

# Immigrant Parents' Perspectives on their Children's Mathematics Education

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**Abstract:** This paper draws on two research studies with similar theoretical backgrounds, in two different settings, Barcelona (Spain) and Tucson (USA). From a sociocultural perspective, the analysis of mathematics education in multilingual and multiethnic classrooms requires us to consider contexts, such as the family context, that have an influence on these classrooms and its participants. We focus on immigrant parents' perspectives on their children's mathematics education and we primarily discuss two topics: (1) their experiences with the teaching of mathematics, and (2) the role of language (native language and second language). The two topics are explored with reference to the immigrant students' or their parents' former educational systems (the "before") and their current educational systems (the "now"). Parents and schools understand educational systems, classroom cultures and students' attainment differently, as influenced by their sociocultural histories and contexts.

## 1. Introduction

The under-achievement of many low-income immigrant students in school mathematics has become a globalized phenomenon in the modern world. Recently, studies about identity issues are helping to better understand what is happening to low-income immigrant students when learning mathematics in mainstream schools (e.g., Abreu; Cline 2003; Planas; Gorgorió 2004). These studies have shown that cultural/ethnic identity is an essential construct to consider when interpreting relationships as well as differential treatments in the mathematics classroom. Immigrant children (and here we include children who were born in the "new" country but whose parents are immigrants) are often caught between at least two cultures. As Suárez-Orozco and Suárez-Orozco (2001) write in their study on immigrant children in the U.S., "immigrants are by definition in the margins of two cultures. Paradoxically, they can never truly belong either 'here' nor 'there'" (p. 92). These authors write about the identity issues that immigrant children confront in feeling caught between their parents' culture and the culture in their new country:

"Children of immigrants become acutely aware of nuances of behaviors that although 'normal' at home, will set them apart as 'strange' and 'foreign' in public...Immigrant parents walk a tightrope; they encourage their children to develop the competencies necessary to function in the new culture, all the while maintaining the traditions and (in many cases) language of home" (Suárez-Orozco; Suárez-Orozco 2001, pp. 88-89).

This attempt to navigate two cultures extends to all aspects of their life, including schooling. Our research has shown that immigrant parents often go back and forth between their own experiences learning mathematics in their home country and what their children are experiencing in their new country (Civil; Quintos; Bernier

2003).

In this paper, we argue that in order to gain a better understanding of the situation surrounding immigrant students' performance in mathematics, we need to know more about these students' social contexts and, in particular, about their parents' perceptions of their children's mathematics education. Although the students' perspectives on their achievement are not necessarily a manifestation of their parents' perspectives or of any other pre-existing perspective, their learning opportunities are likely to be framed by what their parents think and expect. As Marisol<sup>1</sup>, a mother in one of the research projects discussed in this paper reminds us, parents and children come together:

This is the first problem, 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<sup>2</sup>.

Marisol is a parent leader in a research project<sup>3</sup> that we have had in Tucson, USA, for five years. Like many other parents in this project, she advocates for the need for teachers (and schools in general) to pay attention to parents' voices and opinions. In this paper, we draw on data from this project as well as from a research study<sup>4</sup> in Barcelona, Spain to illustrate parents' perceptions about their children's mathematics education. The main focus of the study in Barcelona was on the immigrant students' knowledge of mathematics. In order to gain a deeper understanding of these students' experiences, their parents were invited to participate in a mathematics project, along with their children. The research in Barcelona took place within this mathematics project.

## 2. Theoretical Framework

Our orientation to research is grounded on a socio-cultural approach to education. In this approach, the classroom is both a constructed reality by its participants and a reality in many ways given by external groups of people and facts (Khisty; Chval 2002). Explanations for inequity within the classroom must be focused on a complex set of social relationships, rather than on particular relationships in isolation, and are to be interpreted as a product of larger social problems. From this point of view, the learning conditions and opportunities of immigrant students within the mathematics classroom are seen as being symptomatic of a social structure. In particular, when analyzing the mathematics classroom, the social structure may be reflected in many different ways by looking at what the different participants are doing there, what their interests and intentions are, which strategies help to maintain particular positions and how these strategies contribute to maintain or reduce other positions.

