

*Pushing Into Advanced Mathematics Classes: A Grounded Theory Study  
of Ability Grouping in Middle Level Mathematics Classes*

**CHAPTER 1**

**Introduction**

***Mathematics Ability Grouping***

Ability grouping is a widely debated practice in the United States as well as among educators and parents worldwide. Some researchers have found the practice is detrimental to low and high achieving students (Ballantyne, 2002; Boaler, 2002; Boaler, Wiliam, & Brown, 1998; Camblin, 2003; Oakes, 1985; Slavin, 1990; Slavin, 1995; Stevenson, Schiller & Schneider, 1994; Wheelock, 1992).

International studies like the Program for International Student Assessment (PISA) have found that the practice is largely responsible for achievement gaps in various subject areas (Haahr, 2005). However, other proponents have forcefully defended the practice claiming that it is required to meet the needs of gifted learners or that the literature used by anti-ability grouping researchers is flawed (Allen, 1991; Kulik, 1992; Loveless, 1999; Loveless, 1998).

During the 1990's middle school reform movements recommended a shift from the secondary-styled junior high school structure to one more suited to young adolescents (Mills, 2001; Oakes, et al., 1993). Among other recommendations, middle school reformers suggested that schools alter homogeneous grouping

methods toward heterogeneous groupings (Carnegie Council on Adolescent Development, 1989; Camblin, 2003; Fuligni, Eccles, & Barber, 1995; Mills, 2001; Oakes, J., Quartz, Ryan & Lipton, 2000). These recommendations seem to have been heeded for many school subjects except mathematics (Braddock, 1990).

The size of schools affects student grouping practices. Small schools do not have the number of students or teachers to be able to offer more than one mathematics level but as they increase in size and can afford staffing for multiple classes, many small schools begin to split classes by ability. *Last year we did not have enough students to form ability groups but this year we had more 8<sup>th</sup> graders and split them into a high and low math group.* As the number of students increase, the number of ability group levels increase but this number varies widely. Most schools offer a low, average and advanced mathematics group; however, schools also exist with as many as six and as few as two group levels (at grade level and advanced).

### ***The Problem***

With the more prevalent homogeneously-grouped middle school mathematics classes, the main problem identified by educators and parents concerns the methods by which students are filtered into the various mathematics ability levels designated at schools. Educators struggle to set unbiased criteria that accurately place students into the advanced ability groups. *We are making great efforts to establish criteria in our placement of students into the different math*

*classes but it is difficult.* Educators worry that when parents overrule placement criteria they harm the system. *Placement recommendations have been a problem. Last night we attended a meeting where parents wanted their kids to be placed in level four math.* Parents, on the other hand, who request that their children be placed into high level mathematics classes, find ability grouping filters to be inaccurate, placing children who should be in advanced mathematics classes into unchallenging average or remedial groups. Parents feel that there is a lack of clarity of grouping filters, curriculum and expectations.

*My son exceeded the benchmark but didn't do well on the placement test. He was placed into 6<sup>th</sup> grade math. When I talked to the principal she acted like she didn't believe me and the next week called back to tell me that indeed my son had exceeded the benchmark. I'm not one to push my kids but I want them to progress and not stay stagnant. The grade 6 work seems slow. Out of hundreds of points he has missed about five that included tests, quizzes, homework and journal.*

Middle schools that group students by ability use criteria for placing students into the various mathematics groups. These criteria are usually set by a committee that organizes and establishes filtering criteria. This process is sometimes affected by outside forces along with the committee participants' beliefs, student population needs, and examples from other schools. Once criteria are established students are filtered into various ability groups by educators using the set criteria as well as personal or group judgments. Although a variety of different mathematics class levels may be available, the data are easily discussed in terms of responses to advanced course placement and at/below grade level

placement. For this study the mathematics groups were designated and discussed as ‘above grade’ level and at ‘at/below grade level’. The term at/below grade level was chosen because some of the schools have chosen to eliminate remedial mathematics classes. These schools offer only grade level and above groups. Sometimes these classes are offering higher than remedial curriculum; however educators and parents view this as remedial (or not the advanced class). Whether placement in these classes remains depends on whether the mathematics teacher sees promise or failure in the student and is willing to move them up or down, the child’s parent is satisfied with the placement, or the child’s parents trust the school to make this important decision.

The focus of this study is on how educators and parents continually work to resolve their concerns over the ability grouping filter process. The findings from this Grounded Theory (GT) study reveal how loss of trust affects educators’ and parents’ actions surrounding the placement of middle level mathematics students. The results describe how educators’ and parents’ struggle for control can be in conflict while for others partnerships are fostered to meet the needs of untrusting parents and teachers. And finally, the results describe how educators with children in the system struggle to balance their call to educate their own child and educate all children.

Repeatedly, interviewed teachers talk about parents who push the ability grouping process and student placement thus making placements inequitable. Yet, just as often parents complain that the placement process is inaccurate, unfair and

fails to recognize the ability of their children to successfully learn advanced content. Educators' forces on the student ability grouping process is not obvious in educators and parents complaints however it was readily apparent in compiling the multiple interview data. Just as parents lose trust and begin to take action in their child's mathematics placement so to do educators push the system in accordance with their beliefs about mathematics and student abilities.

## **CHAPTER 2**

### **Methodology**

This study of mathematics ability grouping in middle schools employed the use of classic grounded theory (GT) based on the early work by Glaser and Strauss (1967) and further development by Glaser (1978, 1992, 1996, 1998, 2001, 2005). GT is a qualitative research method (no *a priori* hypothesis). This inductive research method is used to generate theory “from data systematically obtained from social research” to insure that the theory will “fit and work” (Glaser & Strauss, 1967, pg. 2-3). This method is in direct contrast to common logico-deductive methods that focus on confirming or refuting *a priori* theories. GT also differs from many qualitative methods such as ethnography, case-studies, and others as these methods do not generate theory but focus on descriptions of phenomena. Glaser and Straus (1967) reference some attempts at theory generation among qualitative researchers but have found that most of these efforts either do not ground their theories in evidence or they use their data to confirm or refute previously generated theories.

Many studies demonstrate and illustrate the unique advantages that classic GT methodology contributes to both research and praxis, “the practice and practical side of a field of study as apposed to a theory” (Collins, 1986, pg. 1205). GT methodology provides a method for viewing the complexities at work in a focused

environment (Colmant, Schultz, Robins, Ciali, Dorton, & Rivera-Colmant, 2004; Partridge, 1996; Yuen-Sang, 2001). GT also provides a way of finding variables within that environment (Cranton & Carusetta, 2004; Thulesius, Lindgren, Olsson & Håkansson, 2001). Data and variables provide material for organizing the complex ideas into a useable theoretical map (Bookman & Malone, 2003; Stern, 1996). The new theory, grounded in data, may reveal missing, understated, or overstated variables in the literature that have not been grounded in data (Bell & Bromnick, 2003; Bigus, 1996; Glaser & Strauss, 1967; Wilson 1996). These new, more revealing and accurate theories can then transform action (Elkins, 1999; Guthrie & Lowe, 1999; Simmons & Gregory, 2004).

Classic GT was used for this study. It uniquely provided a way to see what was really happening in middle schools with respect to ability grouping students in mathematics. Use of this method aided the researcher in looking for the problems associated with ability grouping in middle level mathematics classes and in viewing how those who work closest with students' work to resolve those problems. The topics that surrounded the problem for this study and the work towards resolution revealed in the schools were then sought in the literature to add to the compiled data. The multiple-sources of data were compared and synthesized into a theoretical map of the main problem and the continued attempts to resolve that problem.

### ***Theoretical Sampling, Subject Selection, and Data Analysis***

GT methodology is cyclical in nature. This process is difficult to organize and discuss as separate categories such as subjects, data collection, and data analysis as these categories are implemented repeatedly through a GT study. For clarity this methodological discussion will include a section that describes the cyclical process of GT followed by detailed descriptions of the subjects, data collection and data

Subjects for this study were not selected using an experimental plan that included a data collection phase or a data analysis phase as they would have been using common quantitative methodologies. Instead using GT all of these phases were done repeatedly over the entire study. For this study the researcher began with a collection of data from teachers via interviews. Each interview was transcribed onto computer file, printed and then coded line by line. Coding was completed by the researcher, who repeatedly asked the following questions: ‘What are this person’s problems related to ability grouping in middle level mathematics class and how is he/she ‘resolving them?’ Codes were written onto copies of the interviews and cut into meaningful chunks. This cycle was repeated following each interview. As ideas and questions occurred to the researcher during each coding session, they were written as memos. After each coding session memos and coded interview statements (which had been separated after coding) were sorted and arranged into possible organizational piles. Memos and organizational piles (early theory development) led the researcher to approach new sources of data that were likely to answer the questions or provide missing information to the theory. Sometimes these data sources included people to interview while others required access to district information or literature. Occasionally data were collected purely because



they were available and meaningful to the developing theory (e.g. data collected from the regional mathematics conference). In all, the cycle of data collection, coding, and sorting processes took five months.

### ***Subjects***

Forty-one subjects who worked with children attending 13 schools were interviewed. Eight of the schools grouped all mathematics students by ability, three grouped grades seven and eight only, and two did not group mathematics students by ability (one of these schools' decision was due to size and one was altered because of a curriculum adoption). Fifteen teachers, three administrators, and 23 parents were asked to share their thoughts and feelings about ability grouping in middle level mathematics classes. Twelve of the 14 teachers taught middle level mathematics classes and two taught 5<sup>th</sup> grade students. All three administrators worked in middle schools. Nineteen of the parents had at least one student in middle school. Although several of the parents had children in elementary and middle or middle and high school, one had children only in high school (ninth and twelfth grade) and two had only children in elementary school (all of these subjects had planned or were actively planning for middle level placements). Seven parents had children in grade level or below grade level classes and 16 had children placed in high-level mathematics classes. Six out of the 18 teachers and administrators spoke of their own middle school aged or older children.

Subjects were first approached through a letter sent to middle schools, including schools known to the researcher. One subject responded to this letter and was interviewed. The remaining subjects were predominantly identified through recommendations (although their schools were also sent letters requesting interviews). The researcher interviewed teachers and administrators known to the researcher. These teachers were asked to recommend other teachers or parents they identified as pertinent to issues surrounding ability grouping in mathematics at their school. The researcher then approached these subjects requesting an interview (by email, telephone, and in person). Another round of interviews began with known parents (approached by telephone or in person). Following the interviews, these parents were asked to recommend other parents, teachers, and administrators who might be interested in being interviewed about the topic. Finally, a few interviews were conducted from casual contacts made by the researcher during trips to conferences.

Theoretical sampling was conducted throughout the study as the categories and properties took shape. This deliberate but ongoing process of collecting data from subjects (people, school sites, and research topics) gathered input that was likely to aid in the saturation of the progressing GT theory. The researcher collected data, coded it, and then made decisions about who next to approach in order to fully develop categories and properties of categories. This process was repeated until theoretical saturation occurred (that is no new categories and properties were found and established ones were repeated).

As the main problem became apparent from the data, the researcher approached administrators, teachers and parents for their perspectives. If most of the interviewed parents had children in the high mathematics group, the researcher sought parents with children in at/below grade level classes for contrast. As parents mentioned others who were actively working towards advanced middle level mathematics placements, the researcher contacted them for interviews. Since the same problem developed among several schools in one part of Oregon, the researcher interviewed teachers from wider regions within Oregon and the Northwest United States. Literature was collected and integrated representing research projects across the United States, Canada, United Kingdom as well as from multi-nation studies; finally, as parents with ties to India, China, Korea, and Mexico were interviewed, the researcher requested information about how students were grouped in mathematics in those countries. Although specific gender, ethnic, and socioeconomic data were not collected the researcher attempted to gather data from a variety of sources, including gender, ethnicity, and socioeconomic status.

### ***Data Collection***

This research project applied for and received Research on Human Subjects permission from the Institutional Review Board (IRB) affiliated with the researcher's institution. All interviewees signed informed consent paperwork that has been collected and stored in methods commensurate with IRB human subjects' anonymity protections.

