

The Politics of Language and Schooling in the Mathematics Education of Bilingual Chicana/o¹ Students

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This paper offers a theoretical perspective for the underachievement of Chicana/o bilingual students in U.S. mathematics. The perspective rests on sociopolitical and institutional factors and how they affect the learning of Mexican descent students. Our discussion focuses on this population of students because they form the largest group of Latinos in the U.S., because their educational status is a national crisis, and because they share with Puerto Ricans historical experiences of colonization and subjugation, experiences which persist to this day but which receive little attention in contemporary mathematics education discussions. We argue that educational change for Chicanas/os can only happen if we begin to address social processes of oppression and discrimination that occur within the mathematics context. We ground our discussion in examples from current school-based research and work with teachers.

INTRODUCTION

In the United States, Latinos—particularly Mexicans, those of Mexican descent, and Puerto Ricans—have now become the largest “minority” group. Of the Latina/o population, about 60% are Mexicans or Mexican Americans (U.S. Census Bureau, 2001). Our discussion is concerned with this group who we collectively refer to as Chicanas/os. The growing number of Chicanas/os in U.S. schools is highly significant for mathematics educators, because among the major ethnic and racial groups in the country, Chicanas/os have the most disturbing and persistent pattern of underachievement – especially in mathematics (National Center for Educational Statistics, 2004).

The school failure of Chicanas/os is not a new situation. In fact, it has long historical roots (Donato, 1997; San Miguel and Valencia, 1998, Valencia, 2002), roots that stem from a history of colonization and subjugation. “School failure” is used deliberately by Valencia (2002) to point to institutional factors to explain Chicanas/os’ educational condition. In essence, this perspective suggests questions regarding how school policies, practices, interactions, attitudes and beliefs impact Chicanas/os’ education. For decades, Chicanas/os, along with Puerto Ricans and Native Americans—another language minority group in the U.S. – have struggled (and continue to do so) for educational equality, self-determination, non-discrimination, dignity, cultural and linguistic identities, and civil rights. Educational equality has included striving for language (i.e., Spanish) rights and the end of language degradation. These shared experiences in the U.S. distinguish Chicanas/os and Puerto Ricans from other Latino groups who do not have

¹ The term Chicana/o refers to persons of Mexican heritage often born in the U.S. Its root is in the U.S. Civil Rights era of the 1960’s. Chicanas/os selected the name for themselves and it connotes political activism for equality.

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histories of oppression and educational inequalities in the U.S. and who are well disposed to assimilate into the U.S. context.

Given the characteristics of Chicana/o education and their history of subjugation, discrimination, and racism, we are led to examine how these sociopolitical factors interact with mathematics education. We assume that mathematics teaching and learning do not occur in a social vacuum, that racism, discrimination, and bias do not stay outside the classroom door while minority students are taught mathematics. Furthermore, we assert that to really understand Chicana/o mathematics school failure—and to be able to take appropriate and sustained action to reverse it—we have to better understand how these factors operate in mathematics. We use, in part, Valencia's (2002) framework to guide our discussion:

Chicano students are affected by the pernicious ideologies, institutional practices, and outcomes of educational inequality. How some people have viewed the educability of Chicano students (i.e., through the ideological lens of “deficit thinking”), how the schools have been structured to disallow Chicanos from learning (via unequal schooling arrangements), and the resultant differential schooling outcomes attained by Chicano and White students (e.g., differences in high school graduation rates) are all important subject matters...(p.3).

In this paper, we focus on language ideologies and differential instruction for Chicanas/os. Our intention is to demonstrate their presence in Chicana/o mathematics learning and to provide examples of their impact. We begin our discussion with a description of the conceptual lens we use for understanding the politics of language, and other hegemonic views of Chicanas/os, and the data sources from which some of our examples are taken. We follow this with a discussion of how language (i.e., Spanish) is used as a tool for subjugation and how instruction as it frequently occurs with Chicanas/os perpetuates discrimination. We conclude with implications for the next steps toward social justice in education.

