

Parents and Mathematics Education in a Latino Community: Redefining Parental Participation

Marta Civil, Jill Bratton, & Beatriz Quintos

Introduction

Rhonda: The good thing about MAPPS is that it [opens] our awareness in math, you know the workshops, it just opens up the doors that we thought that were closed specially for me.... I think that it is important that I learned that, our kids aren't really being taught what they are supposed to be taught and that's one big thing and that parents have a lot of power that we don't know that we have it, that's what MAPPS taught me.

Our work aims to expand the vision of parent¹ participation in school mathematics, in particular the role of mothers from diverse ethnocultural and low socioeconomic groups. The experience of some of the mothers has led them to believe, as in the above quote, that their role is limited and that their ability to voice their opinions and concerns is hampered by the traditional school structure.

Through their involvement in MAPPS² (Math and Parent Partnerships in the Southwest), parents like Rhonda have had experiences that took them through a series of processes that provide us with a different vision for parental participation in mathematics education. This vision is the focus of our article.

The vision consists of four components: Parents as Parents (i.e., parents originally joined MAPPS because they want to help their children with their mathematics education); Parents as Learners (parents become learners for themselves; some even pursue further education); Parents as Teachers (this is a unique feature—parents become facilitators of mathematics workshops for other parents in the community);

Parents as Leaders (e.g., parents become advocates for the education of not only their children but for all the children in the district).

This article elaborates on these components based on the parents' own reflections.

Theoretical Framework

Our work with adults in mathematics draws from three bodies of research. The first one is grounded on socio-cultural theory and in particular on the concept of "funds of knowledge" through which households and communities are seen as having knowledge and resources that can be tapped into for educational purposes (González, 1995; Moll, 1992).

The second body of research combines ethnomathematics and adult education grounded on critical pedagogy (Benn, 1997; Flecha, 2000; Knijnik, 1993). Finally, we draw on research on parental involvement, in particular that which critically examines issues of power and perceptions of parents (especially language and ethnic "minority" and working-class parents) (Delgado Gaitan, 2001; Henry, 1996; Lareau, 2000).

Our approach to parents and mathematics education is grounded on the concept of parents as intellectual resources (Civil & Andrade, 2003), which means that we are particularly interested in parents' views and understandings of mathematics and that we seek to learn from them and to build our mathematics instruction on these adults' knowledge and experiences. This is consistent with approaches to parent participation that are largely based on facilitating parents in their empowerment process so that they can effect change, work to challenge the rhetoric of parent involvement, and work to build community action (Delgado Gaitan, 2001).

We focus on the strengths and assets of the families and communities with which we work in order to change the focus from needs of the communities to the pos-

sibilities present within the communities (Guajardo & Guajardo, 2002).

Context

The focus of MAPPS is on engaging parents in mathematics through three different types of activities: (1) *Mathematics Awareness Workshops (MAWS)*, which are open to all the parents (and their children) in the school district and range over key topics in K-12 mathematics (e.g., multiplication, misconceptions about the equal sign, exploring patterns, proportional reasoning). These workshops are self-contained and last about two hours.

(2) *Leadership development sessions* in which parents, teachers, and administrators learn how to facilitate workshops (MAWS) for the larger parent community and participate in team building activities. Each team of facilitators has a mentor—a parent or a teacher who entered the project earlier. Thus, there are teams in which parents are in fact mentors for the teachers.

(3) *Math for Parents (MFP)* courses that meet for eight weeks in two-hour sessions in which parents in the Leadership Teams have an opportunity to explore mathematical topics in more depth. The five courses developed in this project are: Thinking about Numbers; Thinking about Fractions, Decimals and Percents; Data for Parents; Thinking in Patterns; and Geometry for Parents.

Method

The research we report in this article took place in a MAPPS school district that is largely Hispanic/Latino (85.4%) and with the majority (77%) of the children on free or reduced lunch. Central to our approach to parental participation is Flecha's (2000) proposal of engaging in an egalitarian dialogue where each participant has a voice and where contributions are assessed in terms of their content and not in terms of the status of who makes them.

Marta Civil is a professor
in the Department of Mathematics
at the University of Arizona;

Jill Bratton and Beatriz Quintos are
graduate students in the College of Education
at the University of Arizona,
Tucson, Arizona.

