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Nature of Arabic mothers' involvement in their children's mathematics education

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THE NATURE OF ARABIC MOTHERS' INVOLVEMENT IN THEIR CHILDREN'S MATHEMATICS EDUCATION

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ABSTRACT

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In this qualitative study, the researcher explored the nature of Arabic mothers', who live in the United States involvement in their children's mathematics education. There is no data about this minority population as related to mathematics educational involvement since Arabic and Muslim women are scarcely represented in the educational research. Eighteen mothers participated in four focus groups, all agreed on the importance of mathematics and their involvement in their children's math education despite the fact that many of them had negative experiences learning mathematics, and were not familiar with the new teaching methods. These mothers became involved at home by helping with children's math homework; playing math games; motivating children; and providing them with comfortable atmospheres to study and do homework, and at school by volunteering, attending parent-teacher conferences, and communicating with math teachers.

All of these mothers believed that their educational involvement resulted in many benefits for their children such as improving children's understanding and grades, easing struggling and frustration, improving study habits and parents' knowledge of child's learning, increasing family time, increasing parents' support, attention, and encouragement for the child, and increasing child's happiness and comfort.

These mothers faced many challenges when they strove to become involved such as fear, math and new teaching methods' difficulties, difficulties dealing with teachers and school personnel, poor math instructions, gender differences, child's behavior, and standardized tests challenges. In addition, they faced some cultural related challenges such as their children feeling embarrassed by their *hijab* (head covering), and school students and personnel treating them differently. Thus, most of these mothers agreed on the importance of informing teachers and school personnel about their culture.

These mothers had many different suggestions to teachers and school personnel in order to enhance their educational involvement and build cooperation between home and school such as inviting parents to school and to their children's classrooms, encouraging them to volunteer at their children's schools, welcoming and greeting them, teaching all students about other cultures different from the dominant culture, keeping communication open about their children's academic progress, teaching them new methods for teaching mathematics, encouraging and providing cultural activities, recognizing *Eid* (Islam's most reverent holiday), teaching Arabic in schools similar to Spanish and French, and offering math support to weak students.

In addition, the use of the Critical Race Feminism focus group data collection method resulted in a dense quantity of rich data about the nature of Arabic mothers' involvement in their children's mathematics education, which provided the researcher with a clear understanding of these mothers own experiences, challenges, and perspectives in a relatively short period of time. The Critical Race Feminist theory provided room to fully appreciate these mothers' important role of their involvement in

their children's education despite the enormous challenges they face as a minority group in this society.

More studies are still needed in this important field in particular, the United States society is a multicultural one and the home culture should be taken in account in order to improve minority children's achievement. Specifically, the number of Arabic families in the United States has grown during the last two decades.

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CHAPTER I

INTRODUCTION

In the last few years, there has been an increased national focus on the role that parents play in their children's educational development because research has shown despite of educational, economic, and racial backgrounds, there is a strong link between students' educational achievement and different forms of parental involvement (Mapp, 2003). Crosnoe (2010) defines parental involvement in their children's education as the ways parents attempt to support and manage their children's educational experiences. Studies such as Carreon, Drake, and Barton's (2005) have shown a correlation between parental involvement in their children's education and better outcomes in children's schooling such as improvement in school attendance, grades and test scores, attitudes about school, and graduation rates.

Many parents face challenges when they engage in their children's education, especially mathematics education. Researchers such as Remillard and Jackson (2006) give examples of these challenges, such as parents' unfamiliarity with the current methods of teaching mathematics, racial stereotypes, and language differences for non-English speakers. Despite such challenges, most parents believe in the importance of learning mathematics, are willing to be involved in supporting their child's mathematics learning, and are eager to improve their mathematical content knowledge of reform mathematics and the current mathematical pedagogical practices in order to help their children (Civil, Guevara, & Allexsaht-Snider, 2002; & Muir, 2012b). Parents may become involved in their children's mathematics education in many different levels and ways, such as helping children with homework, encouraging their children's

achievement, attending parent-teacher conferences, or volunteering at school (Balli et al., 1998, Mapp, 2003; & Lee & Bowen, 2006).

Stepanek (1998) stresses the need for improving parents' and schools' cooperation since both parents and school are partners in children's lives and each plays an important role in a student's educational achievement. Therefore, despite their race, language, or economic situations, schools need to empower parents more, and allow them to be more involved in their children's mathematics development by creating involvement opportunities for parents such as evening workshops and interactive homework, making all parents feel welcome at the children's school, respecting and valuing their efforts, diminishing the language difficulties that some parents face, keeping parents informed of their children's progress, and inviting parents to visit classrooms to observe and learn the current mathematics, and to volunteer at school (Stepanek,1998, Turney & Kao**,** 2009; Muir, 2009, 2012a; Jackson & Remillard, 2005; & Voorhis, 2003). However, constructing true cooperation with parents is difficult and requires effort and commitment because interactions between teachers, students, and parents, will not constantly be easy and directly effective (Stepanek, 1998).

There is an urgent need for more research on this important issue since "there is a small set of studies, primarily in mathematics education, that takes a more critical stance on parental involvement in school" (Barton, Drake, Perez, St. Louis, & George, 2004, p. 4). In particular, the United States society is a multicultural one and that discontinuity between the school and home culture might be one of the reasons of poor achievement among minority children. Minority parents' voices should be heard and their voices count even if they do not speak English. "I learned that your voice counts, even if you

don't speak the same language, it counts," stated a parent unequivocally (Bratton, Quintos, & Civil, 2004, p. 22).

One of these minority groups of parents is Arabs who live in the United States. According to the Arab American National Museum (2013), Arabs have been coming to the United States for hundreds of years in search of better opportunities. Arabs are among the several cultural groups that make up the United States. They come to the U.S. for political, economical, and educational reasons. In general, Arabs value education and care about their children's educational achievement. Arabs come from the Arab world that stretches from North Africa to West Asia (Arab American National Museum, 2013). Arabs practice many religions such as Islam, Christianity, Druze, Judaism and others (AMEMSA Fact Sheet, 2011). The Arab world consists of 22 countries: Algeria, Bahrain, Comoros, Djibouti, Egypt, Iraq, Jordan, Kuwait, Lebanon, Libya, Mauritania, Morocco, Oman, Palestinian Territories, Qatar, Saudi Arabia, Somalia, Sudan, Syria, Tunisia, United Arab Emirates, and Yemen. Arabs share language, history, and cultural heritage. Arab parents' voices should be heard and their voices count, in particular Arabic mothers' voices since they generally are more involved in their children's education than fathers.

Statement of the Problem

In his call for more research on ethnic minority parental involvement, Sy (2006) states,

> The increasing number of ethnic minority children in a school system… calls for research on involvement practices of families from different cultural backgrounds. Such information would shed light on individual differences in children's early achievement and adjustment and may provide additional avenues for early intervention (p. 120).

Although many researchers have studied U.S. dominant group parents' involvements in their children's mathematics education, a few researchers have studied minority parents, particularly minority mothers' involvement in their children's mathematics education. In fact, I was unable to find any research about Arabic mothers' involvement in their children's mathematics education. Thus, to my knowledge, no researcher has studied Arabic mothers' involvement in their children's mathematics education. Opinions of Arabic mothers about this essential topic are an under explored area in the field of mathematics education. Therefore, a detailed study of this important issue is needed.

Purpose of the Study

Since Arabic mothers are generally more involved in their children's education than fathers, the purpose of the current study was to explore the ways Arabic mothers, who live in the United States, are involved in their children's mathematics education, the challenges they face when involved, and the mothers' attitudes toward mathematics and towards new methods of teaching it. Similar to other mothers, Arabic mothers come to the mathematics reforms with different mathematical background, history, and levels of success, and most faced difficulties with mathematics (Remillard & Jackson, 2006), and as other immigrants, Arabic mothers want their children to be successful and receive a good education, and they do not want their children to be left behind in education (Lopez & Donovan, 2009). However, some Arabic mothers and their children face many difficulties in adjusting to the new culture and traditions, in addition to the difficulty of learning a new language for most cases and the discrimination that some face.

Rationale for the Study

According to Aburumuh, Smith, and Ratcliffe (2009), the number of Arabs in the United States has grown by more than forty five percent between the years 1990 and 2000. In fact, Arabic-speaking student population in U.S. public schools has increased significantly in recent years since fifty four percent of Arabs who live in the United States are of public-school age (Aburumuh, et al., 2009). However, educators' lack of basic understanding of Arabic culture is a serious issue which has received little attention (Aburumuh, et al., 2009). Therefore, this study was fundamental to 1) explore how Arabic mothers who live in the United States engage in their children's mathematics learning despite the fact that educators lack the knowledge of Arabic culture, 2) investigate how Arabic mothers' culture influences the ways they are involved in their children's mathematics education, 3) examine the challenges these mothers face when engaging in their children's mathematical learning, 4) explore the benefits that students receive when their mothers engage in their mathematics education, 5) inspect these mothers' attitudes toward mathematics, 6) study their attitudes toward the current methods of teaching mathematics in relation to the mathematics they learned in the Arabic World, and 7) investigate their attitudes about their engagement in their children's mathematics education, and gather their suggestions for school personnel and teachers on how to enhance mothers' involvement and build a school-parent collaboration. Since I used culturally competent focus groups as a method to collect qualitative data about the nature of Arabic mothers' educational involvement, I expected to collect a large quantity of data because Arabic women speak more freely in focus groups that have women only.

In addition to the above aspects, this study explored the impact of the critical race feminist focus group data collection method on the nature of data that were collected.

Research Questions

Q1 What is the nature of Arabic mothers' involvement in their children's mathematics education?

- 1a What are the mothers' attitudes towards mathematics?
- 1b What are the mothers' attitudes about their children's current mathematics education?
- 1c What are the mothers' attitudes about their engagement in their children's mathematics education?
- 1d What are the benefits the children receive when their mothers engage in their mathematics education?
- 1e How do Arabic mothers engage in their children's mathematics education?
- 1f What challenges do these mothers face when they engage in their children's mathematics education?
- 1g What challenges do these mothers and their children face due to their culture?
- 1h In what ways does the mothers' culture influence how they are involved in their children's mathematics education?
- 1i What are the mothers' attitudes about informing teachers and school personnel about their culture?
- 1j What are the mothers' suggestions for teachers and school personnel on how to enhance Arabic mothers' involvement and build school-parent collaboration?

Methodology Research Question

Q1 What is the impact of the critical race feminist focus group data collection method on the nature of data collected in this study?

This study led to many possible positive results such as increasing awareness and understanding of Arabic mothers' culture, nature of their educational involvement, and challenges they face when they engage in their children's mathematics education. If educators understand the cultural aspects that manage these mothers' involvement, they might respect their values and efforts and enhance their educational involvement by creating opportunities for them to get involved in some school activities**.**

Furthermore, the awareness increase of challenges that these mothers face could help in finding solutions for these challenges such as, for instance, reducing language barriers by translating written materials, proposing programs or workshops that familiarize these mothers and other parents with new approaches in teaching mathematics in order for them to help their children learning mathematics. The study could also unveil some effective methods of Arabic mothers' engagements in their children's mathematics education that other parents could use. Moreover, the Arab mothers' suggestions for school personnel and teachers could enhance mothers' involvement and build strong school-parent collaboration.

In fact, being culturally similar to my study participants would make it easy for me, the researcher to clearly recognize individuals' messages because of the background similarity that we share within our culture (Halcomb et al., 2007). This similarity might reduce communication barriers between participants and me and help me provide them with culturally sensitive treatment when conducting focus groups where topics discussed are placed within a culturally specific perspective (Halcomb et al., 2007).

Summary

In this chapter, I highlighted the focus of the current study, stated the research problem, and identified the purpose of the study, its rationale and significance, and listed the study research questions. In the next chapter, I will provide a detailed literature review that includes definitions of parental educational involvement, history and goals of mathematics reform, the importance of parental involvement, challenges of their involvement in their children's mathematics education, forms of their involvement, and their attitudes towards their involvement.

In addition, the literature review will include minority parents' involvement in their children's mathematics education that comprise of African-American parental involvement, and immigrant parents' involvement which consist of Hispanic immigrants and Asian immigrants parental involvement. Moreover, the literature review will include how schools can increase parental involvement and examples of school practices in this regard.

CHAPTER II

REVIEW OF LITERATURE

Many authors have defined "parental involvement in their children's education" in several different ways. Jeynes (2003) argues, parental involvement can be a fuzzy term that means numerous different things to different people, and it could consist of family community, parental interest, expectations, and involvement in their children's school. Moreover, Carreon, Drake, and Barton (2005) declare, "parental involvement is not a fixed event but a dynamic and ever changing practice that varies depending on the context in which it occurs, the resources parents and schools bring to their actions, and the students' particular needs" (p. 467). Besides, McKay, Atkins, Hawkins, Brown, and Lynn (2003) claim, traditional definitions of parental involvement include attending school events, workshops, parent-teacher meetings, and academic conferences. In addition, Crosnoe (2010) defines parental involvement as the ways parents attempt to support and manage their children's educational experiences.

Furthermore, McKay et al. (2003) assert there have been attempts to broaden the definition of parent-school involvement in order to better represent the activities of parents with their children. "An expanded definition of parents' involvement has been proposed to include ensuring that children have proper school supplies, monitoring the amount of sleep that children get, and supporting the child in arriving at school on time" (McKay et al., 2003, p. 108). In fact, for the purpose of this proposal, parental involvement is defined as the way parents participate in their children's education at home, school, and community to encourage, support, and help in an effort to improve

children's academic achievement and school experience. I hold this definition as a working one which will be informed by this study.

Parental Involvement and Mathematics Reform

Research has shown that parents could play an essential role in their children's education. Fantuzzo, McWayne, and Perry (2004) state "parents are fundamental partners in the education and development of their children" (p. 478). However, according to Persinni (1998), parental involvement in their children's education has been a disturbing issue for some time with parental involvement being analyzed in the abstract and have not been seriously examined. Anhalt, Allexsaht-Snider, and Civil (2002) asserted, in the early 1980's,

> Parents were characterized as promoting activities that were counter-productive to reform and as lacking understanding of the complexity of teachers' work in instructing children in mathematics…. Parents were portrayed as stumbling blocks for reform in mathematics education, suggesting that their beliefs about learning and mathematics could actually reinforce their children's failure in mathematics…. Around the end of the 1980's parents were considered to be potential barriers to improving mathematics education (p. 257).

Fortunately the contemporary field had moved to an understanding of parents as natural partners as seen in recent research such as Mapp's (2003) work addressing the positive effects of parental involvement in their children's mathematics education. According to Persinni (1998), educational reformers recently have included parents and community members in their efforts to improve schools in the United States, because parental involvement has many positive effects on students' mathematics achievement.

History of Mathematics Reform

During the 1960s, according to Persinni (1998), math educators focused on improving the curricular content of mathematics education. They implemented the New

Math curriculum where parents were not included in the reform effort and did not have a place in the mathematics classroom. The New Math content was complicated, abstract, and now deemed inappropriate for school children since only university faculty and teachers were the owners of its particular knowledge (Persinni, 1998). Thus, parents usually could not help their children with their mathematics homework. Those who implemented the New Math failed to educate parents about the content and goals of the reform. The failure of the New Math was brought in part by parents and the public dissatisfaction with the New Math (Persinni, 1998).

In 1977 the Mathematical Association of America and the National Council of Teachers of Mathematics (NCTM) withdrew most of the1960s reform ideas and replaced them with more traditional forms of instruction and content, emphasized a back to basics viewpoint for mathematics education, and tried to create programs that parents were comfortable with. During the 1980s the work on mathematics education curricular reform continued, emphasizing the importance of problem solving. During this period there was a shift from ignoring parents to recognizing their power (Persinni, 1998).

Goals of Mathematics Reform

There were many educational goals that the mathematics education reform has tried to achieve such as diverging from traditional teaching and learning, and more parental involvement. Persinni (1998) states,

> Mathematics education reform efforts in the United States include ambitious goals for schools, teachers, and students. Those in the school mathematics reform movement-a movement originating in the evolving nature of the discipline of mathematics (i.e., what it means to know and do mathematics), advances in cognitive psychology, shifts in curriculum and assessment theory, the study of teaching, and analyses of the changing needs of U.S. society-have drawn on their roots to establish a framework for changes in mathematics education. Accordingly, new images have been outlined for the nature and amount of

> mathematics that students should encounter in school, the activities and educational settings in which students encounter this material, the role that the classroom teacher plays in organizing and implementing these experiences, and ways in which students' developing mathematical knowledge and understanding are assessed (p. 557).

Furthermore, according to Muir (2012b), the reform focused on how students can best learn mathematics rather than mathematics content, and to move away from traditional teaching methods of telling and practice of procedures to a constructivist view of learning that helps students construct meaningful concepts of mathematics. Schwandt (2007) defines constructivism as,

> The belief that the mind is active in the construction of knowledge… knowing is not passive… but active… constructivism means that human being do not find or discover knowledge so much as construct or make it. We invent concepts, models, and schemes to make sense of experience, and we continually test and modify these constructions in the light of new experience…. We do not construct our interpretations in isolation but, rather, against a backdrop of shared understanding, practices, language, and so forth (p. 38).

Moreover, (2012b), explains, the reform involved a variety of processes such as reasoning and proof, problem solving, and communication and reflection, with emphasis on developing a conceptual understanding of mathematical ideas and connecting these ideas.

Lehrer and Shumow (1997) explain the mathematics reform is a student-centered method of teaching that stresses the progressive construction of mathematical meaning by students as the foundation of mathematical pedagogy where students practice problem solving, communication, and sense making. In addition, Anhalt et al. (2002) argued, "mathematics education reform has recently emphasized equity and excellence for all students, and that schools have an obligation to ensure that all students participate in a strong instructional program that supports their mathematical learning" (p. 256).

In addition to their goals for students, teachers, and schools, reformers had goals for parents. For instance, Muir (2012b) states reformers advocated the need to work with parents because parents have their expertise and knowledge about their children and therefore can add to their children's mathematical learning. Moreover, Jeynes (2003) asserts, research on parents' involvement in their children's education has increased during the past two decades. Jeynes adds recently, parents' involvement in their children's education is one of the most important topics in educational fields particularly because the American family strength has declined during the past decades, the fast rapidity of contemporary society, and the increase of numbers of two working parents' families. Furthermore, Persinni (1998) asserts, recently in their efforts to improve schools in the United States, educational reformers have expanded their range to include parents and community members because parental involvement has many positive effects on students' mathematics achievement.

Importance of Parental Educational Involvement

Research has shown that parental involvement in their children's schooling is one of the most important factors in children's educational success. Several research studies such as Mapp's (2003), have addressed the positive effects of parental involvement in their children's education by showing positive correlation between parental involvement and improved outcomes in children's schooling. Stepanek (1998) asserts, "educational research consistently shows that one of the most important and effective resources available to a child is his or her family" (p. 2). Moreover, Mapp (2003) states,

> In the last decade, there has been a renewed national focus on the role that families play in their children's educational development. More than three decades of research show that, regardless of economic, racial/ethnic, and

> educational backgrounds, there is a strong link between educational benefits to children and various forms of family engagement (p. 36).

Therefore, Persinni (1998) stresses the need to involve parents as an important group in mathematics education reform and to understand the different aspects of parental involvement of school mathematics. In fact, Persinni (1998) claims, "it is important to acknowledge that much of a child's education takes place out of school and that parents have their own expertise and unique knowledge about their children and thus can contribute to their children's mathematical development" (p. 578).

Benefits of Parental Educational Involvement

Research has shown many positive effects of parental educational involvement on student's achievement, cognition, behavior, and attitude toward learning. In addition to student benefits, educators may benefit from parental educational involvement.

Achievement and Attitudes

Many studies have shown that students' achievement improves when parents get involved in their children's education. Mapp (2003) argues parental involvement in children's education results in many educational benefits to children such as better school attendance, higher grades and test scores, more positive attitudes about school, higher graduation rates, and greater enrollment in postsecondary education. Similarly, Persinni (1998), Balli, Demo, and Wedman (1998), Sheldon and Epstein (2005), and Muir (2012b) claim, beside improving student achievement, behaviors, and attitudes toward learning and school, parental involvement might increase parent-child communication and home-school communication, and enhance the educational experiences of disadvantaged students.

In addition, Carreon et al. (2005) argue, high levels of parental involvement correlate with children's higher homework completion rates, fewer placements in special education, academic determination, fewer suspensions, and lower dropout rates. Furthermore, Izzo, Weissberg, Kasprow, and Fendrich (1999) explain, when parents participate in school activities and communicate with teachers effectively, parents understand school expectation of their children and learn from teachers how to enhance children's education at home, and students receive constant messages from both home and school about the significance of education, which influences their learning positively. Besides, Stepanek (1998) claims, when parents participate in their children's education, they show their children that school activities are important and interesting, and give their children the opportunity to view and model their parents' positive behaviors and attitudes.

In fact, Sheldon and Epstein (2005) assert, students whose parents meet with mathematics teachers to discuss ways to help at home, attend training and information workshops, and obtained materials to help their children at home succeed more in mathematics than did students whose families does not do so. In addition, Muir (2009) explains, "the single biggest factor in children's educational success is their parents … parental comments, such as "I was never any good at math *either*", send a signal that it is quite acceptable for the next generation to neither learn nor care about mathematics" (p. 395). Additionally, Stepanek (1998) asserts,

> Parents are instrumental in demonstrating the many uses of mathematics and science in home life, jobs, and other real-life situations…. When students are aware of mathematics and science outside the classroom, they are more motivated and can develop a better understanding of what they are learning (p. 4).

In fact, researchers have shown parents' education expectations and goals for their children correlate positively with children's academic achievement. Fan (2001) studied the effect of parental involvement on students' academic growth during the high school years. Fan (2011) has found that parents' education aspiration for their children has a consistent effect on students' academic achievement. That aspiration effect is stronger than the effect of their social economic status, and it might transform to a range of useful educational activities and behaviors during student's life (Fan, 2001).

Lee and Bowen (2006) state, parents' higher educational expectations for their children were associated with higher academic achievement across different demographic groups. In fact, Flannagan (1997) asserts, "parents' beliefs about children's academic abilities may be more powerful predictors of children's own views of their abilities than their actual prior performance" (p. 603). Flannagan adds parents, mainly mothers, are seen as essential contributors to the development of their children's self-perceptions about academic performance.

Similar to the dominant race parents' involvement, Jeynes's (2003) meta-analysis shows significant impact of parental involvement on children's academic achievement for all the minority groups under his study and for boys and girls. Like with other subjects, Sheldon and Epstein (2005) have found that parents' beliefs and expectations for their children in mathematics predict student achievement in mathematics.

Cognition and Social Behavior

In addition to improving students' achievement and attitudes, parental involvement may improve students' cognition and social behavior. Driessen, Smit, and Sleegers' (2005) have found that parental involvement in their children's education

positively affects the cognition and social performance of children. In addition, according to Pan, Gauvain, Liu, and Cheng (2006), social communication between adults and children contribute to cognitive grow thin memory, attention, problem-solving and planning.

Attitudes toward Learning

Besides achievement, attitude, cognition, and behavioral benefits, parental involvement may improve students' attitudes toward learning. Crosnoe (2010) asserts parental involvement shows children that parents, their role models value education. In fact, the National Council of Teachers of Mathematics (2000) states, "when parents understand and support the schools' mathematics program they can be invaluable in convincing their daughters and sons of the need to learn mathematics and to take schooling seriously" (p. 378).

Educators' Benefits

Not only students can benefit from parental involvement, but also educators. Yan and Lin (2005) argue educators benefit from increasing parental involvement in many different ways: teachers gain confidence in their efficiency to teach children, curriculum transfers to parents, administrators strengthen community relations with parent interactions, and schools become more mutual and caring in nature when they work with the community at large. Likewise, Stepanek (1998) asserts, parents can provide teachers with many helpful ideas of how to improve students' achievement or motivation because parents know their children very well.

Despite its great benefits, parental educational involvement is not an easy task for many parents since they face many different challenges being involved in their children's

education in general and in their children's mathematics education in particular. In the following section, I will explore reasons behind lack of parental educational involvement.

Reasons behind Lack of Parental Involvement in Math

In their attempts to be involved in their children's education, many parents face different types of challenges that might prevent or weaken their involvement especially in their children's mathematics education since according to Pan et al. (2006), mathematics is thought to be one of the most difficult subjects in formal education. The following are a few of these challenges.

Mathematics Anxiety

According to Muir (2009), "many adults, in relation to mathematical tasks, admit to feelings of anxiety, helplessness, fear and dislike…. This is of concern as presumably many of these adults become parents who will potentially pass these feelings onto their children" (p. 395). Furthermore, Muir (2012b) asserts, some of the reasons that might prevent parents' involvement are parents' believe that mathematics is dull and boring, and makes them feel anxious, helpless, and fearful. These parents might pass these attitudes and feelings on to their children. Moreover, Stepanek argues, when parents express their fear of mathematics and their dislike for it this might affect their children's potential of their own ability in this subject.

Negative Reaction to Reform Math

Besides mathematics anxiety, many parents might react negatively to the current reform in mathematics education and find it complicated. Remillard and Jackson (2006) claim, mathematics education reforms encourage a view of mathematics that is unachievable to most of these parents, which limits parental involvement in their

children's mathematics education, such as limiting their access to reform discussion. Limiting parents' access to the discussion of reform is pointing that parents are not important educational players despite the fact that these parents already view themselves as significant players in their children's education (Remillard & Jackson, 2006). Remillard and Jackson add, excluding parents from the discussion of mathematics reform might lead to the failure of the reforms because the more parents understand about the mathematical approaches their children are learning, the greater the potential for these parents to be involved in their children mathematics education.

One of the reasons behind parental negative reaction to reform mathematics is the current approach to teaching mathematical concepts that were created to increase emphasis on conceptual understanding, problem solving and reasoning and to decrease emphasis on the memorization (the National Council of Teachers of Mathematics, 2000). These new approaches are different from the approaches that parents are familiar with, and according to Muir (2012b), many parents feel uninformed about these new teaching methods. Furthermore, Stepanek (1998) asserts, many parents are concerned about helping children with homework because they do not want to interfere or do not feel confident about their own knowledge and skills.

Additionally, according to Muir (2012b), one of the difficulties the new methods of teaching mathematics have created to parents is that parents may value their own ways of doing mathematics over school mathematics, while many children value schools' methods over their parents' methods, which creates conflicts between children, parents, and teachers. In his study about parents in the school of mathematics reform, Peressini (1998) states, many parents experience tension when they observe the huge distinction

between their children's mathematics classes and their own experiences with mathematics. For instance, Lehrer and Shumow (1997) report on a parent who was not comfortable with the new teaching methods of odd and even numbers. The parent argues, "Well, we always learned if you can divide it in half evenly it's even. And these poor kids were all frustrated trying to explain it in different ways, and I think our simple, one-line rule would have solved their whole problem!" (p. 52).

However, according to Civil, Bernier, and Quintos (2003), many parents have mixed feelings about reform mathematics; many seemed supportive of particular practices such as children sharing their approaches to problems that the children were exploring, while many showed some anxiety and frustration at not being able to help their children with the homework. Carreon et al. (2005) state, "As parents enter these traditional spaces of involvement, they do so with limited power to define their roles or actions… they are expected to agree with and support the structures and dynamics already in place" at school (p. 467). For instance, Civil et al. (2003) report on one parent telling them "It was hard in the beginning to work with the teachers…. They don't give you the opportunity that you may know more or bring other ideas" (p. 6).

Content Knowledge and Teaching Skills

Another challenge that parents face being involved in their children's mathematics education is parents' lack of content knowledge and teaching skills. Sheldon and Epstein (2005) state, home-school partnerships in mathematics might be more difficult to implement than other school subjects because parents might not have the content knowledge or teaching skills needed to help their children as mathematics becomes increasingly more complex across the school years. Moreover, Muir (2011)

asserts, many parents did not have a good understanding of new methods of mathematics education and this creates a lot of tension when parents try to help their children with their mathematics homework. That is in addition to parents' confusion or resistance to some of the new or nontraditional aspects of their children's mathematics school work. In fact, Stepanek (1998) asserts, in mathematics, many of the barriers to family involvement are more difficult to address, and that even highly educated parents might have limited mathematics proficiency and might even fear it.

School Factors

There are many school factors that might lessen parental involvement. Mapp (2003) interviewed 18 parents to investigate school factors that affect parents' involvement in their children's education. Mapp found parents participate when school personnel welcome them into the school and admire their contributions, connect them to the school community, and start trustful relationships with them. These relationships improve parents' aspiration to be involved and influence the way they participate in their children's educational development (Mapp, 2003).

In addition, Stepanek (1998) asserts, parents complained that they do not receive enough classroom-related information from schools, schools are unresponsive, teachers talk down to them, or use unfamiliar educational jargon, and that in some schools teachers only contact parents when there is a problem. In fact, Lehrer and Shumow (1997) states, "providing parents with information about and helping them to acquire greater understanding of children's mathematical thinking are time-consuming activities requiring more commitment than reformers have heretofore made to involving parents" (p. 75). Moreover, according to Jackson and Remillard (2005), some schools make

middle class families feel more welcome than lower class families, and this is a reason for lower class parents' poor involvement in their children's education.

Family Structure

Research has shown that family structure is a key factor in parental involvement in their children's education. Turney and Kao (2009) claim, in two-parent families, parents are more involved in their children's learning. Similarly, Balli et al. (1998) assert, biological parents in two-parent households engage more with their children homework activities than single parents or stepparents, and single parents or stepparents engage less than those students with both mothers and fathers. In fact, Balli et al. assert, the number of children in a family is associated negatively with parents' involvement in children's education and that children who have no siblings normally do better in school than children who have one or more siblings.

Parents' Experiences

Parents' knowledge and experience with mathematics could play an important role in their involvement. Remillard and Jackson (2006) assert parents' own experiences with mathematics might influence their attitudes about the adoption of new mathematics curriculum. Furthermore, Peressini (1998) asserts,

> 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).

Moreover, Anderson and Minke (2007) claim, some important factors in parental involvement are parents' educational aspirations for their children, and parents' previous school experiences because parents' own successful school experiences might make them

feel competent and confident when communicating with school personnel, while negative school experiences influence their involvement choices.

Parents' Employment

Parents' employment and level of education, mothers in particular could affect their involvement in their children's education. According to Weiss, Mayer, Kreider, Vaughan, Dearing, Hencke, and Pinto (2003), mother employment is also a factor; mothers who work or go to school part time are more involved in their children's education than those who do not work or go to school at all. Weiss et al. (2003) also argue, no differences between mothers who work or go to school full time and mothers who do not work or go to school regarding their educational involvement. Weiss et al. explains that mothers who do not work or go to school might have experienced mental health problems that hinder their educational involvement since there is evidence that unemployment is associated with high rates of depression.

Parent's Gender

Research has shown that mothers are more involved in their children's education than fathers. For instance, Reay (2002) argues, in most middle class and working class families, children's schooling is primarily the mother's responsibility, where men seldom help out with school work or attend parents' evenings in school. Reay asserts,

> Parental involvement meant very different things to mothers and fathers…. As one father explained 'Well I suppose I'm typical of most dads in that I'm only involved at a distance'. However, mothers rarely had the option of being involved 'at a distance (p. 26).

Other Reasons

In addition to the above challenges, there are other reasons that might challenge parents' educational involvement such as cultural reasons where educational involvement

it is not parents' role, so they do not expect it. Moreover, parents might not know how to become involved or how to help, they are not aware of their important role in education, they might not know how to approach the schools about becoming more involved, and they may not be aware of opportunities (Stepanek, 1998). In addition, Stepanek states, parents are most likely not aware of the importance of mathematics and frequently think that mathematics is unconnected to their daily lives, thus they might accept their children's poor mathematics performance. Stepanek (1998) adds other reasons that might prevent parents' involvement are parents' lack of education, parents' paid work outside the home, being a single-parent with limited time, language and cultural barriers, and parents' past experiences with school.

In addition, Jeynes (2005) has found a few other reasons behind the lack of parental involvement. Jeynes asserts,

> The presence of more parents in the workforce, the fast pace of modern society as a whole, and the declining role of the family have all been reasons that some social scientists have suggested to explain an apparent decline in parental involvement in education (p. 100).

Furthermore, Balli et al. (1998) indicate that parents' socioeconomic status is positively associated with parent involvement in children's education.

In fact, Lee and Bowen (2006) have found that some parents from non-dominant groups might face psychological barriers to involvement at school such as awareness of racism which is negatively linked to parent involvement at school and positively linked to parent involvement at home, lack of confidence in their interactions with teachers. Lee and Bowen (2006) assert parents with low levels of education might not be involved as much at school because of their lack of confidence about communicating with school

staff due to a lack of knowledge or familiarity of the school system, or due to negative educational experiences.

Besides, Hoover-Dempsey and Sandler (1997) assert, there are three major factors that are important to parents' involvement decisions; parents' beliefs about their role in their children's education which set up the range of activities that parents interpret as important, parents' sense of usefulness for helping their children succeed in school, and general demands, invitations, and opportunities for involvement from the child and school.

As well, Muir (2012b) states, parental involvement is likely to lessen with grade level, which might due to the increasing of mathematics complexity as students move to higher grades. Also, with middle and high school children, parental involvement may lessen because parents might need to contact many teachers to get a complete picture of their child's progress, the school might be farther away from the family's home, parents and teachers often believe that students should be more independent, children study becomes more advanced and technical, parents may feel even less confident about their skills and knowledge, family involvement activities that were used in elementary school may no longer be appropriate, and students do not want their parents to be involved in their school (Stepanek, 1998).

Educators should understand the difficulties parents' face that might prevent or weaken their parental involvement in their children's mathematics education. Understanding those difficulties is essential in order to avoid stereotypes such as being characterized as being not interested in their children's mathematics education (Jackson & Remillard, 2005).

Forms of Parental Involvement

Research has shown that many parents are involved in their children's education in many different levels and many different ways, such as helping with homework, attending parent-teacher conferences, volunteering at school, participation in governance activities, or encouraging their children's achievement (Balli et al., 1998, Mapp, 2003, & Lee & Bowen 2006). Moreover, Civil and Bernier (2006) claim,

> The concept of parental involvement that many Americans are familiar with consists of involvement activities such as encouragement to succeed academically, help with homework or projects, volunteering in the elementary and sometimes middle school classrooms, and participating in governing bodies (P. 315).