CONCEPTUAL FRAMEWORK

Both of us have several years experience teaching mathematics in working class schools that have high Chicana/o enrollments. These experiences are the origins of our perspective on the schooling of Chicanas/os. We also draw on insights we have gained from our three-year-long ethnographic study of Chicana/o primary grade students doing non-remedial mathematics which we describe below.

Our argument draws from several theoretical lenses that help us make sense of how political, social, and educational processes effect what Chicanas/os learn mathematically, how they learn it, and how this all coalesces to affect Chicanas/os' identity and agency as mathematics learners. First, research on Chicanas/os and their schooling has supported a contextual theoretical framework to explain their academic failure (e.g., Garcia, 1995; Gutierrez, 1995; Khisty, 1995). This perspective is rooted in a sociocultural theory of development (Vygotsky, 1986) and suggests that a careful examination of the context in which students learn reveals interactional processes and factors that substantially affect *what* students learn and *how* they learn it. Within this framework, development is mediated through social interaction, and

therefore, language and dialogue are central to one's overall development and specifically, the development of self and self-agency. Also, this framework suggests a dynamic and processual notion of culture that draws attention to how human beings interact with their social worlds through mediational means (Tejeda and Gutierrez, 2005). From this perspective, we can examine and question how language and interactions that are at the heart of development are impacted by other sociopolitical factors.

Second, we also draw on elements of critical race theory (CRT). Critical race theory in education "...starts from the premise that race and racism are endemic, permanent, and central to defining and explaining (Solórzano, 1998, p. 122)" educational processes and outcomes. Consequently, central to CRT are questions concerning what purpose race serves (i.e., to differentiate racial groups), how race is used to subordinate racial groups, and what processes and elements are used to legitimize the super-ordination or dominance of a group. A dominant group needs a "rationalizing ideology" or set of beliefs that explains or justifies the actual biased social arrangement. Historically, language ideology has made Spanish the point of discrimination against Chicanas/os and as the justification for their lack of educational progress. We discuss language ideology in more detail in the next section.

From CRT, we use the concept of microaggressions (e.g., Solorzano, 1998). Microaggression refers to the way that racism—and language ideology--is expressed in covert and subtle ways such as in private conversations or interactions. In today's context, public or overt acts of racism are not socially condoned. Microaggressions, instead, take the form of nuances, body language, or code words that communicate and verify superiority on one side and inferiority on the other side. The covert nature of microaggressions makes them insidious and difficult to challenge, yet highly effective in creating self-doubt among minority group members or in making them feel out of place (Solorzano, 1998). Microaggressions may stem from unconscious attitudes of superiority, but they serve well to communicate, justify, and maintain differential power relations and privilege for some and not for others.

We ground our discussion in extensive ethnographic research conducted with Chicana/o students who voluntarily began participating in an after-school project when they were in 3rd grade and continued until 5th grade (Khisty and Willey, 2008). We describe our work in the after school not because we are reporting results of our studies, but because in the after school the institutional factors we address in our discussion stood out so strongly for us and profoundly reinforced our thoughts and concerns about the politics of language and instructional practices in mathematics education.

Briefly, the after-school was designed specifically on premises of cultural-historical activity theory. That is, we maintained that dialogue, multiple sources of interactions, and various tools would mediate Chicana/o students doing mathematics that was just a little beyond what they were used to doing (Khisty, 2005). The after school was held in a working class neighborhood school that has a student enrollment that is 100% Chicana/o. The neighborhood also is nearly 100% Latino and Spanish is heard frequently in most businesses and social spaces. The objective of the after-school was to better understand the language and cultural resources Chicanas/os draw upon as they do non-remedial mathematics. The intent also was to give students experiences with mathematics that they might not otherwise have in classrooms. In the

after-school, students were encouraged to be active, self-responsible participants, and Spanish was privileged in that activities and materials were in both Spanish and English and bilingual adult facilitators spoke mostly in Spanish to both accommodate and develop students' native language skills.

