Parents as Observers in the Mathematics Classroom: Establishing a Dialogue Between School and Community

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In this paper we present a model for mathematics classroom observations conducted with parents that allows us to engage in a dialogue on issues around reform-oriented mathematics teaching. We will report on our findings on Hispanic, working-class parents' perceptions about the teaching and learning of mathematics.

As a means of introduction, let's look at the two vignettes that follow. Both took place in our local context.

Vignette 1: A second grade teacher has just finished teaching a lesson on median and mean. Unfortunately, she has those two terms mixed up and children go home that evening with the wrong information. By the next day, this teacher has received a long series of phone calls and notes from concerned and in many cases angry parents.

Vignette 2: A second grade girl has attended a Math workshop with her mother, in which she has learned a new way to add, from Left to Right. The girl is really proud of her new knowledge and shares it the very next day with her teacher. The teacher pretty much dismisses it and tells her that she needs to add the way she's been taught at school. The mother is saddened by the teacher's reaction because she feels her daughter's feelings have been hurt. As she is telling us the story, she says, "I understand that it's probably not good for children to learn all these different ways because they may get them confused, but…"

Vignette 1 took place in an upper income school district where teachers know that parents will call in or come by if they perceive that something is not "working out" with their children's education. Vignette 2 took place in a primarily working class, Hispanic school district, where parents hardly ever challenge the teachers on academic matters. In terms of Bourdieu's concepts of capital, in vignette 1 parents have the kind of economic, cultural and social capital that yield power. Our work centers on the parents represented in vignette 2, who also have cultural and social capitals, yet not of the kind necessarily recognized by the schools (Lareau & Horvat, 1999). In this paper, we first give a brief theoretical orientation to ground our work. We then give an overview of the parental involvement project in which we carry out our research, including some history on the mathematics curriculum in one of the districts. The core of the paper focuses on a model that we developed in which parents in that district conduct observations of mathematics classrooms with the goal of establishing a dialogue around issues related to the teaching and learning of mathematics.

Theoretical Framework

Our orientation to research on parental involvement is grounded on the work we have carried out during several years in projects such as Funds of Knowledge for Teaching

(González, 1995; Moll, 1992; Moll, Amanti, Neff & González, 1992) and more recently in project Bridge (Civil & Andrade, 2002; in press). In this orientation, we view parents as intellectual resources towards their children's education. We explicitly reject the deficit view model that is often attached to the education of ethnic and language minority, working class students. A deficit view often positions the homes and communities at the root of students' academic failure, without taking into account the institutional biases inherent in schools that have contributed to the mismatch between home and school. We use a socio-cultural lens with which to situate the people, places and contexts in which we work. This allows us to move away from descriptions of obstacles and deficiencies toward a description of resources and competencies. We base our work in a growing knowledge of the particular families we work with, as Valdés (1996) suggests, including their broader context. We consider crucial to learn about their daily-life contexts, resources, values and beliefs that shape their learning experiences at the schools. In our work, we rely on establishing a two-way dialogue with the parents as we seek to learn from each other's experiences and knowledge bases. Flecha's (2000) concept of dialogic learning, and in particular the idea of egalitarian dialogue have been particularly helpful in our research:

> A dialogue is egalitarian when it takes different contributions into consideration according to the validity of their reasoning, instead of according to the positions of power held by those who make the contributions. (Flecha, 2000, p.2)

As Abrams, L. & Taylor, J. (2002) mentioned, strengthening ties between parents and schools is a challenging task as we are part of a context of inequitable power arrangements of the larger society. This idea of critically examining issues around positions of power is also reflected in some of the literature on parental involvement (Henry, 1996; Vincent, 1996). Lareau (1989) and Henry (1996) have discussed the influences of culture and socio-economic factors on the nature of home-school relationships. Research indicates that working-class parents as well as parents from certain cultural groups have historically had an uphill battle in advocating for their children's best interests in schools. Reay (1998), in her research on mothers' involvement in their children's schooling, points out the different roles and approaches among middle-class and working-class mothers:

> [For the middle-class mothers] Educational problems, when they did arise, were due to deficits in schooling, rather than located in either themselves or their child…. In contrast many of the working-class women had learnt from their own experience of schooling that educational difficulties were due to failings in the individual, rather than the system (p. 64)

Furthermore, Reay's interviews with immigrant women underscored the difficulties that many of them encountered as they tried to build on their cultural capital for their children's benefit. Their experiences with schooling were so different from what their children were experiencing in their new country that their cultural capital was of little use in their current situation. Cultural capital is field specific or valuable depending on the social context as it is made evident in immigrants' experiences. Furthermore, as Lareau and Horvat (1999) highlight, parents' cultural and social resources become forms of capital when they facilitate parents' compliance with dominant standards in school interactions. It is this concept that puts our working-class parents and Latino parents in a position of disadvantage next to other mainstream groups. Reproducing cultural capital is not deterministic. Those involved can and do have the power to activate or use their resources as a way to think about the social forces playing against them. Sztajan (2003) found that educator in schools could also shift their practices and pedagogy through partnerships or leadership and on-going collaboration. In this context we believe parents, students, educators and policy-makers are capable of transforming inequitable power relations between parents and schools and between cultural and social class groups (Abrams & Taylor, 2002).