As in our case, Flecha's work is with working-class adults that have often been marginalized and have encountered cultural, social, and personal exclusionary barriers in their journeys. Furthermore, as parents tell us about their former experiences as learners of mathematics, we have seen many similarities with the narratives of other people who were excluded from the "in-group" as mathematical learners throughout years of schooling and led to believe that mathematics was not for them.

We have multiple sources of data including field notes and evaluation protocols from most of the MAPPS activities (many of which were videotaped), interviews, and focus groups with small groups of parents. Furthermore, in our more recent work with a group of parents we used the strategy of the Unfolding Matrix (Padilla, 1993), which allowed us to work towards an egalitarian dialogue.

This strategy purports that by critically examining problematic aspects of their own lives, participants can gain the understanding necessary to identify possibilities of change. The question that we explored with the parents through the Unfolding Matrix was, "How can all children in the district be successful in mathematics?" Our data were examined and analyzed for themes as in grounded theory (Charmaz, 2001).

In the next sections we illustrate the four components of the proposed vision for parental participation in mathematics education. We pay special attention to the voices of immigrant mothers to illustrate the complexity of their situation. Language and cultural differences are variables to be expected as these parents try to make sense of their children's school system. What has not been so fully researched, however, are the implications of such differences within the context of mathematics education. To this end, we have conducted in-depth interviews and in some cases classroom observations (Civil, Bernier, & Quintos, 2003) with several immigrant mothers.

In this article we focus on the voices of Bertha, Esperanza, Lucinda, Marisol, Mónica, and Verónica. These mothers (with the exception of Lucinda) were part of the small group of parents with whom we have done our most recent work. We chose them because of their expressed interest and commitment to the project MAPPS. We are aware that they may not be representative of all immigrant parents. We also include the voices of other MAPPS parents to further illustrate some of the issues.

Parents as Parents

Most of the parents said that their children were the primary motivation to join the project. Being a role model or example for their children was important to them, and some felt that it was the best inheritance they were able to give their children, i.e., an understanding and appreciation of the importance of education.

Bertha: a parent role [is] like a leader, willing to take more risks in our life and also we can be a model for our children. If we have opportunities to grow, if we have some kind of knowledge we can support our kids better and they can see, "oh my gosh, they're doing this for themselves and also for me" and they can feel stronger.

The parents often talked about the importance of showing confidence and assurance to their children even when they themselves were not sure of the subject matter. They stressed the value of being positive and resourceful in the search for needed information.

They wanted to learn more about mathematics to be able to help and support their children with that subject, but several of them also brought up the idea of being involved in an educational project to inspire and motivate their children to continue studying.

Esperanza: Yo, para mis hijas, era su líder porque estaba involucrada en MAPPS. Darse cuenta porque estaba con ellas en la escuela también al mismo tiempo. Decían, "mi mami también va a la escuela."

(I was my daughters' leader because I was involved in MAPPS. You know, it was because I was with them in school at the same time. They said, "My mom goes to school too.")

For many parents, helping their children with mathematics homework can be challenging, especially as their children get older and the mathematics content becomes more specialized. Adding to that challenge is the fact that in many schools, mathematics is taught in ways that are likely to be quite different from what parents experienced when they were in school.

Although this is so whether parents went to school in the U.S. or in Mexico (as is the case for many of the immigrant parents in MAPPS), we argue that for immigrant parents it may become more of a challenge as the differences in approaches come charged with values about educational practices in two different countries. For example, in the excerpt below, we sense Mónica's frustration at her son's not want-

ing to go to her for help since "she does not know."

Mónica: Precisamente ahora estábamos... anoche me dijo que la escuela de México no valía lo que vale aquí, o sea, no cuenta. Lo que yo estudié allá no cuenta aquí, y hoy me dijo, "Mami, sabes este problema?" "No pues la verdad no," le dije. "Ves," me dijo, "ves, por eso te digo porque no te enseñan lo que me enseñan aquí." "Pues, no entiendo pero voy a tratar de averiguar para entender lo que tú estás aprendiendo." El sabe que es una enseñanza diferente la de allá y la de aquí y luego dice, para qué le voy a pedir ayuda a mi mamá si no sabe. Entonces ahí hay una barrera.

