

School of Graduate Studies
Bemidji State University
1500 Birchmont Dr NE, #27
Bemidji, MN 56601-2699
218-755-2027

EFFECTS OF TRACKING STUDENTS IN A SECONDARY MATHEMATICS
CLASSROOM

by

Nicole Seyfried

A Research Paper Submitted to the Faculty of the
DEPARTMENT OF MATHEMATICS AND COMPUTER SCIENCE

In Partial Fulfillment of the Requirements
For the Degree of

MASTER OF SCIENCE IN MATHEMATICS

BEMIDJI STATE UNIVERSITY
Bemidji, Minnesota, USA

December 2012

STATEMENT BY THE AUTHOR

Brief quotations from this research paper are allowable without special permission, provided accurate acknowledgement of the source is indicated. Requests for permission to use extended quotations or to reproduce the manuscript in whole or in part may be granted by the Department of Mathematics and Computer Science or the Dean, School of Graduate Studies when the proposed purpose is in the interest of scholarship. In all other instances, however, permission must be obtained from the author.

Signed: _____

APPROVAL BY RESEARCH PAPER ADVISOR

THIS RESEARCH PAPER HAS BEEN APPROVED ON THE DATE SHOWN BELOW:

Glen Richgels
Committee Chair
Professor of Mathematics and Computer Science

Date

Dean, School of Graduate Studies

Date

EFFECTS OF TRACKING STUDENTSON A SECONDARY MATHEMATICS
CLASSROOM

Nicole Seyfried

This paper evaluates current research on the effect of grouping students of comparable abilities, a process known as tracking, in a secondary mathematics classroom. The research explores questions regarding the advantages and the disadvantages of tracking students by ability; the manner in which tracking affects the achievement of students in homogeneous and heterogeneous settings, and the ways tracking affects the achievement gap. In addition, this paper answers the question of how tracking affects students' self-concept and self-esteem. Lastly, it examines changes in teacher attitude with respect to each track level and the impact of ability grouping on classroom structure and the curriculum being taught. The results show that tracking has a negative effect on achievement for lower ability students and has produced no significant achievement advantage for higher ability students. Consequently, tracking has effectively increased the achievement gap. In addition, the research has demonstrated that students in the lower track have lower self-esteem but no demonstrable change in self-concept. Lastly, the research shows that teachers of the lower tracked students had lower expectations for their students and had a disparaging attitude towards the lower track.

Approved by:

Committee Chair

Date

Committee Member

Committee Member

Graduate Faculty Representative

ACKNOWLEDGMENTS

I wish to thank Glen Richgels, Derek Webb, and Randy Westhoff for all their help and support when I was writing this paper and being on my committee. An extra thanks to Glen because he opened my eyes to how I should be teaching math and exposed me to the idea of tracking our students. I would also like to thank my husband, Matthew, for all his support and encouragement at home. I could never have done it without you. Lastly I would like to thank my father-in-law, Stephen, for helping me look for research and sharing his experience and advice.

TABLE OF CONTENTS

Chapter	Page
1. Introduction	
Background	1
Statement of the Problem	3
Research Questions	3
Significance of the Research Problem and Study	4
Limitations and Assumptions	4
Definition of Terms	5
Summary Statement	5
2. Review of Literature	
History of Tracking in the United States	7
Types of Tracks	7
Types of Students in Each Track	9
Why Schools Track their Students	10
Effects of Tracking on Achievement	10
Students' Self-Concept in Tracking Systems	13
Students' Self-Esteem in Tracking Systems	14
Teacher Quality and Instruction in the Different Tracks	14
Detracking Schools	16
3. Results	
What are the Advantages and Disadvantages of Tracking on Student's Learning?	18
What Types of Tracking Systems do Schools use?	18
What Measures and/or Criteria do Schools use to Assign Students to each Track?	19
What Effects has Tracking had on Achievement of Different Ability Groups?	20
What Effects has Tracking had on the Achievement Gap Between the Different Ability Groups?	21
How does Tracking Affect the Self-Esteem and Self-Concept of Students in the Different Tracks?	21
What Level of Teacher Quality and Instruction does each Track receive and/or does Tracking affect the Level of Teacher Quality and Instruction as well as Expectations?	22
4. Conclusion	
Author's Perspectives	24
Problems with Reducing Tracking	26
Suggestion for Further Research	27
References	30

Chapter 1: Introduction

Tracking is a very common practice in the United States especially in secondary mathematics. Sometimes the track a student is put on can determine the type of future education and career of that student (Oakes, 1985). In a majority of schools, tracking consist of three levels: high achievers, regular achievers, and low achievers. The theory behind tracking is that lower ability students need extra help in the subjects of deficiency while the higher achievers can explore deeper into a subject and at a faster pace.

There are many different areas that can be examined when it comes to tracking: achievement, race, student and teacher beliefs; as well as many others. The author of this paper will explore, by reviewing currently available research, whether or not tracking does what it is intended to do and investigating different areas that are affected by tracking. First, the author will analyze the research literature to see whether or not tracking decreases the achievement gap between the upper level students and the lower level students. Next, the author will examine the research literature to determine if there is a direct effect that tracking has on the self-esteem and self-concept of students in different tracks. Lastly, the literature will be examined to see if there is an effect on teacher instruction due to tracking. This analysis of the current research will try to answer the question about the role of tracking in the education of students in the United States in secondary mathematics.