Math and Parent Partnerships in the Southwest (MAPPS)[1]

Project MAPPS is a four-year long project that focuses on parental involvement in mathematics. It is currently in place at four sites (Tucson, AZ; Chandler, AZ; San Jose, CA; Las Vegas, NM). The project started in Tucson in 1999 and at the other three sites in 2001. The implementation at the different sites may vary somewhat according to their local needs but overall we share some common goals. One such goal is to develop leadership teams (LT)

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(parents and teachers/administrators) that will help in the mathematics education outreach effort throughout the districts involved. The project seeks to promote the leadership of parents in mathematics activities in home and school, through three components:

a) Leadership Development sessions in which parents, teachers, and administrators come together to explore different learning styles, to learn how to facilitate workshops for the larger parent community, and to work on parent recruitment issues.

b) Mathematics Awareness Workshops (MAWS) that are open to all the parents in a given district and range over key topics in mathematics in K-12 (e.g., one workshop explored multiplication and its different representations; another workshop centered on "discovering π (PI)"). These workshops are self-contained and last about 2 hours. Children and parents are invited to attend with the children being dismissed at some point in the workshop to allow for the parents and other family members to engage as adult learners or to discuss and analyze their children's thinking.

c) Math for Parents (MFP) courses in which parents in the Leadership Teams (and a few other guests) have an opportunity to explore mathematical topics in more depth. These courses meet for eight weeks in 2-hour-long sessions. We have developed five MFPs-- in algebra, geometry, fractions and decimals, numbers, and data. These courses are taught by experienced instructors (teachers, university professors), some of whom are the authors of the MFP materials.

In this paper we focus on our work in Tucson, where the project has been in place for four years. We currently have four leadership teams with a total of 34 parents and 17 teacher/administrators involved. The Math Awareness Workshops are facilitated by teams of parents and teachers. A team of six participants from Leadership Team 1 (4 teachers and 2 parents) coordinate the different teams presenting the MAWS. This structure was developed as a means to facilitate district's ownership of the project once the funding ends. The school district is largely Hispanic (82%) (mostly of Mexican origin) and with 81% children on free or reduced lunch. Students in this district overall do not fare very well in terms of academic achievement (as determined by results on tests such as Stanford 9 or on a more recent and so far highly controversial high stakes assessment program).

A Look at the Mathematics Education Context

When MAPPS started, this district was using a Standards-based curriculum for its K-5 grades (Everyday Math) and for its 9-12 grades (IMP). For the middle school years, things were a little less clear. Some used Everyday Math for 6th grade and some started introducing aspects of IMP in grades 7 and 8, but overall the trend seemed to be to use a somewhat more "traditional" curriculum. One of the reasons why we chose this district as a site to implement MAPPS was the fact that they were using these Standards-based curricula. The materials developed in MAPPS as well as its overall teaching approach are largely based on NCTM (1989, 2000) documents. Prior to the implementation of MAPPS, the first author had had a chance to interact with some parents in the district. Some of them had expressed certain concern about IMP, but not so much in a negative way as in being against it, but in terms of wanting to know more about it because their children were bringing homework that did not look familiar and they were not sure how to go about helping them. A key problem, in our view, with the implementation of that curriculum was that there were not enough textbooks in the district and thus students were not able to have their own book to bring home. A key concern that the parents were having was not so much with the curriculum but with the fact that very few students graduating from high school were placing into the mathematics courses at our University. Quite a few of them had to take the "remedial" courses at the community college before being able to transfer to our university. This, we think, had nothing to do with the curriculum per se, since it had been happening for a while, long before IMP was in place. At the K-8 level, many teachers were not really using the curriculum as intended. Many of them were using a combination of "traditional" worksheets as well as standards-based material, but what was not always clear is whether they had a coherent road map for the mathematics education of their students.

About two years ago, the district decided that these adopted curricula were not working out and has since switched to a more traditional set of textbooks. As one of the district's curriculum specialists confirmed, only about 15 to 20% of the elementary teachers were really using Everyday Math. This may have been due to the fact that teachers had not been given enough professional development opportunities to use this curriculum. Other factors may have played a role, such as teachers' beliefs about what teaching mathematics entails.