(Just recently we were... last night my son said to me that school from Mexico was not valued the same as school here, that is, it doesn't count. What I studied there doesn't count here and he said, "Mom, do you know this problem?" "No, to tell you the truth, I don't," I said to him. "See," he says, "see, that's why I said that they didn't teach you in what they teach me here." "Well, I don't understand [the problem] but I will try to find out more so that I understand what you're learning." He knows that what is taught here is different from what is taught there and so he says why would I ask my mom for help if she's not going to know. So, there is a barrier.)

In addition to the differences regarding methods, some children have to translate the problems to their Spanish speaking parents in order to receive their help. This makes the parents' situation even more difficult since it places the responsibility for explaining and translating on the children. Although the children may use Spanish to communicate, this does not mean that they will be able to use it to construct meaning in mathematics (Ron, 2000).

What is more, there is a growing body of research that suggests that a rift caused by language shift is being created between immigrant parents and their children that may have serious effects on the educational paths of children (Fillmore, 2000). Children are choosing to use English instead of Spanish, thus limiting the development of their Spanish abilities. In Verónica's case these factors are at play; her son lacks trust in her ability to help and she is frustrated about her possibility to help him,

Verónica: Apenas mi hijo esta en 6to y yo no pensaba que iba a pasar esto, también él no le gusta. El no se siente seguro como yo no hablo inglés, él no se siente seguro que yo le pueda ayudar, "Mijo, son matemáticas." "Sí, mami pero..." No sé si le da flojera o no encuentra las palabras— sabe español, pero el español no está tan amplio, el vocabulario de ellos cuando lo aprenden aquí

Reaching Out to Families: Parental Participation

yo no se siente seguro que yo voy a entender ni que él me va a traducir como me debe traducir para yo poderle ayudar.

(My son is just in 6th grade and I didn't think this was going to happen, he doesn't like it either. He's not sure of me because I don't speak English and he's not sure I am able to help him, "Son, it's mathematics." "Yes, mom, but..." I don't know if it's laziness or maybe he just doesn't find the words—he knows Spanish, but when kids learn Spanish here their vocabulary is not as developed and he's not sure I'm going to understand so he doesn't translate like he should so I'm able to help him.)

Parents as Learners

MAPPS was designed to engage parents in the exploration of standards-based mathematics. Group work, hands-on materials, and discussion of different approaches for a given problem were characteristics common to most MAPPS activities. Parents often commented on how this approach differed from what they had experienced as school children.

One salient aspect is the fact that these parents want to learn mathematics. Their questions and participation in the MAWS and the Math for Parents courses reveal a strong interest in understanding what is going on and not just in going through the motions. That approach is no longer satisfactory to most of the parents, although many of the parents did in fact learn in that manner:

Marisa: I can memorize formulas and so that's how I did the math, but it never clicked why until I took some of the MFP courses. A couple of the instructors were proving the theorems or whatever we were doing at the time, and then I said, "oh, that's why," and it made so much more sense and I said, "okay, wow, now I know why I was doing that." I wasn't just blindly memorizing facts.

And another mother stated,

MAPPS has been very different from my previous experience (with math). I went through my whole life being told how things were not and not given any freedom to figure it out on my own.

Many of the parents have experienced frustration with mathematics in the past. Some of them are outspoken about their change in attitude since their participation in MAPPS. They have developed more confidence and a better understanding of what mathematics entails. For some it has awakened a thirst for learning.

Esperanza: ¡No me gustaban! Si ves el video de las primeras entrevistas que me

hacían, te decía- yo no sé que estoy haciendo aquí, si a mí nunca me han gustado las matemáticas. Pero ya después cuando fui conociendo más de mate-mática, y estudiando más a fondo, es como una droga. Entre más números, ves, ¡más números quieres sumar! Le decía yo a Marta, me estás haciendo adicta a las matemáticas (risas).

(I didn't like mathematics! If you see the video of the first interviews, I said, I don't know what I'm doing here, if I have never liked mathematics. But after I started getting to know more about mathematics and studying more in-depth, it's like a drug. You take in more and more numbers and you want to add up more numbers! I said to Marta, you're making me a mathematics addict [laughter].)