In fact, Lee and Bowen (2006) examined five types of parental involvement on elementary school students' academic achievement by race, poverty, and parent educational achievement. Lee and Bowen found parents with different demographic characteristics demonstrated different types of involvement. In addition, Lee and Bowen argue, parents with different backgrounds might exhibit different types of involvement because they differ in behaviors, attitudes, or perceptions, financial resources, educational knowledge, and experiences with and confidence in the educational system. In the following section, I will explore ways of parental educational involvement.

At Home

One of the most common ways of parental educational involvement is teaching children or helping them with their homework at home. Crosnoe (2010) asserts, parents might engage in their children's education at home by setting up learning activities and

providing learning materials. In addition, Balli et al. (1998) assert, "parental engagement in children's homework is an example of the most direct, face-to-face form of parental involvement in children's lives, communicating affection, nurturance, and support for children and facilitating their overall sense of well-being" (p. 149). Similarly, Shumow's (1998) findings show that individual parent-child tutoring is the most effective form of education because conversations allow parents to notice their children's way of thinking, understanding, and explanations and may adjust to a child's thinking especially during a problem solving session.

At School and Community

In addition to their involvement in their children's education at home, parents may get involved at their children school(s) and the community. Parents may help in their child's classroom, volunteer at school, or participate in school activities in or out of school. However, according to Civil and Bernier (2006), for parents from certain language or ethnic groups and from low-income backgrounds, parental involvement often fall into monitoring the cafeteria and the playground, helping out with bulletin boards, or selling refreshments for the school fund-raising. In addition, Crosnoe (2010) asserts, parents might engage in their children's education in the community by exposing children to events and programs, sharing school information with other parents, participating in school activities, and communicating with teachers.

Parents' Attitudes Towards Educational Involvement

Mapp (2003) interviewed 18 parents to understand their perceptions of educational involvement in their children's education. Mapp's study shows that the

majority of parents desire for their children to succeed in school, and wish to help them succeed. Mapp quotes what one parent says,

> What's more important than your child's education…? Do you really want someone else to mold your children and determine what they're going to be like? Being involved…. knowing their teachers, the students they're with, and the students' parents… will help me keep them interested in school (p. 43).

Another parent from Mapp's study says,

> Learning doesn't stop at school. It's also being reinforced in the home. It's [the parents'] job, too. You can't just send [your kid] to school and think your child is going to learn on their own. You need to get involved and help out. You can't just plant the seed and expect it to grow on its own (p. 42).

Similar to other school subjects, Muir (2012b) has found that parents appreciate the opportunity to engage in school discussions about mathematics teaching, and they are eager to improve their mathematical content knowledge and gain a better understanding of reform mathematics. In fact, Muir asserts, parents seem more willing to become involved in their child's mathematical education if they understood the mathematics and the current mathematical pedagogical practices. Moreover, Civil, Guevara, and Allexsaht-Snider (2002) assert, the parents in their research believed in the importance of learning mathematics with understanding rather than memorization. These parents took an eight-week course that was created for them to help them understand fractions, decimals and percentages in order for them to support their children's mathematics learning.

Since Muir (2012a) believes, parents might be the greatest factor in their children's educational success and their attitudes and perceptions of mathematics influence their children's learning outcomes and self-efficacy, she conducted a study to investigate the perceptions of parents in relation to mathematics education. Muir asserts

parents in her study were willing to be involved in supporting their child's mathematics learning at home, although some are unsure how to help their children, and many of them felt uneducated about the mathematics curriculum and the teaching methods used in their child's school.

In fact, Fantuzzo et al. (2004) state, parents wish to be more involved in their children's education, and schools need to recognize parents wish, through policies and practices. Thus, schools need to allow parents the opportunity to be more involved by encouraging their involvement in school activities, appreciating their efforts, and respecting them.

Minority Parents' Educational Involvement

There is a lack of research on minority groups' parental involvement in their children's education. Thus, a few research studies such as Jackson and Remillard's (2005), Jones (2003), McKay et al. (2003), and Civil (2008a) have been conducted in this important field. McKay et al. (2003) assert, "Relatively little prior research has examined the unique obstacles experienced by low-income parents of color which potentially act to discourage parental involvement at school (p. 107, 108).

Weiss, Bouffard, Bridglall, and Gordon (2009) explained lack of research on minority group parental involvement. Weiss et al. asset, "Until recently, research into and understanding of parenting practices … was largely on white, middle-class samples" (p. 10). Therefore, Civil and Bernier (2009) suggest that "more research is needed that views parents as intellectual resources… especially working-class/language/ethnic 'minority' parents" (p. 328), particularly,

Discontinuity between the school and home culture tied to inequities in the social structure is often cited as the cause of poor achievement among minority children…. In order to achieve this goal, schools need to take the initiative to create effective family and school partnerships (Gillanders et al., 2012, p. 285). Also, "minority parents are uniquely qualified experts on their own children and their own socio-cultural context… teacher preparation programs rarely consider their perspectives in the development of curriculum and experiences for pre-service teachers" (Jones, 2003, p. 73).

Similar to other school subjects, Civil et al. (2003) argue that few studies have focused on the intersection of social class, ethnic /language minority communities, and parental involvement in mathematics education. However, according to Weiss et al. (2009),

> Research in the past few decades has moved away from a dysfunction-based to a strengths-based approach, and it acknowledges, measures, and examines the ways in which particular contextual factors and forces, such as socioeconomic disadvantage and racism, affect racial/ethnic minority families (p. 10).

In this section, I will explore African-Americans', Latinos', and immigrants' parental educational involvement and challenges they face when they get involved in their children's mathematics education.

African-American Parental Involvement

Race has played a major role in the lives of African Americans because of their experiences with oppression in this society (Martin, 2006). Therefore, African-American parents are rarely seen as academic resources for their children's education (Civil & Bernier, 2006). Johnson and Kristsonis (2006) examined reasons behind low achievement of a large number of African-American students in mathematics, and found

that one of the main reasons was the lack of parental support, which affects students' attitude toward mathematics.

In contradiction, Jackson and Remillard (2005) interviewed ten African-American mothers about their involvement in their children's mathematics education, and found that they are all highly involved in their children's education despite limited resources, stereotypes, and the lack of opportunities provided by school. Remillard and Jackson (2006) assert, African-American parents who live in low-income areas are usually characterized by administrators and teachers as uninterested or uninvolved in their children's education, despite the fact that all parents they interviewed took serious roles in their children's education.

At Home

In order to improve their children's mathematics learning, some African-American parents try to make connections between school and everyday activities such as using regular household tasks to teach or review the mathematics children learn in school, making up counting or computation activities, arranging Christmas tree ornaments into different groups before putting them on the tree, gardening to practice measuring, playing different card games to help learn numbers, cooking with their children to learn measuring and combining quantities of ingredients, counting money or using a play cash register to count money, using computer software and games to practice basic computational facts and other skills, or using flashcards and board games such as Monopoly (Remillard & Jackson, 2006).

Jackson and Remillard (2005) report on one mother interview about helping her daughter with her mathematics homework, "with her math especially she'll do it and then

she'll ask me just to check it…. So when I go over it I will see her weaknesses…. She's getting better" (p. 62). Another African-American mother asserted that she tries to install good study habits early and put an emphasis on education so her children know that she values education, and she sets up the home where children do their homework in a quiet setting without any interruptions (Suizzo, Robinson, & Pahlke, 2008). Moreover, when African-American parents were not able to spend significant amounts of time at their children's school, they find ways to supervise their children progress and encourage them, try to help them with their mathematics homework, seek help of a friend when the children's mathematics is very difficult, or write notes to teachers to ask questions or to clear up some concepts (Jackson & Remillard, 2005).

At School

In addition to their involvement at home, African-American parents get involved with their children's school(s). Jackson and Remillard(2005) report, African-American mothers usually visit their children's classroom to speak to the teacher about some homework confusion or when their children did not understand a particular concept, or to ask for additional work to give their children. These parents also visited their children's classroom to observe how teachers teach or in order to understand a particular approach or representation.

Furthermore, McKay et al. (2003) conducted a study about inner-city African American parental educational involvement using a sample of 161 parents and 18 teachers. McKay et al. state parents reported more formal contacts with school staff, and higher levels of racism awareness, religiosity, and African-American cultural pride. In addition, Gillanders et al. (2012) state, all mothers in their study participated in school-

wide parent involvement events, particularly their children's interest activities, and they appreciated when teachers welcomed them in the classroom.

Challenges of African-American Parental Involvement

African-American parents might face different types of challenges when they participate in their children's mathematics education such as racism, and struggling with reform mathematics.

Racism

According to McKay et al. (2003), African-American parents' perceptions of racism they have experienced in society discourages their parental involvement at school. Moreover, Suizzo et al. (2008) assert, many of their African-American mother-participants expressed that racism could be a potential barrier to their children's education, and that these mothers described many forms of racism in education, such as test bias favoring Whites, different standards of behavior for Black and White children, tracking Black children into lower level classes, lower expectations for Black students' achievement, redistricting to ensure Whites and Blacks attend separate schools, and personality conflicts with White teachers.

For example, a mother felt like the teachers of her son would tell him that he is fine where he is, and he doesn't have to go farther educationally (Suizzo et al., 2008). However, according to Suizzo et al., these mothers believed that educational achievement could reduce their struggle. For instance, a mother states,

> As African Americans, we all have to work hard, which is a shame; our children are going to have to do the same. Just because of the color of our skin, we're going to have to excel in our class and be noticed. We're going to have to excel socially, so we're noticed (Suizzo et al., 2008, p. 303).

Another example, an African-American parent states,

> African Americans were not even allowed in math and sciences in certain colleges for a long time… when I was with other kids in high school, their parents are like doctors, scientists, you know, newspaper writers. And all these people went to college. They all had to take some type of higher math and they all know what college represents and they all got to push it all strongly on their children. And their children see that their parents do it, can do it, have done it, brother, sister, mother, grandparents, have done it. It's like ice-skating downhill. It's not ice-skating uphill (Martin, 2006, p. 213).

Furthermore, in their study about the challenges African-American mothers from a low-income neighborhoods face when they involve in their children's mathematics learning, Jackson and Remillard (2005)assert, "some of these challenges were due in part to stereotypes held by practitioners about the families they serve in low-income urban schools" (p. 51).

Mathematics Curriculum

In addition to racism, Jackson and Remillard (2006) found that African-American parents find the new mathematics curriculum tough and confusing, expressed tremendous frustration about their struggles with its new teaching methods, and offered several examples of unclear and confusing homework assignments that they did not understand or know how to use without a reference book that teachers did not send home for fear of losing it. For instance, one mother asserts that her confusion about the new approaches of mathematics affects her independence and confidence as a parent who is committed to engage in her child's schooling (Jackson &Remillard, 2006). Another mother complains "Just getting over the hurdle with this new math about how to make sure that I'm learning it so I can teach it to her and make sure I'm doing it with her right. So that was like the biggest hurdle with this new math" (Remillard & Jackson, 2006, p. 63).

Although African-American parents make considerable efforts to understand the reform mathematics in order to help their children, many of them told stories about disagreements they had with their children over the right computing approach (Remillard & Jackson, 2006). For example, a child responds to a parent's instruction with, ""my teacher doesn't do it that way." In other cases, parents reported teachers identifying students' strategies learned at home as wrong" (Remillard & Jackson, 2006, p. 247). Furthermore, a parent complains,

> I remember like back in the day it was kind of easy, but [my daughter's class was] doing this, divide by this and you add this… and I'm like, 'No way! I don't get it!' I know the old way, that's it. So I told [the teacher], 'I'm sticking to the old way,' and she was like, well… I think the new way is kind of easy (Martin, 2006, p. 252).

In fact, African-American parents complain that the amount of vocabulary in the mathematics curriculum is problematic, most of them do not like the lack of repetition in the new curriculum nor the speed at which it moved from one topic to another, most believe that their children are being taught mathematics in a puzzling way, are unconvinced that the school is providing children the needed learning opportunities, and that the new approach has made math more difficult for their children (Remillard & Jackson, 2006). Parents also complained, in some cases when they try to ask the child's teacher, they found a teacher who is equally frustrated with the new curriculum or they get turned away with few answers (Jackson & Remillard, 2005).

Furthermore, Remillard and Jackson (2006) believe that African-American parents do not see the connection between old mathematics and new mathematics methods because their conceptions of mathematics were grounded in computational

proficiency and because they were denied access to discussions about reasons behind the reforms or its implementation. Moreover, Remillard and Jackson argue,

> Even though parents saw themselves as critical players in their children's learning, we found that the implementation of reform-oriented curriculum tended to disempower parents with respect to school mathematics. Parents had little understanding of the reform-based approaches, and thus limited access to the discourse of reform (p. 231).

It is very important for educators to understand African-American parents' feelings about mathematics and the mathematics reform, the reasons behind their feelings, and to try to find solutions that maximize parents' involvement in their children' education.

African-American Parents' Perspectives About Their Involvement

Because they care about their children's educational achievement, most African-American parents try to be involved in their children's schooling, and are willing to learn the reform mathematics in order to help children with their homework. In their study about African American mothers' beliefs and goals with their children, Suizzo et al. (2008), state, many mothers believed that being actively involved in their children's education is an important aspect of their role as mothers, and several explained that they support their children's learning on a daily basis by helping with their homework, going to their schools, and meeting with their teachers. In addition, Gillanders, McKinney, and Ritchie (2012) conducted a focus group of African-American mothers about their perception towards involvement in their children's education. Gillanders et al. stated, these mothers viewed themselves as having a prime responsibility for helping their children succeed in school and that the teacher's role was to support what the children were learning at home.

Moreover, Gillanders et al.'s mother-participants believed that open communication with teachers is essential, though they thought that communication across racial and cultural groups could be a sensitive matter, particularly if one thought that the other was trying to get in the other's business. Gillanders et al. added African-American mothers of their study always appreciated teachers' suggestions to help their children perform better, though these mothers sometimes did not understand the homework assignment, but they always tried to get help. For example, one mother said that she took her child's homework paper to her work and asked three co-workers for help because she did not know what a Venn diagram was.

Additionally, according to Remillard and Jackson (2006) their study's African-American mothers were willing to learn about the new approaches to help their children success, and they made efforts to understand these new approaches, though struggled to incorporate it into their own mathematical knowledge. For example, Remillard and Jackson report on an African-American mother-participants' attitudes towards learning the new mathematics approaches. The mother asserts, "It makes me want to go back to school and just learn the math and stuff because I'm totally lost when it comes to the math they're doing… so, it's something that I'm willing to learn" (p. 250).

Another African-American mother asserts her "biggest hurdle with [the] new math" was to find ways to learn about it so that she could do math the "right" way with her daughter" (Remillard & Jackson, 2006, p. 250). A third African-American mother states,

> If an 8 year old can do it, I know I can do it. I was like—wait a minute, he's the kid and I'm the parent, and he knows and I don't know…. He had got upset one day and said, 'Mom, you're going to make me get a bad grade. That's not right. That's not right. That's wrong' (Remillard & Jackson, 2006, p. 231).

As well, Remillard and Jackson explain, in order to educate themselves about the new math curriculum, most of African-American parents of their study attended school meetings, talked to teachers, visited their children's classroom to observe how the teacher was teaching the students, and appreciated any learning chance they get. For example, about her appreciation of some parents' mathematics training, Martin's (2006) participant states,

> With my oldest son… he would come home with math and I was like 'I can't help you'… that was discouraging that I couldn't help him with his 5th grade 6th grade math. Same thing with my daughter… when I came up here and took math, I found out it was easier for me to help her (p. 222).

African-American Parents' Attitudes Towards Math

Research has found that most African-American parents fear mathematics, though they value its utility. For example, Remillard and Jackson's African-American mother-participants spoke about their fear of mathematics in general, lack of confidence when doing computation, feeling of being lost, and feeling of disconnect between new mathematics curriculum and the mathematics they used in their daily lives. Martin's (2006) African-American participant states, "there's a phobia about math that must come from probably further back than I would even care to remember" (p. 214). Another African American parent states,

> Because, I don't know, I don't have the confidence…. I've had lots of bad experiences with math. I've lost jobs over math…. I just have an anxiety attack right there at the job… 'I can't do this'… my life has kinda shown you gotta have math to excel.... It shuts off a lot of doors for you if you don't do well at it (Martin, 2006, p. 213).

However, according to Remillard and Jackson (2006), their African-American study participants believed in the importance of mathematics despite many of them having negative experiences learning mathematics.

In fact, these participants described some of the mathematical practices they engage in regularly, such as opening up bank accounts, balancing a checkbook, and making purchases that require a down payment, using mathematics when cooking or paying bills (Remillard & Jackson, 2006). Moreover, Remillard and Jackson state, all of their parents-participants have talked about the importance of learning mathematics in order to learn specific skills and develop confidence and independence, avoid being cheated in activities that involved monetary transactions, and to develop an understanding of and comfort with mathematics.

African-American parents' racism history, resistance to change, and the way parents feel about mathematics in general or about the current reform in mathematics education are parts of the reasons that might be behind parents' lack of involvement in their children's education. Other minority groups such as Latinos might have similar challenges in their involvement in their children's education in general and mathematics education in particular.

Latinos' Parental Educational Involvement

According to Coven (2011), Latinos are people who derive from Spanish speaking countries of Latin America, the Caribbean, and Spain. Yan and Lin (2005) assert Latino-Americans are considered one of the largest and fastest growing minority groups in the United States. Research has shown that Latino immigrant students' mathematics achievement scores have been lower than most of other student populations

in the United States. In fact, Lopez and Donovan (2009) state, mathematics underachievement among Latino students is of a great concern and deserves the attention of mathematics educators. However, Civil et al. (2005) argue, Latino students in the U.S. are often over-represented in special education because second language effects on achievement usually are mistaken for learning disabilities.

Latino Parents' Attitudes Towards Their Involvement

Research has shown that most Latino parents value education and get involved in their children's learning. Jones (2003) conducted focus groups with thirty-four parents in a predominantly Latino- American school district. Jones's study indicates that Latino parents endorse attitudes, values, and characters that should improve their children's academic achievement, and they spend time with their children talking about school and doing some academic activities such as monitoring homework. Moreover, Gillanders et al. (2012) state, their study's Latina mother-participants believe they had an important role in their children's education and their academic development and that it is their responsibility to encourage their children to do their homework.

In addition, Valencia (2002) reported on a Latino-American parent says,

> We talk to our kids about their ambitions…. Anyone can flip a burger. You're not gonna do that. You're gonna need more education, we say. We want them to be successful…. If you really want to make a difference, you've got to stay in school and go as far as you can (p. 98).

Another mother states "The job market requires college now…. It's important to get further education to get a good job. That's the only way to break the cycle [of poverty] that our parents and grandparents went through" (Valencia, 2002, p. 98).

Latino Parents' Ways of Involvement

Many Latino parents get involved in their children's education in many different ways, at home and at school. For instance, Valencia (2002) talked about her study parent-participants' involvement in their children's education through service, teacher contacts, and school visits. In addition, Latino parents attend school performances and open houses despite their limited English proficiency, low levels of education and economic resources (Yan & Lin, 2005). Moreover, Valencia (2002) states, some parents contact their children's teachers. For example, one parent states "I never hesitated to call the teacher when [my daughter] needed it" (Valencia, 2002, p. 97). In fact, Civil, Diez-Palomar, Menendez, and Acosta-Iriqui (2008) assert, Latino parents might ask other family members or neighbors for help with homework.

Moreover, Gillanders et al. (2012) conducted focus groups of Latina mothers with low income. Gillanders et al. assert the mothers in the focus groups mentioned that they would approach the teacher several times during the week to ask about their children's achievement, to ask the teacher to explain the homework. Indeed, Gillanders et al. state, these Latino mothers reported participating in school activities that were related to events of their home country or when teachers' invite them to volunteer in the classroom to help children to read in Spanish or to help the teacher in a variety of tasks. Latino parents' decision to participate in children's school is related to their skills, energy, knowledge, available time, and cultural values (Gillanders et al., 2012).

However, Yan and Lin (2005) believe that the Latino parents are less involved in their children's education than European-American and African-American parents and that low levels of parent involvement arise even when these parents have positive

attitudes toward school involvement, are concerned about their child's education, and want to help their children with homework.

Latinos' Parents' Involvement Challenges

Latino parents care about the schooling of their children, but many do not understand the educational system well enough to show their caring and participate, many are very young parents who do not know about parenting, many work two jobs and don't have time to participate in school activities, and many worry about stereotypes (Jones, 2003). "Involvement by Mexican American parents was influenced by educational jargon, 'language, parent cliques, parents' education, attitudes of school staff, cultural influences, and family issues"' (Lopez & Donovan, 2009, p. 42). In this section, I will explore challenges that Latino parents face in their involvement in their children's education.

Language

Language could be a tough difference when parents try to get involved in their children's education. Gillanders et al. (2012) state, when their Latino mother-participants help their children with their homework, they often find it frustrating to them and the children because the mothers sometimes did not understand the homework because it was in English or because their teaching methods were different from the teachers' methods, thus they were not capable of helping their children. Moreover, Bratton, Quintos, and Civil (2004) interviewed five mothers about their experiences as Latino immigrant parents. The following is one mother's description of her struggle when she tries to help her son.

> It takes a lot of work when it is difficult to translate something for me… so he prefers to go early or ask someone else and that is something I don't like…. [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 (Bratton et al., 2004, p. 20).

Another mother complains about her child's teachers. She states, "They really don't want to work with the mothers who don't speak English. From that point you start to sense the barrier" (Bratton et al., 2004, p. 21).

Stereotypes and Low Expectations

In addition to language difficulties, Latino parents may face stereotypes and low expectation of themselves and their children from children's teachers and school personnel. Jones (2003) asserts, Latino parents often expressed frustration about the low level of expectations teachers and administrators held for their children. For instance, one of Jones's (2003) participants complains that teachers talk down to parents so most parents don't want to go back to their children's schools. Another mother states,

> The prejudgment before you even get there… your stomach starts churning, and I mean, I think that's how most parents feel. It's like, oh, I gotta go in and talk to the teacher at the teacher conference and they're going to look at me like I don't know anything (Jones, 2003, p. 95).

Moreover, one of Jones's parent-participant claims, "I don't believe I've ever heard a teacher say they expected a lot from our kids, that they expected them to go on to college" (p. 87). Another parent, a mother said with a voice full of emotion "our children are just as bright and we just haven't given them the chance" (Jones, 2003, p. 87). Another mother illustrates her concern, "my son got a C… and I went in… and asked what's going on here? Well, it's a passing grade… and I said, no, no, not in my house it's not and they're like, well, it's passing. What's wrong with it?" (Jones, 2003, p. 88).

A fourth said,

> In high school, they go to the counselor and then it's like, 'I see on her records that she really has no plans for the future right now, so maybe she doesn't need to take this extra math.' I've heard that… don't tell me she doesn't need to, push her, make her, don't let her take the lesser way out (Jones, 2003, p. 88).

Similarly, Goldenberg (1987) investigates the role Latino parents played in their first grade children education. Goldenberg found that one of the problems that affect these parents' educational involvement is that no organized effort from the school to request their aid due to school personnel's low expectations of Latino parents. "Families must be treated with the dignity that they deserve … to develop and nurture partnerships that can reverse the trend of Latino underachievement in our schools" (Goldenberg, 1987, p. 219).

Mathematics Curriculum

In addition to the above involvement's barriers, Latino parents are not familiar with the new methods in mathematics education and they are resistance to change. For example, in their study about establishing a dialogue between school and Latino parents, Civil, Quintos, and Bernier (2003) report a story about a second grade girl who learned to add from left to right and shared 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" (Civil, et al., 2003, p. 2). Civil et al. also report the following Latino mother's story.

> My daughter tells me "come to learn how they teach here, come see that I am right," when we are upset at each other… 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' (p. 15).

In order to ease Latino parents' challenges, Yan and Lin (2005) suggest, schools provide clear guidelines for parents, encourage them to talk with their children about homework, school activities, and events, and create new opportunities for positive parent involvement. "Families must be treated with the dignity that they deserve… to develop and nurture partnerships that can reverse the trend of Latino underachievement in our schools" (p. 219). Lopez and Donovan (2009) add, "all parents, including Latino parents, need to be seen as resources and strengths that can positively and effectively influence any partnership. Schools need to show an understanding of parents and base family–school partnerships on mutual respect" (p. 222).

As other parents, Latino parents care about their children educational success. They engage in their children's education and support and encourage their children's educational success. Moreover, as other parents, Latino parents face many challenges when being involved in their children's education, particularly these parents are immigrants and most likely, their first language is not English. Thus, language, poor social support systems, and low self-esteem are barriers that prevent some Latino parents from becoming involved (Lopez & Donovan, 2009). These parental involvement challenges might be shared with other minority groups such as immigrants.

Immigrant Parents' Educational Involvement

The United States attracts more immigrants than any country in the world (Turney & Kao, 2009). In fact, Zhou (1997) claims, "since the 1980s, immigrant children and children of immigrant parentage have become the fastest growing and the most extraordinarily diverse segment of America's child population" (p. 63).

Turney and Kao (2009) assert,

> There are some commonalities in the experiences of immigrant parents, especially as they navigate through the school system and interact with teachers…. This is more important than ever because almost one in four school-aged children has at least one immigrant parent (p. 257).

In their definition of immigrant children, Civil, Planas, and Quintos (2005) include children who were born in the United States but whose parents are immigrants. Research has shown that immigrant students' mathematics achievement has been lower than most of other student populations in the United States. Civil et al. (2005) assert, "the under-achievement of many low-income immigrant students in school mathematics has become a globalized phenomenon… cultural/ethnic identity is an essential construct…. Immigrant children… are often caught between at least two cultures" (p. 81).

Immigrant Parents' Involvement Challenges

Immigrant parent want their children to be successful and receive good education, and they do not want their children to be left behind in education (Lopez & Donovan, 2009). However, immigrant parents and their children face many difficulties in adjusting to the new culture and traditions, in addition to the challenge of learning a new language for most cases, and the discrimination they might face. According to Yan and Lin (2005), lack of immigrant parents' participation in their children's education might be due to school failure experience, lack of education, limited resources, and low self-esteem since their cultural values are not appreciated by school personnel. In addition, Lopez and Donovan (2009) argue, poor social support is also a barrier that prevents some immigrant parents from becoming involved in their children's schooling.

Bratton et al. (2004) report on an immigrant parent says, "it costs immigrants a lot of work to adapt to a society that never is really going to accept us… you are always

going to have something stopping you from having the power/ability to say I need this as an immigrant (p. 11). Furthermore, Turney and Kao (2009) claim, minority immigrant parents face a greater number and degree of barriers to get involved in their children's school than did native-born White parents. Moreover, Civil and Bernier (2006) assert, parents from certain cultural groups such as immigrants have historically had a tough time in advocating for their children's interests in schools. Challenges that those parents face might be a big factor behind their lack of involvement in their children's education.

In their ethnographic study, Carreon et al. (2005) explored the challenges that immigrant parents face when they participate in their children's education. Carreon et al. claim,

> Many of these parents experience immigration as a process of isolation that makes it difficult for them to create social support networks that can sustain their efforts in regard to engaging in their children's schooling… parents perceive that they are not respected or are marginalized by school actors, and thus they have little motivation to participate in school-parent activities" (p. 471).

In this section, I will explore a few challenges that immigrant parents face when engaging in their children's education.

Language

Language is a tough challenge for immigrants with English as a second language to overcome. Immigrant parents usually have communication difficulties with their children's teachers (Carreon et al., 2005). Carreon et al. (2005) state,

> Language is also an instrument of identity and power, and thus immigrant parents lose some of the authority they had in their home countries because they lack knowledge of the nuances of language called for in particular situations, such as talking to a teacher (p. 470).

Moreover, Carreon et al. report on one of their participants who mentioned, "there is a lot of discrimination. If you don't speak English, they treat you badly" (p. 491).

The latter agrees with Civil's (2008a) statement, "language plays a key role in the learning and teaching of mathematics, particularly in reform-based classrooms. It is also true that language is a key component of one's identity" (p. 334). Moreover, Lopez and Donovan (2009) state,

> The acquisition of a second language can be difficult enough for any family. Contrary to the popular belief that mathematics is a universal language, the acquisition of mathematical language can be even more difficult and complex for children as well as adults (p. 223).

Expectations and Cultural Issues

Another challenge that immigrant parents face when they get involved in their children's education is the gap between their educational expectations for their children and the children's actual school experiences. Civil et al. (2008a) argue, "research with low-income, minoritized and immigrant families reveals that there is often a cultural and social gap between their expectations for their children's education and their experiences with the actual schooling their children are receiving" (p. 41). Moreover, according to Delgado-Gaitan (1994),

> The manner in which parents relate to schools becomes a cultural issue not so much because different cultural groups interact differently with the schools, but because the process of engaging with the educational system is bound by rules, language, and values that privilege some people and exclude others (p. 299).

Furthermore, Civil (2008b) adds,

> Research with immigrant parents… brings up several themes… including: a concern… of immigrant parents for a lack of emphasis on the "basics" in the receiving country; a perception that the level of mathematics teaching was higher in their country…; and a feeling that schools are less strict in their "new" country (p.1).

Li (2006) argues, immigrant parents' values and educational expectations they transmit to their children might differ from those of school and that difference often results in

discontinuity between home and school and this discontinuity is one of the main barriers for English language learners in accomplishing academic success. However, Li (2006) asserts, students from diverse backgrounds bring various and rich experiences to the classroom which are often unrecognized because the home culture and language are considered to have little contribution to the curriculum, although "culture shapes what parents believe and what practices they socialize their children into for academic achievement" (Li, 2006, p. 31).

Mathematics Curriculum

In addition to the above difficulties, immigrant parents have difficulty with the reform mathematics since they are not familiar with the new methods in mathematics education, and that according to Civil et al. (2003), might create a conflict between parents and their children when parents try to help with children's homework. Civil et al.'s (2005) 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" (p. 81).

Civil (2008a) asserts, there is a need for educators to consider the different kinds of mathematics immigrant students bring with them and to use it as a resource for learning instead of focusing on what immigrant students do not know or cannot do which in most cases is a result of not knowing the language of instruction. As any immigrant group, Chinese immigrants may face some of the above challenges when they get involved in their children's education.

Chinese Immigrants' Parental Involvement

As other parents, Chinese parents care about and get involved in their children education and mathematics education in many different ways. Li (2006) asserts, in order to support their children's math learning, majority of Chinese parents help their children with homework, buy workbooks, assign additional homework, and use Chinese math textbooks to reinforce their children's math learning. Pan et al. (2006) compared the involvement of American and Chinese mothers in their children's elementary mathematics education. Pan et al. claim, Chinese mothers are more frequently involved, and devote more time and effort to their children's mathematics learning than American parents. However, according to Jeynes (2003), Chinese parents are less likely to attend school activities than White parents. Pan et al. (2006) explain Chinese mothers might have a more effective way in teaching mathematical knowledge than the American mothers because Chinese mothers might be better educated than the American mothers.

Moreover, Jeynes (2003) explains, the difference between Chinese and American parents is due to great emphasis on education in the Chinese culture and due to the fact that Chinese children are most likely to come from two-parent families. Thus, "research supports the notion that family structure is the most important facet of parental involvement" (Jeynes, 2003, p. 215).

Chinese Parental Involvement Challenges

There are many challenges Chinese parents face when they get involved in their children's education such as cultural differences and language difficulties. In this section, I will explore these challenges.

Cultural Differences

Eastern cultures differ significantly from Western cultures. One of the reasons that Chinese parents are less likely to be involved in their children's school activities is due to cultural differences in parental expectations of children's academic performance such as Chinese parents have higher expectations of their children's academic achievement which might encourage them to be more involved in their children's education (Pan et al., 2006). Moreover, Li (2006) conducted a study about middle-class Chinese immigrant parents' beliefs and attitudes about their children's education. According to Li, social and cultural contexts are important in these children's education and that parents' engagement in their children's education involves diverse languages and literacy traditions.

Similarly, Sy (2006) asserts, Chinese immigrant parents usually do not involve directly with their child's school, though, they involve indirectly because of two cultural values: respect for authority and value for education which implies a clear separation of parent and teacher responsibilities and to consider teachers as the educational authority figures. Thus, these parents are less likely than other parents to participate in school activities or volunteer in their child's classroom, but they supervise their children's study at home, providing additional academic practice, and enroll their children in out of school classes that involves school-related activities (Sy, 2006).

Teaching Methods and U.S. schools

In addition to cultural differences, Chinese immigrant parents are not comfortable with mathematics teaching methods that are used in U. S. schools. In his study, Li (2006) found that 50% of Chinese parents did not like the way math was taught in American

schools, and that many of them believed math teaching in American schools was easy and insufficient in depth and content, but "believed that U.S. schools were better at focusing on student interests and motivation and on encouraging creativity" (p. 37). In fact, Li adds, research shows Chinese immigrant parents appear to lack familiarity with American schools, thus they are less likely to be involved in the school activities or volunteering although the majority of them attended parent-teacher conferences and felt comfortable talking with teachers.

In addition, Li asserts, the majority of Chinese immigrant parents expressed their need to know more about school practices and subjects' materials, and recommended improving math instruction by adding drills and practice, and more complex content, and by teaching more basic concepts. Moreover, in order to increase Chinese immigrant parents' educational involvement, Yan and Lin (2005) suggest for schools to provide clear guidelines for parents, encourage them to talk with their children about homework, school activities, and events, and create new opportunities for positive parent involvement.

In addition to the above difficulties, as other immigrant groups, some Chinese immigrant parents face language difficulties when being involved in their children's education since their first language is not English. Although Chinese immigrant parents are less likely to be involved in their children's school activities, Chinese immigrant parents, care about their children educational success, engage in their children's education, support and encourage their children's educational success.