In any case, as the district's administrators were looking for which textbooks to adopt, since they were aware that not many resources would be allocated for professional development, the idea of finding some kind of "teacher-friendly" series looked quite appealing. In the end, the adoption resulted in rather traditional series of textbooks at all levels (at the elementary level, the teachers were given three choices, one of them being another Standards-based curriculum that once again would have required extensive professional development). Some exceptions to the adopted series were allowed (based on school's choice) and thus there is one elementary school that is still using Everyday Math and at least two elementary schools that are using a "back to basics" type of series.

The adoption took place after our second year of MAPPS. Several of the parents and teachers in the project were very discouraged with the change and even questioned what the point of MAPPS would be since the district was moving away from "reform math." We recently interviewed Rhonda, a mother who was an active participant of MAPPS during the first two years. She is very involved with the PTO at her school, where she also works as a teacher aid. She was particularly upset when the district decided to change textbooks. We include below some of her comments on the adoption process.

> No one ever told us, parents were never informed that they were gonna change the curriculum. And the district says, "but we sent notices home." I never got a notice at home. I didn't even think there was anything wrong with Everyday Math, I liked the curriculum, I could see first-hand that it was different, and there are things I didn't even know, you know, se te prende el foco! [the light bulb goes on] Yeah, it was hands-on and I liked that, that it was hands-on and the book explained everything, very, very well, so that's when I found out that they were gonna change it and my teacher was not happy, and they gave them a selection, and I saw books out here, you know all parents saw a bunch of books out here but nobody knew what they were about, you know, nobody told them "hey, we're gonna change the curriculum, come and look at the books."
>
> Well, they need to tell us, this is why we are going to change, they need to give us specific why, what are the reasonings for the changes, myself as parent, I want to see a book, show me a couple of chapters, show me how you would teach my child, how is it better than this other book that you have, you know, and that's the questions that I would ask, and … this book if I have to read it and I don't understand it, why would I want this book for my child, because I am supposed to be helping them with their homework and if I don't understand it, and I am the adult, why choose material that a parent can't understand, so it's like, it doesn't make sense, but that's what I've learned, they don't consider parents and they don't consider the children, whoever makes the decision.

Rhonda is not alone in her frustration. As the change was taking place, we heard from several other parents, all involved in MAPPS. Their main concern was their lack of knowledge about the process. They feel they were kept in the dark. Granted, our group of parents and teachers was a very small subset of this school district and we cannot even say that they were representative: most of them had chosen to be in this project, which was geared towards standards-based mathematics.

What is problematic, we think, is that even this mother who was so involved in many aspects of school life and was physically present in the school building everyday since she works as a teacher aid, was kept in the dark. But perhaps more problematic to us is how we can help parents become so familiar with the intricacies of mathematics teaching and learning that they will be able to be their children's advocates, should there be a need. Rhonda said that she did not think that parents were aware that the curriculum had changed. Based on informal conversations we have had with parents, we would tend to agree with her assessment. To us, it is not so much about what curriculum has been adopted but what the teaching and learning practices are (Boaler, 2002). From what we have gathered both, from talking to teachers and parents in the district, as well as from our classroom observations, it seems that there is a wide variety in terms of how (and whether) the new series are being used. One teacher-leader who has been involved with the project for 3 years was extremely upset about the change from Standards based to a more traditional text adoption. When asked why he thought other teachers voted to change the books he felt that other teachers were uncomfortable with the new curriculum. He went on to say,

> There are teachers here and at the other high school, who, this is not how they learned mathematics, they are going to do math the good old fashioned way and where is the practice? Where can I give them 50 problems so that I can sit right there and have them do it and have them turn stuff in? Well it wasn't there, this was all hands on active stuff. You had to grade using a lot of different techniques. You'd think after a while that paper and pencil assessments may not be the only way of determining what a student knows. They didn't like it because they tried to mold it into a traditional program, so they didn't like it. The book didn't have all the problems they wanted to give them. [Teacher Interview 1-27-03]

How can we then help parents make sense out of the mathematics education that their children are receiving, when, to be honest at least in our local context, it appears to be

confusing even for those of us who are mathematics educators since it is not clear who is using what? Here are a few obstacles that we have identified, as we try to establish a dialogue with parents on issues related to the teaching and learning of mathematics in their children's schools:

1) Parents' own lack of knowledge of mathematics (e.g., if Vignette 1 at the beginning of this paper had taken place in our district, we doubt that many parents would have realized the mathematics error. The majority of parents in our project (and keep in mind that this is a select group to begin with) were not familiar with the concepts of mean and median till they were discussed in a Math for Parents course on data.)
2) Parents' beliefs about what mathematics teaching and learning should be like: this is a complex issue. On one hand, parents bring to the table their own experiences as learners of mathematics when they were in school (whether in the US or in Mexico); they are also experiencing a "reform-based" approach in most of the MAPPS events, which they all find very enjoyable… but is it what they want for their children?
3) Parents' cultural capital does not fit the expected norms of the school. As Reay's (1998) found out in her interviews with immigrant women, we also have many examples along the same lines among the mothers who are recent immigrants from Mexico and Central America. In some cases, even their having been teachers in their country of origin seems to be of little help in their current situation. And we would add that unfortunately their cultural capital is hardly ever recognized by the school.
4) Parents' and teachers' differing perceptions of their roles and expectations. There is a persistent deficit view of working-class parents by many teachers in the district, which may spill over to expectations for students of working-class parents. Teachers want to feel like they are not alone in the educational realm, however, they also want to be in charge of the learning process. The parents want to be included in schooling in meaningful ways but are often unsure how to do this, or in the very least, are unsure how to navigate school norms when they are different from their own experiences and knowledge.

The different components (Leadership Development; MAWS, MFP) in our project as described earlier, allow us to address some of these obstacles. By engaging parents in

learning and teaching activities that reflect the recommendations of Standards-based instruction (NCTM, 2000), we hope to accomplish two goals:

1) To familiarize parents with these recommendations in a direct, hands-on way. This may help address the questions, doubts, and misunderstandings that some parents may have about these "different ways" to do mathematics. There is not much research on parents' views on mathematics education reform, but that research points out to the mixed feelings that parents seem to have about the new approaches (Lehrer & Shumow, 1997; Peressini, 1997).
2) To counteract the possibility that, as Lubienski (2002) writes, these new learning environments that are called for in the reform documents, may in fact further "privilege those possessing White, upper-middle-class 'cultural capital' (Bourdieu, 1973, p. 71) in new, unanticipated ways" (p. 108). We agree with Lubienski that these new environments call for different roles for teachers and students and that in particular the focus on discussion in the mathematics class may privilege some voices over others (see Civil, 2002, for an example of a teaching innovation in a fifth grade classroom and its effect on patterns of participation). By engaging with the parents in dialogue about these issues, we hope to bring the potential obstacles to the foreground and hence address them rather than ignore them.

By bringing in teachers and parents together, we have one third goal in our project:

3) To provide a common arena for parents and teachers to dialogue about mathematics education reform. Research on parental involvement, including that specific to mathematics points out that parents and teachers are often seen as opposing each other rather than as partners and true collaborators towards the education of their children (Henry, 1996; Peressini, 1998).

The Math for Parents courses provide learning experiences for the parents, aimed at strengthening their understanding of mathematics. The Math Awareness Workshops provide yet another avenue for parents to learn mathematics as they become facilitators of these workshops. But furthermore, MAWS allow for teachers and parents to work together, and in doing so, we hope that this helps establish a fruitful relationship between parents and teachers (Civil, 2001). But, there is one more activity that we have found perhaps even more

powerful towards the establishment of this dialogue with parents about issues on teaching and learning: to provide opportunities for parents and researchers to observe mathematics teaching at the K-12 level and then debrief these observations to better understand each other's perceptions and beliefs about teaching and learning mathematics. This work was started in the first year of the project (Anhalt, Allexsaht-Snider, & Civil, 2002) and has evolved into quite a systematic approach that we describe in the next section (Civil & Quintos, 2002).

Conducting Classroom Observations with Parents

Our research draws on classroom observations held with a small group of mothers, usually four, who participate in MAPPS. Two of the authors have conducted several classroom observations at Elementary schools, a Middle School and a High School. Furthermore, after the mothers had done at least one observation with us, they went on their own to observe a mathematics lesson from at least one of their children.

Right after the classroom observations with us, we conduct semi-structured interviews where we engage in a dialogue about our impressions, inquiries, and connections with their children's schooling or their own experiences with learning an teaching mathematics (within MAPPS or outside). These debriefing conversations last approximately an hour and a half. Key to these observations and subsequent debriefing is the fact that we had previously established rapport with the mothers who participated.

Once we coordinate the schedules of mothers, teachers and researchers, three or four mothers and one or two researchers, engage in this learning experience. We meet at the school site approximately half an hour prior to the time to talk about the experience, discuss the ethics of the observation, our role inside the classroom, the theme of the lesson, and we give them some forms to guide them during the observation. Some prompts included in these forms are: "what do you see the students doing?", "are the students talking with one another about math?", "describe what the students are using in class to do mathematics", "how is the instruction in this classroom driven (e.g., textbook, activity based, manipulatives, homework, the routine, etc.)?" We tell the mothers that the purpose of the observations is for all of us to learn about how mathematics is taught in the district as well as to make connections with their MAPPS experience.

