ENGAGING WITH PARENTS ON A CRITICAL DIALOGUE ABOUT MATHEMATICS EDUCATION

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In this paper we present a continuing effort to engage in a dialogue with parents about mathematics education. Using the technique of the unfolding matrix (Padilla, 1993), a group of parents and researchers critically examined and reflected on the parents' mathematics educational efforts with their children and in the district. The dialogue expanded our understandings of the valorization of knowledge making evident power relations. We discuss mathematics as a cultural tool highlighting the need to acknowledge intellectual resources and ways of knowing present in the home. This research is particularly relevant to those working in low-income, ethnic / language minoritized communities (e.g., with immigrant parents).

Keywords: Parental involvement in mathematics education; Equity; Immigration; Social class; Knowledge valorization; Socio-cultural theory.

The work reported in this paper took place within a large parental involvement project in mathematics called (MAPPS)[1]. One of the goals of this project was to develop the concept of leadership in mathematics education as it applies to parents. To this end, parents in MAPPS first engaged in a series of learning experiences in mathematics and then formed teams (with teachers in some cases) and facilitated mathematics workshops for other parents in the community. This approach to "parental involvement" is grounded on the concept of parents as intellectual resources (Civil & Andrade, 2003) and is particularly relevant in communities such as the one where our work takes place—low-income, ethnic and language minoritized communities. In those communities, parental involvement is often confined to a very traditional definition in terms of volunteering in school activities such as fund-raising events, preparing bulletin boards, or organizing supplies. Parents, especially those who are low-income, immigrant or members of certain ethnic groups, are hardly ever invited to contribute their knowledge and expertise to the academic aspects of school life.

The research we report in this paper focuses on our work with a small group of mothers, most of whom have been long-time participants in MAPPS. To further understand their perceptions about mathematics education, while at the same time continuing to engage them in mathematical explorations, we began the "*tertulias*

[1] Project MAPPS (Math and Parent Partnerships in the Southwest) was implemented in four sites in the Southwest of the USA. The project is funded by the National Science Foundation (NSF) under grant – ESI-99-01275. The views expressed here are those of the authors and do not necessarily reflect the views of NSF.

matemáticas" [mathematics forums]. The *tertulias* emerged as an effort to facilitate additional dialogue, critical examination, and reflection about the MAPPS parents' mathematics education efforts with their children and in the district. These conversations were seen as a vehicle towards community action. In this paper we elaborate on how the parents experience and understand issues surrounding their children's mathematics education. This topic is of interest to educators across the world due to global population movements, the existence of class differences, and the differential treatment of ethnic and language groups, all of which reflect power issues at play in modern societies. For example, recent work by Abreu, Cline, and Shamsi (2002) and Gorgorió, Planas, and Vilella (2002) address issues surrounding immigrant families and mathematics in England and Spain, respectively. Their research highlights mathematics as a cultural tool and the relevance of establishing a connection between home and school knowledge.

Theoretical Framework

As with any large project, different staff as well as the participants themselves may have had differing understandings and expectations for MAPPS. For some, the primary goal was for parents to be able to help their children with their school mathematics work. For others, and this includes the three authors, MAPPS was about leadership development among parents. It was about engaging in a critical dialogue with parents in which several issues related to their children's mathematics education were jointly explored. Our approach to research is informed by the lens of cultural historical activity theory (CHAT) and in particular the framework of "ecologies of parental engagement" (EPE) (Calabrese, Drake, Perez, St. Louis, & George, 2004).

As we examine the role parents play in their children's schooling, we part from the notion that individual agency is embedded within a system of activity impacted by social, economical, and political forces (Monzó, 2004). Accordingly, it is through that sociocultural lens that we examine the issues surrounding working class / low income parents and their engagement with the schools specifically regarding the mathematics education of their children. CHAT allows us to consider the interaction of parents and schools in a broader sense by using the family and the school as units of analysis. These systems have taken shape and been transformed over time (Engeström, 2001) under the influence of the above-mentioned forces. In our work regarding parents' understanding of their role in the mathematics education of their children, CHAT also provides us with a way to explore unequal power positions and the tensions that result from the power differentials within and between the different components of these systems. As Calabrese et al. (2004) write,

> Social organizations, such as schools…are embedded with cultural values. These values manifest themselves in recurring social practices and their artifacts that give order, purpose, and continuity to life in that social organization. (p. 4)

Hence, for example, the correct way of doing mathematics is defined by the teacher and communicated to the parents and their children. Schools also define how parents should be involved. Accordingly, schools reflect and abide by the structural location of individuals in the wider society (Valdés, 1996). The knowledge that working class and minoritized parents possess is not given the same value as that which middle class parents possess and the ways that these parents are "involved" in their children's schooling experience are defined according to the ways in which middle class parents participate in their children's schooling (Horvat, Weininger, & Lareau, 2003; Lareau & Horvat, 1999).