In summary, lack of minority parents' participation in education is mostly due to limited resources, an educational failure experience, and disempowered feeling because

their cultural values are not accepted by school personnel (Yan & Lin, 2005). Parents of any race "need to be seen as resources and strengths that can positively and effectively influence any partnership. Schools need to show an understanding of parents and base family–school partnerships on mutual respect" (Lopez & Donovan, 2009, p. 222).

Gillanders et al. call for efforts to build effective family-school partnerships that consider perspectives of parents of all races about their involvement and its usefulness in their children's education, and that teachers, schools, parents, and communities should bond their resources to support and maximize the child's learning and the teacher's teaching prospective.

School-Parents Cooperation and its Importance

According to Sheldon and Epstein (2005), in their efforts to improve mathematics education, researchers and educators have given little attention to develop connections between schools and families, and that parents in mathematics education reform have been positioned on the margin. Sheldon and Epstein assert, in some cases, parents have been considered more as enemies to reform than as partners and have been considered among the greatest threats to the implementation of the new mathematics education standards. Although, the Principles and Standards for School Mathematics (NCTM, 2000) emphasize the importance of working with parents in order to bring change to the mathematics education of all K-12 students (Civil et al., 2003).

According to Stepanek (1998), "if the reform of mathematics and science is to succeed, parents must become partners and advocates in the reform process" (p. 5). Stepanek believes parents and schools should be normal partners in children's lives since both play an important role in children's successful learning, thus, "educating parents

about the exciting changes underway to improve student learning in mathematics and science" (p. 2). Moreover, Stepanek explains, when the expectations and attitudes of school and parents agree, learning is extended further than the classroom and into the home because students receive a general message about the importance of thinking, learning, hard work, and determination. Similarly, Muir (2012b) claims, students' learning is maximized when strong educational partnerships between home and school exist, although that the nature of these partnerships in the area of mathematics education is not widely documented.

In addition, Shumow's (1998) argues,

> Education, experience, and communication are required in order to promote parent understanding of the reforms. If schools want parents and community members to make informed judgments about teaching and learning, then conscious efforts must be made to involve parents in children's learning (p.124).

Stepanek (1998) asserts parents need to be involved in their children's learning, despite their backgrounds or socioeconomic status. Stepanek concludes teacher practices and school policies are more important than parent education, race, marital status, family size, and even child's grade level in determining parent's educational involvement. Therefore, schools need to empower parents and to allow them to be more involved in their children's mathematics development by creating opportunities for parents to engage in clearly stated and explained mathematics activities with their children at home.

Enhancing Cooperation

There are many ways that schools can offer to enhance school-parent cooperation such as welcoming parents to school and reducing language barriers. Moreover, Sheldon and Epstein (2005), list six types of involvement that schools can offer to all parents: providing information and ideas to parents about how to help children with homework,

helping parents to create supportive home environments for children, employing and arranging parent help at school, establishing two-way communication about children's progress and school programs, helping parents serve as representatives and leaders on school committees, and integrating resources and services from the community to reinforce school programs. In this section, I will explore a few ways that schools can offer to parents in order to enhance school-parent cooperation.

Welcoming Parents

Welcoming parents to their children's school and classroom by schools' personal is essential. Turney and Kao (2009) state, children might benefit greatly if schools make all parents feel welcome at their children's school. In fact, Stepanek (1998) asserts, one of the most important types of family involvement is bringing parents to the school as volunteers and observers because it increases the cooperation between home and school and confirms the importance of learning, at the same time parents have an opportunity to see their children's learning and growing, and to develop an appreciation of the challenges that teachers face.

In addition, Stepanek claims, parents might not realize that they are welcome in the classroom unless teachers invite them to come to school and make suggestions about how they can help. Teachers also need to encourage parents to make presentations about parents' own professions and share how they use mathematics skills in the workplace or at home, and encourage them to be mentors to students or serve as role models helping students to develop more general life skills (Stepanek, 1998).

Reducing Language Differences

Turney and Kao (2009) state, children might benefit greatly if schools decrease the language barriers that parents face. In addition, according to Stepanek (1998), schools might reduce language barriers, by translating written materials for non-English speaking parents and providing a resource person or community volunteer to translate for teachers and parents. Similarly, Sheldon and Epstein (2005) assert, school personal need to provide non English speaker parents with translated information in languages they can understand and provide them with ways to contact and communicate with school personal.

Therefore, Turney and Kao (2009) believe that children might benefit tremendously if schools decrease the language or other logistical barriers that these parents face. Furthermore, Li (2006) suggests asking a bilingual people to be a parent-school contact in order to increase parental involvement by communicating information about school instruction and policies to the parents and by encouraging them to be more involved in the school activities.

Creating Involvement Activities

Muir (2009, 2012a) suggests for schools and teachers to create a few involvement activities for parents such as evening workshops, interactive homework, and mathematics materials for students and parents to use at home such as individualized take-home packs of mathematics activities. Likewise, Voorhis (2003) suggests well-designed interactive homework that invites students to engage their family members in an activity or a discussion, and to involve families in their children's education. Though, many families may find that a hard task to do.

Furthermore, Li (2006) suggests, changing the traditional parent-teacher conference design in order to create small group activities such as show and tell, mini-workshops, or discussions on mathematics education. In fact, Stepanek (1998) suggests conducting needs assessments of parents to determine how parents would like to participate, when they are available, and how to communicate with them because parents themselves provide the best information about how to work with parents.

In addition, Stepanek suggests for schools to train parents to act as home tutors, try to make them a part of the school community, and respect and values their efforts. Moreover, Epstein and Dauber (1991) suggest, schools assess parents' strengths and weaknesses, and identify their hopes, dreams, and goals. Moreover, because many immigrants do not have the English capabilities, inside knowledge about U.S. schools, or social standing expected by the American educational system, engaging these parents in the educational process at home, school, and community might bring academic benefits for their children (Turney & Kao**,** 2009).

Contacting Parents

Stepanek (1998) suggests for schools to keep parents informed of their children's progress. As well, Stepanek suggests for teachers to call or write to parents at the beginning of the school year to start an open and friendly relationship, provide an informal orientation that includes an outline of methods of instruction and a sample activity, give parents information about homework and mathematics topics the students are studying, and extend an invitation for parents to make classroom visits and volunteer at school. Also, Stepanek suggests for teachers to call a certain number of parents at least once a month to touch base, give a chance to parents who cannot come to school to

borrow videotapes of classroom activities or school events, provide a parent handbook that has school calendars, volunteer needs, and a list of school staff, and to use a journal to give suggestions for parent and to respond to their questions and observations.

Teaching Parents Current Math

Many authors call for educators to give parents the chance to learn the current mathematics. Jackson and Remillard (2006), and Drummond and Stipek (2004) state, parents need to obtain an opportunity to understand the mathematical approaches that schools are currently teaching. Jackson and Remillard add, the more parents understand the new approaches of their children's mathematics education, the more they will be engaged in their children's education.

Cooperation Drawbacks

Although many authors such as Peressini (1998) called for involving parents effectively in the reform of school mathematics, a few other authors do not have the same opinion. Stepanek (1998) claims that constructing a true corporation with parents is difficult and requires effort and commitment because interactions between teachers, students, and parents, will not constantly be easy and directly effective. Similarly, Lehrer and Shumow (1997) claim, helping parents to understand their children's mathematical thinking is time-consuming. In addition, Reay (2002) asserts, the current interest in more parental involvement does not take into account the dangers that some types of parental involvement and schools' responsibility to parents might work against equal opportunities especially that parents' personal histories and educational experiences affect their involvement in their children's education especially in dealing with teachers.

Moreover, Stepanek (1998) argues, there are difficulties that teachers face in trying to involve parents such as feeling that parents are not capable of helping their children with schoolwork, worrying that parents might weaken classroom instruction or disrupt the learning environment, and feeling uncomfortable working closely with parents and do not have enough time to work with them. There are some other difficulties teachers face in trying to involve parents such as there is not a single type of communication to reach all of them and there is a need for teachers to be trained to work with them (Stepanek, 1998). Thus, Stepanek suggests providing professional development for teachers that focus on working with families because family involvement is rarely included in teacher education programs. "Nevertheless, when both schools and parents are committed to working together and approach each other with mutual respect and trust, questions and debates can be resolved and conflicts can be overcome" (Stepanek, 1998, p. 2).

Cooperation Examples

Shumow (1998) describes an educational program that was designed to create home-school cooperation by sending newsletters to parents with information about their children's developmental model in mathematics such as student's problem solving practice. Understanding children's problem solving improves the home-school relationship by providing parents and teachers a general base for communicating about children's learning (Shumow, 1998). Moreover, Civil et al. (2003) reports on a workshop that was created to help parents understand mathematics so they can help their children. The following is a mother's opinion about the workshop.

> It [opens] our awareness in math… 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… parents have a lot of power that we don't know that we have it (Civil et al., 2003, p. 25).

Civil et al. (2003) reports on another mother who says, "the kids are saying, 'My mom is the teacher also now. My mom isn't afraid to say she's afraid of math so I can be more confident.' That's really unique" (p. 26). Furthermore, Sheldon and Epstein (2005) provide an example of one elementary school teacher who works in an urban setting. The teacher began helping parents improving their English skills and vocabulary that is related to mathematics, later the teacher asked parents to help their children with mathematics problems. In addition, Jones's (2003) Latino parents claim their children's elementary school usually contacts them in English and Spanish about school activities, holds parent-teacher conferences, sends welcome postcards to parents before school started, and invites them to visit their child's classroom. In fact, Bratton et al. (2004) report on a mathematics project for parents to teach mathematics to other parents, that has three components: mathematics awareness, leadership development sessions, and math for parents.

Since I puse focus groups methodology in this study about Arabic mothers' involvement in their children's mathematics education, because I believed, focus groups is one of the most appropriate methods to explore this important topic, I next explored focus groups.

Focus Groups Methodology

Definition

A focus group is an interview on an issue with a group of people who are familiar with an issue of interest (Merriam, 2009). According to Schwandt (2007), "focus group interviews bring together a group of people to discuss a particular topic or range of

issues" (p. 119). Moreover, Halcomb, Gholizadeh, Digiacomo, Phillips, and Davidson (2007), argue, the focus group method is a practice of group interview that produces data throughout the opinions articulated by participants individually and collectively.

Furthermore, focus group method is a type of qualitative approach in social research where a rich understanding of people's experiences and perspectives is the dominant goal (Kress & Shoffner, 2007; Carlsen & Glenton, 2011; & Freeman, 2006). In addition, Webb (2001) claims, focus group interviews tap into human attitudes and perceptions in relation to concepts, services, products, or programs which are developed by interaction with other people because group processes help people to explore and explain their views in ways that are more accessible than in a one to one interview.

In fact, focus groups are a research method devoted to data collection through group interaction in a group discussion on a topic or issues established by the researcher where the researcher has an active role in creating the group discussion for data collection (Liamputtong, 2011; Kitzinge, 1995; Morgan, 1996; & Onwuegbuzie, Dickinson, Leech, & Zoran, 2009). "A focus group method is a research tool that gives a 'voice' to the research participant by giving him or her an opportunity to define what is relevant and important to understand his or her experience" (Liamputtong, 2011, p. 4).

Focus group researchers seek to endorse a safe environment for self-disclosure through cautious participant selection and insightful questioning by a moderator, and clear ground rules for participation, with a goal to encourage self-disclosure among participants in discussions where participants are encouraged to question, and investigate each other's responses (Freeman, 2006). In addition, Halcomb et al. (2007) assert, focus group research is an efficient method to collect a large amount of rich qualitative data

about a variety of issues particularly in minority and multicultural groups. Similarly, Betts, Baranowski, and Hoerr (1996), claim, focus groups can be a useful method for attaining data from special populations such as adults with low literacy skills, or children.

Moreover, Millward (2012) states,

> The focus group is a discussion-based interview that produces verbal data generated via group interaction…. It is the 'interaction element' that is important to understanding how focus groups can be used to generate a very different type of evidence than is possible from a one-to-one interview (p. 413).

The focus of a focus group discussion can be concrete such as images or objects, or abstract such as activities, events, and experiences, which is managed by a moderator who is able to regulate the group discussion (Millward, 2012). Furthermore, Kress, and Shoffner (2007) claim, focus groups are naturalistic because participants use everyday conversation language and engage in many types of communications such as storytelling, arguing, joking, boasting, teasing, persuasion, and challenging. In fact, Liamputtong (2011) claims, there are two types of focus groups: a structured approach which is used more in market research, and a less structured approach which has come out from focus group research in the social sciences. Liamputtong adds

> The primary aim of a focus group is to describe and understand meanings and interpretations of a select group of people to gain an understanding of a specific issue from the perspective of the participants of the group methodologically… focus groups encourage a range of responses which provide a greater understanding of the attitudes, behavior, opinions or perceptions of participants on the research issues (p. 3).

The development of a non-threatening environment within the group such that the participants feel comfortable to discuss their own experiences and opinions without fear of being judged or mocked by others in the group is important for a successful focus group discussion (Liamputtong, 2011).

History of Focus Group Method

According to Halcomb et al. (2007), focus groups started in the 1920s when market researchers used them to obtain consumer expectations. In the 1930s, the social scientists were interested in developing alternate types of interviewing practices because they were no longer satisfied with the precision of individual interviews in all situations. The initial development of focus groups took place between World War II and the 1970s, and was mostly motivated by the market research sector. Since 1980s, academic interest in the focus group approach has been revived. Nowadays, focus groups are used in the research of many different fields, including the social sciences and health to examine a variety of issues (Halcomb et al., 2007).

In addition, Kidd and Parshall (2000) believe, after World War II, focus group methods became the basis of broadcasting, marketing, and public opinion research, however they were largely ignored in more formal academic and evaluation research until the late 1970s. Likewise, Kidd and Parshall (2000), Liamputtong (2011), Millward, 2012, and Onwuegbuzie et al. (2009) claim, researchers have used focus groups for the past 80 years. During the 1920s, focus groups were used to help researchers in identifying survey questions, and in the early 1940s, Paul Lazarsfeld and Robert Merton used focus group technique to conduct a government-sponsored study to inspect media effects on people attitudes towards the participation of the United States in World War II. Later, focus groups were used mainly for market researchers to review consumers' opinions and attitudes. Then, during the last 20 years, social science researchers used focus group research to collect qualitative data (Kidd & Parshall, 2000; Liamputtong, 2011; Millward, 2012; & Onwuegbuzie et al., 2009).

Moreover, according to Liamputtong (2011), during the past century, focus groups have been used for many different purposes such as its use in the US military, Marxist revolutionaries, literacy activists, and feminist activists because focus groups resemble feminist research practice ideals, thus with the power of feminist research and increased use of qualitative research methods, focus groups have now grown to be common in different disciplines. In fact, Millward (2012) asserts, in addition to face-to-face focus group interviews, in recent years, the internet became a new tool for conducting focus group research, though online groups contribute less than face-to-face groups across the same amount of time, and face-to-face participants usually experience their discussion as more satisfying than online participants. Moreover, currently, focus group methods have become popular as a primary or secondary data collection approach in the social and health sciences, and evaluation research (Kidd & Parshall, 2000; &Webb, 2001).

Focus Groups and Individual Interviews

According to Carlsen and Glenton (2011), a major difference between focus groups and group interviews is that the emphasis of focus groups is on the interaction between the participants while the emphasis of group interviews is on the interaction between the researcher and the participants. Moreover, Reed (1997) asserts, focus groups save time more than individual interviews because it allows researchers to gather data from a number of participants in one session rather than a session for each participant alone. Likewise, Halcomb et al. (2007) state, focus groups are more cost and time effective than individual interviews. Reed (1997) adds, in focus groups, participants mostly know each other which might affect their responses, where this is not a concern in

using individual interviews. Additionally, Millward (2012) asserts, focus groups can produce a wide and more in-depth understanding of a topic or an issue because the interaction inspires memories, debate, revelation, and discussion more than a one-to-one interview.

In addition, Kidd and Parshall (2000), assert, unlike the individual interviews, focus groups participants all have an experience in some particular situation, which becomes the focus of the interview. Kidd and Parshall add, in focus groups, it is important to use indirect questions to draw out impulsive expression among participants in order to go beyond the simple recognition of what was well or poorly received. Furthermore, Kitzinge (1995) claims, focus group processes can help people to explore and explain their views in ways that is more accessible than in a one to one interview.

In fact, Kidd and Parshall (2000) argue,

> Focus group members comment on each other's point of view, often challenging each other's motives and actions in a pointed fashion…. With group interviews, agreements or disagreements are fundamental processes that influence the nature and content of responses as the group progresses (p. 294).

Focus group participants may adjust their opinions based on the give and take of the group's discussion during a focus group session thus that may raise concerns about the trustworthiness of the focus group findings (Kidd & Parshall, 2000).

Focus Groups' Advantages

Millward (2012) asserts ,the focus group method is unique in collecting data and procedures, providing small sights of the world that people might not normally be able to see, promoting natural conversation and discussion as a focus of inquiry, and exploring answers to how, why, and what. Millward adds, the focus groups is also unique in capturing perspectives, understandings, stories, dialogues, and experiences that would not

be meaningfully expressed by numbers, and formulating of hypothesis and variables development, when used alone or in combination with other methods (Millward, 2012).

In addition, Millward claims, a focus group is appropriate to use for purposes of intervention, decision-making, collective empowerment, social and attitude change, problem-solving, test constructs and questionnaire developing, validity checking of theoretical models, traditional methods' supplementing, different viewpoints' on an issue inviting, conversation worthy of analysis generating. Moreover, Carlsen and Glenton (2011), argue, focus groups are suitable to explore people's subjective experiences and attitudes and are also recommended as a pre- or post study to prepare or understand data from surveys or trial studies.

In fact, Onwuegbuzie et al. (2009) and Kitzinge (1995) claim, focus groups are a quick, economical, and convenient way to collect data from several people at once, are useful for exploring people's knowledge and experiences, and examining what people think, how they think, and why they think that way. Kitzinge adds focus group processes can help people to explore and explain their views in accessible ways, encourage participants to explore the issues in their own vocabulary, create their own questions, and pursue their own precedence. In addition, Kitzinge argues, focus groups help researchers use many different forms of communication that people use in their daily interaction such as joking, teasing and arguing, reach the parts that other methods cannot reach, and inform scopes of understanding more than other data collection methods.

According to Morgan (1996), the real strength of focus groups is in providing insights into the sources of multifaceted behaviors and motivations as a direct outcome of its interactions, and offering important data due to the agreement and disagreement

among the participants since participants question each other and explain themselves to each other, in addition to the researcher's ability to ask the participants to compare their experiences and views. Moreover, focus groups allow participants a say in the planning, implementation, and evaluation of intervention, and providing researchers the ability to produce large amounts of narrative data from the participants in a short time (Esposito, 2001).

Moreover, Halcomb et al. (2007)add, focus groups might reduce individuals from providing misleading information because of group pressures in, help to obtain large and rich amounts of data in the participants' own words because of its open response format, empower participants since they are actively involved in something, act as a medium for change during the focus group meeting and after, and provide comfort to participants to discuss their experiences with similar others which would result in a more open and honest conversations.

Besides, Halcomb et al., declare, focus groups are highly helpful when there are power differences between the participants and decision-makers, when the language and culture of a group is of interest, or when one wants to discover the degree of agreement on a given topic, and have great possibility in evaluating issues from culturally diverse perspectives. More to the point, Halcomb et al. affirm, in using focus groups, the researcher can gain deeper levels of meaning, make important relations, identify subtle degrees in expression and meaning, and observe non-verbal responses such as smiles, gestures, and frowns, which might carry information that complements or contradicts the verbal responses.

Also, according to Liamputtong (2011), some of the reason that focus groups have become popular in recent years is because they can provide results quickly, generate complex information at short time and low cost, and can be used with a wide range of people and groups in different settings. In addition, according to Kress, and Shoffner (2007), focus groups are culturally sensitive and empowering than more traditional research methods, flexible, save time, serve as a direct contact between researchers and participants, serve as an intervention because it allows group members to explore pertinent issues, might allow for members' attitudes to be expressed in a way that is ultimately helpful to all group participants, and serve as a means of conducting needs assessments, program development, program evaluation, outcome assessments, and descriptive research.

Millward (2012) claims, focus groups are communication events in which the interaction of the personal and the social can be thoroughly explored. Millward adds, the focus groups provide the ideal medium in which the collective recruitment of community resources and traditions could be captured and analyzed, and might provide exclusive insights into the multifaceted and varying processes through which group norm and meanings are formed, elaborated, and applied.

> Furthermore, Millward asserts, in focus groups, researchers could use Projective techniques role-play scenarios, word association exercises, sentence completion and fantasy themes, which have proved especially effective in producing discussion among children…. There is also a growing interest in using Photo Voice techniques in focus group contexts (p. 421).

Millward asserts there is more than one right way to do focus groups as long as it is built on a clear understanding of the goals and outcomes of the research.

Additionally, Liamputtong (2011) states,

> Focus group interviews allow group dynamics and help the researcher capture shared lived experiences, accessing elements that other methods may not be able to reach. This method permits researchers to uncover aspects of understanding that often remain hidden in the more conventional in-depth interviewing method (p. 4).

Focus groups may reduce the power inequity between the researcher and participants, and provide the researcher with an enormous opportunity to understand the way people see their own reality and to get closer to the data (Liamputtong, 2011).

Focus groups have played and continue to play a vital role in helping to voice the viewpoint of linguistically and culturally diverse participants (Millward, 2012). However, the difficulty of the focus group method requires efficient planning and concern about weaknesses, strengths, threats, and opportunities to particular study populations (Halcomb et al., 2007).

Focus Group's Disadvantages

According to Kidd and Parshall (2000), disadvantages of focus groups include deviation of discussion to unrelated issues, competition for dominance among group members, and focus groups are not sufficient as a stand-alone method for social science and need to be enhanced by participant observation or other qualitative methods. Moreover, Lehoux, Poland, and Daudelin (2006) claim, focus group research sometimes disregards the epistemological and sociological foundations of group discussions, and the group interactions might create doubt and highlight the issue of how to control the discussions.

Furthermore, Morgan (1996) asserts, the moderator might disrupt the interaction in her/his efforts to guide the group discussion, her/his behavior might have negative

consequences on the nature of the group interviews. Morgan adds, the group's affect on the participants might distress the variety of topics that can be explored successfully in groups, and that focus groups are unsuitable for sensitive topics.

In addition, Halcomb et al. (2007) asserts, the open-ended nature of responses in focus groups usually make summarizing and interpreting of results difficult, and the revelation of a large amount of information in the focus group setting is commonly a greater concern than a lack of revelation, because it raises ethical issues related to confidentiality and privacy. In fact, Halcomb et al. argue, bringing people who share experiences or characteristics together might result in a discussion that goes beyond the goal construct, and that participants are usually identified by their first names or pseudonyms during focus group discussions, which reduces the capability of group members to identify others.

Halcomb et al. add, focus groups participants' comfort and honesty might be affected if the participants have constant social contact outside the research context since participants might not feel comfortable revealing certain types of information to people they have contact with, thus, informed consent must be attained in order to stress the possibility for violating in privacy and strategies. Halcomb et al. conclude, focus groups can be difficult to assemble since it may not be easy to get a representative sample, and some populations may not like to participate in focus group discussions, such as people with certain psychological conditions and that can result in participation bias.

Besides, Liamputtong (2011) claims, in some focus groups, a participant's dominant or aggressive personalities might influence the group discussion, and the social context of focus groups has an important influence on issues of revelation, social

conformity, and desirability. For instance, the participants might feel threaten to speak, conform to the dominant ideas present in the group due to the presence of some group members (Liamputtong, 2011). Moreover, Millward (2012) asserts, focus groups transcription task is time-consuming and difficult. In fact, Kress and Shoffner (2007) declare, the use of audiotapes in focus groups does not allow researchers to recognize individual speakers in the transcriptions which might prevent the researcher from analyzing ways that participants' perceptions change on the base of contribution of others. Therefore, Kress and Shoffner suggest including videotaped discussions to recognize the individual speakers in order to evaluate the influence of speakers on each others' insights.

Focus Groups' Sampling

According to Millward (2012), in using focus groups, random sampling is not necessary because it is not the goal of focus group studies to produce results that can be generalized beyond the circumstances used for, and that the sample should reflect sectors of the population who will provide the most meaningful information in relative to the research goals. Millward adds, differences in participant lifestyle and background might reduce the flow of discussion due to lack of common ground, while, close similarities in participants' lifestyles and backgrounds, might lead to unexciting and unproductive discussion. In fact, Millward asserts, group members should have at least some common characteristics such as same socio-economic class, or same age group to assist disclosure.

Moreover, Merriam (2009) claims, in conducting focus groups, "purposeful sampling should be used to include people who know the most about the topic" (p. 94). Merriam adds, in using a focus group interviews, most researchers suggest the sample

size to be between six and ten participants. Likewise, Lehouxet al. (2006) claim, in focus group research, groups are usually contain 6–10 participants and discussions last 1.5-2.5 hours.

While Millward (2012) claims, a range of six to eight participants is ideal in order to keep groups as small as possible which might help in being able to obtain the breadth of responses required.

> Large groups are unwieldy to manage, allow free-riding and can be apt to fragment as subgroups form. Also it may be hard to obtain a clear recording of the session: people talk at different volumes and at different distances so the discussion may be difficult if not impossible to track (Millward, 2012, p. 425, 426).

Alike, Morgan (1996) argues, in focus group research, smaller groups are more suitable for emotionally stimulating topics that cause high levels of participant involvement, while larger groups are more suitable for more neutral topics that cause lower levels of involvement.

Similar to Millward (2012), Liamputtong (2011), states, "focus group interviews involve a group of 6-8 people who come from similar social and cultural backgrounds or who have similar experiences or concerns" (p. 3). Whereas Kress, and Shoffner (2007) asserts, focus groups can be defined as a practice in which 8 to 12 persons discuss a particular topic of interest for one to two hours under the direction of a group moderator. But Carlsen and Glenton (2011) suggest that in focus groups research, group size of a minimum of 4 and a maximum of 12 participants per group.

Additionally, Onwuegbuzie et al. (2009) asserts, the reason for the above focus group size range stems from focus groups' goal to include enough participants to yield diverse information, but not to include too many participants in order not to create an

uncomfortable environment for participants. Some researchers suggest 3 or 4 participant focus groups, when participants have specialized experiences to discuss in the group, and the number of times a focus group meets can vary from one meeting to multiple meetings since using multiple focus groups permit the focus group researcher to assess the degree to saturation (Onwuegbuzie et al., 2009).

However, according to Freeman (2006), some researchers are critical of the use of convenience samples and preexisting groups when conducting focus group research, and they insist on caution when using people who know each other. Freeman explains these participants will have their own pre-existing dynamics which might pose some problems for analysis because of the pressure of current relationships on contributions, reserve of negative observations, and sway of formal and informal hierarchies. In addition, there is the threat to external validity caused by convenience sampling (Freeman, 2006).

Focus Groups Unit of Analysis

According to Kidd and Parshall (2000), there is a disagreement among researchers about whether the individual or the group is the unit of analysis in focus group interviews. Onwuegbuzie et al. (2009) claim, some researchers believe that the individual or the group should be the focus of the analysis instead of the unit of analysis, although most focus group researchers use the group as the unit of analysis. Onwuegbuzie et al. add,

> Most focus group analysts use the group as the unit of analysis. However, using the group as the unit of analysis precludes the analysis of individual focus group data. In particular, it prevents the researcher from documenting focus group members who did not contribute to the category or theme (p. 348).

Those who did not contribute might be relatively silent such as shy members or members who do not want to expose their different opinion, experience, attitude, or level of

knowledge; members who do not value the issue under discussion, members who have a propensity to comply with the majority opinion, or members who did not get the opportunity to speak (Onwuegbuzie et al., 2009).

The Role of the Moderator

According to Kress and Shoffner (2007), Buttram (1990), and Onwuegbuzie et al. (2009), an effective moderator is vital for the success of a focus group where her/his role is to encourage interaction, use probing comments, ask for details when needed, observe nonverbal behaviors, keep directing the discussion toward the topic of interest, explore participants' answers to generate themes, ask sample members open-ended questions, and monitor their responses. Kress and Shoffner (2007) add, usually structured questions are created prior to the focus group interviews and used in guiding the discussion, such as the first one or two questions are used to help increase members' comfort level within the group.

In addition, Kress and Shoffner argue, moderators need to be flexible, adapt to different situations as they occur, express thoughts fast, treat participants as experts, encourage an open exchange of information and sharing opinions and ideas, communicate their own feelings, show interest in other peoples' thoughts and feelings, and be aware of their own biases. The interaction amongst focus group members is what makes the focus group exceptional in comparison to asking participants separately about their views (Kress, & Shoffner, 2007). Kress and Shoffner add, after the end of a focus group, the next step for the moderator is to decide how to make meaning of the data using notes that were taken during the focus group and the transcription of the focus group and then, identify themes based on these.

Moreover, Onwuegbuzie et al. (2009) and Halcomb et al (2007) argue, it is best for the focus group to have a moderator team which usually consists of a moderator and an assistant moderator. Furthermore, Onwuegbuzie et al. (2009) asserts, in most cases, the moderator asks the focus group participants a series of questions, however, in some cases the moderator might present the members with motivation material such as newspaper article, video clip, or audio clip, and ask them to respond to it. Otherwise, the moderator might ask the participants to engage in a particular activity such as team-building exercise or brainstorming exercise, and then provide reactions to it (Onwuegbuzie et al., 2009).

Onwuegbuzie et al. (2009) and Halcomb et al. (2007) add, the assistant moderator's responsibilities is to record the session by audio or videotape, create an environment that is conducive for group discussion, take notes, provide verification of data, and help the researcher or moderator to analyze and interpret the focus group data. According to Kidd and Parshall (2000), within focus groups, the discussion depends on the moderator's skill and the participants' personalities and their emotions.

In fact, Halcomb et al. (2007) assert, the moderator needs to be a reliable and respected person with participants, where consideration should be given to one who is a member of the cultural or community group of participants because cultural mistrust might have a negative effect on participants' willingness to reveal information, which in some cultures might be an barrier in terms of the awareness of maintaining confidentiality.

Also, Halcomb et al. claim, it is essential that the note-taker remains a non-participant observer in the group to protect neutrality, and to concentrate only on

capturing the core of the group processes. Besides, Halcomb et al. argue, immediately after the session is concluded, the moderator and note-taker should debrief and evaluate the quality of field notes to make sure that reflections are representative of the process that has taken place.

Moreover, Halcomb et al. assert, methods of conducting focus groups differ significantly in different cultures, and topics discussed are placed within a culturally specific perspective, which makes it hard for the researcher to clearly recognize individuals' messages because of the important contextual differences that were inherent within cultures. Thus, Halcomb et al. suggest for the moderator of a focus group to be culturally similar to participants since the similarity might assist in reducing communication barriers because the facilitator would be aware of and would provide culturally sensitive treatment to participants.

Reliability

According to Kidd and Parshall (2000), reliability is a concern with focus groups when the same group meets together on more than one occasion, particularly if a few members are in attendance on one occasion and absent on another. Similarly when multiple moderators or coders are used, differences in moderator experience and interviewing style might affect the flow, quality, and content of focus group interviews (Kidd & Parshall, 2000).

Validity

Kidd and Parshall (2000) suggest using a stepwise process for validating findings as interviews and analysis proceed, and when research team members and external consultants review the coding method, the contents, and definitions of coded categories

are, then going to be similarly represented focus groups that judge the credibility of what we derived from earlier groups. Because focus group participants can talk things over openly, it is possible to hear similar viewpoint on some issues in multiple focus groups which would tend to support content validity (Kidd & Parshall, 2000). In addition, Kidd and Parshall assert, other methods can be used to evaluate content validity of focus groups such as secondary analysis, comparison with themes or theory in extant literature, or content validity indexes.

Morgan (1996) asserts it is important for the researcher to report the sources for locating participants and information about recruitment procedures, and to discuss ethical issues. Morgan explains data quality depends on many factors such as the number of participants, sample selection, types of questions, moderator qualifications, the analysis strategy, and standards for reporting on research procedures. Making sufficient planning and decision clarifications during conducting the focus group study can significantly improve the validity and reliability of the project (Halcomb et al., 2007).

In addition to the above factors, Webb (2001) argues member checking might increase validity in particular with translated focus group data. In fact, Esposito (2001) states, "the truth value of translated focus group data is supported when the participants' expressed meaning is understood by the listener. Failure to accurately portray the intended meaning of the participants' words and actions renders data useless" (p. 570). In any research, especially when language is a barrier, misunderstanding of meaning might be problem that can be minimized by bilingual researchers (Esposito, 2001).

Analyzing Focus Groups' Data

Although focus group research has a long history relatively, about 80 years, until recently, no framework exists that describes the types of qualitative analysis techniques that focus group researchers have to use (Onwuegbuzie et al., 2009). Also, Onwuegbuzie et al. (2009) argues, since focus group data are analyzed one focus group at a time, it assesses the meaningfulness of the themes and filters them, which would assist the researcher in reaching data saturation. Onwuegbuzie et al. add, the analytical techniques that are common to focus group data are

Constant Comparison Analysis which has three main stages: first stage where the data are chunked into small units and the researcher attaches a code to each of the units, second stage when the codes are grouped into categories, and third stage when the researcher develops one or more themes that state the content of each of the groups. Onwuegbuzie et al. (2009) add focus group data could be analyzed using constant comparison analysis especially when there are multiple focus groups within the same study, which allows the researcher to assess general and across-group saturation.

Classical Content Analysis which is similar to constant comparison analysis since it includes producing smaller chunks of the data and then attaching a code to each chunk. Then, these codes are placed into similar groups and counted.

Keywords-in-Context which represents an analysis of the culture of the use of the word, with the assumption that people use the same words differently, which requires the examination of how words are used in context especially in focus groups because of the interactive nature of focus groups.

Discourse Analysis which was developed by a group of social psychologists in Britain who hypothesize that it is important to study how people communicate on a daily basis to understand social interaction and cognition.

In addition, Onwuegbuzie et al. (2009) mention a new method of focus group research analysis; the *Micro-Interlocutor Analysis* which requires providing precise statements such as quotations made by focus group participants, information about the number or percentage of members who appear to be part of the agreement that produces a category or a theme, specifying the number or percentage of members who appear to represent a rebellious view and the number or percentage of participants who did not appear to express any view at all, and documenting the number of members who provide substantive statements or examples that generate or support the agreement view.