The mathematics lessons usually last about an hour. Inside the classroom, researchers and mothers' role varies according to the classroom dynamics and social norms in place. In some classrooms that role has been primarily non-participatory, where we observe from the back of the room. In other classrooms, we walk around the room, talk to the students, exchange ideas with them as they work in groups or individually.

Right after the observation, the observers meet to share their impressions. The debriefing follows the principles of an egalitarian dialogue (Flecha, 2000). As we mentioned earlier, it is a dialogue where the individual mothers and the researchers exchange ideas and enrich their perceptions in a safe environment where each other's views are equally valued. To start the conversation, we tend to ask general questions such as "what were your impressions about the class?" "What was important for you in the class?" "Was the class what you expected or not, and why?" "What did you think of the math content?" The conversation usually flows quite naturally and takes us in a variety of often unexpected directions, based on the mothers' comments and inquiries. All the conversations are video and audio taped. These are then transcribed and form the core of our data for this part of the research. Furthermore, we take detailed field-notes of the classroom observation itself, as well as of the debriefing conversation.

The transcripts have proven to be quite rich in terms of possible themes to pursue. At this point, the two researchers who took part in the classroom observation have been the only ones analyzing the transcripts (first separately and then we come together to compare and contrast). For this paper we have decided to focus on only two themes ("then and now" and "about understanding"). Our intention is to capitalize on parents' voices, though we acknowledge that this is done from our point of view, and not from the mothers' perspective.

Some Key Findings from our Debriefing Sessions

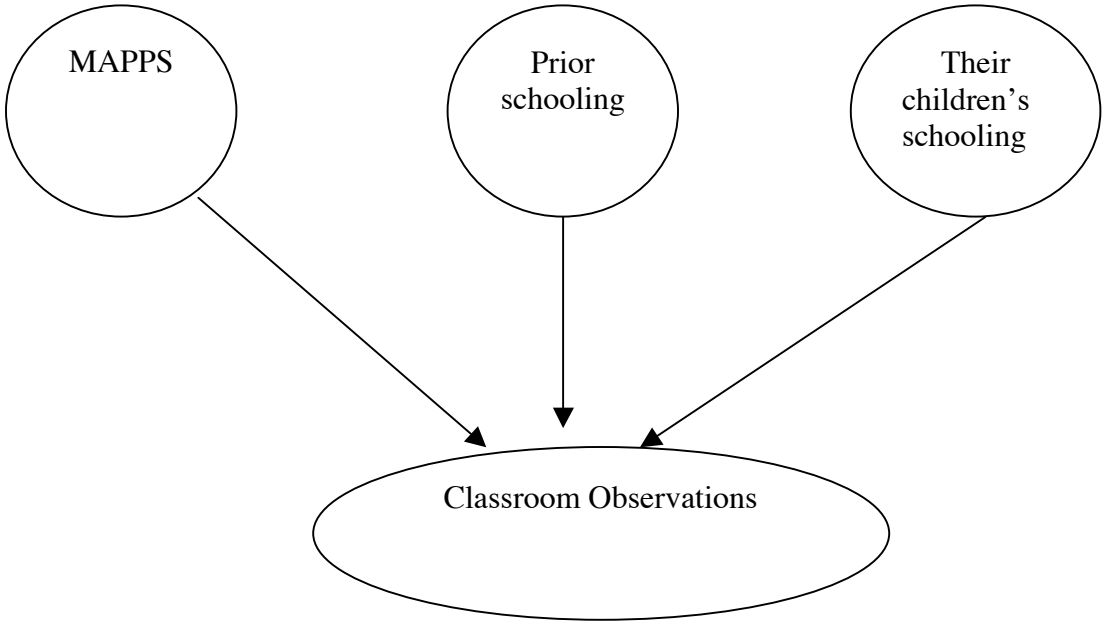
In Civil & Quintos (2002), we listed the four questions that guide our goals in these classroom observations, namely, 1) What do parents pay attention to when they observe a mathematics classroom? 2) How is it different or the same from what a mathematics educator focuses on? 3) What can we learn about these parents' beliefs and values about the teaching and learning of mathematics based on their reflections on the classroom visits? and 4) What may be some implications to keep in mind as we think of implementing reform programs if we want parents to support these efforts? In that same paper we illustrated these questions