Zevenbergen's (2000, 2003) use of Bourdieu's notion of habitus in her research on mathematics education is particularly relevant to our work. She has interpreted habitus as a structure of practices and beliefs that shapes the expectations on working class students' mathematical attainment. She has documented that the preferences, attitudes, values, behaviors and demands made by the dominant groups do not always fit with those of the

marginalized groups. From her perspective, the way in which action and practice are structured according to social and cultural differences highly influences the social and individual construction of identities when learning mathematics.

In our work, the notion of habitus leads us to connect the micro and macro levels of our analysis, moving back and forth between these levels. On one hand, our micro level of social analysis in contexts of mathematical practice consists of the study of relationships among individuals and among individuals and practices. On the other hand, our macro level of social analysis in this type of contexts looks at relationships among different cultural and social groups somehow involved in the mathematical practices. The Bourdieuan notion of habitus permits us to interpret what happens at the micro level by introducing considerations from the macro level. Taking into account the notion of habitus, the difficulties that an individual may encounter when learning mathematics have to do with his/her membership to specific social and cultural groups, the value given to their mathematical practices by other groups, and the relationship between his/her social and cultural groups and other groups.

Social and cultural differences and how these may affect the construction of identities when learning mathematics are sometimes constructed as obstacles or as resources. Within our socio-cultural lens with which we situate the people, places and contexts in which we work, we move away from descriptions of obstacles and deficiencies toward a description of resources and competencies. Hence, in this orientation we view parents as intellectual resources (Civil; Andrade 2003) in their children's education. We explicitly reject the deficit model (García; Guerra 2004) that is often attached to the education of immigrant or 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. Instead, we base our work in a growing knowledge of the particular families. We consider it is crucial to learn about the daily-life contexts, resources, values and beliefs that shape their learning experiences at the schools.

As Abrams and Gibbs (2002) mention, creating strong ties between parents and schools is a challenging task since, "these relationships mirror the contexts and inequitable power arrangements of the larger society" (p. 385). Reay's (1998) interviews with immigrant women underscored the difficulties that many of them encountered as they tried to build on their knowledge for their children's benefit. Their experiences with schooling were so different from what their children were experiencing in their new country that their knowledge was of little use in their current situation. 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" (p. 42). It is this idea that their knowledge, their experiences, and their forms of language/discourse is not necessarily recognized or valued by schools that puts working-class parents and immigrant parents in a position

of disadvantage next to other mainstream groups.

### 3. Context and Method

The context for our research in Tucson is a school district that is largely Hispanic (82%) (mostly of Mexican origin) and with 81% of children qualifying for free or reduced cost school lunch. Students in this district do not fare well overall in terms of academic achievement (as determined, for example, by results on standardized tests). The research in Tucson took part within a large parental involvement project in mathematics education, MAPPS (Math and Parent Partnerships in the Southwest). A main goal of MAPPS is to develop leadership teams (parents and teachers/administrators) that will help in the mathematics education outreach effort throughout the community. Parents in the leadership teams took part in a series of activities including taking Math for Parents courses and facilitating mathematics workshops for other parents in the community (for a more detailed description of the project see Civil; Quintos; Bernier 2003). The data for this paper come from three different sources: Math for Parents sessions; individual interviews with five immigrant mothers (audio- and video-taped); and classroom visits. These visits were developed to include a focused conversation with some of the parents on specific issues related to the teaching and learning of mathematics. We invited parents in the leadership teams to join us in a visit to a mathematics class at one of the project participating schools. After each visit, we held a debriefing conversation (audio- and video-taped). To start the conversation, we usually asked 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? (see Anhalt; Allexaht-Snyder; Civil 2002; Civil; Quintos 2002; Civil; Quintos; Bernier 2003, for more details on the classroom visits with parents and the method we use in the debriefing.) The data analysis for the overall research component in MAPPS follows Glaser and Strauss's (1967) constant comparative method. The different pieces of data (e.g., field notes and transcriptions of the tapes) are looked at and codified. This process leads to the development of themes, such as the one we discuss in this paper, "before and now". We follow a phenomenological methodology (Van Manen 1990) that relies heavily on participants' contributions to the experience. The lived experience of each parent is considered significant and thus we try to capture it in our analysis and writing.