Furthermore, Millward (2012) asserts,

> Content analysis comprises both a mechanical and an interpretative component…. The mechanical aspect involves physically organizing and subdividing the data into categories, while the interpretative component involves determining what categories, are meaningful in terms of the questions being asked (p. 431).

Moreover, Millward asserts, transcription is a primarily task, though it is time-consuming and difficult. On the other hand, Millward adds,

> Feedback to participants or an organization raises a dilemma for the researcher… information arising out of the focus group may not be what the sponsor wants to hear and may even be personally compromising… what people have talked about in the group may be not what they would wish to pass on, and not pleasant to receive (p. 434).

The confidentiality of group members should be complete and no trait information must be known (Millward, 2012).

Despite its disadvantages, focus groups are widely used in researching issues of different social groups, in cross-cultural groups, and in development research because of

their collective nature especially with people who cannot express their thoughts easily such as marginalized people (Liamputtong, 2011) including Arabic mothers of school children, living in the United States.

United States' Arabs

According to Al-Hazza and Lucking (2005), "the term *Arab* refers to individuals who speak Arabic and belong to the Semitic race with roots leading back to the Arabian Peninsula" (p. 4). Arabs are about 300 million various mixtures of people who initiate from more than twenty countries in Northern Africa and the Middle East that are divided into three different regions; Northern Africa, Mediterranean countries, and the Arabian Gulf Region and Saudi Peninsula, have a variety of climates and landscapes and climates range from soaring desert temperatures to cool mountain weather. Arabs speak Arabic with different dialects; have moderately different traditions and diversity of physical features such as olive or light skin, diverse hair and eye colors (Al-Hazza & Lucking, 2005). "Yet, with all this diversity, Arabs are still united by a common thread of identity and a bond of heritage based on culture and tradition that dates back thousands of years" (Al-Hazza & Lucking, 2005, p. 4).

According to Al-Hazza and Lucking, the first wave of Arab immigration to the United States started in the mid to late 1800s of mostly Christian villagers and farmers from Lebanon and Syria due to economic reasons. These immigrants frequently opened businesses, became recognized merchants, were very interested in their children becoming educated, their children attended public schools, and spoke Arabic at home and English at school.

After World War II, a second wave of Arab immigrants came to the United States mostly for political and economic reasons, who were mostly Palestinians who were displaced after the establishment of Israel, Egyptians, Syrians, Yemenis, and Iraqis. During the 1960s, a third wave of Arabs immigrated to the United States who were called the "brain drain" because they were the educated best of their countries, often college graduates, bilingual and fairly westernized, initiated churches, mosques, meeting centers, newspapers when they arrived to U.S., and stressed the value of education to their children (Al-Hazza & Lucking, 2005).

Al-Hazza and Lucking state, the 2000 U.S. Census indicated there were 1.2 million people of Arab Ancestry in U.S. with Lebanese reaching 440,279 people, followed by Egyptian and Syrians totaling about 143,000 people each, most likely live in five major states, New York, Michigan, California, Florida and New Jersey and form communities based on nationality and religious orientation. Arabs have been successful in the U.S. schools and according to Al-Hazza and Lucking, the 1990 Census Report indicates that Arabs in U.S. as a group are more educated than the average American; 36.3% of them hold bachelor's degrees, and 15.2% holding graduate degrees.

Arabs and Muslims made great contributions to many scientific fields particularly mathematics, which was their favorite subject (Kadyrov, 2009) despite the fact that many historians of mathematics omitted any mention of Arabic or Islamic mathematics in the historical development of this subject (O'Connor & Robertson, 1999). O'Connor and Robertson (1999) add,

> Recent research paints a new picture of the debt that we owe to Arabic/Islamic mathematics. Certainly many of the ideas which were previously thought to have been brilliant new conceptions due to European mathematicians of the sixteenth, seventeenth and eighteenth centuries are now known to have been developed by

> Arabic/Islamic mathematicians around four centuries earlier. In many respects the mathematics studied today is far closer in style to that of the Arabic/Islamic contribution than to that of the Greeks (p. 1).

In addition, according to the American-Arab Anti-Discrimination Committee (2013), the Arabic zero, *sifr*, provided solutions to complex mathematical problems, and the Arabic numeral and decimal systems assisted the global scientific field. Moreover, the Arabs created algebra and expanded it, and made great contributions to geometry and trigonometry.

Until the events of 9/ 11/2001, Arabs were considered quite invisible minority in U.S. which may due to the fact that Arabs historically have not faced extreme educational failure as have other minority groups, they immigrated by choice in waves instead of in one massive arrival, their immigration has been fairly quiet with slight media attention, most of them had smooth transitions to U.S. society, and they are not physically noticeable so they may fit in more easy than other minorities (Al-Hazza & Lucking, 2005).

The stereotypes about Arabs in U.S. became more negative after the events of 9/11 due to extreme negative images in the media, for example, according to Al-Hazza and Lucking,

> Negative images of Arabs abound in print, and more significantly, in the print found in the classrooms of this country. A venom-ridden debate rages beneath the surface of school politics over Arab and Islamic portrayals in textbooks… many textbooks showed an overrepresentation of Arabs as nomads, living in the desert in tents using camels as their major method of transportation…. While historically these living conditions were the case, less than two percent of Arabs now reside in the desert; the overwhelming majority of Arabs live in Modern cities with modern amenities…. The majority of textbooks also failed to recognize Arabs' contributions to society, science, medicine and mathematics and the fact that Arabs sustained ancient Greek and Roman knowledge, translating it and preserving it for the rest of the world. These vital translations later helped trigger the European Renaissance.

For these participants, I used culturally responsive focus groups, which according to Vissandjee, Abdool, and Dupere (2002), result when the researcher has political, geographic, socio-cultural, and economical knowledge related to the research population and topic. Thus, I expanded on focus groups more in chapter III.

Summary

Parents have been and still remain an essential part in their children's mathematics education. For example, Peressini (1998) argues, "parents have been involved in mathematics education and will continue to influence the direction of reform" (p. 579). Parents came to the mathematics reforms with different mathematical histories and levels of success, and many faced difficulties with mathematics, however they all want their children to be successful in mathematics, and they work hard to guarantee their children' success (Remillard & Jackson, 2006).

Research has shown a positive correlation between parental involvement in children's education in general and students' academic achievement. Parental involvement might result in many educational benefits to students such as improving their school attendance, grades and test scores, attitudes toward school, and lowering their dropout rates. Research has also shown that although parental involvement in children education differs in ways and level from one parent to another, many parents help their children with homework, attend parent-teacher conferences, volunteer at school, and encourage their children's achievement.

It is the responsibility of mathematics educators to recognize parent's role as partners in their children's mathematics education rather than barriers, and view parents as rich assets for students' mathematics learning. Mathematics educators also need to

give parents accesses to resources in order for those parents to understand aspects of the new curriculum. Many authors such as Gillanders et al. (2012) call for efforts to build effective family-school partnerships that consider the parents' perspective about their involvement and its usefulness in their children's education.

More studies are still needed in this important field since parents are one of the most important factors in their children's mathematics education. For example, Barton, Drake, Perez, St. Louis, and George (2004) argue, "there is a small set of studies, primarily in mathematics education, that takes a more critical stance on parental involvement in school" (p. 4), in particular, the United States society is a multicultural one and that discontinuity between the school and home culture is a cause of poor achievement among minority children.

In his call for more research on ethnic minority parental involvement, Sy (2006) states,

> The increasing number of ethnic minority children in a school system… calls for research on involvement practices of families from different cultural backgrounds. Such information would shed light on individual differences in children's early achievement and adjustment and may provide additional avenues for early intervention (p. 120).

It is very important for educators to provide minority parents opportunities to expand their mathematical knowledge and to treat them as partners in their children's mathematics education rather than barriers despite their different cultures and languages, because their voices should be heard and their voices count even if they do not speak English. I believe in the Bratton, et al.'s (2004) minority mother's statement "the fear just slowly went away and I learned that your voice counts, even if you don't speak the same language, it counts (p. 22). One of the useful tools for engaging culturally and

linguistically varied populations and immigrants are focus groups since it allows cooperative discussions and thus provides a deeper understanding of the issue under study (Halcomb et al., 2007; & Willgerodt, 2003).

CHAPTER III

METHODOLOGY

In the last chapter, a review of the relevant research literature was provided to give context to this study. In this chapter I explained the theoretical framework of the study, which is Critical Race Feminism (CRF), as related to storytelling, the history of CRF as stemming from other theories such as Critical Race Theory (CRT). Furthermore, I provided information about CRF and women of color, CRF and diversity groups, and CRF and Arabic and Muslim Women. Moreover, I explained the research methodology of the study, which is culturally competent focus groups, the researcher's role, described the setting and participants of the study, and explained data collection and data analysis procedures. In addition, I illustrated how to enhance the trustworthiness of the study, researcher stance, and potential ethical issues of the study.

Theoretical Framework

Critical Race Feminism

> "If the voices of women of color were to be heard, clearly a theory that spoke to their interests would be needed" (Carter, 2012, p. 9).

> "While many are now familiar with Critical Race Theory, few have heard of Critical Race Feminism" (Wing, 1996-1997, p. 339).

"In many cultures, particular groups benefited and prospered because of the entitlements, advantages, and dominance conferred upon them by society" (Black & Stone, 2005, p. 243). Black and Stone argue, social advantage is articulated through some blend of the following: race, gender, religion, age, sexual orientation, socio-economically status, and ability degree. Moreover, Black and Stone claim,

> The tenets of racial privilege are rooted in historical White supremacy that permeates society in the United States. The term *historical White supremacy*... means that being 'White' has been and is viewed as culturally valued and the norm against which all other races are evaluated (p. 246).

In addition, Black and Stone assert, gender privileged status indicates that the male biological sex is advanced and favored, so

> Men were granted financial, career, and gender role benefits and rewards that were greater than those given to their female counterparts who had similar training and experience… men have been and continue to be viewed as the more valued, more powerful, and more influential members of U.S. society (p. 247).

Many theories have opposed areas of social privilege. One of these theories is Critical Race Feminism. Critical Race Feminism is a set of beliefs related to legal scholarship that is rooted in feminist and anti-racist critical traditions, whereby scholars analyze the roles of race, class, gender, and other identities in the experiences of Black, Latina, Asian and other diverse groups of American women (Lewis, 1998). "Critical Race Feminism cannot afford to ignore the role that these women play in the complex mix of law and politics in the United States" (Lewis, 1998, p. 319).

Moreover, Wing (2003) asserts, CRF is an

> Embryonic effort in legal academia that emerged at the end of the twentieth century to emphasize the legal concerns of a significant group of people—those who are both women and members of today's racial/ethnic minorities, as well as disproportionately poor (p. 1).

Furthermore, Carter (2012) asserts, CRF offers opportunities to inspect race and gender as they overlaps with systems of control such as the legal, political, and socio-economic system within the United States system. Few (2007) claims, CRF theory has been informed by the writings of multicultural and Black feminists, thus, it is useful in focusing the researcher on the inspection of how the institutions that women interact with reinforce social inequalities.

Moreover, Few explains, Critical Race Feminists are interested in how legal and social policies such as education, health, welfare, immigration, child care and custodial rights, domestic violence, and other facet of family policy assist or dominate racial women and their families. Critical Race Feminists are also interested in performing activist research that has a social justice schema, therefore, they choose methods that promote some kind of political, social, or economic change that benefits the people they study (Few, 2007).

In addition, Hua (2003) considers CRF as anti-racist feminism; a body of writing that integrates the way race and gender work together in organizing social inequality. Hua claims CRF opens epistemological space to include other colored feminists, mixed-race feminists and white feminists who are engaging in critical race analyses in addition to Black feminists. Hua adds CRF is characterized by three central interventions: it theorizes an analysis of the interconnection of race with gender and other oppressions, it argues for the ideas of social difference and multiplicity within feminism, and it offers a unique and different feminist epistemology.

Furthermore, Hua asserts, CRF highlights that people are part of a racial economy and that race is always part of a business in everyday social interactions. Hua adds, CRF indicates that race and racism create difference among women which challenges the notion of a universal global sisterhood and unity and the notion of a common experience of gender domination.

According to Rubinstein-Avila (2007), "Critical race feminism focuses on the myriad of factors affecting the oppression of and discrimination against women—particularly women of colour" (p. 364). Rubinstein-Avila adds the CRF differs from the

feminist movement of the 1970s and 1980s that was dominated by white, middle-class and heterosexual women and ignored women of color, poor women, lesbians, and bisexuals. Moreover, Rubinstein-Avila argues, CRF opposes the uncritical, color-blind philosophy and advocates for color, gender, and sexual identity-consciousness. Rubinstein-Avila adds, CRF takes into account the range of complexities of women's sexuality as an important aspect of their identity formation and it counters the naive, apolitical, individual stance to sexism. Rubinstein-Avila recommends that educators need to promote conversations about issues of race, class, and gender.

According to Onwuachi-Willig (2006),

> CRF serves as a bridge toward understanding the legal status of women of color and the ways in which women of color face multiple discrimination on the basis of factors, including but not limited to race, gender, class, able-bodiedness, and sexuality. Critical race feminists expose how various factors, such as race, gender, and class, interact within a system of white male patriarchy and racist oppression to make the life experiences of women of color distinct from those of both men of color and white women (p. 1).

Furthermore, Few (2007) states, CRF brings a few advantages such as helping in developing interference or prevention approaches that are culturally available and relevant to targeted people or communities, and challenging researchers to be reflexive about reasons behind participating in the process because self-reflexivity unveils theoretical blind spots such as subconscious classism, racism, sexism, and ethnocentrism.

CRF and Storytelling

Berry (2010) asserts CRF supports storytelling because it helps in understanding multiple positions of persons or groups of persons, particularly the socially and politically marginalized individuals living at the juncture of identities. Berry suggests centralizing the story telling in the teaching and learning of teachers and students as a model for de-

marginalizing the lives of minorities. Berry asserts CRF recognizes the importance of storytelling because students' stories are important to know in the context of their development since stories and experiences might influence what they learn and how they learn it, so teachers need to center their experiences while helping their students to engage in such centering.

History of Critical Race Theory

Critical Race Theory had a similar path to feminist theory. In its early stages, CRT was developed as racial-minorities within the official academy have developed a clear race alert form of legal criticism (Minda, 2010). Critical Race theorists highlighted the importance of understanding how racial identity is unobserved in the way the law is structured and social relations are regulated. This coincides with the second wave of feminism emphasizing gender identity (Minda, 2010). CRT became the elite territory of minority scholars who asserted the only authority to speak on behalf of people of color (Minda, 2010). Wing (1996-1997) argues,

> Critical Race Theory embraces the Critical Legal Studies de-construction methodology to challenge racial orthodoxy. Additionally, it draws from intellectual traditions such as liberalism, law and society, Marxism, postmodernism, pragmatism, and cultural nationalism. Critical Race theory is skeptical of traditional legal theories that support hierarchy, and so-called neutrality, objectivity, color-blindness, meritocracy, and a historicism. In areas as wide ranging as hate speech, affirmative action, and federal Indian law, Critical Race theory questions the ability of traditional legal strategies to deliver racial and social justice (p. 340).

Evans-Winters and Esposito (2010) add CRF is a branch of Critical Race Theory that grew out of critical legal studies, which was conquered by the voices of white male legal academics such as feminist legal theorists that highlighted the viewpoints of white and upper class women. In fact, Wing (1996-1997) asserts, CRF has much in common with

CRT since it considers racism as a fundamental part of American society, it uses the well-known narrative practices to construct other visions of reality and identity, adopts feminist philosophy focusing on the oppressed status of women within society.

In addition, Few (2007) claims, CRF theory emerged from CRT as a result of racial women feeling barred by their male peers and White females. Few argues, the basic views of CRT theorists are: racial identity is a product of social consideration and is not objective, fixed, inherent, or automatically biological; people have possibly contradictory overlapping identities, loyalties, and commitments; racial individuals and groups negotiate inter-sectionalism concurrently within their groups and in relation to other groups; and minority status assumes an ability for minority to speak about race and the experiences of multiple oppressions without vitalizing those experiences.

Similarly, Berry (2010) argues, CRF originated from the CRT which has been known as a movement of activists and scholars who are interested in studying and changing the relationship among race, racism, and power. Berry asserts, CRT and CRF have many basic principles such as declaring that racism is common and normal in American society; placing women of color in the center of the discussion, thought, reflection, research, and praxis of their lives in dominant culture; supporting pedagogy as a theory and practice within the context of teacher education; and addressing African American, woman, sister, friend, teacher-educator, researcher, scholar and more.

Likewise, Carter (2012) declares, Critical Race theorists have come up with six views that CRT consists of: racism was an normal aspect of America's basics, White interests dictated the legal benefits of people of color, race and races were products of social reflection and relations, race and races are always changing, inter-sectionalism and

anti-essentialism are important grounds, and that the sole voice of people of color is based on their distinctive experiences and histories.

In fact, in the educational field, Berry (2010) argues, CRT and CRF encourages teachers to acknowledge and accept the multi-dimensionality of minority students and understand that students bring all of their experiences and knowledge into the classroom, and what teachers plan to teach them gets filtered through these experiences because engaged pedagogy allows and encourages the integration of students' experiences in the curriculum; advocates for centering the socially and politically marginalized people in the dominant culture; addresses the junction of race and gender while recognizing the multiplicative and multi-dimensionality of being and praxis for minority women.

Minda (2010) divides the recent history of the feminist movement into three distinct waves. The first wave was dominated by white, middle-class, and heterosexual women, where liberalism and social democracy were accepted as the base for bringing equality to gender. The second wave stressed the need to identify difference in identity politics, where the struggle for income equality transferred to masculine cultural hierarchy in feminist dialogue. The third wave is global feminism which is global in orientation, and argues that feminism is no longer a gender-specific matter, but it is a human rights matter that involves forms of political demonstrations. This third wave feminist movement is more comprehensive because it appeals to all people who experience prejudice: female, male, gay, or lesbian, despite of class, ethnicity, and color (Minda, 2010).

Furthermore, Carter (2012) argues, "Critical race feminism… promises to afford "legal and academic stratagem for studying and eradicating race, class, and gender

oppression in educational institutions" (p. 3). Carter adds CRF scholars provided critiques of several other legal theories that appeared before, such as the Critical Legal studies. Carter concludes "by recognizing and creating spaces to critique these structures, critical race feminism offers hope. The theory's practical use in educational settings is where hope can begin to appear" (p. 11).

CRF and Women of Color

According to Wing (2003), CRF challenges the invisibility of women of color in laws and challenges the idea that the law is fair, when it instead enables race, gender, and class hierarchies (Carter, 2012). CRF represents a racial analysis and critique of traditional civil rights theory and critical legal studies, emphasizes the need for praxis, and it emerged as an answer to the use of color blindness in the law that allowed the law to ignore social and institutional domination and worked to maintain systems of domination based upon race that law appeared during the Civil Rights Movement (Carter, 2012).

Moreover, Carter asserts, CRF stresses the uniqueness of women of color and emphasizes the experiences that form the viewpoints of these women are different from those of men of color and White women and men. The viewpoints of women of color pools from many fields of study and different theories such as Black feminist thought, doubts the various forms of oppression and how it manifests thus their lives, focuses on anti-essentialism and suggests that women of color have multiple political identities that need to be considered, and calls for the encouragement of theories and practices that critique and fight gender and racial oppression (Carter, 2012).

In fact, Evans-Winters and Esposito (2010) state, CRF is a useful framework for representing and speaking to the experiences of African Americans in educational spaces because it may provide a legal and academic device for studying and eliminating race, class, and gender oppression in educational institutions. In addition, Evans-Winters and Esposito assert, CRF in education is valuable to examine and build a theory around educational issues that affect African American girls in the following ways.

> Critical race feminism as a theoretical lens and movement purports that women of color's experiences, thus perspectives, are different from the experiences of men of color and those of White women; Critical race feminism focuses on the lives of women of color who face multiple forms of discrimination, due to the intersections of race, class, and gender within a system of White male patriarchy and racist oppression; Critical race feminism asserts the multiple identities and consciousness of women of color (i.e., anti-essentialist); Critical race feminism is multidisciplinary in scope and breadth; and Critical race feminism calls for theories and practices that simultaneously study and combat gender and racial oppression (p. 20).

Wing (1996-1997) asserts, CRF adds to CRT and Feminism by placing women of color at the center, rather than margins of the analysis, it attacks the notion of the essential woman, the white middle class, and explores the lives of those who face prejudice on the basis of their race, class, and gender, it celebrates the differences within women of color and expresses how the law might improve their status, it attempts to identify ways to empower women through law and other regulations. "Critical race feminism can serve as a framework to transform educational policy, teacher education, curriculum design, and more importantly the lives of young females of color" (p. 12). Furthermore, Evans-Winters, and Esposito (2010) assert,

> Currently, not enough is being done by scholars in the field of education on the policy front or pedagogically to unabashedly develop and implement classroom practice and curriculum that directly relates to the needs of Black girls…. Critical race feminism in education offers the most nuanced and straightforward framework for contending with the social, economic, political and educational

> problems confronting Black female students inside and outside of schools (p. 22-23).

Moreover, Carter (2012) argues,

> Critical race feminist theory, if used in an educational context, can potentially center educational discourse on the lives of young, female students of color… can benefit Black girls by supporting anti-essentialist standards of identity, by maintaining a 'multidisciplinary' scope (p. 3).

Wing and Smith (2005) add, CRF in its global dimension emphasizes the official status of women of color worldwide because women of color might face oppression because of their race, gender, class, religion, disability, nationality, sexual orientation, language, age, marital status, parental status, stature, or political beliefs. On the other hand, Few (2007) explains, some of the criticisms against CRF theory such as difficulties to determine feminist concepts or foresee individual or group behavior. Carter (2012) asserts,

> Critical race feminism emerges from those theories before it that dared to critique discriminatory power structures—that dared to actually see the faces at the bottom of the well, and stop to help them to the top… critical race feminism does something that none of the previous theories can do, which is deal with the intersections of race, gender, and class while also critiquing the structures of domination, namely the political and legal structures that perpetuate the degradation of Black girls (p. 13).

According to Carter (2012), Wing (2003) continues to develop CRF as she introduced what is called "multiplicative identity", which means that the multiple identities of women of color converted into a holistic one when these women understand the discrimination against them.

CRF and Arabic Women

Most Arabic women are also Muslims since "most Arabs are Muslims, but most Muslims are not Arabs" (American-Arab Anti-Discrimination Committee, 2013). Arabic and Muslim women are scarcely represented in the educational research. Wing and Smith (2005) claims, CRF is concerned with de-marginalizing the views of Muslim girls and women themselves, and not just reporting what men, the media, or Americans think about them because very few Muslim female voices are heard on this subject or other subjects (Wing & Smith, 2005). Lewis (1998) claims, despite the increasing majority of female immigrants to the United States, the completion of gender-conscious analyses of U.S. immigration and refugee policy is still uncommon in both the popular imagination and legal scholarship. There is a need for more studies in this important field especially given the United States is a multicultural country. Despite its importance, "understanding race, ethnicity, and culture in family processes remains a difficult and precarious undertaking" (Few, 2007, p. 452).

Culturally Competent Focus Groups

For the purpose of this study, I used culturally competent focus groups. According to Vissandjee, Abdool, and Dupere (2002),

> A culturally competent focus group can result when the research team has geographic, political, economic, and socio-cultural knowledge related to the research area and its population… focus groups are sensitive to cultural variables, which is why they are often used in cross cultural research with ethnic minorities (p. 826).

Vissandjee et al. (2002) add, a researcher's knowledge of economic and socioeconomic status of the population under study allows conversations about participants work, and her/his knowledge of social relations allows discussions about existing relations of power

and gender. Vissandjée et al. add, researcher's political knowledge of the participants' region helps her/his understanding of fundamental power relations, and her/his geographic knowledge helps her/ him finding a sample of study and a convenient location for participants to conduct focus groups.

Focus Groups and Diversity

According to Halcomb et al. (2007), focus groups are a valuable tool for engaging culturally and linguistically diverse populations (Halcomb et al., 2007). In addition, focus groups are often used in work with ethnic minorities because "the focus group method allows researchers to pay attention to the needs of those who have little or no societal voice" (Liamputtong, 2011, p. 4). Similarly, Halcomb et al. (2007) assert, focus groups are suitable to access marginalized groups or people with insufficient literacy or language in the dominant culture. Likewise, Esposito (2001) argues, focus groups are an outstanding way in recognizing the needs of under-researched populations. As well, Halcomb et al. (2007) state, focus groups are a highly efficient and flexible technique for examining a wide range of topics involving a range of individuals from different settings, an available research tool for attaining data from individuals who are not mostly literate, children, marginalized groups, and people from culturally and linguistically diverse backgrounds.

Moreover, focus groups do not discriminate against people who cannot read or write, encourage participation from those who are hesitant to be interviewed on their own, and encourages contributions from people who feel they do not have anything to say (Freeman, 2006; & Kitzinge, 1995).

> Focus groups can facilitate increased understanding of perspectives of culturally and linguistically diverse groups…. It is only through culturally sensitive

> modifications to the traditional focus group method that the voices of participants from culturally and linguistically diverse back grounds can be heard (Halcomb et al., 2007, p. 1001).

In fact, according to Willgerodt (2003), focus groups are a practical qualitative method for use with immigrant populations since it allows cooperative discussion about a particular issue and thus provides a deeper understanding of the issue under study. Additionally, Halcomb et al. (2007) asserts,

> Focus group method is progressively more appealing in engaging people from culturally and linguistically diverse backgrounds… because participants may feel more comfortable discussing experiences with similar others… the focus group method has great potential in assessing issues from culturally diverse perspectives. This capability is critical in developing culturally competent care as researchers may unconsciously interpret experiences of other 'cultures' through the lens of their own cultural beliefs and values, leading to ethnocentric assumptions of meanings of other cultures' experiences that are inaccurate and incomplete. Instead, a focus group can enable the exploration, validation and clarification of multiple participants' voices, regarding their perspectives and beliefs, thereby stemming inappropriate interpretations by researchers (p. 1009-10).

The Role of the Researcher

I conducted four focus groups. The first focus group included four mothers, the second included five mothers, the third included five mothers, and the fourth included four mothers. Carlsen and Glenton (2011) suggest, in focus groups research, group size of a minimum of 4 and a maximum of 12 participants per group. Each focus group lasted between an hour and a half and two hours. I arranged with the first 4 participants the time and the location of focus group interviews, and repeated that with the other groups. Two of the focus groups took place in two different Islamic centers' meeting rooms, one took place at my house, and one at a friend house in a different city. The choice of these locations depended on participates' choices or residences.

For the focus groups, I applied the following considerations that were suggested by Strickland (1999) and Halcomb et al. (2007). I conducted focus groups at easy to access places that provided comfort and privacy to participants. I provided ready-made snacks and drinks to three focus groups, but I provided a Middle-Eastern breakfast, tea, and Arabic coffee I prepared myself to the participants who attended the focus group I conducted at my house. Since the participants indicated they did not need child care for their children, I did not provide child care. I arranged the seats in a ‘‘U’’ shape in order to maintain eye contact amongst focus group members. I informed participants that there was no right or wrong responses and their information were confidential, they might speak in English, Arabic, or both. I spoke Arabic and English with the mothers. Although we had different Arabic accents, we clearly understood each other. I asked the mothers to speak separately in order for me to identify each person's information. In two of the focus groups, one Arabic woman helped in the audio taping process.

Since cultural and speech patterns of communication is essential in the Arabic culture, I asked older mothers to talk first, as a sign of cultural respect. Being a member of Arabic cultural and community helped me gain the participants' trust (Strickland, 1999; & Halcomb et al., 2007). I could see this when participants said "as you know". Cultural mistrust according to Halcomb et al. (2007) might have negative effect on participants' willingness to reveal information, which might be a barrier in terms of the awareness of maintaining confidentiality. Thus, cultural similarity assisted in reducing communication barriers between the participants and me because I was aware of and provided culturally sensitive treatment to participants (Halcomb et al., 2007).

During focus groups sessions, I asked participants open-ended questions, monitored their responses, encouraged their interaction, used inquiring comments, asked for details when needed, observed nonverbal behaviors, kept directing the discussion toward the topic of interest, and explored participants' answers to generate themes, (Kress & Shoffner, 2007; Buttram, 1990; & Onwuegbuzie et al., 2009). I also treated participants as experts, and showed interest in their thoughts and feelings (Kress & Shoffner, 2007).

Participants

For this study, I utilized the nomination sampling method (snowball, chain, or network sampling) (Merriam, 2009) to recruit the participants for the focus groups such as an Arabic mother of school children nominated other Arabic mother(s) she thought would be willing to participate, or a teacher who taught in an Arabic school nominated Arabic mother(s) she thought would be willing to good participate.

Merriam (2009) claims, this type of sampling "is perhaps the most common form of purposeful sampling… 'by asking a number of people who else to talk with, the snowball gets bigger and bigger as you accumulate new information-rich cases'" (p. 79). Where purposeful sampling "include people who know the most about the topic" (Merriam, 2009, p. 94). The sample of this study included eighteen Arabic mothers of school children. Each mother joined one of four focus groups. Twelve of these mothers lived in a Rocky Mountain State and six lived in two other U.S. states.

All Arabic mothers of school children who live in the United States constituted the population of this study. There are about 3.5 million Arabs in the United States (AMEMSA Fact Sheet, 2011), about 25% of them are younger than 18 years old

(Brittingham & De La Cruz, 2005). This is a diverse group in country of origin, length of citizenship, religion, languages spoken, race, and ethnicity. Therefore, part of the data collection included collecting background information (Appendix B) where I described who these women are in a manner similar to my own researcher stance.

Data Collection Procedures

After receiving IRB approval, I contacted the Arabic mothers I knew, who have school children and the teachers I knew, who teach at Arabic schools by phone and introduced the purpose of the research study, invited them to participate, and asked for recommendations of other mothers of school children who might be a good candidate for participation. One day before each focus group meeting, I called each participant and reminded her of the time and location of the focus group and confirmed her intent to attend. On the day of each focus group, I arrived early to the focus group location and prepared the place for the focus group interviews. I greeted each participant as she arrived and encouraged her to help herself to snacks and refreshments, or Middle-Eastern food that I prepared.

After the arrival of all participants, I started the session by introducing myself if the participants did not know me, talked about the study and its importance, explained my role and participant roles during the meeting, and informed them about audio taping the interviews. I then handed out the consent form to read and sign it, and the demographic questionnaire to complete, while sent these forms to the out of state mothers who joined our focus groups via Skype, by e-mail. I asked participants to introduce themselves, and then asked them an engagement question such as “how important is your child’s

educational success to you?" which made participants comfortable with the discussion topic. Then, I asked participants the focus group questions (Appendix C).

I provided the following example of one focus group I conducted at my house in order to give readers a contextual feel of the study. Around 10:00 am, four Arabic mothers came to my house a few minutes apart from each other. Two of the mothers wore *hijabs* and the other two did not cover. The first was in red shirt, black skirt, and black *hijab*. The second was in yellow shirt, dark green pants, and white *hijab.* The third was visibly pregnant and wore a long pink dress. While the fourth was casually dresses in a red t-shirt and black pants. Since I was alone at the house, the two mothers wearing *hijabs* put their *hijabs* off. This is common in groups of all women. I welcomed the mothers into my house. There was no need to introduce myself since the mothers knew me. I invited the mothers to the kitchen table to eat a Middle-Eastern breakfast I prepared myself. The breakfast included Humus, tabbouleh (type of salad), labneh (a dairy product), falafel, white cheese, pita bread, and black tea.

While we were eating, we exchanged Arabic foods' recipes and talked about children and schools in general. After breakfast, I cleaned the table, prepared it for the focus group meeting, and put a Middle-Eastern desert, *konafa*, and more black tea on the table, and invited the mothers to the table. I then handed out the consent form to the mothers to read and sign, and the demographic questionnaire to complete. I thanked the mothers for their willingness to participate, gave them an idea about the research and its goals, explained the rules and procedure of the focus group interviews, informed them about the audio taping, and encouraged them to express their opinions in details. I asked the mothers engagement questions as a warm up, which were "how important is your

child's educational success to you?", and "what do you do to insure that?" I listened carefully to each one of them and summarized their answers. Then, I started asking the focus group interview questions, listened to their answers, kept eyes contact, and asked the shy ones about their opinions.

At the end of the interviews, I asked if any mother wanted to add any information or comments. Next, I thanked the mothers for their participation and moved with them to the family room to drink Arabic coffee (also called Turkish coffee) where we joked about reading the fortune of each other by looking at the residue of the coffee on the bottom of the small coffee cups when we finished drinking. At the end of their visit, I thanked the mothers for coming and informed them I would contact them during the next few days to make sure that I had their right opinions.

The focus group interview questions were mainly on the ways Arabic mothers who live in the United States engage in their children's mathematics learning and how their culture influences their engagement, their attitudes toward mathematics in general, their attitudes toward the current methods of teaching mathematics in relation to the mathematics they learned in the Arabic World, their attitudes about their engagement in their children's mathematics education, challenges they face when they engaging in their children's mathematical learning, benefits their children might receive, and their suggestions for school personnel and teachers on how to enhance Arabic mothers' involvement and build school-parent collaboration.

I created most of the focus group interview questions using my own experience as a mathematics instructor and my own experience as an Arabic mother who lives in the United States and utilized these questions in a pilot study that I conducted two years ago

about parents' involvement in their children's math education. Only questions 4, 5, 9, 11, 12, and 17 are adapted from Van der Zalm's (2010) study about enhancing the involvement of elementary school children's parents in their math education.

During the focus group interviews, I encouraged participants' interaction, used probing comments, asked for details when needed, observed nonverbal behaviors, kept directing the discussion toward the topic of interest, explored participants' answers to generate themes, asked open-ended questions, and monitored their responses (Kress & Shoffner, 2007; Buttram, 1990; &Onwuegbuzie et al., 2009).