Our examples come from data gathered from the after-school. The after-school was held two times a week in the students' school, each session lasting for one and a half hours. The sessions ran for between eight and ten weeks during the fall and spring of a school year for three years. Students worked in small groups with one to two facilitators during each session, and these interactions were videotaped. Weekly planning and debriefing meetings with undergraduate facilitators also were videotaped. Observations and fieldnotes were made of students in their regular classrooms to provide a contrast to observations made in the after-school. Consistent with qualitative analyses, we were interested in patterns that emerged in the data. It is from this process that issues related to racism, microaggressions, and deficit thinking became evident in the interactions surrounding students' doing mathematics.

LANGUAGE BIAS IN MATHEMATICS

Chicanas/os comprise a bilingual population since a significant portion of them speak both Spanish and English at home, even after several generations (Pew Hispanic Center, 2004). On a national survey, only 37% of Latino students indicated that they speak only English in their homes (National Center for Educational Statistics, 2000). However, among second-generation children of immigrants, more than half can only speak English.

The history of Spanish in the lives of Chicanas/os is replete with instances of discrimination based on language and myths about Spanish. Speaking Spanish has been considered a sign of disloyalty to the U.S., treaties guaranteeing the rights of Spanish-speakers have been ignored, and legal petitions have attempted to exclude Spanish from the work place (Macgregor-Mendoza, 1998). School-based language discrimination has been used to segregate Chicanas/os from White students, to force Chicanas/os to attend separate schools, to force students to only speak English with the threat of corporal punishment and verbal reprimands, and most damaging, to be classified as "mentally retarded" (Macgregor-Mendoza, 1998). In this latter case, assessment is on the basis of English-based instruments administered to students with limited-English skills. There have been efforts to deport Spanish-speakers as a means to curb a growing Latino population. Lastly, the English-only movement and some state legislations banning bilingual education have amplified a social climate that denigrates Spanish and those who are associated with it.

In the after school context, we found evidence of students being marginalized because they were Spanish dominant and students reluctant to speak in Spanish. Each year of the after school, approximately fifteen to eighteen Chicana/o students participated. Of these students, only three students were monolingual English speakers, five were Spanish-dominant, and the rest were bilingual and biliterate. Lopez-Leiva and Khisty (forthcoming) report one phenomenon that recurred more than once each year of the three years of the after school. It always involved one monolingual English student (the student was not always the same) "demanding" that the mathematics activities be read in English and that all discussion be done in English likewise. The

group members, including the bilingual adult facilitator, would acquiesce to this demand and all interactions after this would be in English. This occurred even though at least one of the students in the group only spoke Spanish. The result was that this student stopped participating with the group as they did mathematics.

In this example, English was subtly deemed the privileged medium for knowledge and participation, and Spanish became the means for exclusion. Furthermore, in this instance, we have an example of microaggression where an English speaking child, along with the implicit approval of an adult, essentially pushes another student out of the mathematics and signals to the others a warning of what can happen to them if they speak Spanish. Many things are troubling about this; however, two things are worth noting. First, Chicana/o students as young as 3rd grade have already adopted the social “manners” and definitions of which language is for dominance and knowledge—even in a school and an after-school project that strive to develop bilingualism and biliteracy, and even in a community where parents speak Spanish. Second, the bilingual adult (and others who were part of a version of the same event) did not take any action to stop the exclusion of the Spanish-dominant child nor to bring the child back into the group. This is highly significant in that nearly all of the bilingual adult facilitators in the after school are Chicana/o pre-service teachers, or persons we hope would be sensitive to exclusionary actions. Moreover, none of the bilingual pre-service teachers raised questions during debriefing about what strategies might be used to meet the needs of both the monolingual English student and the monolingual Spanish student. The lack of concern for how to deal with such a situation suggested an acceptance that this was simply the way things were—and most likely, the way things would be in their own future classrooms.