The context for our research in Barcelona is a mathematics course taught by the second author to 15 and 16 year-old students in a school that has a large number of immigrant students. The main goal of the larger study was to uncover possible reasons for the difficulties with school mathematics that the thirteen immigrant students in that class (there were a total of 24 students) were experiencing (Planas 2004). Although other teachers had interpreted these difficulties as inherent in the students, in our research we did not find evidence of this. As the study evolved, data pointing to the influence of the parents' perspectives on the children's behavior (e.g., "My parents

tell me not to bother you, Miss”) emerged. To gain a better understanding of these possible influences, the second author carried out individual interviews (audiotaped and transcribed) with twelve parents (five Moroccan, four Pakistani, two Bangla Deshi, and one Dominican). Before these interviews took place and in order to establish rapport with the parents, the teacher invited the parents together with their children to collaborate in a mathematics project. They worked on the project for two months, one meeting per week. The idea was to organize a one day open-air mathematical fair. At the beginning of the project, most parents did not talk and seemed to feel intimidated by their children’s teacher. By the latter stages of the project, they spoke up and made decisions. It would have been very difficult to obtain information from the parental interviews without having created such an atmosphere of mutual confidence. The interviews were based on the discussion of an initial key question: “There are students who get good grades in school mathematics and others who get bad grades. Why do you think your son/daughter gets bad grades [in school mathematics]?” The twelve immigrant students, whose parents were interviewed, were all considered by the school staff to be at risk of school failure and were getting very low grades, particularly in mathematics.

As with the questions used to start the conversation after the classroom observation in the Tucson case, this initial, general question in the Barcelona case served as a prompt to access parents’ perceptions about teaching and learning mathematics and about their children’s mathematics education experience. We adopted an ethnomethodological perspective (Garfinkel 1984) to explore all data. In our analysis, language is not a neutral and descriptive tool but a tool that needs to be interpreted within an interactive context where some parents influence other parents within the community context and the researcher-interviewer influences all of them and is also influenced by them.

In this paper, we draw on data from these conversations and the interviews to illustrate our findings, as parents in both cases try to make sense of their children’s current experience with school mathematics while seeing such experience through the lens of their own experience in a different country.

#### 4. Results: “Before and Now”

Our goal is not to do a comparison between the two contexts, Barcelona and Tucson. Actually, several key differences would prevent us from doing this. Tucson, as is the case with many other places in the U.S. has a long history of immigration. Tucson was part of Mexico until the Gadsden Purchase in 1854 (Sheridan 1995). Thus, the “Mexican presence” in Tucson is certainly not a recent phenomenon. This is not the case with Barcelona, which has seen an increase in immigration in the last few years. In certain neighborhoods of Barcelona, the immigrant population from Africa, Asia and South America represents more than half of the population and many schools, like the school where the second author used to work, have become highly multiethnic and multilingual.

Furthermore, the parents in the Tucson research were

part of a project (MAPPS) that was aimed at developing their leadership in mathematics education and were in most cases already associated with the schools (e.g., as teacher aids, as volunteers, as active members of the Parent Teacher Organizations). Hence, we do not claim that they are representative of all parents in that school district. The researchers (and authors of this paper) were not their children’s teachers, nor were they associated with the schools their children attended. We developed a close relationship with the group of parents whose voices will be heard in this paper. Because we were not seen as part of the school system and we developed close ties with several of these parents, we think that they may have felt comfortable sharing information with us that maybe they would not have shared with, for example, their children’s teachers.

On the other hand, in the Barcelona case, the researcher was their children’s teacher. This may explain the parents’ apparent acceptance and even agreement with the school’s approach towards the education of immigrant students (e.g., these students are taught separately from the “local” students for part of the day; see Civil; Planas 2004, for a description of the system). Despite the teacher’s effort at establishing rapport (e.g., through the mathematics project described earlier), the fact remains that she was in a position of power. Thus, the information gathered from the interviews has to be seen through this lens.

A final difference is that in the Tucson case we had a wide variety among the parents in terms of how long they had lived in the U.S. (in fact some were born there, but in this paper we focus on the voices of immigrant parents). In the Barcelona case, the parents were all recent immigrants.