I was flexible, tried to adapt to different situations as they occurred, treated participants as experts, encouraged an open exchange of information and sharing opinions and ideas, communicated my own feelings, showed interest in participants' thoughts and feelings, and was aware of my own biases (Kress, & Shoffner, 2007).

Data Analysis Procedures

I assigned a fake Arabic name to each mother to protect her identity. I made sure that the fake names were completely different from the whole set of these mothers' names. No mother asked to use her real name and it is doubtful if they would due to cultural reasons. In my experience for many Arabic women their name is considered private and for family. Even if they do not personally feel this way members of their family may who they will defer to. For example, it is common from my background not to put the bride's name on the wedding invitation as a way of protecting her modesty. I transcribed each focus group interview at my home office as soon as it was possible. I listened to these interviews and wrote down my impressions as I went through the data in order to benefit from these impressions later in the study. The different Arabic accents of

the participants helped me recognize and track each mother's responses. I later compared these initial impressions of focus group interviews with my later findings. This process along with the use of my knowledge of the topic increases the credibility of the findings. I also reviewed my research journal notes that I wrote during the focus group interviews. A rich description of Arabic mothers' perspectives might result in transferability of the findings that could be applicable to other immigrant mothers from other countries.

Later, I organized the data looking across all participants' responses in order to find consistencies, patterns, themes, and connections within and between the categories. Next, I compiled all the data from each question. I saved all data electronically and as a hard copy.

Further, I identified topics and words and created categories or codes for focus group participants' responses. This involved reading and re-reading what I wrote from the interviews' responses to identify coherent categories. I continued identifying categories until saturation occurred (Creswell, 2009) meaning no new categories were found. These categories helped me identify some themes within the focus group interviews and this system helped me to describe this whole focus group interviews experience. Finally, I interpreted the data by using the themes and connections to explain the findings. I also developed a list of the key points and important findings that resulted from categorizing the data. Then, I presented the results, and wrote the final report regarding the study.

I applied the following qualitative data analysis techniques that according to Onwuegbuzie et al. (2009) are suitable for analyzing focus group data.

Constant Comparison Analysis: I chunked the focus group data into small units, attached a code to each of the units, grouped codes into categories, and developed one or more themes that stated the content of each of the groups.

Micro-Interlocutor Analysis: I provided precise statements such as quotations that were made by focus group participants (Onwuegbuzie et al., 2009).

Trustworthiness

Although qualitative studies are not generalizable in a statistical way, their depth of explorations and descriptions provides the reader with details that seize the uniqueness of the situation. Qualitative research has many positive features that make it important in research and the knowledge that it generates is always significant, in particular, if the researcher identifies possible threats to the trustworthiness of the research and controls them. To add to the credibility of the findings, I enhanced the trustworthiness of the study since trustworthiness is an important aspect of research that every researcher tries to achieve.

Generalizability is the degree to which the findings can be generalized from the study sample to the entire population (Myers, 2000). Generalizability of qualitative research is found when research findings reflect the meanings to the extent possible as described by the participants (Lietz, Langer, & Furman, 2006). In fact, Stake (1995) defines a special kind of qualitative research generalizations, naturalistic generalizations. Naturalistic generalization are "conclusions arrived at through personal engagement in life's affairs or by vicarious experience so well constructed that the person feels as if it happened to themselves" (Stake, 1995, p. 85).

Many authors such as Onwuegbuzie and Leech's (2007) have suggested methods to enhance trustworthiness such as the following ones that I used to add to the trustworthiness of this research:

Triangulation: "Triangulation is a means of checking the integrity of the inferences one draws" (Schwandt, 2007, p. 297). According to Onwuegbuzie and Leech (2007), triangulation is the use of various methods, sources, investigators, and theories to attain confirming evidence. It allows researchers to be more certain of their findings, enhances the development of creative ways of collecting data, untangle contradictions, and leads to thicker and richer data and blend of theories. Types of triangulation include data triangulation, investigator triangulation, theory triangulation, and methodological triangulation (Onwuegbuzie & Leech, 2007). I conducted data triangulation by gathering data at different times, different social situations, and from different Arabic mothers (Bryman, 2003).

Leaving an Audit Trail: maintaining extensive documentation, records, and data that stem from the study such as raw data: audiotapes and written notes; data reduction and analysis products: field notes, summaries, and unitized information; data reconstruction and synthesis products: structure of categories, findings and interpretations, and final reports; process notes: methodological, trustworthiness, and audit trail notes; materials related to intentions and dispositions: personal notes, reflexive journals, and expectations; and instrument development information: pilot forms, preliminary schedules, and observation formats (Onwuegbuzie & Leech, 2007). I maintained raw data, data reduction and analysis products, data reconstruction and

synthesis products, process notes, materials related to intentions and dispositions, and focus group development information.

Keeping a Researcher Journal: "writing short notes, or memos, to one's self during the entire research project" (Watt, 2007, p. 83). Writing notes and memos allows researchers to find out things in their heads that they are not aware of which might stimulates more thoughts, makes the researcher more conscious of her/his thoughts, allows researchers to better validate what they know and how they knew it, and helps them to examine their biases, thoughts, and feelings so they can realize how these may be affecting the research (Watt, 2007). Watt adds making this information accessible to readers helps them to better evaluate the research findings. I maintained a researcher journal during the entire research project to write my own notes, thoughts, and memos in order to reflect on my own education, teaching experience, and my adjustment to the Western society and cultural modification experiences. Doing the latter made me aware of these potential differences between the participants and me and the impact they may have on the research.

Member Checking: Schwandt (2007) defines member-checking as "soliciting feedback from respondents on the inquirer's findings" (p. 187). According to Onwuegbuzie and Leech (2007), member checking means, getting feedback about participants' data, categories, understanding, and conclusions. I received feedback from each participant via phone calls about her quotes and checked whether I understood what exactly she meant.

Checking for Researcher's Effects or Bias: making research goals clear. I made the research goals clear to the participants and began exploring my potential bias through the researcher stance I wrote.

Making Comparisons: comparing findings with the existing literature and with the researcher's experience and knowledge. I compared the findings of the study with the literature I found and wrote about this in chapter 5, including my own knowledge and experience.

Checking the Meaning of Outliers: a careful examination of the outliers of observations, cases, settings, events, or treatments in order to reinforce conclusions. I examined the collected data cautiously for any unpredicted outcome. In chapter 4, I sought to report what mothers' said even if it was only one or two of them.

Peer Checking: a form of reliability that provides an external assessment of the research process. I consulted with my dissertation chairs as experts during the research process.

Rich and Thick Description: providing detailed and complete data in order to maximize the ability to find meaning, because rich and thick description informs the reader about transferability. I provided enormous details about participants' perspectives and a rich description of the cultural and emotional context, presented participants' own quotes and detailed findings so the reader could identify if the findings transfer to his or her situation. Moreover, I am a member of the Arabic culture and Arabic community and this gave participants a cultural trust, and had a positive effect on participants' willingness to reveal information, which in Arabic culture might be a barrier in terms of the awareness of maintaining confidentiality (Halcomb et al., 2007). Myers (2000)

claims, a major strength of the qualitative approach is the depth of explorations and descriptions that result in adequate details for the reader to seize the distinctive of the situation.

Assessing Rival Explanations: redirect unclear explanations, and collect more data, until one explanation comes out as the most compelling. I repeated questions, clarified, and probed in order to give participants ample opportunity to clearly explain their thoughts and perspectives.

In addition to the above methods, Harrison, MacGibbon, and Morton (2001) add the *Reciprocity* aspect to all the above strategies. They define *Reciprocity* as the give and take of social interactions. They claim that interviews might become conversations which might provide richer data. I created an environment that promotes social interaction in order to enrich data collection. Moreover, the use of my own experiences as an Arabic mother who lives in the United States and my knowledge of mathematics and mathematics education might add to the credibility of the findings.

Researcher Stance

Wafa Yahya was my birth name. In Arabic, the name "Wafa" means loyalty and fidelity, two beautiful meanings I adore. I owe it to my father who chose this meaningful name for me. I heard that there was a debate between my father and my grandfather about what to call me when I was born. My grandfather wanted to call me Basma which is a beautiful name too. Basma means a smile in Arabic. So I always try to wear a smile in honor of my grandfather. The occasion of my birth was not a joyful one for my grandmother, however, since I am a female.

The birth of a girl was and still is a cheerless occasion for traditional Arabic families since Arabs have a culture of shame where girls are concerned since girls are thought to potentially bring shame to their families. In addition, girls are not a financial source for their parents. I heard it told when my grandmother heard me crying seconds after my birth, instead of feeling happy for the birth of a healthy child she started blaming me for crying while being a female! I should have felt ashamed of my gender and not cry! To get this type of attitude about a female baby from a female matriarch establishes a powerful message of misogynistic oppression.

I was born to a Muslim family in Palestine at a refugee camp because Israel had invaded our small village, kicked people of the village out of their homes and lands and killed people who resisted, completely destroyed the village, and used the land for mining phosphate. I heard my village was bountiful and beautiful. It was called *Annaba*, which in Arabic is a land that produces grapes and red berries. Besides grapes and red berries, *Annaba* was famous for citrus and other fruit produce. Unfortunately, I have never seen *Annaba* and perhaps never will.

As any refugee family, my family was a poor one with eight children. When it came to education, the male children get better chances for education than females, since Arabic societies are male dominant, and people consider males as more important than females. I remember my mother saying, "I wish you were a boy" whenever I received a good grade in school. As if girls did not deserve good grades.

After graduating from high school, the only education chance I got was attending a community college that prepared girls to be elementary school teachers. Education in the community college was free, since it was sponsored by the United Nations Relief and

Works Agency for Palestine Refugees (UNRWA). My major was Mathematics. After graduating from the UNRWA sponsored community college, I taught mathematics at elementary schools for a few years. During that time, I got married, had two children, and immigrated with my family to Toronto, Canada, where I had a chance to continue my education.

Dealing with a new language is difficult and embarrassing. I attended York University in Toronto with English as a second language. The first year of study was difficult. I remember being in some embarrassing situations due to my poor English. The first time I heard the phrase "here you go" from an office manager when she handed me a form, I felt badly because I thought she was asking me to leave her office. One other time, I had to read the name "Gail" which was new to me. I was confused on how to read the letter "G". It is like in "George" or like in "great"? I thought I'll give it a try. I read the name "Gail" as "jail". It was very embarrassing when I saw a strange look on this person's face. Despite all difficulties I faced, I later received a Bachelors' degree in Applied Mathematics.

Cultural differences also create difficulties. A job offer for my husband attracted us to move from Toronto to California where I attended San Jose State University for a Master's of science in pure mathematics. While working on the degree, I worked as a teaching assistant. It was the first time I entered a classroom as a teacher, where the language is English and students had a Western culture. Of course calling students names was a struggle especially names having the letter "p" since we do not have it in the Arabic language. Moreover, some students' behaviors when dealing with their teachers were strange to me, since students show deep respect for their teachers in the Arabic

culture. Despite all difficulties I faced in teaching, I later received a Master's of science in pure mathematics.

Another job offer brought us to Colorado. With the Master's degree I had, I taught for four years at different colleges and universities before deciding to work on a doctorate degree in mathematics education. While working on the degree, I continued teaching mathematics, as a teaching assistant for a while, then as a lecturer in a different university until graduating.

One important aspect of my life is being a mother of two children. As any other parent, I constantly care about my children's educational achievement, though my involvement in my children education was not easy because of language difficulties and cultural differences. Those two factors have affected my involvement at my children's schools, particularly in other subjects different from mathematics.

Both of my children went to public schools in Canada and then in the United States. As their mother, I cared about their education and encouraged their success, and was always involved in their education. As any minority parent, I faced many challenges when I was involved in my children's education. For many years, I was less likely to be involved in my children's school activities or volunteering in their classrooms, though, I was involved in their education at home because of my cultural respect for teachers' and schools' authority and my belief at that time of separation of my responsibilities as a mother and teachers' and schools' responsibilities.

In addition to cultural reasons, lack of familiarity with Canadian and United States' school systems and language difficulties were other reasons for my lack of educational involvement out of home. I had communication difficulties with teachers

and school personnel that were clear when I attended parent-teacher conferences. Prejudgment and stereotypes about Arabs were other reasons for my lack of educational involvement. For example, I have encountered many people in Canada and United States who still believe that Arabs are illiterate people who still live in tents and ride camels. Thus, I felt that teachers and school personnel did not expect much from me or my children. Once, I got the courage to ask for a volunteering opportunity in my son's classroom. The duties I was assigned to do by my son's teacher were cutting papers and baking cookies.

Moreover, one important reason for my lack of educational involvement in my children's education out of home was the challenges that Arabic families face after 9/11/2001 occurrence. My children faced many difficulties and racial ostracism at school after that day. They were called "terrorists" many times by their classmates while teachers and school personnel never cared to stop this type of abuse.

After 9/11, a teacher of my son kept asking him personal and political questions, and the school bus driver once turned her face toward my son and said with anger "see what your people have done", after listening to the bus radio. The latter had discouraged me from going to my children's school or talking to their teachers for any reason, and discouraged my children to attend school. These difficulties are what gave me the idea of this research.

At home, I always supervised my children's study, helped with their homework, and provided additional academic practice. With my mathematics background, I felt comfortable whenever my children asked me for help with their mathematics, and was never a challenge to adjust to the teacher's method of teaching.

Therefore, as the primary researcher of this study, I will apply my background and experiences through the research process. I am an Arabic mother who lives in the United States. Thus, I have an understanding of the participants' cultural issues and circumstances. I also have been a mathematics instructor for many years. So I am familiar with the old and the current methods in teaching mathematics.

Summary

In this chapter I explained the focus group research study that was framed by Critical Race Feminism. After explaining the theoretical framework and the research design of the proposed study, I described the sampling method I used which is a purposeful sampling method. Next, I illustrated the data collection procedure and instrument I used. Then, I described the data analysis procedure I used and explained several ways I used to enhance the trustworthiness of the study. After that, I elucidated my stance as a researcher and then have concluded the chapter by highlighting the potential ethical issues of the study.

CHAPTER IV

FINDINGS

In this chapter, I present the results of the current study. First, I describe the participants of the study in terms of their demographics. Second, I present the main themes I found in the study that are answers to the research questions in combination with participants' representative quotes. Third, I present a chapter summary.

Description of Participants

The following table describes the demographics of the eighteen Arabic mothers who participated in this study.

Table 1

Demographics Information

Category	Number
Age	
30-39	3
40 or above	15
Religion	
Christian	1
Muslim	17
Wore the *hijab* (head covering)	12
Wore no Religion's Garb	6
Country of Origin	
Algeria	1
Egypt	3
Jordan	2
Lebanon	2
Libya	2
Morocco	1
Palestine	5
Sudan	1
Syria	1
Citizenship Status	
Permanent Resident	1
U.S. Citizen	17
Time in the U.S	
Between 5 and 10 years	3
Between 11 and 15 years	3
More than 15 years	12
Reasons for Moving to the U.S.	
Economic reasons	5
Educational reasons	4
Political reasons	1
Other reasons	8
First Language	
Arabic	17
English	1
Arabic Ability in Speaking and Reading (mother's perspective)	
Excellent	17
Acceptable	1
English Ability in Speaking and Reading (mother's perspective)	
Excellent	4
Very Good	6
Good	5
Acceptable	3

Table 1, *continued*

Academic Degree	
Graduate degree	3
Undergraduate degree	9
High school diploma	6
Education Before Moving to the U.S.	
Graduate level	3
Undergraduate level	8
High school level	5
Other	2
Mathematics Ability (mother's perspective)	
Very Good	6
Good	7
Acceptable	5
Current Work Status	
Full-time	2
Part-time	8
Does not work	8
Currently Going to School Status	
Part-time	3
Does not go to school	15
Children Were Born	
Before Moving to the U.S.	1
After Moving to the U.S.	15
Some Before, Some After	2
Relationship status	
Married	18
Husband's Ethnicity	
Arabic	18
Number of School Age Children	
5	1
4	2
3	4
2	5
1	6
A total of 41 school age children	
Spoke Arabic with Children at Home	
Always	5
Mostly	8
Some What	5

The demographics show at a glance that while the study focused on Arabic mothers of school children, the women in this category are also quiet diverse, though all are middle class women. Other demographics note included mothers who gave examples about their reasons for moving to the U.S. such as war, job opportunities, marriage, health issues, looking for better life, or combinations of two or more reasons. When writing about their education majors, several mothers mentioned majors such as biology, Arabic Literature, English literature, French literature, Early Childhood Education, Veterinary Medicine, Child Development, Psychology, Architecture, Sociology, and International Development. The type of work, outside of home, some of the mothers are currently doing include teaching or tutoring Arabic, office management, self-employment, volunteering, and office clerical. Each of these mothers has at least one child and at most five children, some are of school age, others are younger, and others are older. It was within the context of conversations with these women that I examined the following research questions.

Q1 What is the nature of Arabic mothers' involvement in their children's mathematics education?

- 1a What are the mothers' attitudes towards mathematics?
- 1b What are the mothers' attitudes about their children's current mathematics education?
- 1c What are the mothers' attitudes about their engagement in their children's mathematics education?
- 1d What are the benefits the children receive when their mothers engage in their mathematics education?
- 1e How do Arabic mothers engage in their children's mathematics education?

1f What challenges do these mothers face when they engage in their children's mathematics education?

1g What challenges do these mothers and their children face due to their culture?

1h In what ways does the mothers' culture influence how they are involved in their children's mathematics education?

1i What are the mothers' attitudes about informing teachers and school personnel about their culture?

1j What are the mothers' suggestions for teachers and school personnel on how to enhance Arabic mothers' involvement and build school-parent collaboration?

The data analyses have resulted in the following categories and sub-categories about the nature of Arabic mothers' involvement in their children's mathematics education. These categories are Arabic mothers' attitudes towards mathematics, Arabic mothers' attitudes about their educational involvement, Arabic mothers' educational involvement's benefits, types of Arabic mothers' involvement, Arabic mothers' attitudes about some educational involvement's situations and aspects, Arabic mothers' involvement challenges, Arabic mothers' culture related challenges, cultural influences on Arabic mothers' educational involvement, Arabic mothers attitudes towards informing their children's teachers and school personnel about their culture, and Arabic mothers' suggestions for enhancing their educational involvement.

Mothers' Attitudes towards Mathematics

Mother's Math Experience

When I asked the mothers who participated in this study about their own experience learning mathematics, I received a variety of answers. Some found math hard, others found it easy and interesting, and others were neutral about their math

experiences. For example, Noha asserted, "learning math was always challenging for me. I lean toward literature more than science," Samiha claimed "I have difficulties learning math. Difficulties in solving problems," and Suaad stated "math was and is very hard to me until now. I learn math with my kids. When I do something wrong, my daughter tells me 'you have to do this and that like what the teacher do'."

Moreover Najwa declared, "I feel that high school math was very difficult, but I feel confident with everything else," Abir said "I learned math in Jordan. In middle school, I learned more because I liked the teacher more. Overall, math is a weak subject for me," and Ameera asserted, "I had good times like learning and hard times because of the teachers. But in general, I liked math and had good experience." Furthermore, Kareema affirmed, "I like math but I don't like geometry. I don't have good imagination. But I like algebra," and Eman stated,

> I did good in math. I don't love it but I did OK. I can do my children's high school math. I think about it for a while. So if they come up to me, I help them. I tell them this is your homework, you have to do it. I help them to figure out what is wrong.

On the other hand, other mothers liked mathematics and felt it is easy. For instance, Sameera stated, "math was my favorite subject in school," Soha asserted "math was the best thing. I liked it the most, but not geometry. I used to solve, write, and finish fast," Sanaa said "I liked math a lot and did so well in it. It was fun to learn math. It was like a game for me," Elham said, "I did not have much difficulties learning math," and Randa stated, "I love math, and I like to learn it but with my kids my experience is very bad because my kids not like me, none of them like math and it was difficult for them to understand it."

Math Experience Effect

Most of the mothers felt that their own experiences learning mathematics had affected their involvement in their children's mathematics education positively, or negatively which in return affects the children. For instance, Kareema explained that effect as, "definitely when you like math, it has an effect on your kids, because they become smarter, you help them, they understand more, and it will be very beneficial for them."

For some of these mothers, their prior negative math experience appears to limit their involvement in their children's math education. For example, Samiha claimed,

> It [her math experience] affected me and my children negatively…. My father died early and my mother was not educated enough to help us especially that she had to work out of the house to feed us…. I only used to help my kids when they were in early grades but not now.

Abir stated, "It affected me because I can't help my children in advanced math or like I would want to." Noha asserted, "I used to help the girls when they were in elementary school and early middle school but after that my husband took over the math help since he is the scientist in the house," and Randa argued, "it affected my children because here in this country they teach math different than our country and every time I try to help them we end up with a big fight." In fact, Ameera asserted

> It affected me a lot because if you are good in math, you will be good in other stuff because spending time thinking, solving problems, getting your imagination to do the geometry or algebra or whatever math means you can do it with smart thinking, being aware that math it lead you to other stuff in science and different kind of science such as chemistry and physics because math is not easy, if you do good in math in general, you can go to other stuff. For me, my son has to prove his smartness by learning math, being advanced in math. For him, I pushed him at the beginning because he was little, he doesn't know where to go. You can discover that, not kind of pushy but you need to know what your son is good in.

Furthermore, Hanan argued,

> I was very good in math all my study years even at university but I never had an interest in math, so I went away from math in my studies. I only used some statistics in my studies. I used to help my daughters in math until the middle school and at the beginning of high school, I had to study math such as algebra to be able to help my daughter because I forgot it. So my husband helps my older daughter and I help the younger one, even some of the middle school math, I forgot it. I am not neglecting my daughter but I don't have the patience to review math. We always encourage them.

For a few of these women, the negative effect is also financial. For instance, Elham asserted, when she could not help her children with their math in high school, she hired a mathematics tutor.

In contrast, some of these mothers felt their positive experiences learning mathematics increased their educational involvement. For example, Sanaa asserted, her son always talks to her about what he is studying in math in school because he knows that she likes math, and that he gets excited about the subject, Sameera said, she could help her children with math when they need help because she was good in math, and Soha asserted, "it affected me because I like it, my daughters like it, they are advanced in math. Because I like math, I sit with them while they study." Moreover, Sanaa added,

> It affected my children positively. When my kids ask me what was my favorite subject, I say math especially algebra. So they were always excited about math. We played a lot of math games…. The math games we used to play was flash cards where we show a card and start looking at a matching card in terms of the answer of some math operations, challenging games in the car especially multiplications. They like math… advanced in math. It is fun for them.

While a few of these mothers did not feel that their own experience learning mathematics had any effect on their involvement in their children's mathematics education or on their children. For example, Suaad emphasized, "the negative experience I had learning math did not affect me. I like to learn math more. When they were in

middle school, they used to come to me. I used to sit with them for hours and learn with them."

Math Utilities

All mothers agreed that mathematics is useful in many aspects of life such as jobs, daily life facets, logical thinking, and education. Najwa asserted, "I feel that mathematics is useful to people, depending on their jobs. My reason is because some jobs require some mathematics knowledge," Randa said, "I feel and know that math is useful because we use math every day and every moment of our life, we use it for all kind of job or in even a house hold everything," and Kareema agreed,

> Definitely math is useful because in every step of your life. You have to use math for it even if you go to grocery shopping, the price, if you have a discount you have to calculate how much the discount is, so you have to use math you always have to think, and this is a method to think.

Moreover, Suaad asserted "math is useful especially these days when they about to go to college for everything they gonna learn in college. Math is useful everywhere in life." Sanaa said, "math is very important. My daughter helps me in the kitchen and measures things for me in ounces. We used to do measurements in rooms of the house," and Sameera stated, "math help to understand science." Similarly, Hanan shared,

> It is important because it is part of science and everything in this world depends on science. My little daughter has interest in design, so I tell her, you need the science, you need to learn math because things that doesn't have the science in it will not be right…. My husband tells my daughter, wherever you go, you will not do good if you don't know math.

Likewise, Elham claimed, "math is the basis of all sciences. Everything in nature has a mathematically derived structure," and Noha asserted "numbers are one of the main factors of our lives, we use numbers all day."

In addition, Ameera explained,

> Math is useful because say you are applying for a job, if you don't know how to calculate what you gonna do? From hourly thing, what you deserve to be paid, for example, and you have to find how much you are to be paid for the whole year, what you gonna use? You need math. The basics are you depend on accurate results and if you don't have accurate results means you are not calculating right and might be not fair with what you are doing to give the right answer. If you do right math, like math and enjoy doing math, you get accurate results which will be satisfying to others.

In fact, Eman asserted

> Math is important because it teaches you the steps to solve problems. The step by step thinking. The 1, 2, 3. This is how to approach the problem. Understanding the problem, the solution, what do you think of this, the step by step solution, the process of thinking.

Mothers' Attitudes Towards Math Current Teaching Methods

Some of the mothers spoke highly of the new methods of teaching mathematics stating the new methods are easier, more creative and helpful, less scary, and require less memorizing than the old methods, and that they liked the group work and discovery learning. These mothers had a hard time learning old methods' mathematics. They felt the new teaching methods are less stressful and more fun than the old one. While other mothers did not like these new methods, and others liked some aspects about the new methods and did not like other aspects. For example, Najwa asserted, "I feel like the new methods are easier for the students to understand," Sameera agreed, "some new methods are creative and helpful," and Kareema explained,

> I love the new methods because it gives them more opportunity what to do and how to do, and I like the idea of group work for just work but not for the grade, each one should have his own grade, they can help each other more than the teacher can help the kid.

Similarly, Rania stated, "the 10^{th} grade math that my son has is much easier than the old methods and it is clear," Rajaa asserted, "I like the new methods for this new generation.

I feel that old methods were hard. Now I see with my kids very simple methods, no difficulties that was the reason I did not like math." Also, Abir affirmed, "they are effective and I approve of them because there are many resources students have like tutoring." Moreover, Eman asserted,

> The old math was facts, facts, facts and a lot of homework. I like the new methods. I think it is important to understand how to approach a solution. To me it is figuring out how to solve problems. But I hate the fact that they don't have books. All books are online. So they don't have something in hand to look through. My daughter is in STEM [science, technology, engineering, mathematics]. Most of their work is in groups. She is weak in math but being in a group helps her. She is not a slacker type. The slacker kids don't benefit but other kids they benefit because everything comes easy from group setting. If you are in a higher level class, there are harder things. You have to think it step by step process, sometimes it is pages, so in this case, group setting might not help. I learned math the old fashion way but in college I learned the concept, the new way, group work which helped me in other classes even in writing papers and in organizing my thoughts. Because memorization of facts, you forget those facts as soon as your course is done but concepts they stay with you.

As well, the following was Hanan's opinion about new methods of teaching mathematics,

> The new methods are good. In group learning, they evaluate the group and also each individual…. I like the group work in math where a kid helps another kid smoothly. Kid with kid is easier. If a kid doesn't do any work within the group, the teacher should notice that and sometimes she mix the groups or let a kid sit only with one other kid in order to discover the problem and help the kid. Discovery learning is a good way of learning math because it allows room for thinking more than putting the kid in a box that he or she can't move in…. Here they increase the amount of math work gradually and they spend a long time in each unit, so I went and asked the teacher 'why you spend a lot of time' the teacher said 'we do it this way here'. So I thought this will not work because they will not cover enough material, but at the end, they did cover a lot of material and I knew my daughters' math by heart.

On the other hand, a few mothers are not fans of new mathematics teaching methods for many reasons such as these methods were not the ones these mothers are familiar with, less fair than the old methods, or children learn less using new methods. These mothers had good experiences learning old methods' mathematics. For example, Randa claimed, "I don't like the new way of teaching math these days because this way the kids never

learn anything, they don't understand any mathematics methods." Laila asserted, "I like the methods that I learned but the new methods I am not used to it yet," and Soha stated, "I like the old method since I learned this way but my older daughter liked the new way so I try to learn her way so I can help her."

Though some mothers like some aspects of the new methods and do not like others. For instance, Ameera argued for differentiated grades,

> Grading is by the group which is not really fair because when your kid gets a 100 and the other kid gets a C, his grade will go to B or B-. I like the old school methods because it is the basics that prepares for college. I like group work when it motivates the kid and the kid gets help from the group if he finds some one smarter than him and learn from him. I want to challenge him to learn by working with the group if they use the right way with the teacher. If they agree on one way to solve the problem because there are many ways but if the teacher does agree on the way.

Moreover, Sanaa defended traditional methods,

> I feel that our old methods are easier in multiplications and division. I taught my kids those ways, now my son is in 8th grade and still uses it and he teaches his friends these methods. The least common denominator also is easier using the old methods. We can combine the easy and new methods to improve ourselves. But the old methods, there was fear because we had to memorize the time tables. Here they train the kids since kinder garden counting by 2's, 5's etc. like a song, the 9 times table, they know it by using their figures like a game, so they never forget it. The 9 times table was the hardest for me. Here they learn math the fun way, there is less stress.

In fact, Suaad said, in contrast, preferred new approaches,

> I like the new methods because using old methods makes math very hard. But I don't like the dependence on using calculators. New methods make math easier. I think 12th grade here is like 9 grade in the Middle-East. I don't like group work. There could be a smart child who does the work for all the group. My daughter had group work twice. She said, 'mama, I don't like group work because there is one guy who does everything and people who don't understand they only sit and look at him. They don't try to use their brains'. The way they use the calculators now, they never allowed us to use the calculators. They get dependent on those so they don't think.

Learning New Teaching Methods

All of the mothers supported the idea of learning new methods of teaching mathematics if they get the chance especially when they believe it will help them support their children, though, two of the mothers prefer learning it online. For example, Hanan asserted, "I would appreciate it," Najwa said, "I am always open to new ideas, so I like having a chance to learn new approaches," and Sanaa asserted, "I would not mind to go and learn new approaches in teaching math. It would be a good opportunity. Learning is always good."

In addition, Elham stated, "as long as it benefits my child's learning experience, I'm always willing to learn about new methods of teaching." Similarly, Abir asserted, "If it helps my kids, I have no problem doing so," Noha said, "I don't mind learning a new approach… kids, especially in early age they should learn their teacher's way or I should say it would be easier for the kid," and Suaad stated, "I like online because the kids would not be comfortable, but I don't mind it."

Old Math Versus New Math

The mothers spoke about the differences and similarities they perceived between the way they learned mathematics and the way their children learn mathematics. The mothers mentioned differences much more than similarities. Some of the common remarks are mathematics in the Middle-East was scary and had a lot of memorization and students did not get a lot of help, but here it is easy, enjoyable, has less memorization, and students get a lot of help. In the following, Hanan explained her opinion about the differences,

> The old methods back home are scary. If you don't use a certain procedure, you feel that you are bad or stupid. They convinced us that math is the hardest

> subject. If you don't know it, you are stupid. Here the learning by groups, and they teach them step by step, so the student could get all steps except one he or she needs help in. Here is good because they encourage which increases self-confidence. I feel kids they don't feel scared to go to math. I remember I did bad in one math exam, then the teacher came to me blaming me which affected me negatively and made me more scared of my performance in math exams. Here they take care of students' feelings and they encourage them, but there you don't know means you are stupid. Here they understand the differences between kids' capabilities and teach them one to one if they need that, which is very good, but back home, the teachers teach all the class at once. They don't care if each student understands or not…. I found that the amount of math they learn by the end of high school is even more than what students learn back home. My daughter takes now in high school some math material that I took at the university. Back home, we don't have math projects until the university where we struggle to learn how to do those. So one of the differences is that there it is between you and the teacher. You understand or you don't. You are stupid or not. But here with group work it is not like that. It helps…. There was no private tutoring back home [like there is here] but there was something free called *Dars el Asser* where the kids go to school in the afternoon to get help.

Additionally, Samiha stated,

> [Here] they know how to deal with kids. I remember we used to be very scared to go to math class. My daughter gets a lot of help in her math from the group members. They even give them math projects here and they don't force them to do projects, so they give them the choice here to do projects.

Moreover, Kareema claimed,

> There are differences in the replacement of the numbers in multiplications and division. The equations also we used to put the x's in one side and the numbers in another but here they mix everything together. We used to do one step at a time and explain more. Here they do more than one thing at a time such as two equations at a time or the parenthesis and the powers at a time… same math but the division difference where they place the numbers. Math here seem a little easier and simpler and easier for kids to absorb it we use to learn a lot of numbers and memorization. We had no Internet facilities.

Furthermore, Sanaa said, "in geometry there was no difference and in statistics, but a lot of differences in algebra the new methods are different." Nevertheless, Najwa finds no similarities between the math she has learned and the one her children are learning. She explained, "there are no similarities between the way I learned math and my children.

My children had teachers who are willing to help my children while I had to learn the material on my own."

In addition, Sameera stated, "the way the kids are learning gives more time to understand and practice simple math facts," Elham asserted, "the difference is there is more technology available in the classroom and at home. Also, there is a difference in teaching styles. The way we are tested is similar, I think," and Noha argued,

> I think it is the differences in the way of educating the children in the States verses Egypt. The students learn by relating math to our lives and using hands on. I remember how easy it was for my girls learning multiplication facts and how difficult it was for me. I used to only memorize tables but my girls learned in a fun way.

In addition, Soha affirmed,

> They seem similar but there was harder and the amount of information is more. It depends on memorization especially the multiplication tables there is to memorize. I think here more thinking than there more understanding. Memorization leads to forget it after a while. These days we keep information because of the way they get it. My daughter in second grade goes to The Net and gets the information because she searches for it. In Egypt we had books to study and here no books. She does not bring books, only work sheets. I feel education here is more better and more enjoyable because it increases the brain capacities, does not depend on memorizations only.

Therefore, Sanaa asserted that in helping her children with their math, she tries to "avoid memorization because they will forget it after a while and avoid the fear that we have in our culture."

Also, Abir claimed, "In Jordan, the subjects are especially different. Back in Jordan, teachers focused on memorization rather than practice and applications. In the U.S., every week there are quizzes or tests. In Jordan there was one or two tests overall," Soha asserted, "it is different here than in my country because of the credit card system

here so no counting, so you feel that your mind is cancelled, but there we have money to count," and Randa clarified,

> There are much difference between the time we was at school and the way we used to learn math and now with the new way of teaching mathematics. Now some of the teachers don't know even how to teach and that from experience with my kids or with myself. I go to school myself now and taking math…. My daughter [is] in 11th grade this year and her math teacher let them use their smart phone instead of their books… I don't know how high school students can learn this way. I think from now on they never learn any mathematics problems.