Parents as learners and parents as parents are closely connected. As parents become learners of mathematics, they told us about how they would share what they were learning with their children. As Esperanza says,

At home, all my family becomes involved in my MAPPS homework, from my husband to my youngest child. As soon as I take my notebook, they come to the table.

Sharing the learning of mathematics with their children brings a different dimension to the family dynamics. Generally, families are not likely to engage in many conversations about mathematics. Yet, this is exactly what some of the MAPPS participants have reported happening. Parents and their children are teaching and learning from each other, as Lucinda describes below,

Lucinda: Y con el tema de los niños, que uno le está enseñando y uno está aprendiendo de ellos, es verdad porque cuando yo vengo a la escuela, la niña chiquita que tiene 5 años me dice, "Mami, tú vas a aprender para enseñarme". "Sí, yo voy a aprender para enseñarte", en cambio la niña más grande la que está en el cinco, me dice, "Mami, te voy a explicar algo que tú no aprendiste en tu clase."

(And with the topic of children, one is teaching them and one is learning from them. It is true because when I come to school, my youngest daughter who is 5 years old tells me, "Mom, you are going to learn to then teach me." Yes, I am going to learn to then teach you. But on the other hand my older daughter, the one who is 5th grade, she tells me, "Mom, I am going to explain something to you that you did not learn in your class.")

Many of the mothers have expressed that they like learning from their children, that it makes them feel proud of them and

that they, in turn, feel that pride. The role reversals are evident to the children as well. Some of the mothers have shared with us stories about how their children have reminded them, very succinctly, of what the parents do to them when they had a question. This has provided an opportunity for parents to view their children's learning through an experiential lens. They are now in their children's shoes:

Leonor: When he was in elementary and he came [to ask me and I was] all mad at him, because I have gone through the same thing over and over, finally I'd just say, "It's in there!" ... He remembers now and when I came last year, with G. [the MFP instructor], and we were doing graphing and I went and I'd say, "I need you to help with this", and he looked right to my eyes, and he goes, "Mom, it's in there!!" Oh! So I can't go ask him...

Parents as Teachers

After their first year in the program, many parents in the leadership teams began facilitating workshops (MAWS) for other parents in the school district community. Although many of them shared that they were very nervous in this new role, their enthusiasm to teach other parents became stronger and a central drive. Parents became aware of their knowledge and the need to collaborate with the schools. MAPPS established a system that challenged the traditional role of parents as listeners or "students." Parents were eager to collaborate to support this approach to parental participation.

Truthfully, I thought that [MAPPS] was to help me, but I didn't know that I was going to get so involved or that I was going to learn so much and that I wouldn't just use it for me but that I would take it to others. You see, it's awesome.

Jillian: What we learned ourselves...we can give back and then they can give and they can give and hopefully this will just keep going and going, even when our kids are gone.

Having parents teach other parents is similar to having teachers teaching teachers in university-run professional development programs. The teachers in those programs are often very grateful to have teachers teaching because they understand their professional reality much better than university professors do. The same is true of parents: they understand where other parents are coming from, and they know how to connect with them.

Esperanza: ... give them confidence by

telling them that I am also a mother...that I may also have doubts and that we are ready to explain something again when they do not understand it. In conclusion, the important thing is to make them feel confident.

Jillian: ...parents know that I am teaching but they are teaching me too, not to make them feel like dummies. Let them contribute as much as I am contributing.

The next two quotes capture how strongly these mothers understood this particular goal of MAPPS and how powerful it is to have parents teaching other parents:

Jillian: ...the whole object of MAPPS was for parents to come in and teach other parents, so they didn't feel so uncomfortable, intimidated...teachers can come in and teach because that's what they do, but when you have another parent come in teaching you...you can absorb a lot more.

Bertha: The point is be part of the school, be part of the community like parents, not like students for the teachers even though you kind of learn through MAPPS...to me the main point was parent involvement ...to me the point of MAPPS was using the parents, using in the right way, using parents to teach other people.