What was particularly striking to us, as we met to discuss the data from the two contexts, is that despite the differences and the possible limitations in either case, there were some common themes. It is this commonality that we want to stress in this paper. We argue that gaining a better understanding of the issues that these two very different groups of parents seem to be facing with respect to the mathematics education of their children, can help researchers and educators develop strategies to improve the current educational arena for immigrant children.

As we mentioned earlier, the research in Tucson has recurrently shown that immigrant parents tend to bring in their experiences with education in their country of origin and compare those with their children’s schooling in their new country. This was also the case with the parents in Barcelona. Not surprisingly, the key aspect in common has to do with their immigrant condition and thus their moving across two different frames of reference in terms of educational systems—that of their country of origin (the “before”) and that of their new county (the “now”). We are aware that there is also a generation difference and that indeed, even among non-immigrant groups, parents and children are likely to have experienced different educational systems. Nevertheless, in the case of immigrants, these differences across systems appear to be particularly value-laden (as we will show). This may create more anxiety, particularly for those immigrants who tend to occupy the lower positions in the social hierarchy in their new country (as is the case of the

parents in this paper) and even more so for those who may have actually “moved down” when they left their country of origin (e.g., we have several examples of parents who were teachers and engineers in their country and are now working as custodians and in factories in the new country).

The “Before and Now” distinction must be understood as a result derived from analysis of our data. In the two research projects, parents faced an education system and, in particular, approaches to the teaching and learning of mathematics that were different from what they expected. Parents’ reactions to these differences varied from accepting them and trying to adapt to the new system to experiencing some form of conflict. The “Before and Now” distinction permits us to explore processes of reconstruction of immigrant children’s habitus. Although some parents maintain high expectations of their children’s school achievement, they feel limited in their influence on the host school system because of their relationships with other mainstream groups that do not seem to value their knowledge. These relationships coming from the macro level have an effect on the parents’ perception of their children’s influence on the school micro level. Changes in the parents’ perception of their children’s influence can be seen as changes in the structure that shapes their children’s opportunities, that is, as changes in the construction of their habitus.

In this paper, the data that we present is focused on two themes within the “Before and Now” frame of reference. The first theme we discuss has to do with parents comparing how mathematics was taught to them and how it is being taught to their children now in their country of adoption (in particular, we address parents’ reflections on their children’s achievement and parents’ reactions to different approaches to arithmetic). The second theme addresses issues of language, as immigrant families are faced with a language different from their native language(s) (in particular, we look at parents’ perceptions on the role that language plays in the mathematics class and in the support they can provide at home).

#### *4.1 About the teaching of mathematics*

Immigrant parents are active participants in their children’s learning. They admit talking with their children about the mathematics classroom and they say they often give advice to them concerning proper behaviors (e.g., “Our children know that we care about mathematics and they listen to our advice”, “We talk a lot about school and sometimes about school mathematics”). Parents in both settings, Barcelona and Tucson, often commented on the differences in the teaching of mathematics in their country of origin versus their new country. The parents in the Barcelona case seemed to be more accepting of those differences and viewed their children’s difficulties with the subject as part of their process of adaptation. When describing differences in achievement, these differences were treated as “natural” consequences of the process of accommodation of their groups to the new reality which also involves “the new mathematics” (e.g., “This is all new to us, new school, new country, new people. Our children did not have such problems with mathematics before”; “It is nobody’s fault! They must get used to the

new mathematics”). The immigrant children’s low grades in school mathematics are seen as something inevitable and explained in terms of group characteristics and long transitional processes (e.g., “You cannot avoid it. It is very hard for all immigrant students”, “Our children need time, maybe years till they learn how things work for other people here”). For example, a Pakistani father said:

It is natural that Pakistani children don’t get good marks in mathematics, even those that used to get good marks in Pakistan. They learn quickly the language but their former schools were very different. Pakistani children are not familiar with how the classroom works here.

When asked how Pakistani children can become more familiar with how the mathematics classroom works in Barcelona, he says [to the teacher/second author]:

When Pakistani children get familiar with how you multiply here, there are still many other things that are very different. Sajid has learned different mathematics, but it’s not about what Sajid has learned, but about what he must learn from now on. He must listen very carefully to you and must not insist on what his former teachers taught him, not in the classroom. You cannot waste your time talking and talking.