through the discussion of the case of a parent with whom we observed what we would describe as reform-based first grade class and a more traditional one. When it came to her reflection on the two classes, her perception and that of the first author clashed. The parent captured very well how the reform-based teacher had taught the lesson, "*she never gave them a detailed explanation. I think that we need to explain to them the "why" behind things. And no, all she did was ask questions. She never told them if something was right or wrong…"* Yet she seemed to view this as a limitation specially when compared with the more traditional teacher, who was in control and organized, "*and the classroom is very organized, the children raise their hands, because she knows how to command respect… The children are really well behaved and they are on task, because she knows how to command respect."* We agree with the characterization of both classes as described by the parent. It is in its valuing that we disagree. For us, the questioning and not reaching closure was seen as part of a teaching approach based on helping children take ownership of their own learning, while the discipline techniques observed in the more traditional classroom were seen as part of the whole lesson that focused on a somewhat procedural approach to mathematics instruction. This parent has been in MAPPS since year 1 and we have had multiple opportunities to engage with her in dialogues around teaching and learning mathematics. Although most parents have commented on the idea of having been exposed to multiple ways to approach a problem as being one of the greatest aspects of MAPPS, this parent seems less enthusiastic about this aspect. This is not because she does not understand the approaches but rather because she does not seem to value the power of having different approaches.

As we reflect on her experience and that of the other parents with whom we have conducted classroom observations, we realize that there are at least three factors that color their experience when they conduct a classroom observation. We view these three factors as lenses. Sometimes, only one is being used; yet at other times, combinations of two of them or the three at the same time are in use. Those lenses are:

1) Parents' experiences in MAPPS (which aim to illustrate reform-based mathematics).
2) Parents' prior experiences with school mathematics as learners themselves (which in some cases may include schooling in a country other than the US).
3) Parents' experiences with their own children mathematics instruction.

The figure below summarizes these different lenses.



For the rest of this paper we focus on our more recent observations, which include two at the high school level, one at the middle school level, and one at the elementary school. We have several themes that have emerged but here we will address two of them:

- Then and now: comparing what they see in the classroom to their own experience when they were in school.
- The role of "understanding" in mathematics.

Then and Now

As Peressini (1997) writes, "the parents participating in this study realized that children of all ages were encountering more and different kinds of mathematics than did their parents during their own school years" (p. 422). Our group of mothers also commented on the differences they observed between their own experience growing up, and that of their children or their own in MAPPS. These comments were perhaps even more pointed when the comparison deals with cultural differences since some of the women had been educated in Mexico. In one of our debriefing sessions, two mothers, both recent immigrants from Mexico, seemed to have opposite views of how to handle the differences they view in the

educational systems. L., who was a teacher in Mexico (and is now a custodian at a local school), experienced conflict between how she thought her daughter should be learning and how she was being taught in school. The other mother, G., who is a homemaker, seemed happy to accept the system here, because she explained that this is where they live now, and this is where her children will live.

> L: Bueno lo que yo digo, por ejemplo mi hija me dice "ven para que aprendas como enseñan aquí, ven para que veas que yo tengo razón", cuando estamos enojadas aquí en la mesa y a veces ella me hace enojar a mi, porque yo le quiero explicar como yo sé y yo le digo "mija como yo te estoy explicando yo sé que es mucho mejor para ti," pero ella se aferra…
> [L: Well, what I say is, for example my daughter tells me "come to learn how they teach here, come see that I am right," when we are upset at each other here around the table, and sometimes she is the one who makes me upset, because I want to explain things to her as I know them, and I tell her "mija, the way I explain it to you, I know it's much better for you," but she sticks to her …]

> G: pero una cosa, aquí estamos en Estados Unidos y aquí ellos van a crecer, y aquí van a estudiar y yo quería hacer lo mismo que haces tú pero digo porque si a él le están enseñando lo de aquí, y él se va a quedar aquí entonces, uno quiere enseñarles más para que sepan más pero lo que a ellos les están enseñando es porque ellos se van a quedar aquí y ellos van a seguir lo que aquí les enseñan.
> [G: but for one thing, here we are in the U.S. and here is where they are going to grow up, they are going to study here, and I wanted to do the same thing as you, but then I say, but why, if they are teaching him things from here, and he is going to stay here, and so, one wants to teach them more so that they know more, but what they are teaching them is because they are going to stay here, and they are going to follow what they teach them here.]

> L: cuando yo me vine de alla [México] estaba [mi hija] en 3er grado, cuando venimos aquí, decía que parecía juego la escuela. "¿Por qué mijita?" "Porque me ponen a hacer 4+3, ay ma, yo no quiero ir a esta escuela. Que rara la escuela". Yo le decía, "es tú vas a aprender al modo de aquí", bueno en ese entonces yo pensé así pero cuando yo visité a mis parientes [en México]…
> [L: When I came from there [Mexico], [my daughter] was in 3rd grade; when we came here, she said that the school looked like play, "why, mijita?", "Because they are making me do 4 + 3, mom, I don't want to go to this school. It's weird." And I would tell her, "but you are going to learn the way from here," well, at that time, that's what I thought, but then I visited my relatives [in Mexico]…]