Open interviews were conducted during data collection as suggested in the GT methodology. Administrators, teachers, and parents were briefly informed of the topic of the project as informed consent forms were signed. If administrators or teachers did not immediately begin to share their thoughts on ability grouping in middle level mathematics, the researcher asked administrators and teachers to discuss their schools' mathematics ability grouping arrangement and parents to talk about their child's mathematics placement and notes were written down by the researcher. Although the researcher had planned questions if interviews stalled, these questions were not needed. Little prompting was required following the initial question except to extend the probing of topics initiated by subjects. Interviews took anywhere from 30 minutes to two hours. The length of interviews were gauged by the interviewees desire to talk.

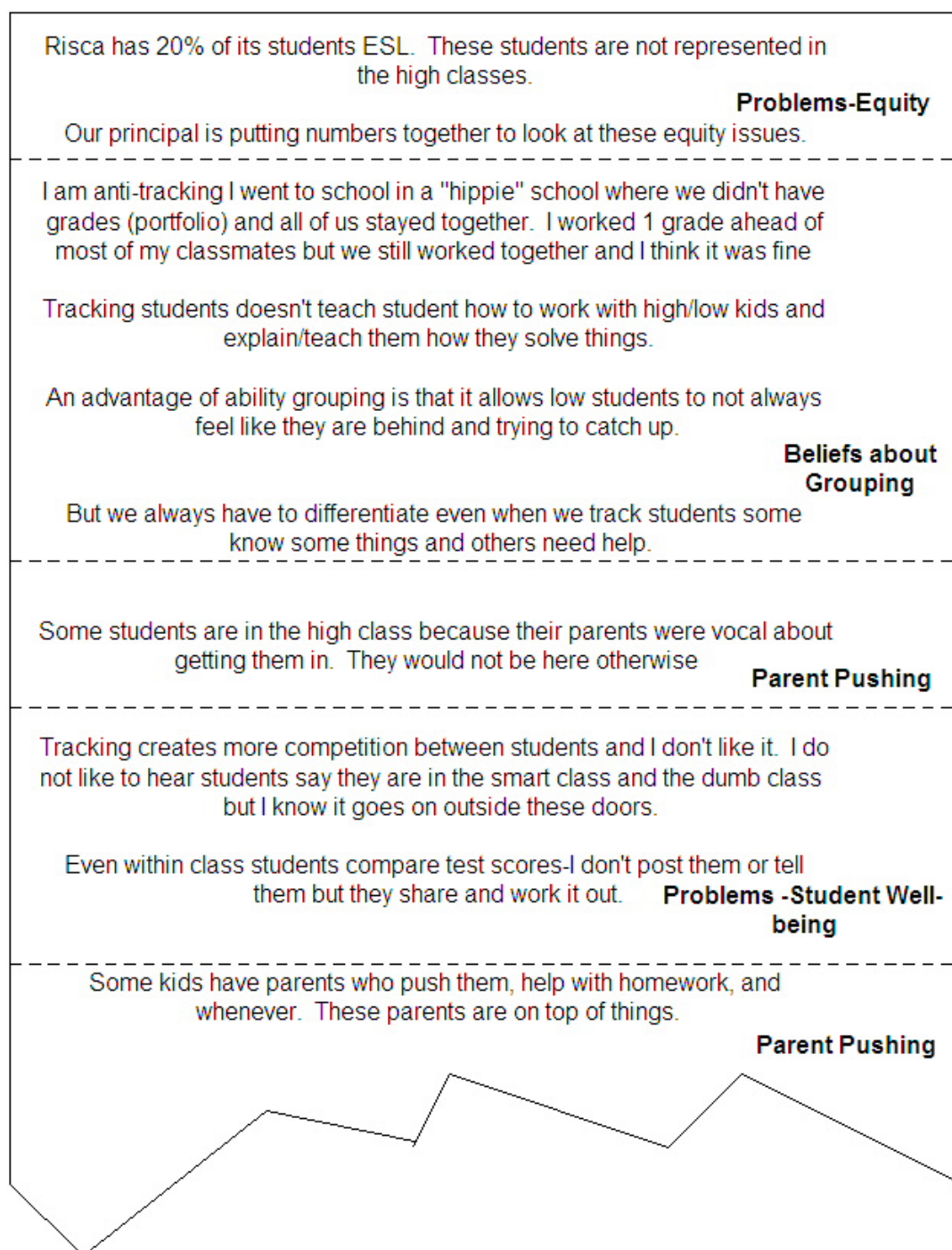
Public domain information from school district websites and information from a professional conference session were collected. Information, such as group levels, filtering methods, and parent recommendation processes, was collected as notes and transcribed as was done with the interview data. During a mathematics teacher education conference the researcher attended a session on student grouping in the heterogeneous mathematics. From this session classroom notes were gathered and follow-up questions were posed to the presenter.

Surveys of the literature related to problems, categories, and properties of categories were conducted. Acquired literature was reviewed and notes prepared. These notes, like the notes taken from the public domain information, were treated as data and included in the process of data analysis.

### ***Data Analysis***

Following each interview, school data search, conference session and reading of the literature, the researcher transcribed and detailed information from notes into computer files. This transcription was completed as soon after the interview as possible. Some transcriptions were completed immediately while others were completed at most eight hours after the interview. Transcribed notes were printed and the researcher coded the interview statements into meaningful pieces (see figure 1). Sometimes meaning was made from one sentence and in others several sentences were needed. Codes were written in the margins beside statements; then, these pieces were cut into strips and sorted seeking meaningful categories, and properties of categories. In early phases sorting focused on finding categories as more data was collected sorting was more often used to develop properties of categories.

Figure 1. Theoretical Coding



At any time during the data collection, coding, cutting, and sorting process, codes and meaningful ideas about the problems and continual solution-making by educators and teachers (as they related to ability grouping in middle level mathematics) were written as memos. These memos were saved, coded and sorted for meaning using the methods described in the discussion of the cyclical nature of GT. The writing/coding and sorting actions were repeated over and over until a main problem became prominent revealing a principle category explaining how subjects continually tried to resolve that prominent problem. Theoretical sampling was used to aide in teasing out the main problems and categories along with the subordinate categories and the categorical properties.

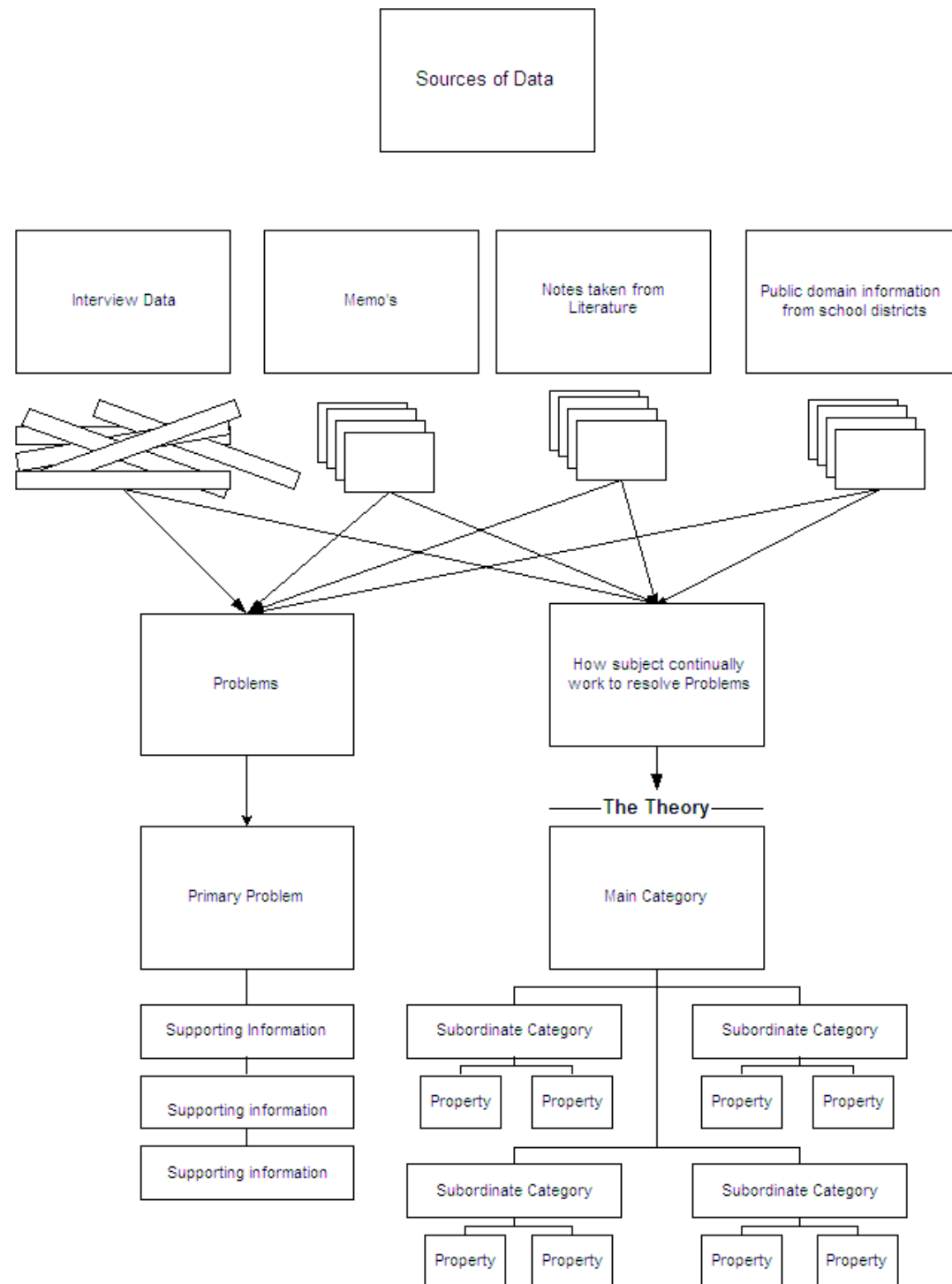
Following repeated sorts of an ever-increasing pile of memos and interview responses, the theoretical framework became stable. In other words, the stability was determined when the data collection and sorting revealed no new facets of the prominent problem or major categories. The researcher's attention and theoretical sampling moved toward saturating one category and its properties until all categories were well-developed and stable. Saturating entailed gathering some additional data (interviews, school district information and literature) but predominant work entailed sorting and resorting data related to each category. This full development and stability termed "saturation" became apparent when new data collection and sorts provided no new categories or properties then had already been identified. The theory was diagramed and detailed to act as support for the primary category. Coded and sorted interview statements served as sources of memos and

quotes to ground the theoretical framework, categories, and categorical properties. Figure 2 provides a model of the process that was followed in the development of the theoretical framework for this study.

Delimiting occurred in the final stages of theory development as the GT methodological literature suggests (Glaser, 1978, 1992, 1996, 1998, 2001, 2005). When the researcher viewed the theoretical map or framework (organization of memos and coded statements) as stable or fairly stable, the theoretical map was viewed and sorted one more time to prune or reorganize categories or properties that did not fit or could be absorbed into other categories. This process was used to enhance the clarity and meaning of the completed theory.



Figure 2. Model for building the theoretical framework using grounded theory methodology.



More than 2500 pieces of data (memos and interview statements) were coded, sorted and organized in the development of this theory. No data pieces were excluded or did not fit into defining the problem or categories. When the process of pruning or delimiting began, the researcher had little difficulty in organizing all categories into the theoretical framework (called, *pushing*). Another prominent problem voiced by parents and teachers was a lack of communication between parents and schools and between elementary, middle and high schools. This problem was, for this study, given a subordinate status and included as one of the reasons for a loss of trust. Because loss of communication is a general education topic and spreads beyond the scope of this study, it required further theoretical sampling outside the confines of this study. As classic GT suggested when two compelling problems or main categories became prominent, the researcher chose one and saved the other for future, follow-up research.