There seems to be an acceptance of the situation among the parents in the Barcelona case. Although they are aware that their children may have different ways to do mathematics (e.g., use different algorithms for arithmetic operations), they seem willing to have them put those aside and learn the “new” methods. This is different from what we have found with some of the mothers in the Tucson case. One of these mothers, Marisol, mentioned how she thought the education in Mexico was much better (in that children in Mexican schools learned arithmetic operations earlier than those in U.S. schools). She explained that the teacher was teaching her son a certain way to divide, which Marisol thought was a mess and an inefficient approach (i.e., slow because there is more writing involved). She had opted for teaching her son her method for doing division, which is how she learned to divide in Mexico (by doing some of the operations in her head instead of writing it all out). When she shared this with the group of mothers in MAPPS, a lively discussion on how to handle these different approaches took place. One of the mothers, Marissa, viewed the differences as an opportunity for reciprocal learning, children learning from parents and parents learning from their children. Marissa is very confident and knowledgeable in mathematics and had been part of MAPPS for three years when this discussion took place. She understood and believed in the values of different methods in mathematics. This allowed her to easily adapt and take advantage of the situation as a learning opportunity. She said:

My son did learn a different method, (referring to an alternative algorithm for multiplication) and he taught me how to do it. I had a choice, whether to push my way or to go with what my kid understands. If your child brings something home that you don’t know then you should not say “I don’t know” right away, don’t be so negative, “I’m going to try and we’ll learn together” so they don’t get discouraged and so they’ll come to you later. I waited to see if my kid understood what the teacher taught him, I wouldn’t say one way was better than the other but say that

there are different ways to do all sorts of things. I'll try and find a way to do it, stay positive and not negative.

Marissa offers an approach to handling differences that not only values the different methods but may actually also help expand the repertoire of approaches that her son will have to do mathematics. Marissa may be an exception, though. Most of the other cases do show a certain level of tension and a preference for one or the other method. In one of our debriefing sessions after having observed a class, two mothers, both recent immigrants from Mexico, seemed to have opposite views on how to handle the differences they viewed in the educational systems. Lucinda, 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, Gabriela, who is a homemaker, seemed happy to accept the system in the U.S., because she explained that this is where they live now, and this is where her children will live:

Lucinda: 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...

Gabriela: 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.

Lucinda: When I came from there [Mexico], [my daughter] was in 3<sup>rd</sup> 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. 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 immigrant parents. Lucinda felt that in the U.S. they were not teaching her daughter with as much depth as she would have liked ("how they explain it here it's easier and over there [in Mexico] they go in depth for everything, and here no, here they only tell you how and how and that's it"); on the other hand, her daughter rejected her mother's

way and was telling her to come to school to see how they do it in the U.S. Gabriela reminds us more of the parents in the Barcelona case. She seemed 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 the teaching of mathematics; we are not addressing here language or larger cultural aspects). What we do not know, however, is whether the parents in the Barcelona case may express a different view if they were to participate in a project such as MAPPS, where we pushed towards the establishment of a critical dialogue. Although the parents in the Barcelona case acknowledge the differences between mathematics content and teaching in their home country and in Catalonia (the north-eastern autonomous region in Spain whose capital is Barcelona), they seem to focus more on language and class norms. Their belief that their children must first learn the new language and how to operate under different classroom norms may account for their apparent agreement with the dual system that exists in Catalonia schools that have immigrant students. In that dual system, immigrant students are separated from the local students for half of the lessons in language and mathematics (see Civil; Planas 2004, for more on these two parallel systems). The approach to the teaching of mathematics in the "special classes" at the school in Barcelona where this research took place was based on the practice of mathematical rules and algorithms, rather than on using problem-solving, which is what the local students in the "regular" class (taught by the second author) were experiencing. Most immigrant parents preferred that their children attend the special classes even though they thought that they would not learn as much mathematics there. They did not interpret the parallel system of regular and special classes as boundaries to be contested, but as a given social fact ("It is as it is") that must be respected. This system is seen as especially convenient for the local students who are supposed to go faster with their learning of mathematics and not especially adverse for the immigrant students. These parents not only predispose their children to accept this situation but also to avoid promotion. Mourad's father (B) clearly exposes this finding to the teacher (T) (second author):

T: Why do you think Mourad gets bad marks in school mathematics?