Parents as Leaders

One of MAPPS' goals was leadership development. One clear level of leadership was manifested in the different roles that parents took. Some of them became MAWS facilitators and a few of them became mentors of the facilitating teams. This level of leadership is quite different from monitoring the school cafeteria, helping with bulletin boards, or doing school fund raising, forms of parental involvement that we have seen in our local context with low-income, ethnic and language "minority" parents (Civil & Andrade, 2003).

Challenging the established roles by having parents become "teachers" is not unproblematic. The expansion of the definition of parent-teacher roles and relationships is a critical component towards parents' inclusion in leadership roles.

As we reflect on some of the issues related to expanding this definition, we realize that MAPPS did not do enough to break existent unequal power relations and to develop a dialogue between parents and teachers (see Bernier, Allexsaht-Snyder, & Civil, 2003; Civil, Bernier, & Quintos, 2003). For example, Marisol, a participant who always embraced the project with great enthusiasm, reflected on the relationship with the teachers,

when she first became a MAW facilitator:

Marisol: It was hard in the beginning to work with the teachers. "They are the best." They don't give you the opportunity that you may know more or bring other ideas. Now we are more equal. Before [with her hands she indicates parents in the team were at a lower level than teachers], but now [she indicates they are at the same level]. Now they rely on me, they check with me, they make you feel that you are important to them. One teacher once told me "you just hand out papers" and I was upset. [Then she goes on to explain how in a more recent MAW she took the lead of the presentation.]

In discussing parents' and teachers' role in MAPPS, Jillian stated that parents are the only way to make sure it is a continued effort,

The teachers may come and go, but they're not going to take it [the school] with them, it's going to stay right where it is, so we have to make it stronger and stronger, but if you start putting people in there that are going to leave [referring to teachers] then where is the leadership? It's gone or it's real thin.

The parents in MAPPS were aware of their critical role in the improvement of their children's education. Some of the parents took action and ensured that their children were assigned to specific teachers or questioned their children's educational placement when they did not agree. A clear example of what MAPPS could do in terms of raising parents' awareness about mathematics education was the case of Esperanza.

When she realized that her daughter's teacher was not teaching as much mathematics (and at a much lower level) as another teacher in the same school, she was able to place her daughter with this teacher just for mathematics. But we wonder, as these parents become more informed about mathematics education issues and more exposed to different approaches to mathematics teaching and learning, will they become more active as advocates for a quality mathematics education for *all* children? How can leadership roles for parents be expanded to lead to action beyond their own children?

In our more recent work in which we have emphasized an egalitarian dialogue and the critical discussion of issues related to mathematics education in general, we have made some strides towards the concept of community action, as the quote below captures. In it, Verónica challenged

the group to move from actions that benefit their own children to "community actions" or actions that would benefit the larger population of the district.

Yo les dije [refiriéndose a las madres en el grupo], ¿qué van a hacer ustedes? como ustedes están promocionando este programa para motivar a los padres al éxito con los niños en las matemáticas. ¿Qué es lo que vamos a hacer? Porque yo lo que hago es venir para ayudar a mi hijo, al mío. Pero eso no significa el éxito de un distrito, de una escuela, verdad. No, ni del distrito, ni de la escuela.

(I said to you [referring to the mothers in the group], what are you going to do? How are you promoting this program to motivate parents for children's success in mathematics. What are we going to do? Because what I do is to come to help my child, mine. But that that doesn't mean the success of a district, of a school. No, not of the district nor the school.)

Conclusion

The vision for parent participation described in this article is grounded on the concept of parents as intellectual resources. This vision calls for parents' engagement in academic spaces (Calabrese Barton, Drake, Perez, St. Louis, & George, 2004).

We argue that engaging parents in an academic subject such as mathematics that is quite "charged" (e.g., consider the role it plays in standardized testing and graduation exit exams) and often functions as a gatekeeper (and in particular in contexts such as ours with Latino, low-income students), may open the door towards action. That action may be at the individual level at first (e.g., advocating for their own children), but through dialogue and group reflection can lead to community action (Bratton, Quintos, & Civil, 2004).