## CHAPTER 3

### Results

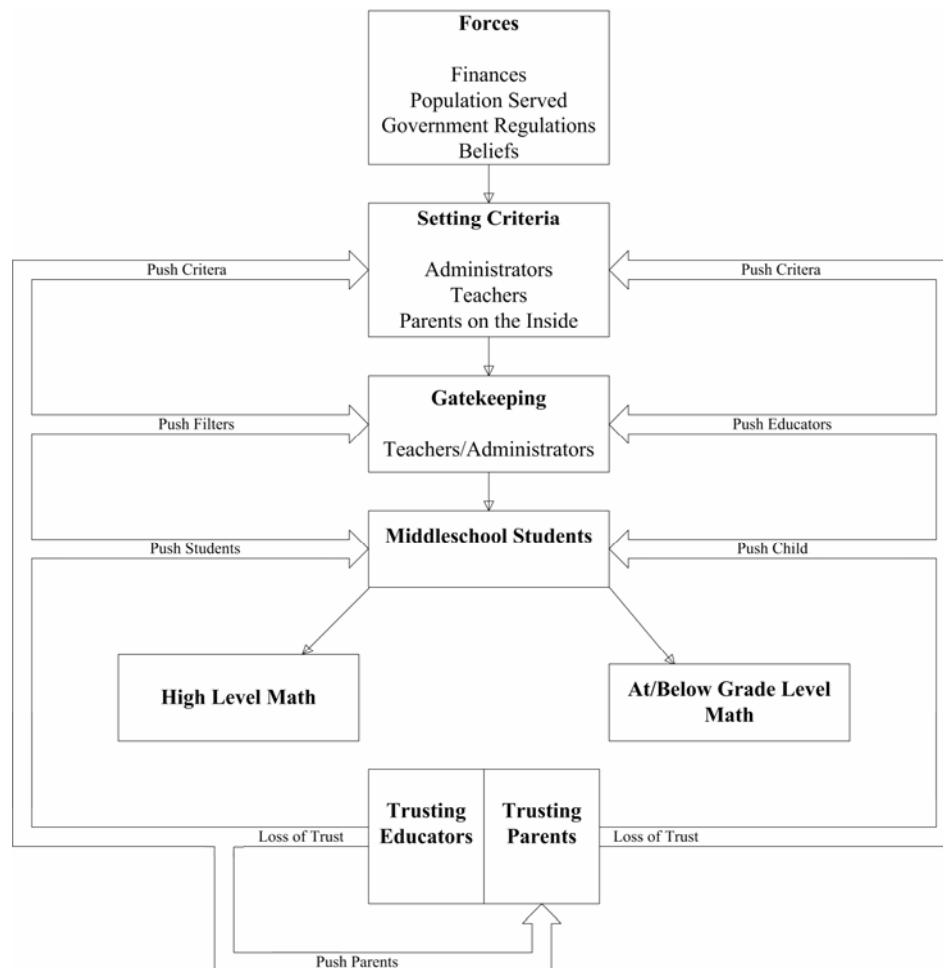
Ability grouping in mathematics is a widely debated practice in the United States as well as among educators and parents worldwide. Through a grounded theory (GT) study of ability grouping in middle level mathematics classes, the researcher identified the main problem for educators who work with and parents who have children in middle level mathematics classes is placement decision-making. Parents and educators struggle with setting, applying and being satisfied with placement criteria used to separate students with high and average/remedial mathematics abilities. Educators' and parents' react to placement conflicts and a lack of trust in a child's school by pushing students, educators, and the school to meet what they perceive are the child's needs. This section contains further description of the process by which students are placed into high and at/below grade level mathematics classes followed by an explanation of the notion of *pushing*, why educators and teachers push and what kinds of pushing occur. In the latter portion of the chapter there is a description of how educators, parents, and educators who are also parents push from different perspectives and in different ways. As stated in the Preface and shown in Chapter One of this document, references to the literature as well as quotes from interviews will be used to illustrate the placement process as well as the various categories and properties of the *pushing* theory.

### ***The Middle Level Mathematics Placement Process***

As students prepare to enter middle schools that group mathematics by ability, middle school mathematics teachers and/or administrators begin a flurry of decision-making. What are the abilities of students who will be entering the school? How many mathematics levels should there be? What criteria will be used for placement? Using interview data and school district data it was found that most schools use very similar processes to design how they will sort students into mathematics ability groups. That method is described in the following paragraphs and Figure 3.

The process by which schools establish criteria setting and student placement methods typically begins when the school or mathematics staff form a criteria setting committee. This committee considers outside forces and beliefs of its members to ultimately establish the criteria by which students are placed into various mathematics levels. Educators use criteria to place students into at/ below grade level mathematics classes. If parents or educators have lost trust in the school to make decisions for children, they begin to push students, educators, and the schools to meet what they think are the child's needs.

Figure 3. Criteria setting and mathematics placement process with pushing forces



### ***Forces***

For some schools grouping criteria are established using a formal process where at others criteria are established more informally. Administrators and teachers usually work together to establish a filtering process. *We have a strong math department as we decided how the student grouping organization would be arranged.* Sometimes parents are included on decision-making committees. These parents are usually drawn from active Parent Teacher Associations (PTAs) participants, school volunteers, or from other school committees.

For some schools, size is an issue. When only enough students are available to create one section of mathematics per grade level, schools often elect to use heterogeneous grouping; however, as soon as enough students are available for two classes, the forces change and become more varied.

Government mandates, such as the No Child Left Behind law (NCLB) or federal mandates to group heterogeneously (Canada), have influenced some schools to switch from homogeneously grouped mathematics classes to heterogeneous groups (Robertson, Cowell & Olsen, 1998).

*Last year we ability grouped students in mathematics and language arts.*

*The change back to heterogeneous grouping in math is due to NCLB.. None of the teachers in sixth grade are highly qualified in mathematics.*

In other situations government pressures such as the NCLB law or yearly high stakes testing causes schools to group students by stricter criteria, working for increased test scores (Oakes, 1992; Wells, 2000; Reay, 1998; Scoppio, 2000). *We group kids this way because the state demands that gifted kids' needs get met and it requires that English as a Second Language kids get met.*

Funding changes can alter the number of mathematics sections and ability grouping criteria is changed.

*Several years ago we had three houses but with students grouped into mathematics classrooms. Budget cuts made it difficult to keep the houses together (couldn't hire enough teachers). At first the math teachers agreed to pull out because we were driving the schedule in the houses-leaving Science, Language Arts and Social Studies to continue to group heterogeneously.*

A lack of funding can affect hiring, buildings and curriculum and supplies purchases.

Beliefs about mathematics and mathematics instruction affect the criteria setting process. Committee members may believe that mathematics is a subject of skill acquisition while others believe that it is predominantly content oriented. (Hallam and Ireson, 2003; Zavenburger, 2002) Some believe that children have fixed abilities and are gifted in mathematics while others believe that that mathematical intelligence can change over time (Archer, 1999; Oliver & Licheveskivi, 1991; Schmidt & Kennedy, 1990).

Finally perceptions about parent/community wishes can affect the process (Oakes, 1985). *I think this grouping method is parent-driven. They found that TAG [Talented and Gifted] kids did not perform as well in heterogeneous classes. Parents complain that their child is not motivated.*

Committee members and educators perceive that attempts to alter or eliminate ability grouping from their school would cause parents of students in the advanced classes to protest and ultimately put an end changes. Some educators have experienced complaints and pressure from parents to keep ability grouped mathematics classes.

### ***Setting Criteria***

No matter how many middle level mathematics classes exist in a school, attempts are made to establish unbiased filtering criteria. The goal is to place students into classes that best meet their ability needs. Filters often include some form(s) of testing, previous teacher recommendation(s), and previous grades. *Students are placed using a district placement test (see district test) and 7<sup>th</sup> grade teacher recommendation or by parent recommendation and a challenge test. Some schools consider students' and parents' wishes openly whereas others feel that student/parent placement choices undermine the filtering process. Some students are in the high class because their parents were vocal about getting them in. They would not be here otherwise.*



Most schools limit the amount of placement slots in their high ability level mathematics classes and some of these schools turn away students who wish to participate in the advanced classes. *Right now we try to place 10% (we drew this number from gifted numbers) into high level math classes. We are really pulling in quite a bit more than this.*

### ***Trust***

When parents and teachers trust the school, the school's decision-making process and the child's teachers, they allow the school to make decisions without interference. Teachers feel they are heard in the decision-making process and, if necessary, they make compromises while also supporting the school in their interactions with parents and students. *The 6<sup>th</sup> grade teachers met and agreed that there needed to be a social skills focus. These students need one more year of self-contained classrooms. The counselors and district office backed the teachers in this belief.* Trusting parents often look at teachers and school staff as professionals who know more about the process than they do and trust them to do no harm to the students.

*I went with the teacher recommendation for my child. I take the suggestions of the teacher. They are the professional. It's like a doctor. I trust that they know what they are saying. If the doctor diagnoses something I will look up what I can on the internet but I will also tend to believe what they say because they know their field.*

Many times trust is maintained because parents or educators are too busy to examine school behaviors too closely. These parents and educators feel that the

current school provides higher quality or more opportunities for children than they were provided. They may value social interaction over academics as a reason to trust the school. These subjects feel that the system meets their needs.

*Many of these kids' parents are juggling their finances, taking care of other kids, and more than one job. They do not worry whether their child is doing his/her homework. They worry that they are being respectful. In this country their children have much more opportunity than they had.*

### ***Loss of Trust***

Events can occur that cause educators or parents to lose trust in the school's ability to make decisions. Students complain about an uncaring or badly prepared teacher; or, perhaps a parent or teacher discovers an administrative or teacher committee decision that is at odds with their own beliefs or not in the best interest of the student(s) that is/are their focus.

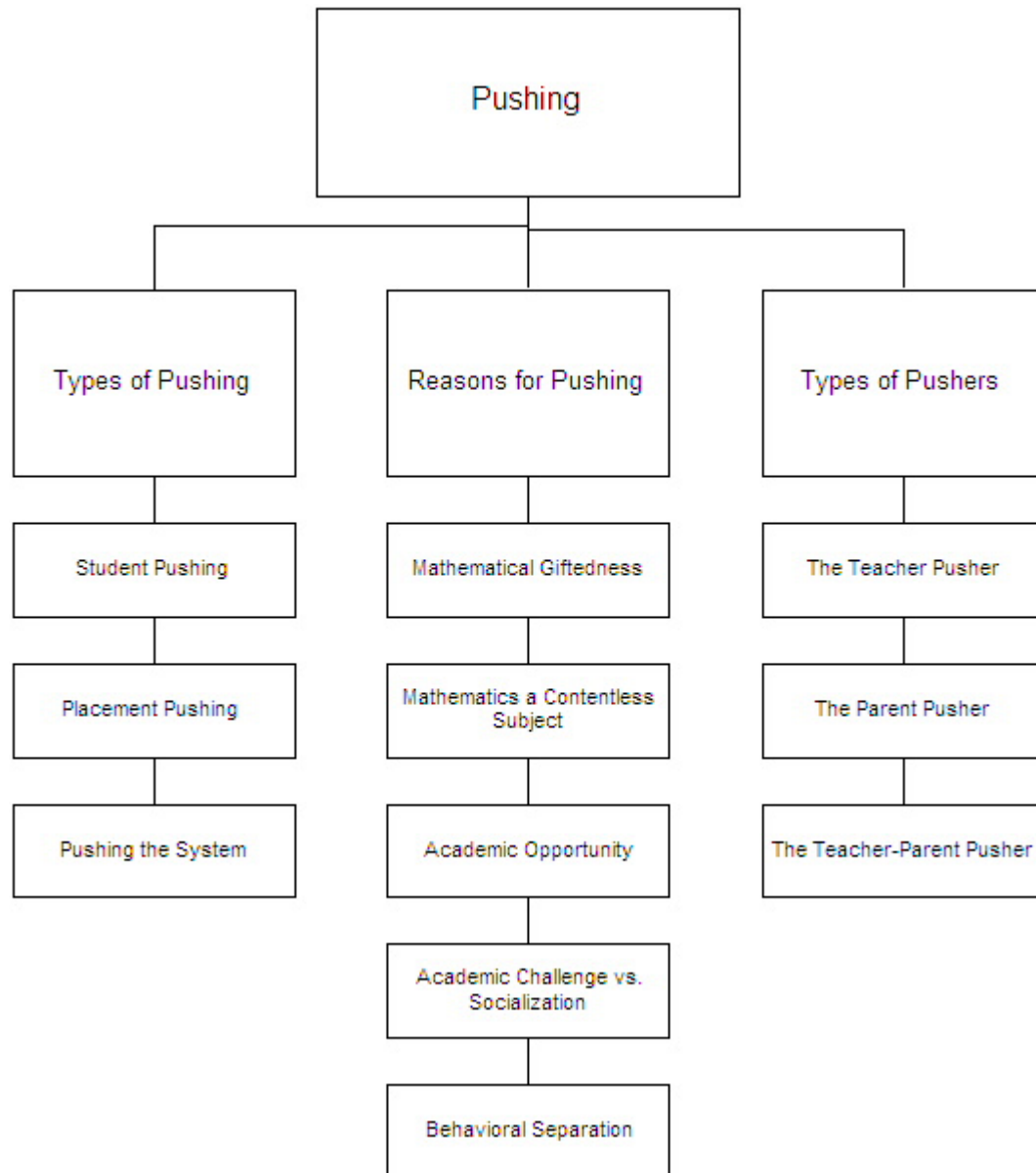
*The counselor after 30 days with this tracking house system came out and said that the plan wasn't working but Duncan refuses to change it. In the beginning the counselors went out and did the legwork to plan but they came back with this plan (I don't know where they found it or if it was a hybrid they made up). At first they were a united front with Duncan but when it was so bad the counselors backed way off and left Duncan holding the bag. This grouping method is socially-biased but now that it is mixed among the teachers you can't tell unless you go into the classrooms.*

Once lost, trust is difficult to regain and in response untrusting educators and parents begin to push the system that they no longer believe can make decisions for them (Tschannen-Moran, 2000; Wells & Oakes, 1996).