B: All immigrant students get bad marks in school mathematics.

T: Why do you think this happens?

B: I don't know, but they are placed in different classes. That should help them.

T: Does Mourad like attending special classes?

B: He doesn't, but I always tell him "you cannot leave it, you need to be at school and you need special mathematics."

T: Would he prefer always attending regular classes?

B: It is as it is. Immigrant students attend special classes and they share with local students some regular classes. Our children must learn special mathematics. If they learn special

mathematics, they will be left better off than if they learn quick mathematics.

T: What do you mean by quick mathematics?

B: In regular classes local students go faster.

T: Can Mourad be promoted to regular classes?

B: He is OK now.

At the time of the study, Mourad and his family (originally from Morocco) had been in Barcelona for four years. During the interview, Mourad's father started talking about the parallel system of classes but he did not do so in order to complain of discrimination or unequal treatment. On the contrary, he made clear attempts to understand and justify a system that, in our view, locates his son in a disadvantaged and subordinated position. Although the dual system includes the possibility for immigrant students to move out of the special classes and join the local students for all their classes, the reality is that very few immigrant students leave the dual system while in High School.

On one hand, the structure of special and regular classes constrains the immigrant students' learning of mathematics ("They learn special mathematics"). On the other hand, the parents' perspectives help to generate and reproduce the structure that constrains their children's actions ("You need special mathematics"). Mourad's father does not interpret his son's position as transitional but as permanent. This father gives his tacit consent to the arrangement of special and regular classes by encouraging his son not to leave the school and to attend the special classes. Some of the immigrant parents may find the special classes rather attractive because their children are given more individualized attention. For example, a Pakistani mother shared that she did not want her son to transition to only regular classes because then he probably would not receive enough attention. This mother appeared to prefer what we view as the general discrimination given by the local educational system to the expected discrimination that she associates with the regular classrooms.

As we said earlier, for the parents in the Barcelona case, the issue of language seemed to play a prominent role in their views about why their children were not doing well in mathematics and why they may need to be in special classes. In the Tucson case, the theme of language also played a role in the mothers' views about their children's education. The next section addresses this theme.

#### **4.2 About the language**

One of the factors that determines whether a student attending school in Catalonia needs to be in "special classes" is his/her level of proficiency in the official languages (Catalan and Spanish). Thus, many immigrant students from countries such as Pakistan or Morocco end up in the special classes since they are often not comfortable enough in either of those two languages. In Tucson the situation is somewhat different. Although one would perhaps expect that more experience (in terms of a

longer history) in the U.S. with immigration from groups who speak languages other than English would be reflected in its educational policies, especially when it comes to the education of English Language Learners (ELLs), the reality is different. The fact is that schools are still faced with uncertainty as to how to best educate students who are ELLs. For example in recent years, several states, including Arizona, have mandates that are dismantling bilingual education and are now following more a model of English immersion. The current tendency in Tucson is to place ELLs in Structured English Immersion (SEI) classrooms. In the communities where our work takes place, it is often the case that every student in the SEI classroom is an English Language Learner. The point we want to make is that the situation is complex and that it is still the case that language issues are often mixed up with cognitive aspects. In fact, at the national level, Hispanic students in the U.S. are frequently over-represented in special education because characteristics of second language acquisition often are mistaken for learning disabilities (Merino & Rumberger, 1999). At our local level, the story of one of the mothers makes the point quite clearly. The teacher of Eugenia's daughter suggested testing her child for a learning disability. Her child's teacher was insistent that she needed to be in Special Education or switched to another school with special services. Eugenia tried to explain to the teacher that her daughter did not always understand English yet. Still, the referral was done and Eugenia accepted the assessment to be able to contest the teacher's judgment. Fortunately, she was able to prove that the diagnosis was not a learning disability but rather a language issue.