As Bourdieu (1986) points out, the difference in distribution of cultural capital and how each group's capital is valued by the dominant group may explain some of the differences in children's school achievement. The four components in parents' participation in mathematics education described in this paper provide a mechanism to address this inequity in how the different forms of capital among low-income, ethnic/language "minority" families is perceived by schools.

Notes

¹ We use the term "parent" to refer to any significant adult in the child's life. Although in our project, most participants have been the

Reaching Out to Families: Parental Participation

mothers, we have also had fathers, grandparents, and other family members.

² MAPPS (Math and Parent Partnerships in the Southwest) is funded by the National Science Foundation under grant ESI-99-01275. The views expressed here are those of the authors and do not necessarily reflect the views of the funding agency.

References

- Benn, R. (1997). *Adults count too: Mathematics for empowerment*. Leicester, UK: NIACE.
- Bernier, E., Allexsaht-Snider, M., & Civil, M. (2003, April). Teachers, parents, and Mathematics: Exploring contexts for collaboration and partnership. Paper presented at the annual meeting of AERA, Chicago, IL
- Bourdieu, P. (1986). The forms of capital. In J.G. Richardson (Ed.), *Handbook of theory and research for the sociology of education* (pp. 241-258). New York: Greenwood Press.
- Bratton, J., Quintos, B., & Civil, M. (2004, March). Collaboration between researchers and parents for the improvement of mathematics education. Paper presented at the 1st Annual Binational Symposium of Education Researchers, Mexico City, Mexico.
- Calabrese Barton, A., Drake, C., Perez, J. G., St. Louis, K., & George, M. (2004). Ecologies of parental engagement in urban education. *Educational Researcher*, 33(4), 3-12.
- Charmaz, K. (2001). The grounded theory method: An explication and interpretation. In R. M. Emerson (Eds.), *Contemporary field research: perspectives and formulations* (pp. 109-126). Prospect Heights, IL: Waveland Press.
- Civil, M. & Andrade, R. (2003). Collaborative practice with parents: The role of the researcher as mediator. In A. Peter-Koop, V. Santos-Wagner, C. Breen, & A. Begg (Eds.), *Collaboration in teacher education: Examples from the context of mathematics education* (pp. 153-168). Boston: Kluwer.
- Civil, M., Bernier, E., & Quintos, B. (2003, April). Parental involvement in mathematics: A focus on parents' voices. Paper presented at the Annual Meeting of AERA, Chicago, IL
- Delgado-Gaitan, C. (2001). *The power of community: Mobilizing for family and schooling*. Denver, CO: Rowman & Littlefield.
- Fillmore, L. (2000). Loss of family languages: Should educators be concerned? *Theory into Practice*, 39(4), 203-210.
- Flecha, R. (2000). *Sharing words: Theory and practice of dialogic learning*. Lanham, MD: Rowman & Littlefield.
- González, N. (1995) (Ed.). Educational innovation: Learning from households. *Practicing Anthropology*, 17(3), 3-24
- Guajardo, M., & Guajardo, F. (2002). Critical ethnography and community change. In Y. Zou & E. Trueba (Eds.) *Ethnography and schools: Qualitative approaches to the study of education* (pp 171- 184). Lanham, MD: Rowman & Littlefield.
- Henry, M. (1996). *Parent-school collaboration: Feminist organizational structures and school leadership*. Albany, NY: State University of New York Press.
- Knijnik, G. (1993). An ethnomathematical approach in mathematical education: a matter of political power. *For the Learning of Mathematics*, 13(2), 23-25.
- Lareau, A. (2000). *Home advantage: Social class and parental intervention in elementary education*, updated edition. Lanham, MD: Rowman & Littlefield.
- Moll, L.C. (1992). Bilingual classrooms and community analysis: Some recent trends. *Educational Researcher*, 21(2), 20-24.
- Padilla, R. (1993). Using dialogical research methods in group interviews. In D. Morgan (Ed), *Successful focus groups* (pp. 153-166). Newbury Park, CA: Sage.
- Ron, P. (1999). Spanish-English language issues in the mathematics classroom. In L. Ortiz Franco, N. Hernandez, & Y. de la Cruz (Eds.), *Changing the face of mathematics: perspectives on Latinos* (23-33). Reston, VA: National Council of Teachers of Mathematics.