### ***Pushing***

*Pushing* is a way for parents and educators to deal with lost trust in the school and in the mathematics ability grouping process specifically. Teachers push the school criteria setting process, individual students whom they see as promising, or they urge parents to push. Pushers push themselves into positions where they can alter criteria setting processes, they push teachers and/or administrators to allow their children entrance into the higher mathematics class, or they push students to insure placement and success. Using GT methodology, this study has uncovered a theory of *pushing* that includes; who pushes, why they push, and what types of pushing occur? Figure 4 represents the model of the theoretical framework termed *pushing*.

The principal category and ultimately the title of the theory (*pushing*) developed from the words subjects used to describe their children/students' needs, the reasons they felt their children/students should have access to advanced curriculum as well as descriptions of the actions taken by educators and parents to gain access to advanced curriculum. This group of words, seen repeatedly as interview notes were taken was '*push*', '*pushing*' and '*pushed*'. Parents and educators said: *these students [perceived as having advanced abilities] need to be pushed*. They said *perhaps these kids were parent pushed*. While others said: *I am not one to push but I want them to progress*. Time again the word push was used.

Figure 4. Theoretical Framework of *Pushing*

As interview statements were categorized and sorted more and more fit under the category of *pushing*. These interview statements described pushing, they fit under types of *pushing*, reasons for *pushing*, and types of *pushers*. Statements that did not fit under these categories fit into the remaining support discussions of how schools group students and how student grouping filters are developed. At times words were used that were synonyms of pushing such as advocated, look out for, supervise, etc. These were sorted into the pushing categories where they fit best. Once the three main pushing categories were found, the data in these piles were sorted, seeking properties. *Student pushing*, *Placement Pushing*, and *Pushing the System* were three properties of *Types of Pushing*. *Mathematical Giftedness*, *Mathematics a Contentless Subject*, *Academic Opportunity*, *Academic Challenge* versus *Socialization*, and *Behavioral Separation* were all properties of *Reasons for Pushing*. The third category, *Types of Pushers*, had three properties, *The Educator Pusher*, *The Parent Pusher*, and *The Educator-Parent Pusher*.

Pushing can be defined as exerting oneself continuously, vigorously, or obtrusively to gain an end or engage in a crusade for a certain cause or person, in essence becoming an advocate for a particular cause or person (Wordnet, 2006). These terms present pushing as a positive action. In theory, educators are the pushers or advocates for students. Parents are the pushers or advocates for their children. So how do seemingly positive notions create conflict? The problem lies in who is deemed deserving of challenging material, all children or specific children? If all children do not deserve access to advanced mathematics content,

how are those children who should get the material selected? Although not a plot or scheme, the school placement system coupled with pushers and non-pushers ultimately create two different educations within the public middle school: One exhibiting and absence of pressures from parents and academically minded educators and the other suffering from an overabundance.

At/below grade level mathematics classes at the middle school often focus on remediation of basic skills and managing poor student behavior (Gamoran, 1995; Mallory & Mallory, 1999). *At the 8<sup>th</sup> grade students took the Algebra test and passed it or use individually-based pullout criteria. Low level students focus on basic skills learning.* Instruction, in these at/below grade level classes is often provided by poorly prepared or less experienced instructors (Boaler, 2002; Oakes, 1985).

Advanced mathematics classes may be primarily influenced by educators with strong beliefs and clout in the school or from parents with prominence in the community. *A parent suggested we add PLATO software to use with some advanced students and I am getting it for these students so that they can start geometry.* Often these programs are driven by both parents and educators (Kohn, 1998; Oakes & Wells, 1998; Spear, 1994; Wells & Oakes, 1996).

A wide range of variety exists between the different highly parent-influenced mathematics education offerings and those with greater influence by educators' at the middle school. What they all have in common is a focus on fast-tracking for the advanced students and slowing down or remediation for the remaining students. *Students who are going into engineering fields need to fast track whereas others don't need it.*

The more influence that parent pushers have in the school the greater the system focus appears to shift to individual students. This shift appears to display a greater disparity and spread of services between student mathematics groups. *Two of the advanced track kids are provided with a bus to the high school so they can take advanced algebra. Well it seems like the really high kids get more money, the low kids get more money and attention but what about the average kids?*

Schools with little to no parent pushing put mathematics ability grouping schemes in place with smaller differences between groups. In educator-controlled situations little to no disparities exist in the funding of groups, along with less incidence of quality mathematics instructor assignment to teaching only advanced mathematics classes. *We have one teacher per grade level and each of us teaches one advanced and grade level class. Although I use the textbook for reference I teach topics from Book one to my grade level class and topics from Book Two to my advanced class. By the end of 8<sup>th</sup> grade the advanced students will be ready for geometry.*

The advanced mathematics classes may include more problem solving opportunities and coursework traditionally considered advanced (Algebra and Geometry). *I like that in the gifted program the kids get to do more simulations and kids get really into it.* In some cases students are encouraged to work independently on advanced computer-based coursework with little instruction from the teacher. *During our first year as a magnet school advanced students were taken down to the computer lab and worked individually on Algebra curriculum.* In extreme cases parents drive students to other schools to attend all their classes with other ‘gifted’ students, while in others individuals are bussed to the high school for only advanced mathematics instruction while remaining at the middle school for other subjects.

*The gifted track was initially supposed to serve 60 kids down at Lodge Hill Middle School but when they started testing them they had doubled that. They opened the second site at Oakfield Middle School. Some of the students with parents I know qualified but Oakfield Middle School was full and they are driving their children down to Lodge Hill Middle School to go there. They said that when both sites are full they will go to a lottery to place kids.*

Academics are the focus in the advanced track where an air of competition prevails.

*He does feel that there is a level of competition and that he’s not smart enough.*

*We offered to let him go back to Highland but he said no.*

At/below grade level mathematics classes are filled with students who do not have their ‘basic skills’ mastered and/or no educator or parent advocating for them. These classes are often focused on remediation; however a growing number



of schools only offer grade level mathematics coursework, reserving remedial mathematics for students in Special Education. Teachers and parents note that there are increased discipline problems in these classes resulting in time off task.

*There were both good and bad things about the grouping last year. The high level kids got more work done but without the high level kids there was a lack of challenge for the low kids. There were also more behavior issues in the low classes even though they were smaller.*

Whether the behavior problems are the result of skimming the academically-advanced from the class or an indicator that classroom behavior is a filter could be questioned (Watson, 1998). The non-pushing educators and parents trust the school to make educational decisions. They are often busy with other projects, earning a living, or focusing on other children. They may not have felt successful in mathematics or school themselves and may focus on social behavior and non-academic needs.

*I would like more information but I have other kids. We do packet checks and they are learning to organize themselves but we trust that their teachers help them through. I think content is important but the teacher's focus seems to be organizing at the middle school.*

In schools where parents trust the school and its teachers, parental pushing does not appear to occur. These trusted schools have clear and strong communication with the community, where grouping criteria and curricula are shared. Teachers in these schools work together and strive for consistency (although teacher pushers may be at work).

*At first this school was a left-behind, bad-behavior school but the principal changed it to an academic school and even sent his children to the school. That said a lot to the community and helped with his earning their trust.*

Although parents may monitor homework, they do not push teachers to move their students into high-level mathematics classes. *Parents contact me about homework and test scores but I have never had one ask me to push their child up into the high group.*

### ***Types of Pushing***

Pushers employ some common strategies to gain targeted student access to high level mathematics classes. These students are pushed to excel by parents at home and by teachers in the classroom. Placement decisions are questioned by parents or educators. They pressure teachers and administrators to move students into higher mathematics groups. Finally programs are implemented or stopped through politicking. One or more of these types of pushing can be employed for any given student and in any given school.

### ***Student pushing.***

Many parent pushers push students by providing them with extra tutoring and providing one-on-one homework supervision. Students may be taken to weekly or biweekly tutor sessions or extra cram style classes such as commercial learning centers. *A lot of the kids in the advanced track have been in school and taking Japanese school classes after school. I even had a parent suggest I take*

*Cinda there.* In these extra classes, students' homework is often highly supervised. Parents spoke of nightly homework sessions helping students' complete assignments, correcting and redirecting students to fix problems and in some cases going so far as to relearn mathematics topics so they can adequately assist their child when needed. *When my son was in 6<sup>th</sup> grade the parent support from the school was lacking. There was no math book. I had to completely relearn Algebra to help him with his homework.*

Although less prevalent, teachers can be thought of student pushers. Sometimes they select specific students for advanced curricula. This selection may be in conjunction with parents during and/or over a school break period or on a one-to-one basis during the school year. *I have two students who are much more advanced than the rest in class. They got tired of always having to teach them how to do things so I let them sit back here at the table and work at their own pace*

### ***Placement pushing.***

Sometimes parents or teachers are dissatisfied with a student's placement. The student may not have performed well on one or more tests. This student may not have performed well in a previous mathematics class or stood out in the mathematics class. Teachers who are dissatisfied with a student's placement communicate with the filtering committee or approach the high-level mathematics teacher to gain access for that student into the high mathematics class. *I continue to recommend students into the high group so they can be challenged.* Teachers who

do not trust the filtering process may both work within the school placement process and also prompt parents to make sure their students get into the high mathematics class. Pushing parents who are dissatisfied with their child's mathematics class placement approach the teacher and/or building administrators and fight for their child's placement into the higher-level class. *My younger daughter did not make the cut off line for math 6/7 and neither did Linda's son so together we went to see about getting our children in that class.* If dissatisfied with the response to their demands, they garner assistance by talking to other parents and if previous teachers have suggested pushing, the parents bring the teachers to challenge for their child to be placed into the desired class. *After he didn't get in I went back to Mr. Bolton and he emailed the school.*

### ***Pushing the system.***

In extreme cases parents and educators act to change the system. Changes may not always be as exclusionary as ability grouping, however the changes always seem to be driven by a desire on the educator's or parent's part to improve the learning for their own child or targeted children. These changes might be as small as pushing for implementation of a new class level to help students transition between grade level and advanced courses, to creating and funding a magnet school. *Because of his brother I pushed for the creation of the 6/7 math class instead of having students jump right into Algebra. I was hoping this 6/7 math would aid in smoothing students' transition to Algebra.* Parents seeking change

position themselves within Parent Teacher Organizations, school steering committees, or as volunteers at the school. *I help every Monday and help in both kid's halls both to get to know teachers and support them.* Educators employ similar political strategies to gain control. They take on department leadership roles and/or take part in district and state level committees. Administrators seeking change rally like-minded parents, counselors and teachers and seek grant opportunities for monetary support.