The problem-solving approach that the teacher in the Barcelona case used, as well as some of the current approaches to teaching mathematics in the U.S., place an emphasis on communication, hence on language. The parents in the Barcelona case, however, tended to see mathematics and language as two separate domains, and advised their children not to use the teacher's time during the mathematics class to ask questions about language. Khati's mother's illustrates this point:

Khati can hardly participate. She doesn't know the language enough. She always says that fractions are easy but word problems are not easy at all (...). She needs time.

When asked how she can help her daughter at home, she says:

We cannot help our children because we have difficulties as well.

When the teacher asked how she could help Khati, the mother replied:

M.: You cannot help her. You are the mathematics teacher. I always say to Khati "don't bother the mathematics teacher with your practical questions about language, you must only ask questions about mathematics, if you don't understand a word, then, before you ask, you must be certain that you will not bother the teacher and your peers". If she is not certain, she must not speak. When she is certain, she will get good marks.

T.: Why can't she ask me about language?

M.: You should not waste your time with language questions. The other Bangla Deshi students can help Khati.

At the time this study took place, Khati and her family (originally from the center of Bangla Desh) had been in Barcelona for three years. They were not fluent in the local school language, Catalan, but they were already competent speakers of Spanish. In her mother's opinion, Khati must manage to learn the meaning of Catalan words and become a competent speaker within the mathematics classroom before she can learn mathematics. She could not help her daughter improve her Catalan because she herself had difficulties with it, neither could Khati's out-of-school context help her as she spent most of the time with the Bangla Deshi community. Moreover, the mathematics teacher was not expected to help her daughter because, in this mother's view, the teaching of language was not and should not be a goal of the mathematics classroom. Khati should not ask for help and interrupt the dynamics of the mathematics classroom unless she was certain that her question would not interfere with the lesson. This may have put Khati in a difficult situation—how to determine whether her question was appropriate or not in the mathematics classroom? She needs to be 'certain' and this is not an easy goal to achieve for students experiencing various and simultaneous transitional processes.

In the Tucson case, the mothers did not address so much the issue of separation between language and mathematics, perhaps because as MAPPS participants they had been learners of mathematics themselves and therefore had had a chance to experience the interplay of mathematics and language. But language did play a prominent role in the interviews we conducted with immigrant mothers. Here we only highlight the issues that are more directly related to the teaching and learning of mathematics (see Bratton; Quintos; Civil 2004 for an expanded version of this topic). One key issue relates to parents' frustration at not being able to help their children with homework because of the language barrier. This, in a sense, is implicit in Khati's case above when her mother says that she could not help her because she herself did not know Catalan well. In the Tucson case, we have examples in which the children do speak both languages, English and Spanish, but do not have a command of academic Spanish. Their parents, on the other hand, may be proficient only in Spanish. Some children have to translate the problems to their Spanish-speaking parents in order to receive their help on the homework. This situation requires the children to be able to explain and translate the problems, which is a process that involves proficiency in the mathematical register of two languages (Khisty 1997; Moschkovich 2002; Ron 1999). As we see in the following quote for Verónica, this has resulted in her son's lack of trust in her ability to help and her own frustration about her possibility to help them:

When I sit with him to see what it is he is doing, it seems that translating the problem so that I can help him is too much trouble for him; so, when it's hard to translate, he kind of prefers to go early or ask someone else and I don't like that.

He doesn't feel very sure that I am understanding him because the problem is written in English. I don't know how to read it

and he doesn't know how to translate well for me because he speaks Spanish and reads Spanish, but we say different things for the same words and questions, I think he thinks I studied differently.

Verónica is particularly frustrated because she knows the content and wants to help and support her son but cannot. She feels that when her son was in the bilingual program, she was able to help him more. She would often volunteer in her son's classroom. But then in second grade, he was placed in an English only class and with a teacher who only spoke English and Verónica stopped going into the classroom. She explained that her limited English proficiency has strongly hindered her possibility to help her children with school work, "I feel as if I don't help enough," she said. She believes she has the knowledge to help both her children who were 7 and 11 years old, at the time of this study. However, even with college studies and with some teaching experience in Mexico, she had to turn to after school tutoring.