Besides, Ameera asserted,

> Our math was concentrated, but we had solutions for every problem, but here it is complicated because it has to be the teacher's way of solving that he has in mind which makes you frustrated even if you have the right answer. Math is tricky but if you reach the answer the short way, medium, or long way it should be the same…. The teachers used to provide a lot of examples for everyone to understand. Here not all do that because the Internet took the place of the teacher. 'did you check the Internet?' teachers ask instead of asking herself 'do I need to help him because he came back to me?' This is not OK with me because for me, the Internet will not sit to solve the problem or how to deal with what you have on the question. They only get the money while the children have to do the work. If he has to do everything by himself and the parents, why he has to go to school? So the teacher exists or not has no difference.

Mothers' Attitudes about Their Involvement

All the mothers who participated in this study agreed on the importance of their involvement in their children's math education. For example, Najwa asserted, "I feel that parental educational involvement is very important because the parents can sometimes teach their children better than the teacher," Randa said, "I think and feel that parent[s] should be involved with their children education," Elham stated, "I think it is very important for parents to be involved," and Noha argued, "I strongly believe that parents should know what kids learn in school on a daily basis."

Moreover, Kareema believed, "it is essential because if you are educated you know how to help your children. Provide big knowledge, see what they gonna do, what

they might do, and help them if they have any problems," Ameera claimed, "It is important because if you don't get involved in his math who is going to help him? Then the teacher doesn't want to help and asks him to check the Internet. I didn't learn math at the university. Thank God my husband did," and Sanaa said, "I like to be involved, the child likes his mom to be involved, it is very important, to check their work and to help them, what did you learn today, what he likes what is not, to simplify things for him, how do you feel?"

Furthermore, Sameera asserted, "I like to be involved as much as I can in my kids' education," Abir stated, I'm very strongly involved in my children's education and homework. It's very important to me," and Eman said,

> I think parental involvement is very important. I was always involved with my kids math until high school where I get them a tutor because I struggle. But to me, only because I can't do it. They don't want me on top of them. I will give it to the tutor. Involvement at home is very important. I also do volunteering at school if they ask me to.

Also, Samiha argued,

> Kids when they go to middle school, they become kind of independent. Encouragement is important because the kid when he or she feels that the mother is interested, they get more interested. The Arabic mother who [is] interested, their kids they do good but the mother who is busy in other things, kids struggle. It improves his or her score and gets encourage and start depending on his or herself.

Additionally Soha asserted that for parents it is

> important [to] help if they can help but not to teach wrong. I graduated from university before I came to U S. but my English is not good. If I have to give them the right information, not the wrong ones, I prefer that my daughter goes to the net and get information than giving her wrong information. But so far I can help them both but I don't know if I can help them in the future. When I try to help them, and I don't know, sometimes I go to the net and get information. I learn with them. It is important for the mother to help if she can help and give right information but not to help by giving wrong information because kids in this age could repeat the wrong things. In Egypt, we don't have the letter P, so we don't know the difference between P and B. The English teacher there used to tell

> us 'the B that has upper stick and the B that has lower stick'. So my older daughter got this mistake from me. The teacher keeps correcting her but with my younger daughter I tried to avoid teaching her words with the letter P.

And Hanan stated,

> Very important. When the kid feels that you are interested in education, he or she feels that education is important, and you also need to know the child's progress. The good thing here is that they give you the chance always to go to school and talk to the teacher and tell them what you notice and they have here the teacher-parent conference. Very important. The teacher sits with you and gives information about the child about the first three months and talks about his or her difficulties and their plan to help and asks you if you like to help. You also have your own notes about your own child, so they give you a lot of details about your child's progress.

Mothers' Involvement's Benefits

It is notable all of the mothers agreed that children benefit when their mothers are involved in their mathematics education. For example, Reema stated, "for sure kids benefit from parents involvement". The mothers all mentioned many types of benefits that they believe their children receive when they engage in their children's mathematics education such as more understanding of the math material which leads to grade improvement, easing math struggling and frustration, improving study habits, knowing child's level of knowledge, increasing child's self-confidence, support, happiness and comfort, increasing family time, and increasing parents' attention and encouragement. I summarized those benefits below.

Child's Understanding and Grade

Many mothers asserted the child understands the math material better and her/his math grade improves. For example, Rajaa stated, "I may use a simple way in my Arabic language that the kid understands better," Randa affirmed, "my children learn from me more math more than they learn from their teacher," and Kareema said, "when you give

your child your time, he or she can absorb the material better. I experienced with my daughter, she went to advance algebra. I helped her and she passed it."

Moreover, Elham argued, "when a parent is involved, the child performs better at school," Soha said, children get "a lot of benefits. I started with my older daughter early with multiplication, she will be advanced in her class," and Noha asserted, "I feel kids perform better when they know we are watching their progress."

Easing the Struggle

Many mothers believed mothers' involvement eases children's math struggles and decreases their frustration. For instance, Sameera asserted, "the child can find help if he or she is struggling," Eman said, "it helps if the kid is struggling with the subject, but if I slack off, it gets worse," and Ameera claimed, "it is calming him down when he is frustrated. This helps him keep going."

Improving Child's Study Habits

One mother believes the child could learn better study habits from her/his mother's involvement. Najwa asserted, "the benefits that my child receives when I engage in their education is that they can learn some study habits from me."

Knowledge of Child's Learning

Most of the mothers believe that being involved in children's math education allow mothers to know their children's learning levels. For example, Ameera asserted, "I know his level in math when I get involved and encourage him to focus more," and Randa said, "I think that every parent should engage [in] their children mathematics education to know how much they learn and know of what they learn."

Increasing Child's Confidence

All of the mothers agreed mothers' educational involvement increases children's self-confidence. For example, Kareema asserted, "the child would be proud of himself, more sure, more secure, and sure about what he or she got," Soha argued, "my daughter ['s] self-confidence improved means a lot of advantages," and Elham said, "when a parent is involved, the child has more confidence."

Increasing Family Time

A few mothers mentioned being involved in children's education provided the chance for the family to spend more time together. For instance, Sameera asserted, when being involved, "the parents and the kids spend more time together."

Support and Attention

Many mothers believed their educational involvement provides their children with more support, attention, and encouragement. For example, Sameera believed, "the child feels that he is supported by his parents," Noha asserted, "they get the one on one attention. We don't leave the table before they get the lesson. There is no bell that rings. We don't move on to the next lesson before we are done with the one we work on," and Sanaa stated, "he gets more encouraged to do his work."

Increasing Happiness and Comfort

Most of the mothers believed mothers' involvement makes the child more comfortable and happy. For example, Abir asserted, "they are helped by someone that they feel comfortable with," and Rania stated, "I helped my son in his math and he felt so happy."

In addition, Suaad summarized much of the above benefits is notable in the following.

> They feel that there is somebody with them to help them if they ask a question, there is somebody for them. It benefits them always to encourage them to do the homework. There is somebody watching their backs, 'I am there for you if you have a question', and their grade gets better. I used to be a D student in math but my daughter is a B student because her dad helps her a lot. It improves their self confidence. My daughter has a lot of friends whose parents are divorced, so they can't concentrate and none of their parents help. My daughter comes home and said 'thank God that you both are here'. We are together thank God. They struggle without their parents. We Arabs are stuck together as a family. Thank God. We help our kids. We cover their backs. We always support them in everything they need.

Types of Arabic Mothers' Involvement

There are many different ways Arabic mothers become involved in their children's mathematics education such as playing math games, helping them understanding the math material, helping with math homework, reviewing math concepts, volunteering in school, and providing children with a comfortable atmosphere to study and do homework. The following elaborates on these types of involvement.

Playing Math Games

A few mothers mentioned that they play math games with their children. For example, Elham stated, "from a very early age, I buy my children educational games and toys so learning would be a fun experience for them," and Sanaa asserted,

> We play games and apply what we learn to real life situations which I used the driving time to quiz them about money calculations and adding taxes where there is a certain budget. They benefit a lot, they get fun and learn. We have a special time which we call it 'Milk Time' that is especially for me and my kids where I talk with them, listen to their problems. In kindergarten, the school sends a folder every week that has a math game, so we used to play the math games, money games, guessing games. My older kids help their little brother in his math games.

For Sanna and her children, milk time is about an hour a day where she sits with her children to talk and listen to them while she drinks her coffee and the children drink their milk.

Also, Eman said,

> If they struggle with their math we help them. Now they are in higher grades we help them less but when they were younger, we used to help them all the time. I do have math games like building pyramids which suppose to help them, and other visual stuff to help with math.

Moreover, Samiha asserted, "we make them count coins," and Hanan claimed, "I used to let them use colored beans to add, subtract, and even multiply."

Teaching and Reviewing

A few of the mothers teach their children the math material in order for the children to understand it. For example, Najwa stated, "I am involved in my children's mathematics education by helping them study for their tests and help them understand any of the material that they didn't understand," Randa said, "I like to help them and make them understand math in the right way, but most of the time we end up with a fight because they tell me that not the way we learn it," and Abir asserted, "I help review math concepts with my child. Ask what grades they are getting. Help test preparation."

Homework Help

Most of the mothers helped their children with their math homework if they can and if the children need help. For instance, Sameera asserted, "I help with the homework when my help is needed," Elham: "I always remind them to do their homework and help them with any questions if you can and hire a tutor if they need one," and Noha said, "I help them through the text book and daily homework."

Moreover, Soha declared,

> I help with homework, e-mail the teacher if I feel that they have a problem, I also registered for the extra math on the net from the school, I go to school to ask about their progress, I go to regular parents' meetings every Thursday. The teacher sends a file about their work. But I depend on the e-mails more than the school visits.

Also, Kareema asserted, "I help with homework, I try to find the gaps, encourage them, follow them step by step," Suaad declared,

> When they sit to do the homework, I sit with them. My daughter wants me around when she does her homework, so she sometimes checks the computer. I ask her 'why you don't use the book' she said 'mom, the computer is easier'. I like to get involved. I always like to sit and see what they are doing every time they come home.

In addition, Hanan stated, "I help with my daughter's math projects in collecting information." On the other hand, one mother, Reema, does not help her children. Reema, who works full time asserted, "I don't have time to help but they do excellent and if they need help, they go to their dad."

Volunteering at School

In addition to getting involved in children's education at home, eight of the mothers say that they volunteered in their children's school. These mothers had good or excellent English. For instance, Kareema stated, "sometimes I do volunteering at their schools," Hanan asserted, "when they were in elementary school, I used to volunteer in the math class but not now since the problems were simpler, but now with my job, I volunteer into other stuff in school," and Sanaa stresses, "in the first years, I volunteered a lot because I didn't work." Moreover, Rajaa said, "it is hard to get a chance to do volunteering since I have four kids and the little one needs a lot of help. He is lost between the two languages." While Rania asserted, "because my English is not that good, so I don't do volunteering because I feel embarrassed, but I go to teacher conferences."

Attending Parents' Conferences

Many of the mothers say they usually attended parent-teacher conferences. For instance, Samiha asserted, "my husband and me go to parent-teacher meetings together since my English is not that good," Hanan claimed, "we go together me and my husband to parents conferences, so if I forget to ask something, he asks," and Suaad said, "when there is a parent-teacher meeting…. When they send me a letter about meeting, I go in person to the school because I like them to see me in person although I have a choice to do that online."

Providing Apt Study Environment

A few of the mothers asserted they always make sure to provide their children with an appropriate studying atmosphere at home. For example, Rania stated, "I provide my kids with a comfortable atmosphere to do their homework and study and concentrate, and encourage them to do their homework." Likewise, Elham declared, "I provide a good study environment".

Motivating Children

Most of the mothers shared that they always attempted to motivate their children to study, complete their mathematics homework, and talk about their math difficulties in many different ways. For example, Najwa stated, "I motivate my children to do their math homework by making the material easy and fun. I motivated them to talk about their difficulties by being open and giving good responses to help them." Moreover, Randa asserted,

> I always try to motivate them to do their homework by using some material to make it easy and ask them to listen to music to make them relax and can think of math like any other subject. I ask them to read the math problems more than one time to understand it better and make them solve it.

In addition, Sameera claimed, "I try to always remind with the importance of math, and get extra materials for practice." In fact, Kareema asserted, "we follow them as we can, we tell them this is your job, you have to do your job." Similarly, Soha argued, "it is her responsibility. I tell her and she knows that. She is scared because she knows this is her duty and she needs to finish it. I only encourage her to do the extra work."

Furthermore, Hanan said,

> My problem with my daughter is getting bored if they spend more time in one unit. I give her more exercises from the Internet. We always talk to her about the importance of math so she can get serious. We tell her that she needs to learn math to be able to go to university.

In addition, Suaad argued,

> I encourage them but they have to tell me that there is something wrong. Sometimes they don't want to do the math homework. I tell them, 'you have to do the homework' then the teacher calls me. He tells me that the teacher doesn't like him. I tell him 'why the teacher doesn't like you but likes your sister?' so they sometimes blame it on the teacher. My son liked his math teacher. When she got a maternity leave he got mad and kept complaining 'why she has to get pregnant?' He hated the new teacher. I called the new teacher. The new teacher said Mohammad needs to step up and do this and do that. I told the teacher 'encourage him, call him, interact with him' because he never called Mohammad's name but he called the other students. I called him right away before even the parents-teacher meeting.

In addition, Ameera declared,

> Always he has to keep in mind that when he struggles with math problems that it is not the end of the world. This is the way we learn, we have to keep working hard and hard towards our goal to learn math and to be advanced, understanding, never to stop because learning has no end. Never to get frustrated when you stop on one thing, keep going to the next, then go back to that one. If you don't know it leave it, it is not the end of the world but remember that you have to find out what was the right answer so you don't repeat the same mistakes. I don't want to lose my son because of math.

Also, Eman asserted,

> We always try to defend the teacher so the child likes him or her. It gets better when they get familiar with the teacher, so it is hard to change the teacher every

> year. My son doesn't like to do his math homework on the computer. He likes to do written homework. The kids who are struggling need more encouragement and patience.

Furthermore, Sanaa stated,

> I motivate them through the homework. I used to feel their struggles and feel the weak points, so I discuss it even for weeks. Sometimes, he comes home and tells me that he didn't understand something and the teacher had no time to help. We help him or he asks the teacher the next day.

Though, Noha did not need to motivate her daughters. She stated, "my girls knew that homework is their job after school I guess we taught them that from the start and we were lucky they never argued about it."

Mothers' Involvement Challenges

The mothers talked about many types of challenges they face when they get engaged in their children's mathematics education at home and school such as fear, math difficulties and teaching methods differences, language, the math teacher, gender differences, child's behavior, math instructions, standardized tests, and school personnel. I summarized these challenges in the following sub categories.

Fear

Najwa asserted "sometimes, I fear that when I am unable to help my child with their homework that they will never ask me for help again." In order to avoid such situation, Randa asserted "I try to challenge myself by making me know all the problem even if I don't know anything of it because I like to get engaged in their school work and education."

Math Difficulty and New Methods

Many participants find mathematics a hard subject in particular the way they learned it was different from the way their children are learning. For example, Rajaa

claimed, "I only could help the younger ones but not the 8th and 7th grade especially it is in English too." Because of math difficulties, Abir asserted "I don't know how to solve the math. I learned it differently."

Moreover, Noha claimed that one of the challenges is "figuring out the way that teacher teach with, after that there is no challenges. My girls told me 'but this not how my teacher said it', then I knew I should find out her way." Furthermore, Laila stated, "I find it hard when I try to help my kids with their math because I am not used to the new methods," and Hanan argued, "You have to review the math and the difference in methods and find time to refresh my memory in math."

Language

Many mothers spoke about their difficulties speaking English which limit their educational involvement. It is important to consider language ability might be a main difference that limits these middle to upper class mothers' involvement. For instance, Samiha said, "the language is a challenge," Sanaa asserted, "my English at the beginning was a challenge in helping my kids but when I translate the words to Arabic, I could help them. I used the dictionary a lot," Rania asserted, "because my English is not that good, so I don't do volunteering because I feel embarrassed but I go to teacher conferences." Moreover, Soha stated,

> Sometimes in conferences, I feel that teachers don't understand me but I go with my husband because we both need to know but I feel they respect me a lot because they know I do double efforts and try and talk more than one language. Sometimes I go alone but I prepare what to say. I say sometimes 'I am sorry because my English is not good' they say 'you are doing good'. They encourage you, you feel that you are one of them.

Also, Rajaa argued, "language sometimes…. I help the younger ones only because math is in English too. The language is the challenge. I feel I don't communicate with the

teachers. Although the teachers encourage us to get involved, they are so nice." Similarly, Rania asserted, "Language is a barrier. Even my kids start talking English always. This made communicating with them harder. They even reject my advice and said 'we are not living in Lebanon'." Despite the fact that these mothers live in the U.S., they like their children to keep practicing Arabic language. For example, Reema stated, "I want my kids to keep practicing the Arabic language but they understand me when I talk to them but they answer me in English."

The Math Teacher

A few mothers asserted the math teacher sometimes added to their challenges such as when the teacher depends on the child to learn the math or on the parents to teach it. For example, Ameera clarified,

> Teachers make the subject hard, fun, or easy, depends on how the way they teach or pass the information to you…. I heard my son saying "'I hate math' because the teacher made him hate the math. The teacher is the most important element. She complicates math by the way she gives quizzes and homework. His teacher gives the long test in the days that they have the short math period but gives the group test in the days that they have longer math period, which does not need long time. The test you need time to get the right answer and write it down. I hated even going to school and fight for my son because she was a hopeless case. I sent her an e-mail. She answered me with the same question I asked her. If the teacher was bad, you don't hear anybody said 'I love math'. The teacher has the biggest effect. When he was eating breakfast the last few days, before going to school, he was in tears because he hated the school. His teacher never did examples for any new unit they go to, 'go do the homework, bring me the homework the next day'.

Gender Differences

A few mothers talked about the differences between girls and boys that could potentially impact students' performance and mothers' educational involvement. I believe most Arabic families treat boys differently from girls and give more freedom for

boys than girls, and this makes dealing with boys harder than dealing with girls. For example, Eman asserted,

> The girl does the whole steps but the boy uses a lot of short cuts…. Boys don't like to ask for help but it is a pride issue. Girls 'mom, I don't understand this'. Now he is OK with the tutor but before, he was ashamed that he has a tutor. If I ask a friend to help him, he goes crazy…. My son hates when I call his math teacher to tell that he struggles. I think it is a guy thing. My daughter is different.

Also, Suaad argued,

> The boy [her son] doesn't like us to help him if he is struggling in school. He doesn't want us to help him. He wants to do it by himself even if he doesn't understand. He doesn't ask for help. He won't go and ask the teacher. So he gets a D. When I see it, I tell him I am home; I am here whenever you come from school I am home. When I see the D on the computer, I call him, I say why? The challenges I get from the girl [her daughter] is like she wants to be always in the A or B, but when she gets in the C mode, she drives me crazy. She is different than the boy. 'Why I got a C, why? I got this right?' She makes me nervous…. I always be there for them. I ask them, do you have homework? In what? So after we eat, we clean the table, she puts her books. But the boy, he goes downstairs. He doesn't want me to get involved even if I go there sometimes; he said what are you doing?

Child's Behavior

The mothers talked about some types of children behaviors that challenge their educational involvement such as when the child does not have the patience to learn or when the child is being stubborn. For instance, Eman claimed,

> My kids shy away from learning the lesson; they only want me to show them only where they are stuck…. You can't teach them since they became teens. They don't want to study; they only need the answer, just give me the answer. They don't want to sit there.

Moreover, Samiha stated that she faces a challenge "when the child is stubborn and doesn't want to work…. We help her if she struggle, sometimes she gets absent minded."

Math Instructions

A few mothers complained about poor math homework instructions that confuse the child and the mother. For instance, Suaad stated,

> Sometimes I ask the teacher 'what do you mean?' when the instructions are not clear, and I e-mail the teacher, then she send me an e-mail, and I ask my daughter to go early before class starts to ask the teacher for help and she comes from school happy.

In addition, Eman asserted, "instructions are important and sometimes one challenge when your kid does it right but skips some steps and gets [points] knocked off. This is very frustrating."

Standardized Tests

A few mothers also complained about the stress that standardized math tests cause for them and their children. For example Sanaa argued, "Sometimes when they have the standardized tests, it is a challenge for me and my kids. I feel that I need to review all the math I learned before."

School Personnel

One of the mothers, Ameera complained about the school personnel's attitudes and explained this experience discouraged her educational involvement in her son's school. Ameera stated,

> At school, I can't blend with them, they have attitude, they don't greet or welcome you, I tried to go two or three times then stopped. Because I don't like the school, I don't like to volunteer at the school. It is difficult. If you feel welcome, you go easily. 'Never compare high school to middle school' they say. They want to depend completely on the child and his parents. Since he is in high school, none of the teachers is helpful for him…. I don't even like to reach the parking lot of this school. The attitude of some school personnel discourages you. I asked her 'why you are mad?' the way she answered me over the phone, she had an attitude. When I started getting involved, I understood why he hates the school. The school doesn't take care of the kids.

On the other hand, a few mothers did not face any difficulties when they got involved in their children's mathematics education. For instance, Elham stated, "I didn't really

experience any challenges," and Soha said, "I don't have challenges so far since my kids still are in first and second grade, so nothing hard yet even the word problems still easy."

Child Struggles with Math

When their children struggled with mathematics, some of these mothers felt badly, sad, or panic, but always try to do something about it such as asking the teacher, or reviewing the material with the child. For example, Najwa stated, "When my child struggles with mathematics, I panic. I help them understand the material to make it easier for them," and Eman said,

> It is a struggle for all the family if a child struggles because you know how important with math especially math. If it history, it is not a big deal, I don't push his grade in history. I know it is boring and could not care less. It is not my priority. I will let this slide, but for me math and science are important.

In addition, Rajaa asserted,

> I feel very sad because math tells about how smart is the kid understanding. Math makes the brain flexible. The good in math kid I feel that he or she has a bright future. My daughter was good in math but when she got a new teacher, she doesn't understand from her…. The older kid, I don't know how to help him, sometimes my husband does but he is very busy. I wish the school can help more. We feel shy to ask the teacher for extra help.

And Rania claimed,

> I feel sad when my kids struggle with math, I worry about their future because the science studies are the strongest at the universities especially in our countries. You have to be strong in math to go to good colleges and different jobs. Even when my son's level is average in math, I encourage him but I never discourage him. I say just try your best.

Likewise, Reema said, "I feel bad if my kid struggles with math but I communicate with the teacher." As well, Suaad asserted,

> Mohammad struggled a lot with math in his 9th grade. I sent him to Sullivan Learning Center for six months. It is very hard. When you see your child struggling, you struggle too. Math is important. What he is gonna do in the future, math will be in it. I was telling him wherever you go, math will be there, and everywhere for being successful you need math.

Also, Randa said,

> I try to help them understand it and try to explain the problem they struggle with. But sometimes really it is hard to keep up with them because they as I said before, don't want my way of explaining because my way is different than their teacher's even the answer would be the same.

Furthermore, Kareema explained,

> I work with them and go and explain the chapter from the beginning. I had an experience with my daughter with equations. She struggled with them. I went with her from the beginning step by step until she managed how to do it. I don't get discouraged. She struggles. She needs help because the teacher might not have the time to help her. So I have to help her. If she misses with one step, the whole equation becomes wrong. So I handle it myself. I don't go to the teacher.

Likewise, Sameera asserted, "I explain several times the difficult part, and help them understand how to solve a problem." Furthermore, Soha asserted,

> I try and my husband, but if I feel a problem, I contact the teacher. At school, there was a teacher assistant who helped the children for about two months until my daughter became good in her math. There is a difference between my two daughters, the older needs you to sit with her longer, then she get great results, the younger needs shorter time but for me if one of the girls has a problem, this bothers me a lot and upsets me. If it is a small problem, even for little things like multiplication, I don't calm down until she learns it.

In addition, Ameera argued,

> If I see my child struggling with math, I will find what is the reason first, what is the cause of struggling. It is the teacher, his smartness, his capabilities. If this is over his capabilities, you have to accept it that he is not in that level, you can't force something that he is not interested in, go talk to the teacher because she or he knows his level and concerned about his success if the teacher cares about the children more than making money. Once he got B-, I went running to the school. The teacher said B- is OK. I said it is not OK. There is a big reason because that he dropped from A to B-.

However, Sanaa stated,

> I don't panic because he would be more nervous. I think about how to simplify it for him and discuss it even before I see the book. I relate it to his daily life. For math you need to be very relaxed to communicate the information if he doesn't understand it wait a while, then try again. My neighbor sometimes sends me her daughter to help her in math because she and her daughter get nervous. So,

> sometimes you need to change the time and sometimes to change the person and to think about different way to explain it or let the kid help the kid or go online, there are people doing lessons on line.

Similarly, Laila stated, "I don't feel bad because I know that I need to communicate with the teacher. When my daughter struggled with math, I borrowed books from the teacher and helped her," Abir asserted, "I tell them to try to ask a teacher. Find tutoring services, or even use Google. I ask for them to pay attention more in class and ask questions," and Hanan talks about her daughter, "she gets frustrated, so we tell her that we will help her, if our way is boring, we can hire a tutor. Her problem is that in exams she skips some questions."

Child Asks for Math Help

Some of the mothers felt comfortable when their children ask them for help with mathematics homework, others sometimes felt comfortable, and a few did not feel comfortable. For example, Samiha asserted, "I like when they ask," Najwa said, "I feel very confident when my child asks for help on mathematics homework," Randa asserted, "I love to help them with their homework and I would be very comfortable when they come to me for help. Try to be relax[ed] and make them, him, or her comfortable too." While Elham felt comfortable "up to a certain level, until they got to high school or college level math, it was easy for me to sit down and help them with their math homework." Similarly, Noha asserted, "I was very comfortable in the early age but middle school and high school my husband took over," and Kareema said, "I am confident so I can help them easily except geometry."

Likewise, Eman said, “I feel comfortable up until calculus. I struggle with calculus,” and Soha asserted,

> I don’t have a problem with helping her but the size of the problem is important because sometimes she only wants to get the help to finish. If she can do it by herself, I don’t sit with her but if she has difficulty, I sit with her. Sometimes, she only wants me to sit with her while doing the homework even if she doesn’t need help. She feels more comfortable.

Moreover, Ameera stated, “I say ‘solve it and I will check it for you’ because it is his homework not mine.” Likewise, Sanaa claimed that when her son asks her for help, she feels comfortable “not most of the time because I have a lot to do, so I prefer he does it himself but the truth I feel very guilty if I don’t help him especially I help a lot of students at my work, why not my son?”

On the other hand, Abir did not feel comfortable because her math abilities are weak. Similarly, Suaad stated, “I feel scared when they ask because I don’t know what kind of math, so I tell them to wait for their father to help them.”

Not Understanding Child’s Math

Most of the mothers felt bad, sad, and useless when they do not understand their children’s mathematics and cannot help them, but these mothers usually try to get help from the father, the teacher, or the Internet. For example, Najwa asserted, “If I don’t understand my child’s mathematics homework, I feel useless. To help them, I find a website that is able to teach my child the material,” Randa stated,

> If I don’t understand their work, I feel bad because they think their mom knows everything and can help them with anything not just math. I try to learn what we don’t understand by reading the subject and try to solve some problems to make me understand it and can help.

Similarly Abir asserted, “I feel very bad. I try to find someone else that can help him, like my husband or my friends.”

Moreover, Suaad claimed,

> My older daughter helps a lot when we can't help. I feel very bad when I don't know how to help because I can't, and her dad feels bad when he doesn't know how to help her. We tell her that we feel bad for you but we don't understand especially when her older sister doesn't have time to help her. So I call her math teacher and ask for help. So the teacher asks me to tell her to go to school early so she can help her. The older they get, the more they don't want you to get involved. I am afraid that in 12th grade they gonna shut me up. They don't like me to volunteer even they hide the paper that the school sends to ask for volunteers.

Also Eman asserted,

> I get frustrated and anxious when he asks me because he wants the answer right away and they are emotional…. I e-mail the teacher although he doesn't like me to e-mail the teacher. Yes he has a tutor, but the tutor sometimes does his homework for him, so he doesn't understand. Sometimes it takes a while until I know that he is struggling. I know that after a test or after they finish a chapter, so I ask the tutor to review the whole chapter with him.

And Sanaa said,

> I feel bad when I can't help him, but sometimes I have to wait or change the subject because he was stressed at school and I am stressed from work, so I go to IXL online where they present ways to solve problems especially when my way is different from the teacher's way. So first I try to understand the method, then I explain it to him. Because I feel that the child is lost between my way and the teacher's way so sometimes I also write a note for the teacher about things he did not understand and I could not help him with.

Similarly, Rajaa stated,

> I feel sad. It bothers me a lot. I always feel that my language is the problem, so I don't understand or the material is hard since I learned in the Arabic world but when my 7th grade kid asks me to help, I don't try, I know myself, so I send him to his father. I feel that I am illiterate here. Sometimes I send my 3rd grade kid to his sister to help.

Likewise, Rania stated, "my older kid [is] in 11th grade, so his math is hard for me. He gets stressed and I feel bad for him. We try together to reread the question and we go to the Internet," and Laila argued, "I try to control myself and leave it for a while or I and her take a break to avoid being stressed both of us. I call the teacher and ask her advice. My husband never gets involved in their education."

But, Sameera stated, "we ask his father to help or research the subject together and then I explain to him after I get more information." Also, Noha stated, "when I use to help the girls, I used to ask my husband just to remind me, I went back to the text book a lot and also Google was a great help in these situations," and Kareema stated, "I try to help as much as I can. I try to ask others for help, or I ask them to go back to their teachers." On the other hand, Ameera said, "I will not be shy. I will say OK I can't help you with this, let's check the internet to find how to solve it or call a friend or go to the library to check some math books," and Soha asserted,

> There are many things that I don't go back to the teacher because she may not have time, so I check the net or ask her father who also go to the net but sometimes, he uses old methods, so he check the net. She knows the way the teacher uses and mentions that this is the right way. It doesn't bother me if I don't understand it because there is differences between my math education and hers.

Child Rejects Mother's Method: *Daka kadeema*

Some of the mothers felt frustrated if their child rejects their method of teaching mathematics because it is different than the teacher's methods, but most of them try to adjust somehow to the teacher's method. For example, Soha asserted, "my daughters don't buy it. They say 'I need the teacher's way. It is wrong' so we get to the Net until she tells us this is the right one, so we build on it. When I was a child, I acted the same way when my father solve with different ways." In fact, Hanan asserted, "'not this way, not this way' my daughter said. So we go to the Internet and try to match with the math teacher's way and sometimes we contact the teacher."

Furthermore, Abir said, "frustrating because not everyone learns the same. I ask for the teacher to explain it more." Moreover, Eman asserted,

> It causes a fight and he gets frustrated…. We feel very bad, frustrated, and they feel bad. I show them this one way and then I try to go and look at the teacher's examples and do it her way. But if I don't get it, that is it. You ask them to ask

> their teachers, they don't go and ask the teacher until they get a D or below 70% range especially for boys. That's when they start panicking and start doing things seriously which is when around the end of the semester.

Also Randa stated,

> We always have different understanding of mathematics method because they learn here in this country in a different ways and method than us and the way we learn it in school in our days. This can end up most of the time to a big fight with each other. But I understand that the way they learn.

In addition, Suaad asserted,

> You try to make them understand, then they come back to you. I tell my son, my method is good and your father's method is also good. May be your teachers has another method to do it. We solved it for you, why you are mad? Next time don't come to us, go to your teacher. I feel very bad when this happens. I try to help them as much as I can. I feel that they feel that we don't know nothing that what is makes me feel bad. I told my son, even if I was a high school teacher you gonna feel that I am doing bad because I am a mom. I sit down and try to help him. He never tells me thank you. Always no mom, you don't do this you don't do that. Sometimes I go and open their homework while they are sleeping. I find that they used my method. I feel good. They like to talk, they like let you down. But I don't tell them that I looked in their bags. One day we had a meeting and my daughter was angry when we went to school. She talked to me with an attitude. I told her 'if you don't change your attitude, you gonna see mine. I think you will not be happy when you see mine'. The teacher heard us and said 'let me write it down, I love this, let me write it down'.

Also Sanaa argued,

> I was afraid at the beginning to help them with my old ways because they would say mom, you are old fashion or *daka kadeema* in Arabic, but they liked my way, they start asking me if I solve it using my way. Sometimes, I worry about confusing them with my ways because they are different from teacher's ways. I try to help them in their own way.

While Najwa stated, "I accept my child's choice of rejecting my methods because it is important that my child uses the method that helps them the most. In this situation, I allow them to use any method they please," and Sameera asserted, "I ask him or her to explain to me how did he learned in the class room and then try to help or do research to find easier way or ask the teacher."

Moreover, Noha claimed,

> I would change my way and make sure I know the teacher's way. Math is the same all over the world and that is the beauty of this subject even though I am not the best to talk but I know that. There are different ways of teaching the same theory but at the end it is the same answer and the kids need to know but in young age they might not be interested to know any other way but their teacher's way.

Additionally, Rajaa asserted, "I believe my child because I know they use modern methods here, so I send him to his sister to help him," and Kareema said, "we can do it our way and ask the teacher if it right or not. When the teacher said it is right, my daughter would have more self-confidence." Furthermore, Laila asserted, "I borrow books from the teacher and try. Trying never harms," and Rania argued, "in this situation, I leave him to the teacher." Never the less, Ameera believed, "the teacher should give them the chance to show their way but sometimes they get the right answer but the teacher doesn't like it because it is not her way."

Asking Teachers for Help

Most of the mothers do not mind asking the teacher for help, and they contact the teacher in many different ways such as e-mails, calls, notes, or face to face. For example, Abir asserted, "I have no problem contacting the teacher. I usually have telephones or e-mails. Schoolloop.com [an Internet management tool for supporting student progress] helps for contacting as well," and Najwa asserted, "I feel that my child's teacher's explanation is very helpful for me to understand material that I don't know. I would contact the teacher by calling, or setting up a meeting."

