons outside the classroom like Pokémon, Scooby Doo, and Frankenstein.

In Excerpt 9, María holds the teddy bear allowing her the right to respond to the question of the day and then opens up the floor for additional comments from those who had passed previously. Robert takes the floor and echoes similar themes to those previously uttered by the teacher, yet extends the connection to the popular Frankenstein motifs shown in Excerpt 9.

[6] Teacher comments prior to excerpt 8.

Excerpt 9

Robert	1	Well u::m: when I think..about scientist I think about…
	2	When they doing their experi: ⇑ments..like…when they:
	3	Pla:y Frankenstei::⇑n..when they have 'em covered u⇑p
	4	And the hand come out…and they say he alive
	5	and they thought he was gonna be (bu::ried)
	4	Because he was real dee:::⇑ p…real ta:ll..and
	7	He messes ki::ds [and ki::ds] thought he was ()
Student 1	8	[Frankenstein]
Robert	9	() and being kids () padded him on the ba::ck
	10	And then he-
Teacher	11	Think about the scientist what what did the scientist look like
Robert	12	The sci:entist..he um ah long white coat⇑ (1) he was short…
Students	13	((giggling))
Robert	14	And he had a hump on his back..

Robert's extended response relates to an adapted narrative (line 1-7) of Frankenstein, which demonstrates his familiarity with the reference to scientists but especially his interest in fictional scientists. Moreover, he expands on the basic sharing question by introducing the idea of someone acting like a scientist as in "playing" Frankenstein (line 3) or replaying the story of Frankenstein. The source of Robert's narrative is not clear, yet he mixes icons from horror and animation texts like *Frankenstein* and the *Hunchback of Notre Dame* (line 14) (Hugo, 2012; Shelley, 2008). In this case, the distinction between imaginary and actual characters is not significant when the goal is tapping into students' prior knowledge of texts, icons, and experiences involving scientists. In effect, Robert's turn is an example of a student creating coherence on the subject of being scientists, and a type of persuasive argumentation for including Frankenstein in the context of talk about scientists. Robert appropriates "scientist" and makes meaning of past experiences of the story of Frankenstein within this new context of Community Circle time.

The previous excerpts demonstrate how Community Circle time expectations shape, enable, and sometimes constrain the use of expected "academic" language examples through student participation in Community Circle time activities. Moreover, students actively share in both interpreting participation rules and improvising on them as well. This regulated space is imbued with affective and normative stances on how to proceed in repeated interactions during Community Circle time. However, as Robert's narrative demonstrates, even the explicit rules here are permeable and allow student adaptation of activities.

Discussion and Conclusion

My observations of this third-grade classroom capture prototypical encounters of the unfolding of classroom interactions through the repeated practice of Community Circle activities and other science-related activities. Community Circle activities and the use of classroom rules are mundane occurrences. Common also is the decision to offer English instruction time with science as this practice also occurs in many bilingual programs. The activities surrounding Community Circle time are culturally significant in that they serve as critical establishing experiences in the language socialization of students to fundamental elementary school practices and early experiences with respect to what it means to do science in school and learn "scientific" discourses (Brown, 2006; Lemke, 2001; Vygotsky, 1962). The expression of classroom rules appears critical in mediating elements in Community Circle activities that work in concert with student existing resources, teacher expectations, and administrative goals. When referring to sharing time classroom activities like the one in this case study, Cazden (2001) identifies the pedagogical work done by the teacher and students as a pervasive and constant tension because it often requires validation of existing student contributions while simultaneously re-grounding it with additional meaning (p. 22). Validation of a student's meaning in this case is synonymous with using student resources and experiences as critical tools for learning. This tension is clearly evident in the creation and performance of interactional rules where combined pedagogical goals and purposes collide to create multi-functional and multi-purpose spaces like PM science time.

Moreover, the study of routine and common classroom practices needs to move into understanding actual contexts, like the heterogeneous contexts at La Paz Elementary School, and not in creating ideal or monolithic language teaching typologies (Canagarajah, 2013; Gort,

2015). Emergent bilinguals occupy highly diverse educational spaces within and across classrooms. That is, classroom contexts are locally negotiated while influenced by institutional and cultural models. As we see in several of the excerpts, individual participants can and do "evade, bend, or violate the constraints established by the current sequential environment of their talk" (Zimmerman & Boden, 1991, p. 10). The work of participants is continually constrained and enabled by the sequential context for further actions. Interactions in the Community Circle activities illustrate how some students negotiate those constraints (i.e., using Spanish during English-only time, making novel science connections to cultural icons like Frankenstein). Similarly, teachers and administrators interested in the teaching and learning of science in diverse classroom contexts can similarly question how science teaching spaces are promoted and influenced by larger district and school policies and historical events. Why is science taught differently in a specific time period or grade level? How are bilingual/multilingual students able to use their cultural and linguistic repertoires to learn and do science?

The potential breakdown of classroom lessons is the explanation for the explicit creation of classroom rules that anticipate and regulate student interactions with the ultimate goal of avoiding derailment or of realigning planned activities. In the context of a classroom where students come from a variety of ethnic and linguistic backgrounds, classroom rules take on a new dimension. PM science time was identified by some teachers as the favorite activity of their weekly teaching days because teaching mainstream students all day long was seen as a genuine challenge whereas during PM time, teachers had an opportunity to work with emergent bilinguals mixed from other classrooms for science time. In the words of most teachers, PM time students were just "better behaved" than other students. For these teachers, student behavior was an everyday concern and the formation of rules to regulate participation was a principal concern and solution.

Studying the socialization of interaction rules and norms in classrooms activities like the one in this case study is moreover ultimately part of the larger project of reconceptualizing learning as a contested space where "trouble is an essential feature of teaching-learning interaction…[a] feature that defies our attempts to correct it, or repair it, or make it disappear" (Mehan, 1998, p. 264). Daily encounters during Community Circle activities occurring during English-only time, like any other classroom routine, make visible some of those tensions as well as attempts to manage them.

Appendix. A

Transcription Conventions

	DEVICE	SYMBOL	NOTES
1	Rising Intonation	? or ⇑	
2	Falling Intonation	. or ⇓	
3	Continuing Intonation	,	Listing, falling-rising
4	Stress/Loud	CAPS	Louder, stressed
5	Pause	(1)	
6	Short Untimed Pause	..	Less than .5sec
7	Short Untimed Pause	…	Between .5-1 sec.
8	Spoken slowly	< >	
9	Spoken rapidly	> <	
10	Lengthened syllables	ha::rd	
11	Word Cutoff	-	Abrupt end/interruption
12	Latched talk	=	No temporal gap between speakers
13	Overlapping speech	[ ]	Simultaneous talk
14	Soft Speech	°Hi °	Softer than surrounding text
15	Paralinguistic/Non-verbal	(( ))	
16	Unclear/Unintelligible	( )	Lack of certainty

Adapted from the following sources:

Jefferson, G. (2002). Is "no" an acknowledgment token? Comparing American and British uses of (+)/(−) tokens. *Journal of pragmatics*, *34*, 1345–1383.

Ochs, E. (1979). Transcription as theory. *Developmental pragmatics*, *10*(1), 43-72.

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