Many of the students in the after school would respond to adult Spanish-speakers in English indicating that they preferred to speak in English even if it was more difficult for them to express complicated ideas in that language. Several would speak only English causing some of the after-school workers to think the students did not speak Spanish. Often it was when a parent was present that a student would reveal that she/he could speak Spanish. From these actions and non-verbal signals, it appeared that students were embarrassed to speak Spanish publicly, except when their parents were present. Also, even though all materials were in the two languages, students often chose the ones in English and ignored what was in Spanish. Here it should be pointed out that the children, most of the pre-service teachers, and even many of the participating researchers had difficulty with mathematics materials or problems written in Spanish. The pre-service teachers – and the researchers – especially noted that they had had little experience in school or university doing mathematics in Spanish, and thus, were not as proficient in this form of Spanish compared to conversational Spanish. In essence, even in a bilingual school, mathematics materials and instruction was still in English, and those of us who see the need for bilingual mathematics instruction could not adequately use them because our lack of experience with mathematics in Spanish made it difficult to use Spanish.

Students’ reluctance to speak Spanish and the difficulty students had in using Spanish in mathematics points to a general social definition that Spanish is not to be used in schools. This message is given through the lack of Spanish materials in mathematics (in some cases, materials exist but are not used) and the lack of mathematics being taught in Spanish. Recently, we encountered a national organization’s listserv message where the sender proudly described a new

school where all subjects would be taught in both Spanish and English—except for mathematics, which would be taught in English. Our experience in the after-school along with many instances of encountering attitudes such as the one expressed above, suggests an ideology that excludes Spanish from being a viable mediating tool for learning, and de facto discriminates against Chicanas/os.

Indeed students should become proficient in the official language of schools, and instruction should develop second language skills. However, students can just as easily become bilingual and feel proud of their home language and themselves. The essential point here is that “learning language” and “learning through language” are simultaneous (Halliday, 1993). What a student learns and how she/he learns it depends on the context in which learning occurs. However, linguistic choices realize particular kinds of contexts. Various classroom learning experiences are socially constructed events, that is, contexts for learning created by the interactions of teacher and students (Gutierrez, 1995). Therefore, which language and how language is used constitutes both the context that mediates learning and the content of what is learned. But the power of language extends to one’s definition of self, one’s relationship to a community, and one’s status in a wider sociopolitical and cultural milieu (Cummins, 2000). Therefore, language choices in schools mediate the value of students’ knowledge, how they perceive themselves and community, and their place in the wider society.

DIFFERENTIATED INSTRUCTION

In this section we discuss the issues surrounding the instruction delivered to Chicana/o youth. It is critical to point out that the mis-education of Chicanas/os has received attention for nearly 40 years (United States Commission for Civil Rights, 1978). Incredibly, little has changed in terms of radically transforming policies and practices in an effort to curb a disturbing pattern of Chicana/o dropout rates or to increase the level of educational attainment (Secada et al., 1998). Even in the midst of a major constructivist reform movement around mathematics education in the U.S. (Wood, Cobb, & Yackel, 1990), Chicanas/os continue to receive differentiated pedagogy (Brenner, 1998; Lipman, 2006), perpetuating that status of underachievement that has plagued Chicanas/os for decades (see Foley, 1990; Moll & Ruiz, 2002).

In our many collective years in classrooms serving Chicana/o children, we have witnessed discouraging practices in mathematics instruction. While we realize that learning how to effectively teach English Language Learners (ELLs) is a complex process, we see few strategies aimed to utilize the vast funds of knowledge (Moll et al., 1992) students bring to the classroom or to capitalize on the unique Chicana/o epistemologies they maintain. Instead of actively engaging students in culturally relevant curricula, we see large numbers of passive learners in teacher-centered classrooms.

Unfortunately, this finding is consistent with other recent reports nation-wide (e.g. Brenner, 1998; Lipman, 2006). Brenner (1998) discusses how despite the efforts of one teacher to make large group instruction more interesting and accessible to her students, she did not succeed in “stimulating two-way communication with her students (p. 113)”. Furthermore, the school made additional efforts to support Chicana/o youth with Spanish-speaking aides in the

mathematics classroom. However, students still did not receive enough comprehensible language input to develop their communication skills. With mathematical communication being a major tenet of the standards produced by the National Council of Teachers of Mathematics (NCTM, 1989), this presents a serious problem for the advancement of Chicana/o youth in the discipline of mathematics.