In addition, Sameera stated, "when there is something we can't understand we ask the teacher. I contact her through e-mail," Elham said, "I was a school volunteer for many years and always kept in contact with my kids' teachers. So contacting them and

asking them for help was easy," and Noha said, "Teachers were usually very helpful so asking after school or sending an e-mail would work for me. I am always available at the end of every school day and most days I had a word or two with my girls' teachers."

Moreover, Soha affirmed, "I contact teachers by e-mail mostly because you need to get an appointment if you need face to face," Hanan said "I don't feel shy to ask the math teacher and sometimes the counselor. Here they are good and encourage you to ask. We communicate with the teacher by e-mail," and Sanaa asserted, "I don't mind to ask the teacher. I also write notes or send an e-mail for teachers and sometimes I ask the math teachers I work with to show me how they solve problems. Yes, I like to ask the teacher for help."

Furthermore, Kareema stated, "here they are very nice and very helpful and try to help the kids and give advice. I contact them face to face," and Suaad stated, I like it but the kids they don't like it. I am comfortable to go and ask the teacher. I call, I e-mail, I go to the school." Similarly, Eman argued,

> The kids don't like it. Sometimes I feel the teachers don't like it when I say he struggles and I hired a tutor. Can you see if you can talk to him to go to tutoring because he doesn't listen to me if I tell him? Even the teacher sometimes, you feel they feel as if you blame them if you ask them to ask the child. I e-mail the teacher.

Also Randa stated, "I never did that because my children won't let me ask their teacher for any help because they themselves feel embarrassed that their mom go and get help from their teacher. I ask them to go to the teacher and ask her for explanation."

Visiting Class to Observe Teaching

Some of the mothers felt comfortable visiting their children's mathematics classroom in order to observe how the teacher teaches the math material and they felt it is

important to do so. These mothers' English is excellent or very good and most are highly educated, while other mothers, who were not as confident English speakers, did not feel comfortable doing that. For instance, Sameera said, "it is a great idea," Noha said, "that would be fine. I have done that when they were in the elementary school. The girls were okay but as they get older, they don't like me being in the class room. They like their independence but I still go to their teachers," and Randa stated,

> It is very important to do that. We should visit their classroom and see how the teacher teach[s] them and how she make them understand mathematics, but really as a parent, I never visit any math classroom even I did visit other subject teachers.

Moreover, Najwa asserted, "I feel that visiting my child's classroom is important so that I know what they are learning," and Elham and Sanaa stated when their children were younger, they were volunteers and frequently observed teachers' teaching methods. Likewise, Soha argued,

> I like it. I used to do volunteering to see how they teach, the way they teach is interesting and they give them chance to think. The way they ask them to write one, she ask[s] her to draw something straight and make a curve to make it number two.

On the other hand, Abir stated, "I don't feel comfortable doing that," Eman asserted, "I don't like it. I feel that the school doesn't like the idea," Hanan said, "In middle school, my daughter did not want me to show up in her school or class," and Suaad stated empathically, "my God, my kids would kill me."

Communication with Teachers

All the mothers agreed on the importance of communicating with their children's math teachers and most of them felt comfortable doing so. For instance, Sameera said, "It is very helpful. It is very important for the parents to always follow the child progress

with the school staff," and Noha stated, "very strongly. I have done that through all their grades," and Soha argued,

> Very important and necessary. I ask about her progress and I follow up after a while if there is weakness…. I feel they appreciate our efforts at home. They know who works with the kids or not. I like the way they report the child progress. I am very satisfied with that. Here I feel that they keep improving the education so this year could be they try to go to advance levels different than next year because for example in my country the education is the same for the last 30 years. They want to advance continuously.

Similarly, Abir said, "I have done that before, and it helps me understand where my child is in his or her class…. A very good tool for us to know where my child is at," Elham asserted, "very comfortable, in fact I believe it is necessary to do so…. In my experience, they always kept me informed and updated," and Najwa stated,

> I like communicating with my child's math teacher, so that I can know where my child is struggling, and what I can do to help them…. I support math teachers communicating with me about my child's progress so that I can understand how well my child is doing.

Furthermore, Kareema said,

> Very nice to talk to the teacher and the counselor. They are very nice. They used to send a progress report every week or other week, you know how your child is doing. I like the grading system [numerical] not A, B, C, D. It gives you exactly how he is doing. Every time they did a test, they send it to you…. The school was proud of us because we work with our children. They say it shows. They appreciate it.

Moreover, Randa said,

> I always try to call the school to see how my kids doing in school in general because I like to stay involved in their educations and I did so many meeting with their mathematics teachers…. I communicate many times with the school and with the school personal about my child mathematics problems and fear, and I agree with them last year for my daughter to take the same math class [over again] to make her do better in math and understand it well because she didn't do well with it.

But Samiha found parents' conferences are enough communication since they take place every three months. However, Hanan asserted, "conferences are good, but if there is

something urgent, you go and talk to the teacher." Furthermore, Sanaa likes the report cards and the high school planner idea. She said, "they send us report cards and the planner or on the homework but I communicate with them by writing notes and e-mails… they are doing a great job." Suaad always goes online to check her children's progress. She said, "I feel comfortable and happy if the school communicates with me. Because we are in the home with them, so we know what is going on. So I feel happy if the teacher call[s] me." On the other hand Eman has a somewhat different opinion and experience. She asserted,

> Sometimes teachers don't understand. They feel that you blame them. They are busy. I know how my son works and I write to them my son has this and this. We log on the computer and check their progress in high school. But before then, you wait until the report card comes…. I feel comfortable if the teacher contacts me, for me to know what is going on because I need somebody to tell me. From there, I try to help. I never blame the teacher. I like them to contact me and I appreciate it if they do. I would like to suggest even if the kid is not struggling that the teachers contact me by e-mail because the report card unless your kids struggling, it just gives you his grade.

Fairness and Respect

Most of the mothers agree on the fairness and respect that they and their children felt in schools. Some of these mothers wore a *hijab* (head covering) and some did not. For example, Sameera said, "the school staff has always been fair, helpful and respectful," Rania asserted, "they are fair and they respect and welcoming me…. The school, the principal helped me dealing with the problems I had with my daughter," Noha said, "I never felt a problem. Teachers were always fair and respectful," and Kareema stated,

> They are very nice, respectful, and helpful and fair with the kids especially when the kids are good kids and have no trouble. I contact them more than they contact me, when there is a problem, I don't wait until they contact me. I jump right a way to solve the problem.

Moreover, Soha argued, "they are very fair. The school contacts both ways [phone and e-mail] if the kid does something good or has trouble. When my older daughter did something good such as helped her friend, the teacher contacted us," and Hanan said,

> They are very fair with my children. Once, one child was bad to my daughter because of her last name [same name of U.S. enemy]. The teacher and school took care of that even before we knew about the incident, and sent us an apology and punished the child. The school respects our culture. They give our kids a day off for *Eid* [Islamic high religious day]. Even when Arabic children come here, they help them until they learn English.

In addition, Randa asserted, "the teachers and the school respect the child and try to help how much they can, but the way of the system in the school for how to teach mathematics these days make them don't understand it that easy," Najwa stated "I am satisfied because if my child or I have a question, the teacher is willing to give a clear answer," Elham affirmed, "I always had good experiences with my children's teachers," and Sanaa said, "I don't feel discrimination in schools…. Here I admire them. They are very fair and respectful." Sanaa lives in a liberal city in a Rocky Mountain State.

Two mothers gave stories of unfairness. Rajaa said,

> Most of the teachers accept us, they respect the person wherever he or she from. They have good hearts and they like to help mothers but my daughter sometimes said that her teacher treat her worse than the other girl. The other one laughs and talks and the teacher never talks to her.

On the other hand, Ameera argued,

> I don't believe they are fair…. They don't believe that the teacher should help the student, even if she is going to help; she is not helping as she should. They depend on the parents and the student to do the whole work. At parent school night, the teacher said 'by the way, I don't do any examples for math'. They consider high school students adults. My husband went to her and asked 'why you don't do math examples when you give them new units?' He asked her 'when you were in high school, your math teacher never gave you any examples?' she said 'she did. I teach them to depend on themselves'. My husband said 'they come to you and ask you from where we got this result?' you say to them 'this is not the way, I want it my way'. But what was your way as an example?

Besides the above challenges, it is important to note some of these mothers and their children face other challenges due to their culture such as discrimination, which I summarized in the following categories and sub-categories.

Culture Related Challenges

Mother's Challenges

Many mothers talk about the fact that their children felt embarrassed by their *hijab* and that students and school personnel look different at these mothers. For instance, Rania complained,

> My daughter was embarrassed at me because I wear *hijab*. She moves from my side and sits near her friend's mother. She walks far from me. That hurt my feelings a lot…. Also, some of the parents give strange looks and passive inform [stereotypes] about culture.

Moreover, Laila shared,

> My daughter is 12 years old. She keeps everything inside herself and never share[s] it with me. She doesn't like me to pick her up from school and I wondered why. Then I discovered that my *hijab* is the reason. She was embarrassed at me. Then I talked to her.

Furthermore, Sanaa stated, "when I visited school, I feel that my son is ashamed of me wearing al *hijab* because they look at me in the school a different way. I talked with my kids about the benefits of *hijab*, so they changed," and Suaad said, "I face challenges because of my *hijab*. Everybody is looking." Similarly, Rajaa asserted, "when I go to my kids' school, sometimes I feel that people are surprised to see me. My kids don't want me to go to their school because of my poor English, *hijab*, and stereotypes."

While other mothers do not face many cultural problems, and a few felt they face none. Abir said, "not many cultural problems, except when I can't help my child because I don't know the same methods of teaching math as they do in the U.S." However,

Najwa asserted, “my children don’t face mathematics challenges due to their culture but because I went to school in the middle-east, learning was very different. This made my culture a small challenge for helping them in math.” Moreover, Kareema stated, “no problems because they know me before wearing al *hijab* but there are mothers who were asked about their *hijabs*.” Kareema wore *hijab* a few years ago, after her husband went on a pilgrimage to Mecca, as is typical in Islam.

Child’s Challenges

Many mothers talk about cultural related problems their children face in their math classes and school in general such as discrimination. Ameera claimed, “my son’s culture is affecting him. Means he is in a wrong place,” Laila asserted, “my daughter feels some discrimination at school but she doesn’t like to talk to me about it. They [the children] don’t give the clear picture,” and Rania stated,

> My kids faced discrimination after 9/11 and they were called many times ‘terrorists’. My son cried once. They [classmates] told him ‘when you become 18, you gonna become terrorist and wear [a turban] like Bin Laden. The school did not do anything even when I went to pick him up from school; a kid pointed at me and said ‘terrorist’.

Moreover, Suaad said,

> The kids feel some difficulties because they are Arabs. For example, my son’s name is Mohammad. His teacher told him ‘you should call yourself Mo instead of Mohammad’. My son said ‘but my name is Mohammad not Mo’…. My older son when he was in high school, one student pushed him and injured his ear because his name is Jihad because that student did not like my son’s name.

In addition, Eman stated,

> I think there is some discrimination in schools. The girls who wear *hijab*, they tend to be more shy and more quieter. I heard about some of these issues. With my boys growing up, they faced constant harassment as jokes ‘terrorist’ jokes, jokes, bullying, it got to our nerves. They tried too hard to fit in. Teachers like the fact that you are involved, period. So I don’t face any issues from teachers.

Also, Randa asserted, her children "don't know anything about our culture and the way they teach mathematics or even any other subject because they born here and went to school here. They only learn and got challenges from the school in this country only." In fact Rania complained,

> We teach our kids to save themselves until marriage to avoid sexual transmitted diseases and pregnancy that could damage their future and this is a cultural thing, so in our cultures boyfriend and girlfriend stuff are not allowed. Our children face a lot of challenges because of that from their peers. If a boy does not have a girlfriend that does not mean he is gay, similar for girls. My daughter suffered a lot from her peers because she did not have a boyfriend.

Rajaa asserted, "my daughter suffers from isolation. Nobody is friend to her only because they see me with her sometimes at school wearing my *hijab*. We can't get rid of our skin to live here [we can't change our ways]."

Additionally, Sanaa argued, "I think in their first years in U.S., Arabic students feel bad. They feel different before they learn English. They feel nobody understands them and they are isolated. But after they learn English, they mostly advance in math." On the other hand a few mothers said that neither they nor their children have faced any challenges due to their culture. For example, Sameera stated, "neither my kids [n] or I have faced challenges due to our culture," Elham said, "there were no cultural challenges," and Noha asserted, "cultural challenge was never an issue." Some of these mothers wore *hijab* and mostly their children's English is excellent.

Cultural Influences on Mothers' Involvement

Most of the mothers felt their culture influenced their involvement in their children's mathematics education positively since their culture stresses the importance of education, in particular mathematics education, and negatively since the mother in their culture has many responsibilities which do not leave them enough time to get involved in

their children's education as they hope. In the Arabic culture, women are often responsible for all house work in addition to taking care of children even if they work outside of home or go to school. For example Najwa asserted "in my culture, education is very important, so I must make sure that they do well in school." Moreover, Randa claimed "in my culture, we as a parent, we should get involved in our children mathematics education because in our culture we love math and we know that math is very important subject in our life."

Furthermore, Noha said "my parents were involved in my schooling, so I guess that is the culture in our house too," and Abir stated "I grew up with a big expectation to do well in school, so I expect the same for my kids." In fact Elham agued "culturally, education and doing well in school is extremely important," and Eman asserted "in our culture, math and science is important, so we always challenge them, so if they are not good in these subjects, they feel less of themselves,", and Samiha said "math is very important. My husband tells my kids that the most important subject is the math." In addition, Sanaa said that her culture "has a good influence. I took the positive sides of both cultures."

On the other hand Sanaa added, "the Arabic mothers have a lot of responsibilities at home which limits our time. I ask the kids to help me so I get time to help them," and Kareema claimed, "I go alone to parents-teacher conferences…. As an Arabic women, you have to find the time to help the children since we have a lot of responsibilities. Men mainly don't help. The older kids help the younger ones if I don't have time." Similarly, Hanan asserted, "here we came with our culture where the mother has a lot of

responsibilities. The mother has to do everything not like the Americans where the dad can do the laundry. So there is not enough time. This also has affected my career."

Every participant felt that her culture has something to do with their educational involvement, except Sameera. Sameera asserted "I don't think the culture have an influence on that other than that we care about the quality of education our kids get, and I think everyone does."

Mothers' Attitudes Towards Informing About Their Culture

Most of the mothers believe that it is important to inform the child's teachers and school personnel about their Arabic culture in order for the teachers and the school personnel to be familiar with it. For instance, Hanan argued,

> It is our duty to inform them about our Arabic culture. They don't know sometimes. They don't mean to ignore you. So when we have the *Eid* [Islam's most reverent holiday], I bake cookies and send them to the school. I also show them pictures and presentations about *Eid* and the *Henna* we use.

Kareema said, "Yes, definitely. We are proud of our culture so it is important to inform them. I introduce myself and my kids and when I tell them how we take care of our kids, they appreciate that. We talk about Islam. During *Eid,* I send them sweets," and Sameera stated,

> I always let the teacher know about our culture, during Islamic holidays, I send cookies to the school and the class room, and my kids share a little bit about the celebration with their class and the teacher. The teacher always encouraged them and said it is part of their personality.

Moreover, Rajaa asserted,

> I wish to inform about my culture. I wish the school teaches about different cultures so teachers understand the others. They have to teach the teachers about different cultures, so our kids would feel more comfortable. The person is the enemy of what he or she doesn't know. Once, my son had a project about Syria with his teacher. The teacher presented my country Syria with a negative image as poor, dirty, people riding camels, which is not the truth about Syria. So I

> wonder why she showed the negatives not the positives. Now with the technology, she can get current information about Syria. She gave my son bad idea about his country. She discouraged my kid.

Also Eman argued,

> I think there is cultural gap for sure. Some kids and parents feel intimidated to approach school system. They feel intimidate to approach authority, period, you know especially for people who have difficulties with English. So it is very important to inform schools about our culture. The shy child in our culture, which are girls, does not mean they disrespect or don't understand. These children need attention. They usually middle of the way, middle of the class. It is our culture. As Arabs, math and science is important, so we push it a lot, which cause friction in the house sometimes.

In addition, Noha said, "I used to go to my girl's class room in our holidays and talk about our culture. The teacher used to ask every year that we would present our culture to the classroom so the holiday time was great for that," Kareema asserted, "my husband talked about Lebanon and Ramadan, and took Baklava to school. They are really nice and treat us nice." Likewise, Suaad said, "once, we did our traditional dance, *Dabka* in school and we took Baklava," and Abir asserted, "we sometimes tell teachers we come from a Middle Eastern background, so understanding my child's math homework is more difficult."

Furthermore, Rania stated,

> I don't have a problem informing the school about our culture…. Kids need to be educated. There should be rules in every aspect of their lives. We once thought to put our daughter home schooling because of the big amount of freedom the kids here have such as the sexual freedom at a very young age which can get them STD's. My English is weak which lessen my social communication and involvement in school.

And Soha asserted,

> I feel that this issue is more complicated now because we have double work because what the media tells them about us and the stereotypes so we feel embarrassed some times to tell about our culture. So we find difficulties to convince them that we are good people. They feel confused when they see good people while they hear bad stuff from the media. For example, when we went to visit Egypt, some [American] parents were worried about us.

Additionally, Sanaa affirmed,

> Communication should always exist between the parents and the teachers. When the teacher feels that parents are concerned about the child's success, they pay more attention. In my kids school, they do projects. My son did one about Ramadan. They know when is Ramadan and *Eid*".

Randa stated, "I never did that but if I have to, I will explain to them how our culture care about learning mathematics and try to explain the way we use to learn it and how it was easy for us to understand it," and Soha claimed, "for my daughters, the teachers send an e-mail to ask us to talk about Egypt, so my husband went and did a presentation and showed the Egyptian currency and talked about the pyramids." Similarly Elham said,

> As young children, their teachers actually would ask me to come into the classroom and explain aspects of our culture and religious holidays to them. I was more than happy to volunteer my time and my children's classmates seemed very interested in learning about it.

On the other hand, some mothers have different opinions about this issue. For example, Najwa asserted, "I don't feel like it is important for my child's teacher to know about my culture because my culture will not get in the way of my child's education," and Ameera said,

> I don't do it. If the child is American, unless he faces some problems related to his culture. Teachers don't have to know; otherwise they might become more picky…. If you are looking to be in a different place than your culture, although you have your culture in your community or society but the majority of them being with others or being in the stated as an American you have to change yourself by building adjusting your thinking, your way of thinking, learning to match other cultures because you are looking to be American, be part of them, not to bring everything from your house. Being with others in school with different cultures but at home you go back to Palestinian, Indian, Chinese, or who you are. Out of the house, you are an American because you are in the States…. I learned English to live in America, their language is English, I don't force them to learn Arabic because they are not in my country to learn Arabic. I believe I am in a different culture, but my culture should not affect my learning because the learning I am taking is the American learning. It is different than the old school we had in our culture because our culture is totally different. Although it has difficulties, I face things, I have to get over the challenges. I have to accept it in

> order to learn. I have to get over it. I should let it go because it is not the right thing to pick on it, and do it their way. It is going to be their way. It is not my way. If I have the question I will ask it but every school is different from district to district from state to state.

Mothers' Suggestions for Enhancing Their Involvement

The mothers who participate in this study have many different suggestions to teachers and school personnel in order to enhance their educational involvement and build a cooperation between home and school such as inviting them to school and teach students about other cultures. For example, Randa asserted,

> The school should … invite parents and let them visit the classroom to see how teacher teach their kids and let parents get involved with them in the classroom. This way I think it can build a relationship between the parents and the teacher, school also… help the mother understand how they teach their kid and when they try to help their children at home this way, they won't get any fight.

In addition, Elham suggested, "encouragement of the parents by the school to actively volunteer some of their time and to keep in communication with the parents on their children's academic progress," and Najwa asserted, "I feel like teachers should allow me to come once a week to see how the class is being taught."

Moreover, Sameera recommended, "contact the mothers and invite them to school in several occasions," and Sanaa stated, if the school allows her, "before my daughter wears *hijab*, I will go to school and talk about her wearing *hijab* so they don't bother her with their looks and questions," and Noha gives an example of what she likes to have. She asserted, "my girls for a while used to go to a private school. They started learning Spanish very young so they provided a Spanish class for parents so they can help the kids at home. That method would be great in math as well."

Furthermore, Abir needed "to have teachers and parents have a closer relationship by encouraging mothers to come by the classroom and always have contact information.

Encourage parents to come to open house or parents' night," Kareema asked teachers to "keep contact with parents, let them involve, offer volunteering chances, and keep open minded so not to stereotype people, understand the other people," and Sanaa suggested to "give parents opportunities to volunteer in school so they go and see where their kid sits in class during math. So when the child talks about school they have good background about school and kids."

In addition, Hanan asked teachers and school personnel to

> Encourage and do cultural activities such as presentations. Connect new Arabic children with other Arabic children to ease their adjustment in the new society. Create workshops to teach parents new methods to teach mathematics. Create mathematics fair where kids present math projects. Present the origins of branches of mathematics in order to appreciate other cultures.

Moreover, Laila suggested that "school should educate the children that not everything they hear in the media is true. For the *Eid*, I have to call… to excuse the kids because of *Eid*." Similarly, Rania said, "*Eid* should be recognized in schools… schools should teach students that in some cultures boyfriend and girlfriend stuff are not allowed so other student would not bother them," Reema asserted, "I suggest they use Arabic language in schools similar to Spanish and French," and Rajaa said, "I hope that the school offer support to weak kids in math."

Moreover, Ameera asked teachers and school personnel to

> be more friendly when you ask for parents help or to be involved in school or volunteering help at school. Welcome them. Greet them. Help them feel they are welcome at school any time to be at school. Some parents helping other students because some parents are good in math, their help for groups. Some of them appreciate it some not. If you feel not welcome you never go back to school and you wish your child finish with the school. If you are involved and really concerned about your child, you feel many things, you wish to hear or to see from teachers but nothing show in his life as a student because teacher not ready to help or do extra time or extra work with him. Why he goes to school if he does not get help and he depends on me and himself on everything. I send him to school to have the right to ask, to be treated nicely, and to have the opportunity. I

> send him to school not online school for being around others, to be treated fair and nice, to be in the community. The teacher herself when she was in school in this same grade, she had difficulties as they now have. I am sure her mother would go to school to ask about her. They want to force them to get older before their time. Some students hate math because of their math teachers.

And Suaad recommended,

> The school should interact with parents and they have to take the first step especially with parents who don't talk English. Even a welcome note from the teacher with his or her e-mail to parents or in the student folder, invitations for activities and events especially the kids don't tell their parents. We like them to tell us about times of tests and what chapters are included. Every month or few months to send an e-mail. Contact us in other occasions not only when the child has trouble. Once, the school contacted us for an international potluck. We took our Baklava and went to the school. We found tables each with a flag of one country, but no table or a flag for Palestine. I said to them 'no Palestinian flag, no Baklava'. The kids said it is OK mom. I told my kids 'no it is not OK'. The next day the school principal sent a letter to apologize. The next year, they called and said 'there is a flag and a table ready for you. We had to go through a lot of troubles from other people to get you that.

Besides, Rajaa suggested,

> Send letters to parents in Arabic language because I need to translate every letter to understand it. For more effective communications in meetings, I suggest providing a translator because it doesn't help that we sit in the meeting and don't understand. I suggest providing workshops to teach us new methods in teaching math. I suggest bringing a specialist in cultures and religions to talk about other cultures and other religions so teachers and kids understand and respect people from other cultures, be fair to other cultures, stop the stereotypes to decrease isolation to our kids and decrease trouble between Americans from different origins since we live in multicultural country, they welcome other cultures and religions to this country, so they should ease our communications with schools…. Schools should communicate with Arabic parents, so we don't feel strangers.

In this section I discussed the findings related to the nature of Arabic Mothers' educational involvement. Next I present the impact of the Critical Race Feminist focus group data collection method on the nature of data collected in this study.

Methodology Research Question

In this section I present data that answers the following methodological research question.

Q1 What is the impact of the critical race feminist focus group data collection method on the nature of data collected in this study?

The focus group data collection method I employed in this study resulted in a large quantity of rich data about the nature of Arabic mothers' involvement in their children mathematics education. It was important to collect a copious amount of data since to my knowledge gained through due diligence; there is no data about this minority population as related to math. Moreover, most Arabic women are Muslims. Arabic and Muslim women are scarcely represented in the educational research. Very few Muslim female voices are heard on this subject or other subjects (Wing & Smith, 2005).

The rich data provided me with a clear understanding of these mothers' own experiences, challenges, and perspectives. In addition, the long focus groups' discussions and interactions, which lasted a hour and a half to two hours each, allowed these mothers the chance to discuss their educational involvement experiences in massive detail and allowed me to investigate their viewpoints in great details.

It was clear to me the focus group setting encouraged these mothers to be more open about their experiences, fears, challenges, and goals. When a mother seemed to be courageous and open about her experiences and beliefs, the other mothers followed her footsteps and became less shy to open up about their own opinions and experiences. When one of these mothers talked, she reminded the others of some aspects they had not talked about, that would make these mothers to open up more and share more about details and stories.

The discussions and interactions also created supporting documents, questioning, gestures, emotions, and disagreements among these mothers. What made these discussions more interesting and seemed to encourage more conversations among these

mothers was the use of both Arabic and English languages. Each mother used the language that she was comfortable with to talk about certain topics, incidents, or stories. In particular, some of these mothers' English was not that good. From my own experience, I give more details, when I use my first language because a second language can limit ones' use of vocabulary that one uses to express oneself and satisfy ones' talking needs. Many of these mothers used their first language, Arabic to explain their thoughts and opinions thoroughly.

The Arabic language has many different accents that differ from one Arabic country to another, and none of them matched the standard Arabic language. The mixture of the different Arabic accents with the English language created interesting and unique conversations. This stimulating mixture created fun, laughter, and joking, which increased the mothers' comfort to share more of their own experiences, thinking, and perspectives and gave me a deep understanding of Arabic mothers' educational involvement's issues in a relatively short period of time.

In addition, many of these mothers did not know each other, which might reduce their biases. I feel I would have never understood this topic in such depth if I used a different data collection method other than focus groups. The focus group setting also gave me the chance to read these mothers' body language that sometimes indicated fear, joy, excitement, agreement, or disagreement. As Rajaa spoke, she gestured to show how irritated she was with her son's teacher showing a bad image of her country, and Ameera also gestured to show how frustrated she was with her child's math teacher. The data I have gathered opened my eyes and mind to issues that have never come to my mind prior

to this research. These mothers have given me their own evaluation of the school system through their engagement in their children's mathematics education.

The Critical Race Feminism theory is concerned with de-marginalizing the views of Muslim girls and women themselves, and not just reporting what men or the media think about them because few Muslim female voices are heard on this subject or other subjects (Wing & Smith, 2005). Through Critical Race Feminist theory, I have sought to place these minority mothers at the center, rather than margins of the analysis of these groups' conversations, thought, reflection, and research (Wing, 1996-1997; & Berry, 2010) and had the unique chance to inspect their ethnicity and gender roles within the school system in the U.S. society that has a majority influence on their subculture (Carter, 2012).

It seemed clear to me the mothers felt they were the center of the discussions, their perspectives were important, and this encouraged them to open up about their feelings of discrimination due to their race and religion, to express their thoughts in details, to say what they think is right and what they think is wrong, and to call for a change in some educational aspects that they don't approve or agree on them. That has resulted in a massive amount of rich data about these minority mothers' educational involvement and the challenges they face when they get involved.

I felt the power in these mothers' voices, the demand for some changes, and I felt they were happy to get this chance to talk about their roles as mothers in their children's mathematics education and their children's' education in general, and about their concerns. Furthermore, I felt that these mothers have appreciated the fact someone was interested to hear them, and someone cared about issues that were important to them,

someone they could trust and open up to. They did not view me a stranger, they seemed to feel I belonged to them and to their culture. There was no defined researcher role or participant role in these focus groups, but a friendly comfortable setting where every mother shared her own experiences and opinions with the other mothers. This was the power of using Culturally Competent Focus Group which resulted in the rich data I have collected and represented.

The Critical Race Feminist theory provides room to fully appreciate these mothers' important role of their involvement in their children's education despite the enormous challenges they face as a minority group in this society. They have talked freely and told long and detailed stories. Berry (2010) asserted Critical Race Feminism supports storytelling because it helps in understanding multiple positions of persons or groups of persons, particularly the socially and politically marginalized individuals living at the juncture of identities. The data collected include many interesting stories about these women and their children experiences and perspectives which are different from the experiences of men and dominant culture women (Evans-Winters & Esposito, 2010).

Carter (2012) asserted, "The theory's practical use in educational settings is where hope can begin to appear" (p. 11). The Critical Race Feminism theorists encourage the inspection of how the institutions, such as schools that these minority Arabic women interact with, reinforce social inequalities when they are involved in their children's mathematics education (Few, 2007). Moreover, Critical Race Feminists are interested in how education assists minority women and their families (Few, 2007), and are also interested in performing activist research that has a social justice schema; therefore, they choose methods that promote some kind of political, social, or economic change that

benefits the people they study (Few, 2007). The data collected contains social justice schema that might benefit these minority women since these mothers have called for changes that provide social equality for them and their children.

In fact, in the educational field, Berry (2010) agued, Critical Race Feminism encourages teachers to acknowledge and accept the multi-dimensionality of minority students and understand that students bring all of their experiences and knowledge into the classroom; advocates for centering the socially and politically marginalized people in the dominant culture; addresses the junction of race and gender while recognizing the multiplicative and multi-dimensionality of being for minority women. Moreover, Rubinstein-Avila (2007) recommends that educators need to promote conversations about uses of race, class, and gender Critical Race Feminism can transform educational policy, curriculum design, teacher education, and more importantly the lives of minority women because these women might face oppression because of their race, gender, class, religion, nationality, sexual orientation, language, age, marital status, parental status, stature, or political beliefs (Wing & Smith, 2005; Wing, 1996-1997). The collected data and these women suggestions have called for similar issues.

I also believe that these Critical Race Feminism focus groups meetings will be a start of a friendship relation among these mothers, which would ease their parental problems and encourage them to be united in presenting their concerns to teachers and school personnel and insisting on changes that could benefit their children's education. Thus these mothers' voices as a minority group will be strongly heard even if their English is developing.

Summary

In this chapter, I presented the results of the data analyses of the current research about the nature of Arabic mothers' educational involvement in their children's mathematics education. I presented the demographics of the participants and the themes and sub-themes that resulted from the data analyses as answers to the study research questions. In the next chapter, I provided discussion about this research topic, implication of the research for educators, limitations of this research, and suggestions for future research.

CHAPTER V

DISCUSSIONS OF FINDINGS, IMPLICATIONS, RECOMMENDATIONS, REFLECTION, AND SUGGESTIONS FOR FUTURE RESEARCH

Through the current study, I explored the ways Arabic mothers', who live in the United States, are involved in their children's mathematics education, the challenges they face when involved, the influence of their culture and their own experiences learning mathematics has on their involvement, their attitudes toward mathematics, new methods of teaching mathematics, their educational involvement, and the benefits their children receive due to their involvement. In addition, I have gathered their suggestions for school personnel and teachers on how to enhance Arabic mothers' involvement and build school-parents' collaboration. Moreover, through this study I have explored the impact of the Critical Race Feminist focus group data collection method on the nature of data that were collected.

Through the current study I have sought to answer the following research questions.

Q1 What is the nature of Arabic mothers' involvement in their children's mathematics education?

- 1a What are the mothers' attitudes towards mathematics?
- 1b What are the mothers' attitudes about their children's current mathematics education?
- 1c What are the mothers' attitudes about their engagement in their children's mathematics education?
- 1d What are the benefits the children receive when their mothers engage in their mathematics education?

1e How do Arabic mothers engage in their children's mathematics education?

1f What challenges do these mothers face when they engage in their children's mathematics education?

1g What challenges do these mothers and their children face due to their culture?

1h In what ways does the mothers' culture influence how they are involved in their children's mathematics education?

1i What are the mothers' attitudes about informing teachers and school personnel about their culture?

1j What are the mothers' suggestions for teachers and school personnel on how to enhance Arabic mothers' involvement and build school-parent collaboration?

In addition to the above research questions, I also sought to answer the following methodology research question: What is the impact of the critical race feminist focus group data collection method on the nature of data collected in this study?

This study is important because the number of Arabic-speaking student population in U.S. public schools has increased significantly in recent years, though educators' lack of basic understanding of Arabic culture is a serious issue which has received little attention (Aburumuh, Smith, & Ratcliffe, 2009).

Discussion of Findings

The current research has resulted in the following categories and sub-categories.

Attitudes towards Mathematics

Mother's Math Experience. Many of the Arabic mothers who participated in this research found math hard and had negative experiences learning it. This finding agrees with Pan et al.'s (2006), and Muir's (2009, 2012b) about attitudes of many U.S. parents about their own experiences with mathematics. This finding also is reflected in

Remillard and Jackson's (2006) and Martin's (2006) about the attitudes of many African-American mothers about their experiences with mathematics. While many of the Arabic mothers who participated in this research found math hard and had bad experiences learning it, others found math easy and interesting, or felt neutral about their math experiences.

Math Experience's Effect. Most of the Arabic mothers who participated in this study felt that their own experiences learning mathematics have affected their involvement in their children's mathematics education, which in return affected their children. For some of these mothers, their negative math experience limits their involvement in their children's math education. This agrees with Muir's (2009), Stepanek's (1998), and Anderson and Minke's (2007) about the effect of many U.S. parents' negative mathematics experiences in their educational involvement in their children's mathematics education.

Moreover, this finding agrees with Yan and Lin (2005) about the effect of Latino parents' negative math experiences in their educational involvement in their children's mathematics education. Furthermore, this finding agrees with Remillard and Jackson (2006) and Martin (2006) about the effect of African American mothers' negative math experiences on their educational involvement in their children's mathematics education. In addition, despite their negative math experiences, a few of these Arabic mothers believed their negative experience had no effect on them or their children.