The Ecology of Parental Engagement framework (Calabrese et al, 2004) includes parents' experiences and actions in the school and in the community. As parents negotiate a space in the school through programs such as MAPPS, they draw on their various experiences and capital to frame their interactions with schools and school personnel. This capital leads to the development of tensions relating to prevalent ideas regarding parents in the system, e.g. valorization of parents' knowledge (Abreu, 1995) and pre-established views of parental involvement.

Context and Method

About the *Tertulias*. The *tertulias matemáticas* took place as MAPPS was nearing its official end. As researchers, we sensed the need to continue our dialogue with a small group of the participant-mothers. We had developed ties and rapport with several of them and we were particularly interested in creating a space of empowerment that would possibly lead to action. This need led to the development of the *tertulias matemáticas* (building on Civil & Andrade, 2003; Flecha, 2000). We sent out letters to approximately 30 mothers who had actively participated in the MAPPS program anywhere from one to four years.

The *tertulias* took place in a meeting room at a public library within the boundaries of the school district. We had 16 sessions that lasted an hour and a half each, every two to three weeks during the fall of 2003 and the spring of 2004. There were 15 participants--14 female, 1 male. The others invited were not able to participate due to personal commitments and scheduling issues. Each session had two main sections. The first section focused on parents learning mathematics. Sometimes we studied a specific mathematics theme such as algebra. Other times, direct connections to their children's school experiences were made through samples of homework that the participants brought in. These samples enhanced the conversation about mathematics content, the current mathematical learning experiences of their children, the current classroom climate (e.g., standardized testing influencing teaching), and parents' values and beliefs related to mathematics education. The second section of the *tertulias* continued our efforts to have a two-way dialogue with parents about mathematics education. The discussions centered on challenges and possibilities relating to their children's mathematical education. The goal of the second component was to facilitate the development of a critical awareness leading to action. This paper focuses on this second component.

The Participants. All the mothers in the *tertulias* had been part of the MAPPS project for at least one year, most of them from 2 to 4 years. There was one father who attended the *tertulias*. He was not associated with MAPPS, but his partner had been in MAPPS for one year and was also attending the *tertulias*. All the participants but four self-identified in the parent profile as Hispanic or Mexican. All the participants had some understanding of English and Spanish, however several of them felt comfortable just in one of the two languages. The participants in the *tertulias* (and here we focus on the mothers, since they were the ones who had also been in MAPPS) are not to be taken as representative of other working-class or low-income mothers in the district. The educational background of our particular group from the *tertulias* is diverse and it is probably higher than the average education level of the parents in the district. Another characteristic of our group is that nine of the fourteen mothers had jobs related to the school system (teacher assistants, instructors at family literacy, bus driver, Parent-Teacher Organization member, substitute teacher). In addition to this, one of them was an undergraduate student of secondary education. Two participants had jobs not related to the school. This information is critical because these positions gave the parents the opportunity to form direct relationships with members of the school staff as well as to access other sources of information about the educational system. At the same time, it makes explicit our belief that a small group of parents cannot be taken as representative for all parents in the district (see Shumow, 2001, for the dangers of listening to the voices of a few "representative" parents).

Sources of data and analysis. All the tertulia sessions were videotaped. We also audiotaped parts of some sessions and took field notes. For this paper we focus on one particular approach that we followed in our analysis. We used the technique of the unfolding matrix based on a dialogical method (Padilla, 1993). This method purports that by critically examining problematic aspects of their own lives, participants can obtain a critical understanding necessary to identify viable possibilities of change. To problematize the experience and to raise the discussion to the level of the community, not just the individual participants' experiences, we asked participants to explore the question, "How can all children in the district be successful in mathematics?" Thus, various tertulias centered on group discussions focusing on knowledge and barriers that the participants had identified related to their children's mathematics education. In the next section we present some of the findings from these group discussions. We begin with an excerpt from the matrix to further illustrate how we used this approach.

The Matrix

To encourage discussion of the question posed to the parents in the *tertulia* we used some prompts from MAPPS participants collected throughout the four years the project had been in place. These prompts were selected using grounded methodology (Charmaz, 2001), that is, they capture emergent themes present in several interviews. The *tertulia* participants responded based on the connections

between their experiences and the quotes. For example, the quote below captures a theme that is a constant in our discussions, that of the changes in the teaching of mathematics. This is even more crucial to discuss when the parents went to school in a different country, as is the case with many immigrant families.

> *And talking about the children, about teaching them and learning from them, it's true that when I come home from school, the little one who's five years old says to me, "Mommy, are you going to learn so you can teach me?" "Yes, I'm going to learn so I can teach you." On the other hand, the older one that's in fifth grade [10 years old] says, "Mommy, I'm going to explain something to you that you did not learn in your class."*

Julie, one of the mothers in the tertulia, commented on this quote:

> And that's just, it's not so much that they're going to teach me what I didn't learn, it's just that the wording to me is different because if I tried to explain to her [her daughter] what she was doing and she says, "no Mom, but they didn't tell me that in school", so that's not the way she's supposed to learn.