In our view, to ignore how language can operate as a barrier in the education of immigrant children, including their mathematics education, goes against any attempts to provide an equitable education for ALL children. The experiences of Eugenia, Khati's mother, and Verónica illustrate only a few of the many obstacles that immigrant parents face when trying to advocate for their children's education. Eugenia succeeded; Verónica has not yet been able to overcome her frustration at the separation that she feels is being established between her son and her. As we saw in the case of Khati, her mother's perception of the need to keep language and mathematics separate, may contribute to Khati's lack of participation in the mathematics classroom, hence limiting her opportunities to learn.

## 5. Conclusion

Our data, both from Barcelona and Tucson, lead us to the notion of recognition. We have parents, such as Lucinda, who do not totally recognize the host school mathematics. We also have parents, such as Sajid's father, who do not recognize their children's former school mathematical knowledge. And we have children, such as Verónica's son, who do not recognize their parents' mathematical knowledge. There are many differences between the "before" and the "now" in relation with the experience of school mathematics, but these differences are not always recognized for their intrinsic value, neither are they recognized for the value they have for those who sustain them. Most immigrant parents seem to have established a clear distinction between the local mathematical practices, which are taught in the local official language(s) and need to follow particular classroom norms, and their former and current group practices, which often show identities that want to adjust to both the "before" and the "now."

The opinions, values and beliefs of Lucinda, Sajid's father, and Verónica's son show a common interpretation of the notion of recognition. Lucinda is concerned about the effect of the host school mathematics on her daughter's former school knowledge. This mother's recognition of certain practices implies an opposition to

other practices. Sajid's father also shows an opposition, not to the host school mathematics but to his son's former educational system ("[Sajid] must not insist on what his former teachers taught him (...)"). In the case of Verónica's son, the idea of recognition is also linked to the idea of opposition and, in particular, to that of conflict between opposing practices. Most parents seemed to experience a form of conflict between the different practices. Some, like Gabriela and Sajid's father seemed to be willing to accept the new practices, since these are the ones in place in their new country.

It is not clear how this notion of recognition-opposition may influence their children's learning of mathematics. However, it is reasonable to think that the recognition-opposition scheme sustained by the parents has an important influence on the children's habitus, that is, on the structure that shapes their opportunities when learning mathematics. To help overcome the recognition-opposition scheme is not an easy task at all. One of the goals of the MAPPS project in Tucson, as well as of the research project in Barcelona, was to consider the content of differences and to explore the perception of differences among members of the educational community. In both research contexts, recognition was interpreted as acknowledging the value of differences, but only in Tucson did the initial research design contemplate enduring actions on and with parents. As we pointed out earlier, in the Barcelona case, the researcher was also the teacher. This may account for some of the differences between the two cases. But further research should also explore whether (and how) the parents' different cultural backgrounds in Barcelona and Tucson (as well as the different immigration experiences in both places) played a role in parents' perceptions of the host school mathematics.

The public recognition of differences in the mathematics classroom is a problematic issue. The individual and group experiences that children have of the school mathematics in their former schools and of their parents' mathematical knowledge may provoke these children to prefer their practices not to be publicly appreciated as different. We have found parents that consider differences as particularities, independently from their content, that must not interfere with their children's mathematical learning (e.g., "He (...) must not insist on what his former teachers taught him"). However, some other parents, most of them in Tucson where the interviewer was not their children's teacher, have learned to develop an inclusive attitude towards differences (e.g., "I wouldn't say one way was better than the other but say that there are different ways to do all sorts of things"). The involvement in the MAPPS project has probably had an important positive effect on the parents' perception of their children's differences. It is reasonable to think that children will hardly recognize their former school practices and their current family mathematical practices as legitimate if they do not perceive recognition in their nearer contexts. The notion of recognition needs to be interpreted not only as an acceptance of differences but also as an alternative to broaden meanings for the mathematical practices and ideas. Further research is needed into the effects of projects such as MAPPS on

parents' perceptions and potential action-taking towards their children's schooling.

## Notes

- 1 All names are pseudonyms.
- 2 Most of the quotes in this paper have been translated from Spanish; we have edited the language (taken out pauses and other characteristics of spoken language) since our main interest is in the content of what the parents have to say.
- 3 Project MAPPS (Math and Parent Partnerships in the Southwest) 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.
- 4 This research project was funded by the Ministerio de Ciencia y Tecnología (SEJ2004-02462).

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