### ***Reasons for Pushing***

Although not all agree, four strongly supported reasons exist for why pushers want advanced mathematics opportunities for their students/children. Some reasons are related to their ideas about intelligence and grouping while other reasons are based within beliefs about the advantages that advanced placement provides. Many pushers believe that some students have a predisposed gift of intellect or gift in mathematics specifically, requiring the need for personal challenge. They believe that although other subjects can be taught to all students, mathematics is unique and needs to be taught in a linear fashion. Placement into high level mathematics classes provides students with greater opportunities to get into universities, to fast track into advanced placement classes, and to avoid classes with students with personal problems, and poor behavior.

**Mathematical giftedness.** Beliefs that intelligence and mathematics ability are fixed is prevalent among both teachers and parents (Dweck, 1999). Educators and parents with these beliefs feel that mathematics ability grouping is the only way to serve student's needs. *I think there are kids who are just good at math. These kids know who are smart and feel more comfortable at their own level.* Educators and parents with strong beliefs about intellectual superiority have strong beliefs about grouping (Campbell, 1997; Ernest, 1989; Howard, 1995). Many parents of students in at/below grade level mathematics classes believe in fixed mathematics abilities and have a *fait accompli* attitude towards their own child's mathematics placement, often referring to their own lack of ability in school or mathematics. *I was not any good in math; I guess he takes after me.* Many parents and educators from western cultures have strong beliefs about intellectual and mathematics superiority. Parents from this group focus more on pushing for higher placement. Parents and educators from Asian countries (including China, Korea and India), on the other hand, seem to have a greater belief that intellectual and mathematical excellence is the result of hard work and high quality early education. *My daughter works hard and sets goals for herself and works to achieve them. She is not really that smart.* These pushers foster academic excellence by pushing students into quality early

child education experiences, closely monitor schools work, seek out tutoring, and when the school system does not filter their child into the high group, they push the school to place their child there. *In India it is shameful for the family if your child fails. There is always plenty of warning and it is up to parents to get their child tutoring.*

***Mathematics as a ‘contentless subject’.*** Many educators and parents believe that mathematics is contentless: a subject not about gaining knowledge but a subject comprised of skills to be acquired and practiced (Spears, 1994). Parents and educators speak of mathematics as a subject that is sequential with facts or basics that must be mastered before algebraic concepts can be comprehended.

*Math is different than the other subjects. Math is more...you gain skill, you follow the book and waiting for other kids to master skills you have already mastered is not fair but other subjects there is more interaction and having some kids who are leaders and workers is good. If you separate all of the leaders out and put them together that doesn't work well.*

Some believe that problem solving is appropriate for advanced students while direct instruction is necessary for remedial or struggling students. *We are talking about splitting off low students for more direct instruction.* All of the schools who grouped students implied that basic skills must be mastered before acceptance into advanced mathematics classes as they used basic skills examinations for placement; however, at times conflict is apparent between the reform curriculum used and placement examinations. *I think that teachers have stopped spending time memorizing math facts and teaching them to know them quickly but use that as their test for advanced math or not.*

***Academic opportunity.*** Pushing parents and educators feel that placement in advanced mathematics classes is important so that students have access to advanced courses while in high school and have a good chance of attending good universities. Access to the advanced mathematics group provides students with high school credit while in middle school. *By taking Algebra and Geometry at the middle school, she gets high school credit. Getting these mathematics credits out of the way while in middle school frees students to focus on other subjects. In high school he will be able to skip two years of math and focus on more science and then refresh at college.* Some people feel that completing Algebra while in middle school and beginning Calculus in high school is imperative if students are to be competitive applicants when they apply for the university. *If a child does not get into the high track, they will not be able to get to calculus before they finish high school and I think they should as it provides a large advantage when they are in college; thus a child's middle school placement can affect their college life.*

***Academic challenge versus socialization.*** Parents of children in at/below grade level classes as well as educators who believe in heterogeneous grouping in mathematics believe that socialization at the middle school is important and that the benefits of social learning are greater than any loss in academics that might occur as a result of holding advanced students back. Some feel that socialization is more important than academics. *Social abilities you will always need but intellectual greatness is not so important.* Those parents or educators who push value



academics. *My son would slot in wherever if he were in a class with lower expectations and would not push himself. He is being pushed more in the high math class.* Some parents and educators push because they want advanced children to feel challenged academically.

*My main concern is that David feel challenged. I think his current placement is the right amount of challenge. Most of the time he is learning new things and sometimes there are topics that he and the other students struggle harder to learn.*

These parents and educators believe that time spent teaching those students who do not understand or review of topics is a waste of time for the more advanced students. *It seems like the kids who do well become teachers for the ones that don't understand and it's not fair that these kids don't get to learn anything.*

***Behavioral separation.*** Off-task and disruptive student behavior is often associated with at/below grade level mathematics classes. This result is not by design. Schools' filtering processes are intended to separate the academically "extra-able" from the average and below average. However student behavior plays a role in both the selection process and the desire for advanced classes to exist.

*Once placed into the class they are on probation for the first half of a term and their success is judged by the teacher. They may stay in the Algebra class or pushed back to the lower one. A, B, or C is the initial cut off grades as well as behavior and the feelings of the student's parents (how much of a pushover they are).*

Some parents and educators believe that separation into mathematics ability groups improves student behavior allowing the advanced to be challenged and the average and remedial to work under less stressful conditions (Hallinan, 2003). *An advantage of ability grouping is that it allows low students to not always feel like*

*they are behind and trying to catch up.* Often ability and classroom behavior become confused and teachers or parents see promise in students who are precocious or socially outgoing while students who are disruptive or quiet are labeled “unremarkable.”

*I was surprised she got into the advanced track. She has always been very quiet and normal. With her brother it was different. You could tell right from the start he was gifted by the way he talked and demanded attention.*

Poor classroom behavior disrupts the learning process. Pushing parents and educators feel that by separating students into ability groups affords a disruption-free education for those students in the high group.

*Frankly I really didn't pay attention to what math class she was placed in but after the beginning of the school year she began coming home talking about how they weren't getting much work done because lots of students acted out in class. I knew she could do more and if she had trouble I could help her at home so I went to the counselor and got her moved up to the advanced class. She says that things are much better now.*

### **Types of Pushers**

This research has up to this point focused on the many traits that *pushers*, whether they are parents or educators, have in common. There are however, some distinct differences between educator *pushers* and parent *pushers*. Educators are called to provide a high quality learning experience to all students (Mann, 1848; The Department of Education, 2005; National Council of Teachers of Mathematics (NCTM), 2000) At times the pull to focus on students who educators feel are exemplary, cause educators to shift their focus to individual students. Parents' main focus is their child and when they do not trust the school to provide for them focus

on making sure the school provides the best possible mathematics education they can. Some educators are also parents which can create conflict between what is best for all students and what is best for one's child. Parent-educator *pushers* have inside knowledge of the school district's and school's methods of decision-making. With this information some parent-educators become more cautious about how they act but others can make large changes to how schools work. Parent-educators can become conflicted between their call to educate all students and transferring what is best for their child onto their view of students needs. This section discusses those distinctions and how pushers employ pushing techniques slightly differently as a result.

***The educator pusher.*** In the United States the education system's mission is to educate all students. Although no Hippocratic Oath is officially stated as in the medical profession, throughout the system reminders exist of this "unstated and non-formalized" charge. The inception of educational equality began with Horace Mann during his term as Secretary of Education in Massachusetts from 1837-1848. In his twelfth annual report, Horace Mann held that providing a unifying education to all was what separated the U.S. from its European neighbors allowing all citizens freedom from class and all a chance at economic prosperity (1848). Establishment of the United States Department of Education followed with a motto that said: "...to ensure equal access to education and to promote educational excellence throughout the nation" (Department of Education, 2005, p. 1). Continued

challenges and reiteration of these ideals have included Brown versus the Board of Education, Student Busing, Head Start funding, and No Child Left Behind legislation. NCTM also embraced this ideal in their mission documents, indicating that citizens “expect students from all segments of society to be successful in mathematics” and further stating that “all students should receive a quality mathematics education regardless of sex, ethnicity or race” (2000, p. 1).

What does ensuring equal access to education for all mean and what does a quality mathematics education look like at the middle school setting? These points have not been defined by the federal government. A internet search for “educational equity and equitable schools” returned more than three million potential websites while “equitable schools and mathematics” returned almost one million. Many of these websites were coalitions, universities, and professional organizations also struggling with the meaning of equity. The National Middle School Association (NMSA) recommends that middle school students be grouped in heterogeneous classrooms; yet, a joint statement with the National Association of Gifted children (NAGC) holds that gifted students need advanced content access and socialization with “like peers” (NAGC, 2005; NMSA, 2001). Although the two agree that they have made a joint statement on each of the websites, the statements, on each site look and are discussed differently. NAGC states that heterogeneous grouping is preferred whereas NMSA makes no such statement (NAGC, 2005; NMSA, 2005), The Council of Chief State School Officers (CSSO), 1998, protests

separation by ability, instead providing materials and professional development materials that can be used at middle schools switching to heterogeneous grouping strategies. Although NCTM does not take a stand on whether equity means homogeneous or heterogeneously grouped mathematics classrooms, they have a mathematics standards document outlining quality mathematics content and instruction (NCTM, 2000). However, the positions have elicited dissention between mathematics educators, mathematicians, and the public (Becker & Jacob, 1998)

Typically, administrators, counselors, and teachers commit to the concept of education for all when they assume the task of public school teaching. However, just as researchers do not agree on what the concept means, educators have differing interpretations of equity in middle level mathematics (Secada, 1994). Some educators feel that restraining an academically advanced student because his/her peers are not “ready” to move forward at the same rate is unfair.

*We owe ability grouping to all kids in math because math is so sequential some kids are able to move faster while others need more time to learn. Kids in the higher class can go through chapters 1-5 in the same time that others can only learn chapters 1-3.*

Some educators believe that, although in most subject areas all can benefit from learning together, mathematics is different. Others believe that although students in elementary school benefit from heterogeneously-grouped classrooms, at middle school grouping by ability is necessary because *as students get higher in grades the spread of ability creates needs that are increasingly difficult to meet.*

Educators exist whose experiences have caused them to believe that heterogeneous grouping in mathematics is preferred. Some of them have personal experiences that have caused them to reject homogeneous grouping because of its flaws. *When I was in school I accidentally filled the bubbles out incorrectly and got placed into the low group. Although I was misplaced and it was obvious, I remained there.* Other educators have had positive experiences with heterogeneous grouping methods.

*I am anti-tracking I went to school in a hippie school where we didn't have grades (portfolio) and all of us stayed together. I worked one grade ahead of most of my classmates but we still worked together and I think it was fine.*

Sometimes, educators lose trust in their school. If they perceive that the school goals, ability grouping systems, curriculum, or administration do not match their idea of an education that is in the students' best interests, they will work to change those issues. *The year that students were grouped heterogeneously made me think that I needed to advocate for my students who were going to the middle school.*

Untrusting educators may work through school channels or when this technique is not an option, they work to control the problematic issues in their own domains. Some educators join school steering or criteria setting committees. Some work to get students they perceive as promising into the high mathematics group, some alter teaching and organization in their own classroom while others urge parents to make sure and their child is placed in the high group next year. *My son's*

*fifth grade teacher told us at his spring conference to make sure he was in the high math group.*

Many schools are organized (some to a greater and lesser degree) so that educators have a great say in the decision-making process and succeed with arguable effect. (Odden, 1995). The criteria setting decisions for mathematics class levels and filters at the middle school is most often made by educators. Sometimes administrators take an active role but, most often, teachers are left alone until someone or something creates enough controversy to bring in outside influences (parents, administrators or school officials). Some of these groups work formally, carefully examining assessment scores and curriculum to establish the ‘right’ number of mathematics levels and filtering process.

*Our committee has worked and continues to work on setting strict criteria for who goes into advanced mathematics classes. Right now students are placed into 6/7 math class using State assessment scores, a placement test, Gifted education or not, and grade 5 teacher recommendation as well as grade 6 teacher judgment at beginning of year for movement.*

Others create loose criteria driven by one strong-minded teacher without protest by the others or they design courses and filters that fit somewhere in-between the strict and loose criteria. *Students in 7<sup>th</sup> grade remain in those groups but in 8<sup>th</sup> grade one teacher wanted to group students into high/lower levels and [this] has been done.* Teachers feeling strongly about grouping often participate in decision-making committees, or use political means to convince fellow group members to follow their wishes.