Bertha, who immigrated from México, also chose this quote and said,

> Me, because I learned a different way in México and to me it was really difficult (…). I had to learn what he [her son] was learning in order to help him at home because I have to build the trust between my son and me because he didn't trust me at all. Because he said, "no, no, you don't know how to do it" and I know that I know, that I have the knowledge but I don't know how to explain (to) him the way that…

Some of the quotes we chose were particularly controversial, such as the one below from a teacher participant in MAPPS,

> *Where here [in this school district], whatever I do isn't really all that important, I don't think the parents really have any idea what I'm teaching their kids, it's not as important to them in this district, from what I've seen. [Referring to another district where this teacher had been before] You know some of the parents were involved and they would come in or were on the PTA [parent teacher association] and you'd see them after school and they'd ask you how their kid was doing, where I don't get that all that often here.*

This quote conveys an often-heard feeling that "certain parents do not care about education" (for a discussion on the history of the myth that Mexican American parents do not value education, see Valencia & Black, 2002). What we have found in our research is that some parents do agree with the sentiment expressed in the excerpt above, as Rhonda, a parent in the tertulia, confirms,

> I don't know how to say that without being insulting … [this teacher is] right. Because a lot of parents don't care and it's not because they don't care, it's because they don't understand what's being taught. And a lot of our parents, especially in this district, are Spanish speaking parents and not all our Spanish speaking parents are willing to stay back and let the language barrier hold them back, but the majority of them do stay back and they have no clue what

they're teaching their children, none whatsoever. They can't help them with their homework, they're intimidated by their teachers, they don't want to get involved, because they're holding off because of the language part of it and as a teaching assistant, I have to agree with [this teacher] because when children bring back the homework, and we tell our parents, Spanish speaking parents, this is the way you do it. If you don't understand, please come, don't be embarrassed, come and help us out, you know, we'll explain it to you, but they don't come, they don't come and the homework is not getting done…

The discussions from this session were transcribed with several themes emerging through that process. These new themes were added to the matrix and became the stimuli for further discussion. This "spiraling" process lends itself to the development of critical awareness and possible action based on the analysis. We wonder if the fact that many of these mothers were themselves part of the school system (through their jobs and affiliations) may have led some of them to conform to the general school system view on some issues (e.g., "parents in this district don't care"). This "being part of the system" may account for some of what we (as researchers) perceived as obstacles to these parents taking action.

We organized the participants' reactions into three sections- parents, teachers, and students. Below is an excerpt from the matrix (for reasons of space, we are only including one of the sections, that of parents):

	How can all children in the district be successful in mathematics?		
	BARRIERS	**KNOWLEDGE**	**ACTIONS**
Parents	1. Learned in a different way (i.e. division) country. and/or different generation 2. Vocabulary. 3. Valuing of one education system over another.	1. How math should be taught in the US standards 2. Knowing the particular method of the teacher 3. Importance of valuing different methods. 4. Knowing that having different strategies is good for children	MAPPS helps parents to be able to help with some homework, gain credibility, understand different methods, confidence in yourself, more communication with your children

As we can see in this excerpt from the matrix, the notions of value / valorization / different methods are clearly present in the three columns. In the next section we elaborate on these notions.

Findings

Parents and personnel from the school system are motivated and constrained by rules (e.g., in our local context, new legislation limiting bilingual education); are

impacted by perceived power differentials (e.g., the teacher as the mathematics expert); have different understandings of the division of labor (e.g., who is responsible for teaching the child); and have different understandings and valorizations regarding the particular tools of a system, (e.g., the curriculum of the school vs. the home as a source of knowledge). In addition, the history of both the individual parents and the school system contributes to the way in which these two institutions interact. Each parent in the *tertulia* brings with him or her past experiences with regard to mathematics learning and teaching. Likewise, the school system, including teachers and administrators, has developed its ideology regarding the teaching of mathematics over time in accordance with the context of the times.