Instead, we see an over-use of teacher-centered instruction and an over-dependency by the teacher on the text and worksheet activities. Students quickly become socialized towards and eventually desensitized from such activities that are so prevalent throughout their mathematics schooling. We notice that Chicanas/os are often viewed as having to be managed or controlled. Therefore, any deviation from this traditional format is perceived as a loss of control in the management of the class. Orderliness is a primary objective of many teachers of Chicana/o youth, and thus the transmission model of instruction seems to dominate these classrooms. The excessive silence that can be seen in these classrooms can be interpreted as the destruction of any mathematical empowerment or ambitions that we hope to develop in Chicana/o children.

As previously alluded to, the majority of Chicana/o youth are not taught mathematics in their native language (Moll & Ruiz, 2002). Therefore, they have the compounded task of learning new ways to talk about mathematics while developing their second language skills (Brenner, 1998). Moreover, we have observed countless examples of Chicana/o children internalizing the strong social and institutional pressures to learn and operate in English at school and with their peers. This sentiment transfers into the mathematics classroom, where students who desire to participate in class discussions in English opt not to due to insecurities in their English language skills. This is particularly true in heterogeneous classes that have a mixture of both native English-speakers and native-speakers of another language. In the mathematics education field, work has just begun to address this issue.

Finally, there is the looming and suffocating issue of accountability being emitted by the federal government in the U.S. Accountability in this sense, and in this context, means the regular testing of every student's mathematical skills (in English) with the penalty of specific sanctions for underperformance. This translates to increasing pressures placed on administrators, and consequently teachers, to compromise what they perceive as best teaching practices in order to adequately produce students who are able to score well on standardized examinations. At one elementary school in which we have invested much time, the school has worked hard to develop and implement a philosophy of teaching and learning that they feel, and we concur, best addresses the needs of the Chicana/o community. It is a dual language academy that structures the school day so that children receive 50% of instruction in English and 50% in Spanish. However, it is increasingly apparent that this philosophy is becoming forcibly compromised due to "underperformance," as arbitrarily deemed by the central administration, on the standardized exams. This results in threats to close the school that teachers, administrators, parents, and community stakeholders have worked tirelessly to develop for decades. When a test becomes the main ends of the educational process instead of the holistic development of the child and consequent improvement of life options, pedagogic means are sure to be negatively altered. Certainly, this is the case at this school.

SIGNIFICANCE AND CONCLUDING REMARKS

Much of the current debate on how to improve the mathematics learning of minority students occurs at the level of primarily methodological and mechanistic terms disconnected from the sociopolitical realities that shape school failure (Bartolomé, 2003), terms that are rooted in deficit thinking that locates failure in the student. However, we know we can change test score results by changing practice (Khisty, 2004); we also can change test scores by changing the language of the tests (Abedi & Lord, 2001). What is needed are schooling practices that genuinely value Chicana/o children and begin to eradicate racism and bias with regards to language and instruction.

Discussion of the politics of racism, marginalization, and discrimination in mathematics is not entirely new in mathematics education (e.g., Martin, 2006) or unique to the U.S. (e.g., Satati and Adler, 2000). However, there is still little discussion of these sociopolitical factors in mathematics and even less so for multicultural, multilingual mathematics contexts. There is much to be understood of how these factors operate. It has been our intention to help fill this gap. The ideas and work presented in this paper contribute to filling this gap.

Language is political and instructional decisions in mathematics, be they curricular or pedagogic, inherently involve language and therefore, have political significance and consequences. Interestingly, the highest correlation with staying in school is enrollment in advanced mathematics (Cardenas, Robledo, & Waggoner, 1988). Furthermore, the highest academic achievement occurs among students with the strongest linguistic skills in their primary or home language (Thomas & Collier, 1997). By implication, Chicanas/os who are able to read, write, and communicate at a high level in their primary/home language—in this case, Spanish—do better in school where English is the medium of instruction, are more likely to enroll in advanced mathematics, and are more likely to complete school and enter higher education. In other words, language and mathematics are intricately intertwined, and as such, together play a significant role in whether schooling is oppressive or liberating, and ultimately, whether Latinos continue to be subjugated. In short, language is power.

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