The conversation on the differences between the two systems (U.S. and Mexico) inevitably touches upon the fact that when they compare what their children are learning here with what their relatives' and friends' children who live in Mexico are learning, the latter seem to be learning things earlier than their children. For example, in talking about the class that they had just observed—a geometry lesson in the high school—G. said that what they had seen there, children in Mexico were learning it much earlier (the lesson had to do with finding areas of shapes). In this paper, it is not our goal to elaborate on the nature of these differences or whether one system teaches topics earlier than the other. We are bringing it up here mostly because this is where our debriefing conversation took us, even though that was not our intention (that is to ask them to compare Mexico vs. U.S.). Yet, this is a topic that comes up in every discussion that we have with mothers who are recent immigrants. For L. the fact that she feels that they are not teaching in the way that she would like, and that her daughter is pretty much rejecting her mother's way and telling her to come to school to see how they do it here, has to be, we think, a very unsettling feeling. That there are differences between how parents were taught, and how their children are being taught in school, is nothing new. What perhaps makes this situation more complicated is the fact that besides generation differences, we have cultural differences. G. seems to have opted for "giving in" to the school culture in which their children are going to grow up in (from the point of view of schooling; we are not addressing here language or larger cultural aspects), while L. is struggling with how to proceed.

The "then and now" of course also includes comparisons from mothers who grew up in this country and experienced a very different approach to the teaching of mathematics than what they are seeing now, either in MAPPS as learners themselves, or in the classrooms they observe (including their children's). In the debriefing that followed our observation in an 8th grade classroom, one of the mothers said with respect to the level that she noticed in this class:

> D.: Much higher, specially compared to what I learned in middle school. I don't remember learning that stuff, not until high school. I was surprised that the students were learning all that, the graphs and negatives, and then they know it; I'm surprised they are learning that in middle school.

That lesson dealt with rotations, reflections, and translations from an algebraic point of view--using coordinates. It was very fast paced because the teacher was going over a test they had just taken. It was also on a topic that most mothers were unfamiliar with (as opposed to the high school lesson on area).

And of course, one key feature that most MAPPS participants have commented on, is the fact that students (and also them in the MAPPS activities) often work in groups, something that was unheard of when they went to school. It may be interesting to note that Ge. graduated from this same high school to which she is referring to in the excerpt below

> Ge: Also the students working together with each other, they didn't seem intimidated or one knowing more than the other, they really worked as a team which is kind of what we do in our study [in MFP]. And when I was going to school it wasn't like that; you just dig at your desk and did your work and that was it; it [referring to the class we had just observed] was really comfortable, it made me want to come back to school.

As Peressini (1998) writes,

> As a way of understanding the changes in their children's mathematics education, parents rely on their own mathematical experiences—experiences that were acquired under a regime of truth that in many ways stands in opposition to the regime of truth embodied in the mathematics education reform literature. (p. 572)

We agree that parents are likely to filter the classroom observation through the lens of their own prior experience and hence their beliefs about teaching and learning mathematics. We also believe, however, that maybe thanks to their own participation in the MAPPS activities, coupled with authentic egalitarian dialogues about their experiences (as classroom observers and as learners / teachers), we may have a mechanism to address the mismatch between the two regimes (Peressini, 1998), and thus counteract "they [parents] neither recognize nor speak this true discourse of mathematics reform" (p. 572).

About Understanding

The notion of what it means to understand in mathematics is probably one of the more debated ones in mathematics education. Our views about mathematics and in particular about what we mean by "understanding in mathematics" mark where we stand in debates on

procedural vs. conceptual understanding, or the more "heated" ones on back to basics vs. reform-based mathematics. Overall, we think that many of the parents in MAPPS do value basic skills and some even expressed concern as to whether those were being taught. In particular, if we go back to the comparison between U.S. and Mexico in terms of mathematics instruction, recent immigrants and those who still have close ties to relatives or friends in Mexico, comment that the teaching of basic skills (computation) seems to be stressed more in Mexican schools than in their experience with schools in the U.S. But again, when it comes o these comparisons, we feel like we do not quite have a grasp of the situation. On one hand, we have parents who have expressed how in Mexico, all they do was memorize and that here, in the U.S., they are taught to reason. On the other hand, we have parents such as L., who worry about whether children in our schools are being taught the why behind things in mathematics. We think that the quote below captures very nicely this dilemma that L. seems to have between explaining how and explaining why. In this excerpt below, L. is once again referring to the conflict that her daughter (a fifth grader) and she seem to have about what it means to learn mathematics:

> L: la niña más grande, la que está en el 5, me dice "mami, te voy a explicar algo que tú no aprendiste en tu clase", porque ya hemos tenido problemas de que yo lo sé de un modo y ella lo sabe de otro, y le digo "¿por qué?", "No sé", me dice, "pero tú me lo explicas diferente, yo te lo voy a explicar como a mí me lo explicaron aquí". Me deja con el ojo cuadrado, porque como explican aquí es más facil y allá, sacan a fondo todo, y aquí no, aquí no más te dicen como y como y ya, y le digo "mija, es que lo que yo te estoy diciendo es que viene desde las raíces, desde abajo", "oh no mami, yo no tengo que aprender las raíces" dice, "si ya sé como se saca aquí arriba, para qué tengo que ver desde abajo?" Le digo, yo voy a averiguar si en México ahorita está igual o ya también están bajando las raíces.
>
> [L: my older daughter, the one who is in 5th grade, tells me "mommy, I am going to explain something to you that you did not learn in your class," because we have already had problems about the fact that I know it a certain way and she knows it in a different way, and I ask her "why?", "I don't know", she says, "but you explain it differently; I am going to explain it to you like they explained to me." I am left with a square eye [??], because how they explain it here it's easier and over there they go in depth for everything, and here no, here they only tell you how and how and that's it, and I tell her "mija, what I am telling you is that it comes from the roots, from below," "ah no mommy, I don't have to learn the roots" she says, "if I already know how to do it up here, why do I need to see it from below." I tell her, I am going to find out if in Mexico now it's the same or if they are also lowering the roots.]

What is interesting to us from this excerpt is that this mother seems to value understanding why, and not just knowing how. This is something that we have noticed that parents pick upon in their observations from the classrooms. For example, in a fourth grade class, the children were using color tiles to work on problems such as "what is 4/5 of 20; 2/9 of 18, etc?" The three mothers who took part in this classroom observation commented on how the use of manipulatives seemed to help develop understanding:

> **B.:** [translated from Spanish] I think that this material [the tiles] helps them a lot, helps them how to think.
>
> **L:** [translated from Spanish] When we learned it, it was through repetition, because we did not have this material to learn.
>
> **D.**: This is so much better, using the manipulatives, tiles. Before they gave us the book, and said "read this, do this" and then they gave us papers to do. But now the kids are more open to talk, more artistic. I remember my teacher being strict, saying what we needed to do, and how.

As we said earlier, parents bring to their comment the different lenses and one that seems to be very powerful is that of their prior experiences when they were themselves in school. Still commenting on this same fourth grade classroom observations, one mother mentioned how much she valued the fact that the teacher made them think,

> **B.**: Lo que hizo la maestra de ponerlos a pensar me gustó porque yo lo hago con mis hijos, yo nunca les digo las respuestas, yo los hago pensar. … Me gustó la forma de ella que nunca les dijo la respuesta, ella los hizo que pensaran.
> [**B.**: What the teacher did in that she made them think, I liked that, because that's what I do with my children, I never tell them the answers, I make them think. … I liked the way in which she never gave them the answer, she made them think.]

In this case, B. is looking at it through the lens of her experience with her children, and the fact that she does not give them the answers either, is in agreement with this teacher's style. This is a characteristic that she values as part of their learning.

In the geometry class that we observed in the high school, the teacher focused on the WHY behind the formulas for area, rather than on just memorizing formulas. One of the mothers, commented on the value of this, by reflecting on how often the stress is put on the formulas not on the why,

> JA.: formula is very difficult, … because it's how you do it, but why? But they don't, they just, "this is the procedure", I think if they understood, they could do it.

We think that trying to uncover parents' views on what it means to understand mathematics is an important yet difficult task. What parents value about understanding is likely to be colored not only by the three lenses that we mentioned earlier (MAPPS, their prior schooling, and their children's schooling) but also by the current stress on accountability and high stakes tests.

Conclusion

Our goal in this paper was to present a model for developing a dialogue with parents that centers on the common experience of having observed a mathematics classroom. This common experience allows us to explore our respective beliefs and values about teaching and learning mathematics. Of course, we are aware that only some of the parents can participate in this classroom observation model, as many of them have jobs that would not allow them the flexibility needed to conduct these observations. Nevertheless, we present this model as one more possible approach to parental involvement. Our work focuses on families in a largely Hispanic, working-class community. Our main interest is in the voices of these mothers who often go unheard. Two perhaps unexpected outcomes from engaging some of these mothers in these classroom visits have been a) the fact that many of them enjoy observing in classes where they can learn some mathematics, that is they view this as an opportunity to further their own development, and b) several of them have since visited their children's classroom and have expressed that they now feel comfortable in doing so.

Educational practices, such as reform mathematics, should be implemented based on a deep respect and understanding of the role and nature of the families involved, as well as their context. Relationships between schools and families need to be established with a careful revision of the concept of power. In this model of classrooms' observations, the teachers' voices are not there… yet. Only on one occasion were we able to hold a debriefing conversation with the parents, the researchers, and the teacher. We are aware that a possible next step is to have parents and teachers talk about a common classroom observation.

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