Our findings in this paper focus on one theme that relates to the first quote given earlier. As children learn approaches to mathematics that are different from what their parents learned, the issue of comparing approaches inevitably comes up. We draw on Abreu's (2002) concept of valorization of knowledge to elaborate on parents' experiences discussed in the *tertulias*. The notion of valorization is related to the "prestige associated with the ways of knowing of specific communities of practice" (p. 190). The results of valuing one person's knowledge over another have profound implications in the parents' and children's schooling experiences, as their knowledge may stand in contrast to schools' knowledge. The parents had an initial tendency to give higher value to their own forms of doing mathematics, which in some cases meant the way they had learned in schools in México, although it was not a group consensus. In one discussion addressing different algorithms for arithmetic operations, Marisol explained that her son's teacher had taught him a certain way to divide, which she thought was a "cochinero" (a mess). So, Marisol had taught her son her way to divide, which she had learned in México. In contrast to parents, children valued schools' form of knowledge more often over the parents' knowledge. Thus, Verónica's oldest son rejected her method of dividing because he feared the teacher would think that he was cheating, since Verónica's method includes doing some mental calculations with no written notation. Verónica was taught that writing everything and crossing out was slower and messier. Yet her son still chose the teacher's method due to his unwavering concern that if he did not show all his work the teacher would think he was cheating:

> Verónica: I tried to do the same with my child with divisions, that he wouldn't write everything, but he says, "no, no mom, the teacher is going to think that I did it on the computer", "but you don't need to write the subtraction son, just write the answer." "No, no, my teacher is going to think I did it on the computer, I have to do it like that", "ok, you have to do it like that, but I want to teach you how we learned it." And I did teach him but he keeps doing the (teacher's) method, and that way he feels sure that he will take the homework how he was told. The same when putting on top what they carry and then crossing it out, when he does that, I tell him, "Son, I remember that homework is not supposed to have things crossed out," and he says, "yes, it's Ok."

Abreu, Cline, and Shamsi (2002) discuss a similar situation in the context of multiethnic primary schools in England and conclude that, in order for parents to adjust to their children's learning they must be aware of the differences, as well as have the knowledge and confidence to tackle the differences constructively. Based on our experience, this also requires valuing diverse methods and the parents suggested that it is constructive not only for parents but also for teachers. Even though some current documents in mathematics education (e.g., in the U.S., the *Principles and Standards*, NCTM, 2000) address the benefits of diverse methods, when it comes to mathematics there is a common notion that there is a "right way" of doing things which is often associated with the textbook's/ the teacher's/ "expected" algorithm/method. Alternative approaches are often not treated equally. Approaches are given a specific value based on the social power of those who hold them. In this context, the parents' or home method is not given the same value as the teacher's or textbook method. Historical relations of power at the schools can not only be reproduced but also exacerbated through mathematics education. Several of the parents shared feelings of frustration about their children's distrust of their ways of knowing. When trying to help with homework the parent-child relationship was affected even more when the parents were not fluent in academic English.

The concern over the discrepancy regarding the valorization of knowledge adds to the tension Mexican immigrant families experience in relation to the quality of the education their children receive. Several immigrant parents in our project wonder whether the U.S. school system is doing a good job at educating their children. These parents often make binational comparisons (for research on this, see McLaughlin, 2002; Macias, 1990). One such immigrant mother, Bertha, is very clear in her view that her children are behind in mathematics compared to her relatives or friends in México.

> Bertha: No, I'm not happy. I feel that there is repetition of a lot of things; I don't understand why the teaching is so slow, I don't like it, I don't like the system, I don't like it at all. I, when we go to México my nieces and nephews or my husband's nieces and nephews, there are children that are more or less the same age as Jaime and I see that Jaime is behind. Here they tell me that Jaime is really excellent.

Bertha's comments capture a recurrent theme in our research (and in comments about other similar settings), which is this idea that the education system in the U.S. is slow and not as advanced as that in, for example, México. This is a complex situation in which critical questions need to be addressed such as, is seeing mathematics content earlier an indicator of a higher educational level? There is a need for more cross-national data on curricular differences between México and the United States and for a further exploration of how parents form their understandings of mathematics education in the U.S.

Final Remarks

The teaching and learning of mathematics is linked to values, beliefs, and expectations (Gorgorió, Planas, & Vilella, 2002). This creates critical challenges for schools with diverse populations, especially in communities with unbalanced power relations among the participants. At the *tertulias* we engaged in a dialogue that expanded and mediated our understandings of the valorization and power relations between the parent and school activity systems. The mothers at the *tertulias* discussions acknowledged their responsibility to understand the school's knowledge, while at the same time they saw teachers as key agents to connect school and home knowledge. As Marisol said,

> This is the first problem, the teacher sends papers, the teachers want to do a better job with the kids that come from México or from people in Spanish speaking places, but they don't start thinking that it is not just the kids it is the parents and they go together.

The idea that children do not come to school as individual beings but as part of a community is true not only for Spanish speaking or immigrant families, but for all families. Schools need to be cognizant of the cultural and historical nature of mathematics knowledge. Having these critical dialogues with parents about mathematics education as an area of power contestation may facilitate the process of empowerment that Delgado-Gaitan (2001) and Freire (1998) have called for. As Valenzuela (1999) argues, home-school relationships are a crucial component for additive schooling where there is a culturally relevant and sensitive curricula that in this specific case would acknowledge the mathematical knowledge present in minoritized communities.

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