Teachers who lack the clout or will to make policy changes control the system in their own domain. *They are talking about switching to heterogeneous grouping here. I disagree and decided I could no longer remain as Department Chair. If they do it I think I'll have to move back down to the elementary school.* These teachers might ignore curriculum mandates, incorporating the teaching methods and topics that they believe are best for student learning. They may offer advanced curriculum to students in their classroom and for work at home. *I don't think this new curriculum provides enough computation for students to be successful but the district says stick to it. Accelerated math provides the computation these kids need.*

Pushing teachers who feel strongly about ability grouping and the mathematics ability of their students may sometimes act as informers to parents. When these teachers see promise in a student, they urge parents to push for advanced course offerings or warn them to push for their child's advanced mathematics placement for the next year at the next school level (middle or high school).

*We have had some problems with gifted students who want to move into level 4 even though that is the middle of the curriculum. I think the problem is due to a gifted education teacher who does not have any idea of how our school grouping system works and how the curriculum is taught (there is a lack of communication with the elementary schools).*

These urgings often occur during teacher/student conferences or to volunteering parents during preparation times or after school. *During Grace's spring conference Mrs. Kitchin told me to make sure Grace was placed into the high math group at*



*Oakfield Middle School.* Pushing teachers take these actions because they are concerned for students they have identified as promising. They worry about reduced expectations because the students from the feeder schools to these middle and high schools are more diverse and in many cases serve students from low income homes.

*Downs Elementary is a bit easier because our low students aren't as low as some other schools and there are fewer of them. Oakfield Middle School needs to accommodate much more low achievers than does the Downs Elementary School.*

Teachers who push may single out students who they feel are promising and provide them with supplemental mathematics work or different assignments than those assigned for the other students in their class. *I provide challenge activities for kids who are interested but not as an add-on. I replace something with them. I also sometimes have parents come in and help individual kids work on say Algebra during our literature block.* They may encourage them or pave the way for them to move up into higher mathematics classes.

*We just moved a kid up to pre Algebra who bounced because he was misplaced. He has a special-ed (IEP) in reading but the student does just fine at least in math. He says he can read just fine and that they wrote the IEP back in fifth grade. Because of the IEP he has to always be in a classroom with an educational assistant even though he never uses the aide. It took a long time to figure out his schedule so he could get special-ed service but also go into PreAlgebra where he belonged. (There is no sped kids in the high track) so he is only in math with the high kids and then goes back to us for his other classes.*

In some cases the teacher may, with parent support strike bargains with students in order to garner advanced placement for the next year. These deals often

involve assigning students work to complete on their own or over the summer.

*My 8<sup>th</sup> grader was placed in regular math. She began to complain that she wasn't being challenged in 7<sup>th</sup> grade math. Her teacher believed in her and said she was capable of more but hesitated to move her up at that time into Algebra. She offered to send her home with the Algebra book over the summer. My daughter completed the first six chapters (we worked together every day for the summer and completed those chapters) and started Algebra B in the fall.*

***The parent pusher.*** Parents are concerned with issues of equity. They worry about the students who do not have parental help. *I often wonder how students' who do not have a parent who helps them and works with them does in class.* Parents see news stories about the issues around the No Child Left Behind legislation. *I was just reading about this No Child Left Behind stuff and it seems like with every class, program, and year more and more kids are being left behind.* These parents are concerned with a lack of communication between middle school and home (Mistretta, 2004). They worry that children from non-English speaking homes and homes of poverty do not have the same access to learning that their own have. However they are not sure that the ideals of 'education for all' really work. *I have empathy for these kids and I am liberal. I believe in public education and the concept of mixing students to pull up the low but I'm not sure if it works. It's kind of like communism. I'm not sure the human spirit rises. If you do too much everything is dumbed down.*

Ultimately parents are mostly concerned about their child's/children's educational opportunity. As long as they feel that their child is placed correctly and

that they are learning what they think they are supposed to learn (that is, making progress and not becoming frustrated at home over homework that is too easy or difficult) then they are satisfied enough to trust the school.

Events can occur that cause parents to become distrustful of their child's/children's school. These events can be perceived ability-level misplacement, rumors from other parents or teachers, lack of school communication or student complaints about homework or a teacher. In some cases, distrust occurs over time while in others it stems from a specific event. Parents who lose trust in the school's ability to make decisions for their children begin to advocate for their children. This advocacy might mean that they begin paying closer attention to the work coming home. Advocacy might take the form of increased contact with teachers and/or administrators. When concern is over academic opportunity in mathematics, parents go to teachers and administrators requesting that their children be given advanced coursework or class placement.

*For my daughter we trusted the system and she was placed in tag high math right away but in 7<sup>th</sup> grade she wasn't so happy. She had some trouble with the teacher. All of her grades were ok. In grade 8 she came home asking if she could take high school geometry. We talked to her teacher and she said she couldn't because she hadn't finished algebra yet. We asked if she couldn't take both the algebra and geometry at the same time. The teacher said she didn't have time for really bright kids like Meghan. This made me think I really needed to go to bat for her. She took the class and did quite well keeping up on her own in both classes. She is now in AP Calc (Advanced Placement Calculus) and is doing quite well.*

Some parents feel so strongly about meeting the needs of their children that they advocate for them by positioning themselves into the school and/or onto

committees in order to have opportunities to influence the mathematics courses offered, the curriculum, or the filtering process. Teachers talk about parents who demand courses or allow parents to teach their child advanced curriculum while the others learn something else. *Last year we had a mom come to the school to teach her daughter geometry during math time.* Parents may volunteer at the school or work on committees to garner influence over course offerings. *I feel that it is the parents' job to advocate and use the system to your own kid's advantage. I'm blessed that I'm at home and can be seen at the school to do that.*

Parents who push their children value academics and foster that value in their children. Many middle school parents closely monitor homework, correcting assignments and aiding their children in corrections before they are submitted. When parents do not know how to do the homework with their children, they may relearn that material or send their children to a tutor for extra help. In some cases careful consideration into what training provides the best competitive opportunity for their children and preschool, extra tutoring, and elementary programs are deliberately selected and balanced.

*One of my friends sent off for Chinese curriculum in mathematics and other subjects. She has taught them at home after school each day in order to make sure they get into the gifted track program. Her daughter is now taking Pre Calculus while in 8<sup>th</sup> grade. She says I should do the same but I'm not sure if that isn't too much pressure.*

When efforts at pushing the student fail to work in garnering placement in the high mathematics group or if parents are strong believers in the innate

intelligence of their children, pushing parents meet with teachers and administrators to gain placements for their children into the high mathematics group. At these meetings teachers or administrators often explain why the children were not placed in the high groups, sharing test results with parents in an effort to dissuade them from their intentions. In most cases the parents wishes are honored and the students are placed into the high mathematics group either permanently or on a trial basis. *We had a parent meeting and the solution, to please parents, was that students were allowed to take level 4 but prove their ability to keep up.* Parents, once knowledgeable of the system, often then inform other parents of the benefits and their ability to garner placement for their children into the high mathematics group. This information perpetuates and spreads the phenomenon.

*When I talked about with the other parents that he hadn't got into the high math group they suggested I put in a change of schedule request and planned go to the principal As soon as possible to get him changed. One of the moms that I knew from Downs Elementary (with an older son in the high math class) said we should go together. Her daughter did not get into the high math class and she wanted her in too.*

***The parent-educator pusher.*** In many cases educators are also parents and as educators with children they are pulled by their educator's priorities. What was once an alliance towards following what is best for all students becomes conflicted with what is best for the educator's child. Many times educators' ideas about what is best for all become bound with what is best for their own children. *If my children could not pass the problem solving exam how can I expect these middle school students to pass it?* As with educators who lose trust in their school's

decision-making capabilities, educators who have children take two paths. Often the difference between educator who do not have children and educators who do is that the needs of all students are viewed through the filter of the educator's own children's needs.

Educators with this altered view and lack of trust either become active in changing the system to best meet their children's best interests or they make a conscious effort to not push the system. Advocating educators and parents fight for new curriculum, magnet schools, or advantageously changing the student grouping process. *The reason we currently group students in 7<sup>th</sup> and 8<sup>th</sup> grade in tracks is because the principal's sons are still here. When they move up to the high school, he will change it back.* The non-confrontational educator-parents may not act on behalf of their children but the loss of trust alters their ideas about curriculum, student grouping, and how schools should work for all students; however, these actions are reflected through the filter of their own children's needs.

*When my daughter reached 8<sup>th</sup> grade she was ready for geometry but the high school would not take students who were still in 8<sup>th</sup> grade just for math. We did not have enough who were ready here. I didn't push it because I did not want to be the "ugly parent" like you hear so much about. I think it's not fair to hold kids who are ready for advanced work back with students who are not.*

Pushing educators who are also parents (educator-parents) have more knowledge of the system than either a parent alone or a teacher with no children has. As a result a pushing educator-parent may position themselves on committees or even in the district where they can make real change to the system. Often the

drive to change the system is to make the school system a better place for their children to garner the kind of education that they consider meaningful. Sometimes the changes made by educator-parent pushers is positive for all students while in others the changes are exclusionary to some but in the best interests of their own children.

*Nichole might have initially gone after the money and begun this magnet school because her kids were going into sixth grade but the benefit has been for all the students. We have heard how our kids are doing at the high school and they are doing great. They are school leaders and have great grades. I think all of the attention and praise they got here gave them confidence that they would not have gotten at the other middle school.*

Using GT methodologies a theory of *pushing* in middle level mathematics classes was developed. The results from this study have included a description of how mathematics ability grouping filtering systems are established, as well as the theory developed from the ways that educators and parents continually work to resolve the main problem found in the data. Some parents and educators are conflicted over how students are selected for placement into advanced mathematics classes. Some educators and parents who have lost trust in the system begin to push the ability grouping system in order to garner advanced mathematics placement for their children or children in whom they take an interest.

Ability grouping filters are sometimes formal processes while at others informal, however all of them include some process of criteria setting that has been

affected by outside forces or beliefs about mathematics and mathematics education. Once set, ability grouping criteria such as testing results, teacher recommendations or parents' requests are used to 'objectively' place students into the mathematics group that is best suited to their mathematics abilities.

Educators and parents who have lost trust in teachers, the school, or education begin to *push* students, other educators or the system in order to garner advanced mathematics learning for their children or children in which they take an interest. *Pushers* act because they believe intelligence or mathematical abilities are fixed, that mathematics is a contentless subject, or that students need advanced curriculum in order to have successful futures. *Pushers* may push students into high mathematics classes so that they can avoid being in classes with misbehaving students.

*Pushers* push students to do homework, or learn extra school work so that they can gain entrance into advanced classes. They push educators or parents to get children moved into advanced mathematics classes. *Pushers* position themselves into schools and onto committees to influence changes to ability grouping criteria and/or curriculum and course offerings.

Educators and parents sometimes have different knowledge of the school and different motivations. Their relative positions create slightly different pushing strategies. Educators and Educators who are also parents sometimes act in conflicting ways to the tenant that the focus should be on, education for all,



whereas parents' foci on their own children cause them to act without regard to the consequences to children of *non-pushing* parents. In all, this theory of *pushing* includes the different aspects of pushing, why educators and parents push and finally who pushes.

## CHAPTER 4

### Discussion

A preponderance of data pointed to conflict over which students deserved to be placed into higher level mathematics classes. Some educators feel that many students are being placed into advanced mathematics classes that should not be. However a group of parents and educators have lost trust in schools' abilities to make decisions for children. These parents and educators work to insure advanced placement for children who they see as having advanced abilities.

The way that some parents and educators reacted to the placement conflict was organized into a theory termed *pushing* using grounded theory (GT). Depending on the subject's knowledge of the school, the level of trust towards the school, and finally the subject's relative position in the school, educators and parents push students, parents, educators, and the system. This pushing garners access to advanced mathematics learning for their children or children they take an interest in.