On the other hand, some of these Arabic mothers felt the positive effect of their positive experience learning mathematics in their educational involvement in their children's mathematics education such as children feeling excited to talk with them about

what they are learning in math in school, or these mothers could help their children with math when they need help because they are good in it. This finding agrees with Anderson and Minke's (2007) that parents' successful school experiences might make them feel capable and confident to get involved in their children's education.

Math Utilities. All Arabic mothers who participated in this study agreed that mathematics is useful in many aspects of life such as jobs, facets of daily life, logical thinking, and education. This finding agrees with Remillard and Jackson's (2006) about their African-American participants who believed in the importance of mathematics and the importance of learning mathematics despite the fact that many of them had negative experiences learning mathematics.

Math New Teaching Methods

Some of the Arabic mothers who participated in this study spoke highly of the new methods of teaching mathematics making statements such as the new methods are easier, more creative and helpful, less scary, and require less memorizing than the old methods, and that they liked the group work and the discovery learning of new teaching methods. Most of these mothers were the ones who had negative experiences learning old mathematics. While other mothers did not like these new methods for many reasons saying these methods were not the ones these mothers are familiar with, were less fair than the old methods or children learn less using new methods. Most of these mothers were the ones who had positive experiences learning old mathematics. This finding agrees with Muir (2011, 2012b), Carreon et al. (2005), Peressini (1998), Lehrer and Shumow (1997) about U.S. parent participants' attitudes about these new methods, and with Remillard and Jackson (2006), and Jackson and Remillard (2005) about African-

American mothers' attitudes, and with Civil, Quintos, and Bernier (2003) about Latino parents attitudes.

Though, some of these Arabic mothers liked some aspects of the new methods such as its discovery learning, and did not like other aspects such as its grading system. These findings agree with Civil, Bernier, and Quintos (2003) that some parents have mixed feelings about reform mathematics.

Learning New Teaching Methods. All of these Arabic mothers liked the idea of learning new methods of teaching mathematics if they get the chance especially since they believed it would help them in helping their children. This finding agrees with Remillard and Jackson (2006) about African-American mothers who were willing to learn about the new approaches to help their children success. Though, two of the Arabic mothers preferred learning new teaching methods only online.

Old Math Versus New Math. The Arabic mothers who participated in the study mentioned differences between the way they learned math and the way their children learned much more frequently than similarities. Some of the common remarks were the way mathematics in the Middle-East was taught is scary and had a lot of intimidating memorization, students did not receive much help, but here in the U.S. mathematics is easy, enjoyable, has less memorization, and students receive a lot of help. This finding agrees with Remillard and Jackson (2006) about African-American mothers' perspectives that they did not see the connection between old mathematics and new mathematics methods because their conceptions of mathematics were grounded in computational proficiency. Moreover, this finding agrees with Martin (2006) about African-American

parents' perspectives, with Civil et al. (2003) about Latino parents' perspectives, and with Li (2006) about Chinese parents' perspectives about this issue.

Mothers' Educational Involvement

All Arabic mothers who participated in this study agreed on the importance of their involvement in their children's math education for their children's success. This finding agrees with Muir's (2012b), Mapp's (2003), Fantuzzo et al.'s (2004), and Lee and Bowen's (2006) about parents' perspectives. It also agrees with Suizzo et al.'s (2008), Gillanders et al.'s (2012), Remillard and Jackson's (2006), and Martin's (2006) about African-American mothers' perspectives about their educational involvement. In addition, this finding agrees with Jones's (2003) and Gillanders et al.'s (2012) about Latino mothers' perspectives and with Li's (2006) about Chinese parents' perspectives about their educational involvement. On the other hand, it is important to note this involvement nuance contradicts Civil and Bernier's (2006) that African-American parents are hardly seen as academic assets in their children's education.

Involvement's Benefits

All of the Arabic mothers who participated in this study agreed children received benefits when their mothers are involved in their mathematics education such as improving child understanding and grades, easing child struggling and frustration, improving child study habits and parents' knowledge of child learning, increasing family time, increasing parents' support, attention, and encouragement for the child, and increasing child happiness and comfort. This finding agrees with Persinni's (1998), Balli et al.'s (1998), Sheldon and Epstein's (2005), Muir's (2012b), Carreon et al.'s (2005),

Izzo et al's (1999), Stepanek's (1998), Mapp's (2003), Fan's (2001), and Suizzo et al.'s (2008) about parental involvement educational benefits.

Types of Involvement

There are many different ways the Arabic mothers became involved in their children's mathematics education at home and at school. It was worth mentioning that the better the mother's mathematical knowledge, the more she was involved in her children's math education at home, and the better the mother's English, the more she was involved in her children's schools. The mothers gave examples of their involvement such as playing math games, helping their children understand the math material and reviewing math concepts, helping children with math homework and projects, providing children with a comfortable atmosphere to study and do homework, motivating the children, volunteering in school, attending parent-teacher conferences, and communicating with math teachers. This finding agrees with Balli et al.'s (1998), Mapp's (2003), Lee and Bowen's (2006), Civil and Bernier's (2006), Muir's (2012b), and Crosnoe's (2010) about parental ways of educational involvement.

It also agree with Gillanders et al.'s (2012), Yan & Lin's (2005), Valencia's (2002), and Civil et al.'s (2008a) about Latina mothers' ways of involvement, and with Remillard and Jackson's (2006), Jackson and Remillard's (2005), and McKay et al.'s (2003) about African-American mothers' ways of involvement. Moreover, this finding partially agrees with Jeynes's (2003), Li's (2006), and Pan et al.'s (2006) about Chinese-American parents' ways of educational involvement since Chinese parents help their children at home, but are less likely to attend school activities.

Involvement Challenges

The mothers talked about many types of challenges they face when they get engaged in their children's mathematics education at home and school. I felt that these mothers became emotional when they talked about these challenges that limit their educational involvement especially that education is vital in their Arabic culture. Examples of these challenges were fear, mathematics difficulties, teaching methods differences and language difficulties for English learners, difficulties dealing with math teachers and school personnel, poor math instructions, gender differences challenges, child's behavior challenges, and standardized tests. These findings except the last three agree with Muir's (2009, 2012b), Stepanek's (1998), Remillard and Jackson's (2006), Yan and Lin's (2005), Pan et al.'s (2006), Peressini's (1998), Lehrer and Shumow's (1997), Jackson and Remillard's (2005), Gillanders et al.'s (2012), Bratton et al.'s (2004), Lopez and Donovan's (2009), Carreon et al.'s (2005), Civil's (2008a), Suizzo et al.'s (2008), Jones's (2003), and Martin's (2006).

The gender differences finding agrees with Turney and Kao's (2009) that parents could be more involved in their daughters education more than their sons education, and the child's behavior finding agrees with Stepanek's (1998) about when students do not want their parents to be involved in their school. However, the standardized tests stress finding within this research, to my knowledge, was not mentioned in any of the literature.

When their children struggled with mathematics, most of these mothers felt badly, sad, or panicked, but always tried to do something about the struggles such as asking the teacher, reviewing the material with the child, looking for examples on the internet, borrowing other math books, or hiring a tutor. This finding agrees with Jackson and Remillard's (2005) and Gillanders et al.'s (2012) about African-American mothers'

attitudes in such situation. It also agrees with Valencia's (2002) and Gillanders et al.'s (2012) about Latina mothers' attitudes in these situations.

Moreover, some of these mothers did not feel comfortable when their children asked them for help with mathematics homework. This finding agrees with Muir's (2012a) and Stepanek's (1998) about their studies' participants' attitudes in such situation. It also agrees with Gillanders et al.'s (2012) and Bratton et al.'s (2004) about Latina mothers' attitudes and with Remillard and Jackson's (2006) about African-American mothers' attitudes in such situations. On the other hand, other Arabic mothers who participated in this study feel comfortable sometimes, and a few always feel comfortable in these situation.

In addition, most of the Arabic mothers who participated in this study felt sad and useless when they did not understand their children's mathematics and cannot help them, but these mothers usually tried to get help from the father, the teacher, or the internet. This finding agrees with Jackson and Remillard's (2005), Remillard and Jackson's (2006), and Gillanders et al.'s (2012) about African-American mothers' attitudes, and with Gillanders et al.'s (2012) and Bratton et al.'s (2004) about Latina mothers' attitudes in such situation. On the other hand, a few of these mothers do not feel bad about the situation and try to get help, check the Internet, ask a friend, or go to the library to check some math books.

Furthermore, some of these mothers felt frustrated if their child rejected their method of teaching mathematics because it was different than the teacher's methods, but most of them tried to adjust somehow to the teacher's method. This finding agrees with Remillard & Jackson's (2006) and Martin's (2006) about African-American mothers'

attitudes and with Civil et al.'s (2003) about Latina mothers and other immigrant parents' attitudes in these situations.

In fact, most of these mothers did not mind asking math teachers for help, and they contacted the teacher in many different ways such as e-mails, phone calls, notes, or face to face. This finding agrees with Jackson and Remillard's (2005) and Remillard and Jackson's (2006) about African-American mothers' attitudes, and with Valencia's (2002) and Gillanders et al.'s (2012) about Latina mothers' attitudes in these situations.

In addition, some of the Arabic mothers who participated in this study felt comfortable visiting their children's mathematics classroom in order to observe how the teacher teaches the math material and they felt it is important to do so. This finding agrees with Jackson and Remillard's (2005) about African-American mothers' attitudes towards this issue but contradicts Jones's (2003), Bratton et al.'s (2004), and Carreon et al.'s (2005) since Latino parents often complain about the low level of expectations teachers hold for their children and because teachers talk down to them so most parents do not want to go back to their children's schools. On the other hand, other mothers did not feel comfortable visiting their children's classrooms to observe how math teachers teach the math material, felt that the school did not like the idea, or their children did not want them to show up in school or class.

Besides, all these mothers agreed on the importance of communicating with their children's math teachers, and most of them felt comfortable doing so. This finding agrees with Gillanders et al.'s (2012) about African-American mothers' perspectives, though they thought communication across racial and cultural groups could be a sensitive matter, and with Yan and Lin's (2005), Valencia's (2002), Gillanders et al.'s (2012), and

Jones's (2003) about Latina mothers' perspectives despite their feelings of discrimination. This finding does not agree with Jeynes's (2003) since Chinese-American parents usually do not become involved directly with their child's school.

On the other hand, a few of these Arabic mothers found parents' conferences were sufficient, since they take place every three months, but they contact the teacher if there is something urgent between these conference meetings. Moreover, one of these mothers believes that sometimes teachers feel the mother blames them, so she logs on the computer and checks her children's progress.

Importantly, some of these mothers believed there were discrimination and stereotypes against Arabic mothers and their children in schools. This finding agrees with Suizzo et al.'s (2008), Martin's (2006), and Jackson and Remillard's (2005) about African-American mothers' feelings, with Jones's (2003) and Bratton et al.'s (2004) about Latino parents' feelings, and with Carreon et al.'s (2005) and Delgado-Gaitan's (1994) about immigrant parents' feelings of racism and stereotypes against them and their children. On the other hand many of these Arabic mothers agree on the fairness and respect that they and their children receive in schools.

In fact, a few of these Arabic mothers did not face any difficulties when they were involved in their children's mathematics education. This finding agrees with Mapp's (2003) that parents feel comfortable when school personnel welcome parents into the school and admire their contributions.

Culture Related Challenges

Mother's Challenges. Many of the Arabic mothers who participated in this study complained about challenges they face related to their culture such as their children

feeling embarrassed by their *hijab* and that students and school personnel looking differently at them. This finding agrees with Lee and Bowen's (2006), Stepanek's (1998), Gillanders et al.'s (2012), McKay et al.'s (2003), Lopez and Donovan's (2009), Civil et al.'s (2005), Yan and Lin's (2005), and Delgado-Gaitan's (1994) about cultural barriers of some parents from non-dominant groups that discourages parental involvement within the classroom. In addition, this finding agrees somewhat with Sy's (2006) that Chinese parents' cultural values imply a clear separation of parent and teacher responsibilities which limit their parental involvement to home involvement only. On the other hand, a few of these Arabic mothers felt they did not face many cultural problems, or face none.

Child's Challenges. Many of the Arabic mothers who participated in this study complained about cultural related problems their children face in school such as discrimination and stereotypes. This finding agrees with Suizzo et al.'s (2008) and Jackson and Remillard's (2005) about African-American parents and their children, with Jones's (2003) and Goldenberg's (1987) about Latino parents and their children, with Turney and Kao's(2009), Carreon et al.'s (2005), Civil et al.'s (2008b), Li's (2006), Delgado-Gaitan's (1994), and Civil and Bernier's (2006) on immigrant parents and their children. On the other hand, a few of these Arabic mothers assert neither they nor their children have faced any challenges due to their culture.

Cultural Influences

Most of the Arabic mothers who participated in this study believed their culture influences their involvement in their children's mathematics education positively since their culture stresses the importance of education, in particular mathematics education.

This finding agrees with Jeynes's (2003) about Chinese parents' great emphasis on education due to their culture and due to the fact that Chinese children are most likely to come from two-parent families, which is similar to Arabic families.

Moreover, a few of these Arabic mothers believed their culture influences their involvement in their children's mathematics education negatively since the mother in their culture has many responsibilities which do not leave them enough time to get involved in their children's education as they hoped it would.

Informing about Culture

Most of the Arabic mothers who participated in this study believed it is important to inform the child's teachers and school personnel about their Arabic culture in order for the teachers and the school personnel to be familiar with it when dealing with them and their children. This finding agrees with Gillanders et al.'s (2012) about some Latina mothers who participated in school-wide events, particularly when it is related to their culture. On the other hand, a few of these Arabic mothers believed it is not important to inform the child's teachers and school personnel about their Arabic culture because they believed that Arabs who live in the United States should adapt to the American culture.

Mothers' Suggestions

The mothers who participated in this study had many different suggestions for teachers and school personnel in order to enhance their educational involvement and build cooperation between home and school such as inviting parents to school and to their children's classrooms, encouraging them to volunteer at their children's schools, welcoming and greeting them, teaching all students about other cultures different from the dominant culture, keeping communication open with them about their children's

academic progress, teaching them new methods in teaching mathematics, encouraging and providing cultural activities, recognizing *Eid*, teaching Arabic language in schools similar to Spanish and French, and offering math support to weak students.

Most of these suggestions except teaching all students about other cultures different from the dominant culture, recognizing *Eid*, and teaching Arabic language in schools similar to Spanish and French, and offering math support to weak students agree with Yan and Lin's (2005), Lopez and Donovan's (2009), Stepanek's (1998), Turney and Kao's (2009), Sheldon and Epstein's (2005), Li's (2006), Muir's (2009, 2012a), Voorhis's (2003), Epstein and Dauber's (1991), Jackson and Remillard's (2006), and Drummond and Stipek's (2004) to ease parents' educational involvement.

In addition to the above categories and sub-categories, the focus group data collection method has resulted in a large quantity of rich data about the nature of Arabic mothers' involvement in their children's mathematics education, which provided me with a clear understanding of these mothers own experiences, challenges, and perspectives in a relatively short period of time. Moreover, the lengthy focus groups discussions and interactions have allowed these mothers the chance to discuss their educational involvement experiences in massive details, and have allowed me to investigate their viewpoints at a deep level. The focus group setting encouraged these mothers to be more open about their experiences, fears, challenges, goals, discussions and interactions created conversations, questioning, and disagreements among these mothers, which enriched the collected data. Furthermore, the focus group setting gave me the chance to read the mothers' body languages that sometimes indicated fear, joy, excitement, agreement, or disagreement. These mothers have given me their own evaluation of the

school system in this country through their engagement in their children's mathematics education.

The Critical Race Feminist theory has placed these minority mothers at the center, rather than margins of the analysis of these groups' conversations, thoughts, and reflections (Wing, 1996-1997; & Berry, 2010) and offered me, the researcher the chance to inspect their race and gender roles within the school system in the U.S. society that has a control of their culture (Carter, 2012). In fact, the feeling they were the center of discussions and the power that this feeling has given them has encouraged them to open up about their feelings of discrimination due to their race and religion, to express their thoughts in details, to say what they think is right and what they think is wrong, and to call for a change in some educational aspects. These mothers felt their perspectives were important.

The Critical Race Feminism theory encourages the inspection of how the institutions such as schools that these minority Arabic women interact with reinforce social inequalities when they become involved in their children's mathematics education (Few, 2007). Moreover, Critical Race Feminists are interested in how education assists minority women and their families (Few, 2007), and are also interested in performing activist research that has a social justice schema, therefore, they choose methods that promote some kind of political, social, or economic change that benefits the people they study (Few, 2007). The collected data contains social justice schema that might benefit minority women since these mothers have called for changes that provide social equality for them and their children in schools. For example, these mothers suggested teaching students about other cultures and religions, encouraging and providing cultural activities,

teaching Arabic language in schools, recognizing *Eid*, presenting the origins of branches of mathematics in order to appreciate other cultures, sending letter to Arabic parents in Arabic, and providing an English-Arabic translator in parent-teacher meetings.

In addition Critical Race Feminism can transform educational policy, curriculum design, teacher education, and more importantly the lives of minority women because these women might face oppression because of their race, gender, class, religion, nationality, sexual orientation, language, age, marital status, parental status, stature, or political beliefs (Wing & Smith, 2005; Wing, 1996-1997). Through their suggestions, these mothers called for similar issues.

Furthermore, the use of Culturally Competent Focus Group has allowed these mothers to consider me, the researcher not s a stranger. They felt I belong to them and to their culture. So they felt comfortable to talk. They have talked freely and told long and detailed stories. Berry (2010) asserts Critical Race Feminism supports storytelling because it helps in understanding multiple positions of persons or groups of persons, particularly the socially and politically marginalized individuals living at the juncture of identities.

Implications

This study could lead to many possible positive results such as increasing awareness and understanding of Arabic mothers' culture, nature of their educational involvement, and challenges they face when they engage in their children's mathematics education. If educators understand the cultural aspects that manage these mothers' involvement, they might respect their values and efforts and enhance their educational involvement by creating opportunities for them to get involved in school activities**.**

Furthermore, the awareness of challenges these mothers face could help in finding solutions for these challenges such as, for instance, reducing language barriers by translating written materials, and proposing programs or workshops that familiarize these mothers and other parents with new approaches in teaching mathematics in order for them to help their children learning mathematics. Moreover, the Arab mothers' suggestions for school personnel and teachers could enhance mothers' involvement and build strong school-parent collaboration.

Recommendations

Mathematics educators need to recognize minority parent's role as vital partners in their children's mathematics education. Rather than perceiving the parents as barriers, educators should view these parents as rich assets for students' mathematics learning. Mathematics educators also need to give minority parents accesses to resources in order for those parents to understand aspects of the new curriculum and to build effective family-school partnerships that consider the parents' culture and perspectives about their involvement and its usefulness in their children's education (Gillanders et al., 2012).

Moreover, it is essential to prepare pre-service teachers for multicultural teaching by requiring them to take a few cultural teaching courses in their teaching preparation programs particularly; the U.S. society is a multicultural one. It is also important to create seminars and workshops to inform in-service teachers about other cultures and how to teach the children of these cultures and deal with their parents including the Arabic Culture. Besides, it is crucial to encourage female students to the mathematical and scientific fields, and to provide higher educational opportunities and scholarships for

female students from cultures that favor educating males more than females such as the Arabic culture.

It is of vital importance for educators to understand minority parents' involvement challenges, and to try to reduce the challenges, in an effort to treat these parents and their children with fairness and respect despite their cultures and languages. Their voices should be heard and counted even if they do not speak English. Moreover, educators need to take minority parents' suggestions seriously and try to offer what these parents feel is important to increase their educational involvement. In addition, educators need to act seriously to stop discrimination and stereotypes in schools against minority parents and their children, and to respect their cultures and values which are parts of their personalities because "one of the most important and effective resources available to a child is his or her family" (Stepanek, 1998, p. 2).

Reflection

I had a pleasant time conducting this focus group research. I enjoyed interacting with the Arabic mothers and learned a lot from this experience; especially as this was my first time to conduct this type of research. Though, arranging focus groups' meeting times was a challenge because of the various responsibilities Arabic mothers had, transcribing focus groups' interviews took an enormous time, and finding enough participants was difficult.

In addition, it was hard to control the amount of time each participant took particularly, a few participants were extremely chatty, and a few dominated the conversations. Furthermore, focus group researchers might need to choose participants who mainly do not know each other in order for participants to feel comfortable to

expose personal details, and might need to ask more participants than the minimum number required to attend each focus group in order to make up for any cancellations.

Moreover, the choice of a culturally competent person to conduct or help in conducting the focus groups' interviews of minority groups might ease the process and increase participants' trust to open up about their perspectives. When interviewing Arabic or Muslim females, I suggest having a female interviewer for many cultural and religious reasons. Furthermore, maintaining a researcher journal during the entire research project was helpful to write personal notes, thoughts, memos, reflect on personal education and experiences, and personal adjustment to the Western society and cultural modification experiences. Doing the latter made me aware of these potential differences between the participants and me.

Additionally, researchers need to actively explore stereotypes about minority groups, examine participants own experiences before coming to U.S. and after, seek to understand their challenges, their lack of knowledge about U.S. systems, and their cultural differences that create many hardships. Thus, before conducting focus groups of a minority groups, the researcher needs to interact with these minority groups and to familiarize her/him with their cultural and religious issues in order to reduce misunderstanding particularly, cultural and religious aspects which are mostly sensitive matters. Moreover, researchers need to understand participants' back ground in areas such as home education, family structures, culture, habits and beliefs they brought with them from their countries of origin shape their attitudes about different aspects of life.

Furthermore, researchers need to be aware of language obstacles and attempt to be able to discuss research questions in details in both English and minority group

language and make sure participants understand these questions in order to avoid understanding complicatedness. Besides, researchers need to give participants enough time to express their opinions, listen to participants carefully, encourage the shy participants to talk, and be friendly and respective of their values, culture, and religious practices. All these can be difficult, but are important goals to strive for.

Suggestions for Further Research

More studies are still needed in this important field since minority parents are one of the most important factors in their children's mathematics education, in particular, the United States society is a multicultural one and the home culture should be taken in account in order to improve minority children's achievement.

Possible ideas for future research in this important field would be a study about the nature of Arabic fathers' involvement in their children's math education, Arabic children's attitudes about their parents' involvement in their math education, math teachers of Arabic children attitudes about Arabic parents involvement in their children's math education, math teachers' understanding of Arabic culture and ways to best support students, or the nature of Arabic mothers' who live in Canada, Australia, Europe, South America, etc. involvement in their children's math education. Moreover, a case study of this research topic regarding participants' experiences or the other suggested topics might be good research ideas.

Summary and Conclusions

Through this focus group study, I have explored the nature of Arabic mothers' who live in the United States and their involvement in their children's mathematics education. Critical Race Feminism theory was used to focus on these mothers' essential

role in their children's mathematics education. The literature has shown parents' involvement in their children's math education improves children's achievement and behavior about education. The focus group interviews of the 18 Arabic mothers has shown the ways these mothers get involved in their children's math education, how their culture influences their involvement, and the challenges they face as a minority group when they get involved. The study has resulted in many themes and sub-themes about this minority mothers' educational involvement. The conclusion of this research study highlights these mothers' attitudes and perspectives about many educational involvement aspects.

In this chapter I reviewed the 10 categories that this study resulted in. Through these categories I showed the nature of Arabic mothers' educational involvement. These categories are 1) Arabic mothers' attitudes towards mathematics, 2) Arabic mothers' attitudes about their educational involvement, 3) Arabic mothers' educational involvement's benefits, 4) types of Arabic mothers' involvement, 5) Arabic mothers' attitudes about some educational involvement's situations and aspects, 6) Arabic mothers' involvement challenges, 7) Arabic mothers' culture related challenges, 8) cultural influences on Arabic mothers' educational involvement, 9) Arabic mothers attitudes towards informing their children's teachers and school personnel about their culture, and 10) Arabic mothers' suggestions for enhancing their educational involvement.

This chapter also states implications about the current study, recommendations to educators to ease minority parents' educational involvement, and limitations of the study

and suggestions for additional research about Arabic parental educational involvement.

In the words of this study's participant, Rajaa,

> Understand and respect people from other cultures, be fair to other cultures, stop the stereotypes to decrease isolation to our kids and decrease trouble between Americans from different origins since we live in multicultural country…. Schools should communicate with Arabic parents, so we don't feel strangers.

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APPENDIX A

INFORMED CONSENT FOR PARTICIPATION IN RESEARCH

UNIVERSITY of NORTHERN COLORADO

Informed Consent for Participation in Research

Project Title: Arabic Mothers' Involvement in Their Children's Mathematics Education.

Researcher: Wafa Yacoub, Mathematical Studies and Applied Statistics and Research Methods, wafa.yacoub@unco.edu,

Research Supervisors: Dr. Maria Lahman, maria.lahman@unco.edu

Dr. Jennifer Harding-DeKam, Jennifer.harding-dekam@unco.edu

With the help of Arabic mothers of school children who live in the United States, I will research the involvement of Arabic mothers in their children's mathematics education. As a participant of this research, I will ask you to complete a demographics questionnaire that will take approximately 5 minutes. I will also ask you questions about your involvement in your children's mathematics education such as ways you engage in your child's mathematics education and problems you face in doing that. The latter will take about an hour and will be audio recorded. Such a study could lead to many possible positive results. One of these results is proposing programs or workshops that familiarize Arabic mothers with new approaches in teaching mathematics in order to decrease barriers between school and home.

In the final report of this study, I will identify each participant by a false name. After the study is complete, I will discard the matching key of the real and false names. All original questionnaires, signed consent forms (this form), and interviews' recordings will be kept in locked cabinet or on a password protected computer to which I am the only one with access. I will strive to protect confidentiality and ask that you keep what is discussed in the group private.

There are no foreseeable risks to participate in this study other than those that are normally encountered in a school setting. You will not be compensated for participating

in this study but your participation may contribute to this research field. You will not be penalized in any way for not participating in this study.

Participation is voluntary. You may decide not to participate in this study and if you begin participation you may still decide to stop and withdraw at anytime. Your decision will be respected and will not result in loss of any benefits to which you are entitled.

Having read the above and having had an opportunity to ask questions, please sign below and complete the demographics questionnaire if you would like to participate in this research. By signing and completing the demographics questionnaire, you will give permission for your participation. You may keep this form for future reference. If you have any concerns about your selection or treatment as a research participant, please contact the Office of Sponsored Programs, Kepner Hall, University of Northern Colorado Greeley, CO 80639; 970-351-1907.

Should you have any concerns or questions, please contact me at Wafa.Yacoub@unco.edu. Your participation in this study is greatly appreciated.

_____	_____
Participant's Name (please print)	Participant's Signature
_____	_____
E-mail address	Date
_____	_____
Researcher's Signature	Date
_____	_____
Researcher's Supervisor's Signature	Date

APPENDIX B

DEMOGRAPHIC INFORMATION QUESTIONNAIRE

Directions: The following questions are optional, but they are very helpful to the researcher.

1- I am in this age category
____ 20-29
____ 30-39
____ 40 or above

2- My religion is
____ Christian
____ Muslim
____ Judaism
____ Druze
____ Other: _____ (Please specify)
____ No Religion

3- My country of origin is _____

4- My Citizenship status is
_____U. S. Citizen
_____Permanent Resident
_____Refugee
_____Other: _____ (please Specify).

5- I have been in the United States for
_____Less than 5 years
_____Between 5 and 10 years
_____Between 11 and 15 years
_____More than 15 years

6- Reason(s) for moving to the United States
_____Political reasons
_____Educational reasons
_____Economical reasons
_____Other reasons (please specify) _____

7- My first language is _____

8- My Arabic ability in speaking and reading is
_____ Excellent.
_____ Very Good.
_____ Good.
_____ Acceptable.
_____ Poor.

9- My English ability in speaking and reading is
_____ Excellent.
_____ Very Good.
_____ Good
_____ Acceptable.
_____ Poor.

10- I have
_____ A graduate degree.
_____ An undergraduate degree.
_____ A high school diploma.
_____ Other: _____ (Please specify).

My major (s) was _____

11- I consider my mathematics ability
_____ Excellent.
_____ Very Good.
_____ Good
_____ Acceptable.
_____ Poor.

12- My education level when I came to the United States was
_____ A graduate level
_____ An undergraduate level
_____A high school level
_____Other: _____ (Please specify).

My major was _____

13- I currently work
_____ Full-time.
_____Part-time.
_____I do not work.

If you work, what type of work do you do?

_____

14- I currently go to school
_____ Full-time.
_____ Part-time.
_____ I do not go to school.

15- My children were born
_____ Before moving to the United States
_____ After moving to the United States
_____ Some was born before moving to the United States

16- My relationship status is
_____Married
_____Single

If married, what is your husband race? _____

17- I am a mother of ____ children, _____ of them are school children.

18- I speak Arabic with my children at home
_____ Always
_____ Mostly
_____ Some What
_____ Rarely
_____ Never

19- My child's age is _____
Child's gender is _____
Child's grade level is _____

My **other** child's age is _____
Child's gender is _____
Child's grade level is _____

Please add more child information if you have more school children.

APPENDIX C

FOCUS GROUPS' QUESTIONS

Welcome everyone to the Arabic Mothers' Educational Involvement research! The following questions are about your opinion regarding your involvement in your child's/children's mathematics education. Your confidentiality will be protected. Your real name will not appear in the final report since your information will emerge under a pseudonym, and what is spoken about here should not be shared outside of the group. I greatly appreciate your honest responses and participation in this research. You may speak in English, Arabic, or both. Please talk one person at a time in order for me to identify your own responses. Please start by introducing yourself.

1- How was your experience learning mathematics?

2- How has this experience affected you or your children?

3- Do you feel that mathematics is useful? Why?

4- How do you feel about the new methods of teaching mathematics?

5- What are the differences and similarities between the way you learned mathematics and the way your children learn mathematics?

6- How do you feel about parental educational involvement?

7- What are the benefits that your child receives when you engage in her/his mathematics education?

8- How do you get involved in your children's mathematics education?

9- How do you motivate your child to do her/his mathematics homework and to talk about her/his math difficulties?

10- How you feel if your child struggles with mathematics? What do you do in such situation?

11- How comfortable are you when your child asks you to help her/his with mathematics homework?

12- How you feel if you do not understand your child's mathematics or you do not know how to help your child with her/his mathematics? What do you do in such situation?

13- How do you feel if your child rejects your method of mathematics teaching because it is different from the teacher's method? What do you do in this situation?

14- How do you feel about asking your child's mathematics teacher for help or explanations? How would you contact the teacher?

15- How do you feel about visiting your child's classroom to observe how the math teacher teaches the math material?

16- As a parent, how do you feel about getting a chance to learn new approaches in teaching mathematics?

17- How do you feel about communicating with your child's mathematics teachers and school personal about your child's progress?

18- How do you feel about mathematics teachers and school personal communications with you about your child's progress?

19- What types of challenges do you face when you get engaged in your children's mathematics education at home and school?

20- How does your culture influence the ways you get involved in your children's mathematics education?

21- What are the challenges your child face in her/his mathematics learning and mathematics classroom due to her/his culture? What are the challenges you face when involved due to your culture?

22- How do you feel about the fairness and respect of the school system and mathematics teachers to your child and you?

23- How do you feel about informing your child's teachers and school personal about your culture? What can you do to help them learn about your culture?

24- What are your suggestions for school personnel and teachers on how to enhance mothers' involvement and build school-parent collaboration?

Questions 4, 5, 9, 11, 12, and 17 are adapted from Van der Zalm (2010). Permission was granted via the following statement.

APPENDIX D

INSTITUTIONAL REVIEW BOARD PERMISSION

UNIVERSITY of
NORTHERN COLORADO

Institutional Review Board

DATE:	July 11, 2013
TO:	Wafa Yacoub
FROM:	University of Northern Colorado (UNCO) IRB
PROJECT TITLE:	[480319-2] The Nature of Arabic Mothers' Involvement in Their Children's Mathematics Education.
SUBMISSION TYPE:	Response/Follow-Up
ACTION:	APPROVAL/VERIFICATION OF EXEMPT STATUS
DECISION DATE:	July 10, 2013

Thank you for your submission of Response/Follow-Up materials for this project. The University of Northern Colorado (UNCO) IRB approves this project and verifies its status as EXEMPT according to federal IRB regulations.

Thank you for the responses to my questions. Your answers were very clear.

Your application is now approved as exempt. Be sure to use all the protocols and scripts provided and created during this review process.
Don't hesitate to contact me with any IRB-related questions or concerns. Best wishes with your research.
Sincerely,
Dr. Megan Stellino, UNC IRB Co-Chair

We will retain a copy of this correspondence within our records for a duration of 4 years.

If you have any questions, please contact Sherry May at 970-351-1910 or . Please include your project title and reference number in all correspondence with this committee.

This letter has been electronically signed in accordance with all applicable regulations, and a copy is retained within University of Northern Colorado (UNCO) IRB's records.

APPENDIX E

INSTITUTIONAL REVIEW BOARD PERMISSION

UNIVERSITY of
NORTHERN COLORADO

Institutional Review Board

DATE:	October 9, 2013
TO:	Wafa Yacoub
FROM:	*University of Northern Colorado (UNCO) IRB*
PROJECT TITLE:	[480319-3] The Nature of Arabic Mothers' Involvement in Their Children's Mathematics Education.
SUBMISSION TYPE:	Amendment/Modification
ACTION:	APPROVAL/VERIFICATION OF EXEMPT STATUS
DECISION DATE:	October 9, 2013

Thank you for your submission of Amendment/Modification materials for this project. The University of Northern Colorado (UNCO) IRB approves this project and verifies its status as EXEMPT according to federal IRB regulations.

We will retain a copy of this correspondence within our records for a duration of 4 years.

If you have any questions, please contact Sherry May at 970-351-1910 or . Please include your project title and reference number in all correspondence with this committee.

This letter has been electronically signed in accordance with all applicable regulations, and a copy is retained within University of Northern Colorado (UNCO) IRB's records.