#### ***Problems with Pushing***

Although *pushing* is in itself is a way that many educators and parents continually worked to resolve the ability grouping in mathematics placement dilemma. New problems occur as a result. These problems relate to privatization, the achievement gap and student well-being.

### ***Privatizing***

Non-pushers trust public schools to be public with equal access for all despite the reality that equal access is not occurring. Some parents are aware that others push the school to gain access to the advanced mathematics classes for specific children and choose not get involved (or take part themselves) while most are unaware and trust the school to do what is best for children. *I'm not the type to push. I had friends' parents who went in and pushed to get their children into high math.* Most non-pushing parents are not aware of what mathematics ability group their child is in, nor do they know what curriculum their child is learning or what mathematics classes their child needs for high school success or college entrance. *There is not much communication between the school and home. We do not know exactly what classes she takes or what she is doing in them.* These parents do know whether their child's homework is getting done and their grades since the schools make an effort to provide that information.

*We don't really get information like I think we should but her math teacher is really good at keeping up and really good at keeping us up to speed at where our student is and missing work.*

Non-pushing parents want more information about the school, the curriculum, and the teaching strategies but do not actively seek it.

Pushers know what mathematics classes children need to be successful in high school and many know what mathematics courses are needed to gain entrance into good universities.

*I want my son to have a shot at a good four-year college. He needs to have calculus by high school without high school calculus and only Advanced Algebra II it will limit his university options like Stanford or Yale, and scholarships.*

Pushing parents know exactly what mathematics class their child is in and what classes they could be in (both lower and more advanced). Most pushing parents at least have a basic understanding of the curriculum their child is using and many supplement this with extra work.

*My younger daughter likes the Connected Math so far. I think its partially because her personality is different but also it might be because she had the experience at the elementary school with more problem solving.*

These parents know their child's daily assignments, they sit down with them and make sure they are completed and monitor whether they are being submitted. *My husband corrects her homework every night and helps her fix it.* Despite the fact that these parents do know quite a bit more than non-pushing parents, like non-pushing parents, they want more information about the school, the curriculum, and the teaching strategies. The difference however is that pushers actively seek information while non-pushers do not.

The result is that those with the most knowledge garner the most power over decision-making and when pushers have decision-making power they use it to improve the mathematics education for their child or children in whom they see promise. *I feel that it is the parents' job to advocate and use the system to your own kid's advantage.* In extreme forms pushers control the creation of advanced

courses so that their children or children of their choosing can benefit by them. In this educational setting, a small number of people (*pushers*) control what kinds of advanced mathematics programs are offered and who gets into the few available places in the programs. *One teacher wanted to group students into high/lower levels and that has been done.* These pushers may then select the students (usually their own or those in whom they see promise) who will be given access. *I prefer ability grouping but it changes every year. I know where these kids are.*

Although most people do not look at public education in its current form as private, for many students placed into advanced mathematics groups, private education is what is happening. Pushers may have formed the advanced class so that their children can take part. Pushers may not have formed the class but does push to get placement criteria implemented that allows their children entrance or a selected student entrance. Pushers might not have great influence on course formation or filtering criteria but they will, when excluded from the class, push those in control (sometimes pushers as well) to allow their children or selected students access to the class. Finally, at the minimum levels of *pushing*, the pusher exerts pressure on specific students in order to insure placement in advanced mathematics classes in the future.

As a whole, pushers ultimately influence all children's education when they make and push through decisions for their children (or a child they see as promising) in ways much like parents influence private schools (Benveniste, Cornoy, & Rothstein, 2003). For some reason the public schools or districts allow

pushers frequent success. Obviously, with the public school system, the influences are not heeded for fear that parents will take their tuition money elsewhere by moving their students to other private or public schools. *Parents are quite vocal about this school meeting their needs. Last year we had one parent who pulled her child out and taught her geometry because we did not offer it.* This phenomenon, sometimes termed ‘white flight’, actually reflects the phenomenon of high and middle class parents moving students into schools serving students also of middle or high socioeconomic status (Frey & Leow, 2005). Some researchers have suggested that prior to school choice legislation this phenomenon occurred by middle and upper class parents moving into school catchment areas serving students from predominantly white, high socioeconomic homes. Since school choice legislation, school selection has become theoretically easier and available to all students without requiring parents to move, however choices remain as predominantly made by parents who earn middle to high incomes (Lucas & Paret, 2005).

The result and problem of this privilege for the few who know the ‘hidden curriculum’ is that the majority of parents who believe that their children are receiving equitable public school mathematics educations are not. Non-pushing parents and educators do not know that students who do not complete algebra by 8<sup>th</sup> grade will probably not be able to take any calculus before they graduate from high school. They may not know that basic skills mastery plays a large role in the placement filtering process. Non-pushing parents do not know that they may be

able to move their child into advanced mathematics courses by asking. They do not know that their child may be excluded from the advanced mathematics class because a pushing parent has requested placement for their child and ‘cut in front’ of their child for placement.

### ***Achievement Gap***

According to the Programme for International Student Assessment (PISA) (2003) and the Trends in International Mathematics and Science Study (TIMSS) (2003) results, students’ mathematics achievement in the United States is average at best. Both PISA and TIMSS found that this level of achievement is because students are not provided with access to meaningful mathematics content (too much review and focus on computation). PISA results further indicate that the United States suffers from large achievement gaps in mathematics performance; that is, there is a large gap between the highest performers and the lowest performers. Unsurprisingly these gaps are linked to both across-school performance and within-school performance suggesting differing expectations of students depending upon the school catchment area in which they live but also among groups of students within schools. While the blame for the problem is directed toward socioeconomics or race, other countries with poor and minority students have much narrower extreme gaps. In countries with the smallest achievement gaps, inclusive strategies as well as meaningful content are employed to produce higher student achievement. In fact some of the highest performing schools in the world employ

inclusive strategies in mathematics (Organization for Economic Cooperation and Development, 2003; National Center for Education Statistics, 2003).

This national problem was evidenced in the middle schools included in this study. All schools with significant racial and socioeconomic differences among student body readily admitted that the poor and minority students were in the *at /below grade* level mathematics classes whereas many of the white, high socioeconomic students were either in advanced classes or fighting to be placed in limited placements for the advanced classes. *Highview has 20% of its students in ESL. These students are not represented in the high classes. Our principal is putting numbers together to look at these equity issues.*

In one school some parents voiced concern that Asian students (from India, Korea, China, and Japan) represented a preponderance of the students gaining access to the gifted track (students are tracked in all subject areas). *I've looked in the gifted track class and it's filled with Indian and Asian students with only a few Anglos.*

### ***Student Well-Being***

Both pushers and non-pushers voiced concerns over the social problems associated with ability grouping. Educators talked about problems with competition in the high mathematics group and hallway conflicts between students from low and high mathematics groups exchanging insults over their relative placements. Research indicates that there is a growing problem of stressed out high achiever while other researchers have found that parents have a great influence on



students' success at school. These researchers indicate that low achieving students need to be pushed.

Parents with students in the high mathematics group spoke of children being ridiculed for excelling at academic competitions or focusing on academics.

*Some of the lower ability kids make fun of the gifted track kids and call them geeks and threaten to beat him up. He feels that and worries about it. One of his teammates wanted to bring in the big trophy they got at the Lego competition and my son did not want to go to school because he was embarrassed. This other student embraces his geekdom.*

Conversely, parents of students in the *at/below grade* level mathematics classes complained of students in the advanced mathematics groups making fun of their children's inability to perform good enough to be placed in the advanced mathematics class, thus being left in the *dummy class* (although this class was sometimes a grade level mathematics class). *I do not like the fact that some of his friends tell my son that his class is a dummy class.* One teacher felt that the name-calling and competition was the result of ability grouping and the competition felt by students. *Tracking creates more competition between students and I don't like it. I do not like to hear students say they are in the smart class and the dumb class but I know it goes on outside these doors.*

Name-calling is a serious issue, often discussed with bullying and harassment (the lines between bullying and name-calling can blur). One American Association of University Women (AAUW) study found that 79% of the boys and 83% of the girls had experienced harassment at school and 1 in 4 "experienced harassment often" (U.S. Newswire service, 2006). Bullying occurs when a student

is exposed, repeatedly and over time to negative actions on the part of one or more other students. Negative actions can include physical contact, words, making faces or dirty gestures, and intentional exclusion from a group. An additional criterion of bullying is an imbalance in strength (an asymmetric power relationship). The student who is exposed to the negative actions has difficulty defending himself or herself. (Olweus, 1995, p. 196)

Children who are continually called names are at higher risk for low self-esteem, depression, absenteeism and dropping out of school (Women's Educational Media, 2006).

Parents discussed a wide range of pressures applied to students in order to be successful in life. These parents pressured their students to complete homework, attend tutoring sessions, or complete extra work at home. Some spoke of limiting extracurricular activities and spending hours doing homework. *Many parents in the gifted track only allow one outside activity reserving the rest of their time for homework.*

On the other hand non-pushing parents exhibited much less pressure and sometimes no pressure. These parents spoke of sheltering their children from failure, the importance of children's social growth over intellectual pursuits.

*I kind of felt bad at the beginning of the year when Linda said to me that I needed to get James into the high math but I didn't think it was the best thing to do for him. What do you choose-your child to be the best in a lower class or the lowest in a higher class? Because James has such a hard time with school and doubts his abilities in math I decided that it would be better for him to stay in the lower class and feel successful. I can't set him up to fail again.*

These parents felt that schools and sometimes other parents applied too much pressure to learn.

*I have heard that people talk about how difficult the job and college markets are and that you have to have more than a Master's degree to compete for good jobs or have more than just good SAT scores to get into a good university. I don't buy it. I think it is too much stress at this age.*

How much pressure is the right amount? Recent research on high school students suggests that too much pressure is placed on students to earn high grades, take too many advanced classes, and maintain large numbers of after school activities. This pressure takes a toll on children who are pushed. Some pushed students suffer from high anxiety and even depression. They may take unethical measures such as cheating to stay at the top of their class in their quest for highly sought after university acceptance (Greenless, 1996; Harrington-Leuker, 1989; Jing & Chen, 1995; Raymond, 1995). Some schools/counselors that recognize the growing problems have begun to limit the number of advanced placement courses students are allowed to take (Celis, 2005). Through the Stanford University Department of Education yearly conferences have been held to assist schools (teams of administrators and teachers) in recognizing and reducing stress levels of children who are pushed too far to succeed (Pope, 2006).

There is no doubt that students need some encouragement from parents to succeed. There is much research on the strong effects that parents play in encouraging and raising academically successful children. Literature suggests that anywhere from 50% to 90% of student academic success is due to parental factors while schools and environmental factors affecting the rest (Belfield & Levin, 2005; Poliakoff, 2006; Doherty & Peskay, 1992). This large influence, according to

Belfield & Levin (2005) has been largely untapped by schools. Research suggests that schools need to more clearly communicate with parents, telling them about the educational system, curriculum, and what they can do at home to encourage their child to be academically successful (Belfield & Levin, 2005; Christenson, Rounds & Franklin, 1992). Referencing the literature Belfield & Levin (2005) suggest schools develop and implement 'metaphorical contracts' (Belfield & Levin, 2005, pg. 69). Using these contracts the authors encourage schools work with parents to teach them and aid them in developing the following environments that have been associated with high achievement.

- Stable and school-like home environments
- High quality preschool and childcare
- After school and summer experiences that do not disrupt learning
- School involvement by parents and school and class choices
- Homework monitoring
- Planning future academic goals

These very behaviors are the ones that pushing parents already exhibit. So again the question remains, how much pushing is the right amount? More research needs to be done on this topic.

### ***Pushing Applied to Other Areas of Research***

Glaser (1998, 2005<sub>2</sub>) suggests that GT studies are often applicable to other areas within the field of study as well as other fields of research. Grounded theory is a sociological research method aimed at developing topic specific substantive results as well as formal theories of social interactions. Glaser encourages GT users to conduct exploratory searches for other areas in which their theory can be or has been applied suggesting the need for further research on both the theory and its application to other subject areas.

The theory discovered in this study, *pushing*, can be seen and in some cases has been researched in other areas. The term *pushing* is used in popular media; however, within academic literature a variety of terms are used, including pressure, advocate, encourage and push. Although the studies did not always use the term *pushing*, the articles did discuss many of the same phenomena and actions as educators and parents revealed through this *pushing* in middle level mathematics class research. Likely, the *pushing* theory can also be applied to many situations of ability grouping in K-12 schools. During interviews with educators and parents, discussions about ability grouping drifted between general ideas and beliefs about ability grouping to those specifically linked to mathematics or middle school adolescents. Of course, the amount of ability grouping in place and specific subjects where ability grouping was employed would affect the results.

Much documentation exists on the phenomenon of adults *pushing* athletic success among youth and the effects that pushing has on their participation in

sports. Studies have been conducted on the effects that too much pressure to be the best player, garner specific positions, or win competitions have on specific player's well being as well as sociological consequences for individuals and the entire team. Players who are placed under too much pressure, similar with those under academic pressure, cheat, use performance enhancing drugs, develop injuries, or exhibit aggressive behaviors. As a result some youth programs work with parents to reduce heckling from the stands and pressures on players, seeking to return youth sports to a leisure activity. At the university level pressures to win cause coaches and players to illegally pay players, exert pressure on instructors to award passing grades or coerce other students to provide homework for players. Players on these teams cheat on school work, use performance enhancing drugs. Some university participation licenses and players have been suspended for illegal and/or unethical practices such as this. (Citizenship through Sports Alliance, 2005; Barrett, 2006; Hellstedt, 1988; Leonard, 1988)

Parents who push their children into performance careers are much less researched; however, popular media cites examples of parents *pushing* children into acting careers, and beauty pageants out of some unrealized dream of their own for stardom (Fields-Meyer, 2003; Pateski, 2006). Research needs to be conducted on this topic to learn more about the affect of *pushing*.

Politics is another area where *pushing* might be applied. Politicians are supported by a large entourage of employees hired for the express purpose of pushing them into a successful bid for political office or lawmaking (Lees-

Marshment, 2006 ; Ormrod, 2006). Some research has documented how citizens push their way through various political barriers to make productive/safe lives for themselves (McGrellis, 2005). Law-making and international agreements are also subject to carefully strategized sessions where the sponsoring group tries to push through their interests, followed by others trying to push through pieces that satisfy their interests. Some pieces of these bills and treaties focus on meeting the needs of individual countries, or regions while also satisfying private industry and voters (Pallis, 2006; Palumbo, 2006)Pork-bellies are a fine example of a politician pushing through his agenda.

“Big Push theory” is an economics theory used in industrial and economic development. In layman’s terms economic developers organize and invest in several industries or one company not to gain a profit but to create growth in related or subsequent industries. For example, a developer invests in a cooperative of cottage industries aiding in garnering increased sales and wages for their products. This initial investment may not make a profit, yet, the resulting production starts that are created by those seeing access to higher wages, and increased regional economy garner profits for the original developers. These developers may be governments of developing nations or profiteers in one industry (Saur,Gawade & Li, 2003).

Although this theory is not directly related to the *pushing* theory of middle level mathematics placements, they do have some commonalities. One example is in the early investment for later returns (students are being pushed in middle school

so that they garner access to good universities and careers). Developers employing the Big Push theory employ specific strategies to create an industry to improve the likelihood of a ripple effect (starting an industry that requires parts from other companies or raising regional wage expectations). In the *pushing* theory of middle level mathematics placement, parents employ homework supervision, tutoring, visibility on committees and volunteering strategies in order ensure future placement into advanced classes.

Differences between the two theories are also apparent. Investors are not planning on a return from the initial investment. They are hoping that the investment will create a large-scale improvement of economic conditions. Research on ability grouping in mathematics indicates that advancing the few does not create or increase learning among those who are not placed in advanced classes (Ballantyne, 2002; Boaler, 2002; Boaler, Wiliam, & Brown, 1998; Camblin, 2003; Oakes, 1985; Slavin, 1990; Slavin, 1995; Stevenson, Schiller & Schneider, 1994; Wheelock, 1992).

Although none of these different push situations are exactly the same as the *pushing* that occurs in middle level mathematics placement situations, plenty of indication exists that a formal theory of pushing could be researched and developed using these situations as well as others. Future researchers have much room to develop both substantive theories in these areas as well as move toward a formal, more inclusive theory of *pushing*.



## CHAPTER 5

### Conclusions

Grounded theory (GT) methodology was an effective method for this study as this method uniquely provided a way to identify the problems from those most closely involved with ability grouping in middle level mathematics. GT allowed the researcher to identify how educators and parents continually worked to resolve the problems associated with middle school ability grouping in mathematics. Although often conflicting, a plethora of research is available concerning the achievement and sociological effects of ability grouping. Using GT, the researcher for this study was able to gather a fresh perspective of ability grouping in middle level mathematics classes.

Results from the study indicated that, for the most part, educators and parents have little knowledge of the literature about ability grouping or have chosen not to believe that it is contraindicated for improved learning. These subjects were not concerned with whether students in middle level mathematics classes are grouped by ability. Their concerns were focused on how best to place students into the two or more ability levels of mathematics classes created. Conflicts were reflected between educators using objective methods to sort students into ability levels and others (parents and educators) pressuring that these objective methods did not accurately place children in which they viewed as promising. These parents and educators reacted to the conflict by *pushing* students to learn more

mathematics, *pushing* parents or educators to apply pressure to placement decision-makers to alter student placements, and finally *pushing* the system to change placement criteria or course offerings.

The theory of *pushing*, developed from the multiple interviews, district information, and literature suggests that a subset of adults (parents and educators) exists who, to resolve issues of lost trust, exert pressures on the ability grouping process in middle level mathematics classes. These individuals use these pressures to control where education resources are applied from a self-interested viewpoint. This result conflicts with the current ‘betterment for all’ values set forth by early education leaders as well as the current United States Department of Education goals. In essence the theory of *Pushing* is summarized by the following statements: pushing is

- driven by a lack of trust and a focus on individual students’ needs.
- an action carried out by educators who see promise in individual students or parents.
- an action or actions aimed at controlling the mathematics courses offered and ability level placement of middle level students.
- an action or actions applied so that the educator or parent can garner perceived challenge, good student behavior, access to a promising future and/or learning with other smart or mathematically gifted students.

### **Need for Further Research**

This research revealed many needed areas for further research. The results indicated that communication between parents and middle school personnel needs improvement. Parents in the study repeatedly reported feelings of decreased communication and knowledge of their children's education as they transitioned to middle school. Although some research was available on the importance of making parents a part of their children's education and partnering with school officials in the decision-making situations (Greenless, 1996; Harington-Leuker, 1989; Jing & Chen, 1995; Raymond, 1995), little research has been conducted about the gradual reduction in communication as children move from elementary to middle and middle to high school.

Many teachers in this study were concerned that they had little opportunity to talk to educators from elementary feeder schools or high schools in which their students were to attend in the future. Little research has been completed on the importance and effects of across-school or intra-school communication. One case-study discussed the positive effects that intra-school communication had on reform efforts (O'Neill, 1995). Further research needs to be conducted in this area.

More research needs to be conducted into how much pressure is the right amount of pressure to insure student academic success without sacrificing mental and social well-being. Several popular news articles have been written about the increasing competition to garner access to elite and high quality university programs (Buhain, 2006; Ellison, 2004). Are these schools that competitive and, if

so, do they actually supply an increased educational quality worth any sociological and mental harm caused for the applicants during their K-12 school experience?

The *pushing* theory needs further development. As discussed in Chapter four, many areas might be explained by similar *pushing* theories. GT investigations of ability grouping in K-12 schools, athletics, child acting, or politics appear to have categories similar to *pushing* in middle level mathematics class. In addition, a formal theory of *pushing*, that is one that looks at pushing as a general sociological phenomenon, needs development.

### ***Credibility and Rigor***

The measures of credibility and rigor suggested by GT methodology are fit, relevance, work, and modifiability. Fit is achieved if the theory, categories, and properties are representative of the data collected. Relevance is attained when the identified problems and issues of those interviewed are relevant to the reader. If the theory readily identifies how subjects resolve the main problem then workability is achieved. Finally, if any new data can easily be incorporated into the theory then the theory has modifiability (Glaser, 2001; Glaser & Strauss, 1967).

The *pushing theory* in middle level mathematics class fits. The problem; the *pushing* theory; as well as problems that result from *pushing*; were all found first through interview data gathered from educators and parents working in schools and with children attending schools in the northwest. Initially, the main problem with a main category (*pushing*), subordinate categories (types of pushing, reasons

for pushing, and types of pushers) as well as the details (termed properties) were found (using repeated and continual categorizing and sorting). Additional data were added (using related literature, school and district information) from throughout the world. The new data were categorized and the entire data set re-sorted until stability (through re-sorts that ultimately resulted in the same organization) and completeness (no new categories or properties were found and no major questions about what was going on remained) were evident. In addition, the researcher made sure accurate GT methodologies were used by extensively reading GT books and literature as well as attending GT training sessions, and joining a GT discussion forum. In all, the theory was proposed as a fit because accurate uses of the data as well as appropriate uses of the GT method were employed.

The reader must judge whether the theory of *pushing* in middle level mathematics classes is relevant. The multiple categories and problems caused by pushing were prominent in public media as well as government legislation and academic calls for research; thus these indications suggest the theory as relevant.

Public media (sometimes representing human interest while other times representing government or research positions) have reported on many topics related to pushing. Internet and library database searches of pushing, pushing students, and pushing students to succeed were conducted. These searches revealed several public media articles. Many of these articles were about pushing students to succeed and the consequences that resulted (Elkins, 2003; Massey, 2005; Wong, 2006).

In many countries including the United States, privatization of education has increased in recent years. This study found that privatization is already applied to middle schools (at least in middle level mathematics classes) and that school districts fear of ‘white flight’ plays a role in the perpetuation of ability grouping.

The No Child Left Behind (NCLB) law indicates that the United States values equity by requiring schools to insure students of all races and socioeconomic status learn rigorous mathematics. Yet, ability grouping research clearly indicates that achievement gaps increase when students are grouped by ability; further, international tests of achievement found that countries that do not separate students by socioeconomic status and ability have much smaller achievement gaps (Organization for economic co-operation, 2003). This study of *pushing* in middle level mathematics class indicates that one of the reasons that ability grouping is still prevalent in middle schools may be because *pushers* perpetuate the practice. This study of *pushing* also reveals why *pushers* continue to maintain ability grouping structures.

The literature is rife with disagreement over the relative merits of ability grouping. Research has discussed parents that advocate for their children, talked about educators and parents that hinder or block reform efforts, and reported on some of the effects that parents have on school success (Kohn, 1998; Oakes, 1985; Wells & Oakes, 1986). This study, without an *a priori* hypothesis, found that some parents

do indeed advocate for their children while many others do not. The study found that both parents and educators sometimes work together to insure advanced placement. Further, this study found a theory of pushing in middle level mathematics classes that other researchers can apply to new research studies..

The theory of *pushing* works (or has workability) as it developed from interviewee's own words when they discussed how they worked to solve the problems they had with middle level mathematics group placements. The name *pushing* came from repeated use of the term by educators and parents when discussing the problem as well as their feelings about the needs of their children/students. Repeatedly, educators spoke of parents who *pushed* them to allow their children into the high group. Parents and educators discussed parents who were pushed by their children's previous teacher to assure placement in the high mathematics group. Finally, many educators and parents said their job or responsibility was to make sure students were *pushed* to do more, *pushed* to do their homework, and *pushed* to succeed. These *pushers* felt the duty to be the advocates for these 'gifted or advanced' students.

By design (theory organization and methodology), a grounded theory study is readily modifiable. Because this study was developed using data from the Pacific Northwest in conjunction with literature collected from national and international studies, similar results are likely from replicated studies of ability grouping in middle level mathematics classes. However, a study that collects interview data from schools in different geographic regions of the United States or

another country may result in additional or different categories and properties of categories. Researchers who have the opportunity to interview parents and/or teachers representing racial groups that this study was not able to include due to availability and time constraints (Native American, Africa American, various Eastern European groups) can add more information to the theory. The theory of *pushing* in middle level mathematics class could readily be altered to include any additional information provided by new research.



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