Background

Tracking is heavily used in American schools and has existed for over a century. In 1990, approximately two-thirds of middle school principals stated that there is some form of tracking in their schools (Wheelock, 1992). In addition, tracking is not a new

concept to the American education system as it has been around since the early 19th century, though tracking has had its effectiveness questioned since as early as 1929 (Slavin, 1988). Because of the extensive use of tracking and questions to its utility, many researchers have dedicated their time to examine the effects of tracking on American students.

Tracking was put into place in American schools because of assumptions educators had made about the benefits and the structure of the tracking system. Many educators assumed that tracking was a practice that was best for students and carefully grouped the students by their abilities (Oakes, 1985). Advocates of tracking believed that by separating the students by their intelligence level, the lower students were offered more help while the upper students were offered a higher level of instruction at a faster pace (Chiu et al., 2008).

According to Oakes, in her book *Keeping Track*, there are four major assumptions educators make about the benefits of tracking. The first assumption is that students will learn better when grouped with people in the same ability. This is predicated upon the belief that they will have similar learning rates, equal levels of maturity, and common beliefs. As a corollary, the low-ability students will develop more positive attitudes about themselves and school by being in a same-ability group. The next assumption is that the grouping of students can be done fairly and be based on past achievement. The last assumption is that it is easier for teachers to accommodate students when they are tracked.

Mathematics is one of the most heavily tracked subjects and receives the most opposition from educators who are proponents for detracking (Wheelock, 1992). In

today's education system, there is a push for all students to learn higher mathematics with the implantation of programs like *No Child Left Behind*, *The Common Core State Standards*, and *Algebra for All* into the school systems. In addition, math is viewed as a linear subject where students need to constantly use previous knowledge to move onto newer content (Linchevski & Kutscher, 1998). For example, if a high school student is behind in the mathematical concept of basic arithmetic, it will be difficult to have the student move onto a higher level of mathematics; therefore it might be more efficient to have the student tracked into a low-ability group. On the other hand, the advanced learners are able to take higher level classes like College Algebra, AP Statistics, and Calculus because they are faster learners in mathematics.

Statement of the Problem

With any practice in the education system, it is important as educators to examine the worthiness of the system. Or, in other words, does tracking do what it is intended to do? Since there are assumptions that are made about the value of the system, this paper will thoroughly examine three of them. Tracking needs to be considered from all view points and justified from this perspective with high quality research in order for it to continue to be utilized in American schools. The effects of tracking need to be explored to see what tracking does to the achievement gap, self-concept, and self-esteem of students at all levels. In addition, the quality of instruction by teachers needs to be studied and assessed within the various tracks.

Research Questions

What are the advantages and the disadvantages of tracking on students' learning?

Sub questions

- a. What types of tracking systems do schools use? What measures and/or criteria do schools use to assign students to each track?
- b. What effects has tracking had on achievement of different ability groups? What effect has tracking had on the achievement gap between the different ability groups?
- c. How does tracking affect the self-esteem and self-concept of students in the different tracks?
- d. What level of teacher quality and instruction does each track receive and/or does tracking affect the level of teacher quality and instruction, as well as expectations?

Significance of the Research Problem and Study

Since tracking is a very common practice in teaching mathematics in the United States, the author's research is needed to either support or present arguments against it. There are major assumptions of the benefits of tracking that deal with student achievement, student's self-concept and self-esteem, fairness of the grouping, and a teachers' ability to teach the students (Oakes, 1985). Administrators and educators need to know if these common assumptions are valid, then they can provide an educational system in which students can succeed, especially in mathematics. In addition, with the pressure of *No Child Left Behind* on school districts, schools need to be implementing the best systems to help each student learn to the maximum of their ability.

Limitations and Assumptions

The author will be limiting the research to focus on the effects of tracking in middle school and secondary levels. In addition, the author will only look at research

that deals with achievement, students' self-esteem and/or self-concept, and teacher instruction. The author will assume that any school that does or does not track their students is doing so because it is what they believe is the best for their students and school. Lastly, the author will not look at research that deals with gifted or special education students.

Definition of Terms

Tracking: the process of dividing students in groups or classes based on their ability in a certain subject area creating a homogeneous classroom.

Ability-grouping: same as tracking

Detracking: the process of removing students from their ability groups and creating heterogeneous classrooms

Achievement Gap: the academic difference between the different tracks

Self-esteem: an individual's overall assessment of his or her value or worth and is based in part on self-judgments about his or her competence in different areas (Chiu et al., 2008).

Self-concept: how a person feels or evaluates oneself in a specific area (Chiu et al., 2008).

Summary Statement

The tracking of students in mathematics is widely used in American schools and has been around since the early 19th century (Oakes, 1985). Schools assume tracking is intended to benefit students at all levels by letting the low-ability students get more help while the high-ability students go at a faster pace and utilize a more intense curriculum. The assumptions made by educators that deal with students' achievement and

achievement gap, students' self-esteem and self-concept, and teacher instruction in the various tracks will be examined to see if tracking betters the education of all mathematics students.

Chapter 2: Review of Literature

History of Tracking in the United States

In the late 1800's immigration into the United States created a greater demand on schools to provide education to a more diverse population of students. From 1880 to 1918 enrollment in schools in the United States grew by 700% and by 1920 more than 60% of American 14-17 year olds were enrolled in school. Schools were faced with a more diverse population of students and were forced to create a system to manage the needs of its students; therefore tracking emerged (Oakes, 1985). First, students were openly divided by race, ethnic and economic background until after WWI when the creation of the IQ test would determine the placement of students (Oakes, 1985). However, the tracking system was not without its critics. As early as 1929, Luther Purdom began questioning the process of tracking. He believed this grouping was more based on personal impressions rather than hard evidence (Slavin, 1988).

Ignoring the critics, tracking continued for another half a century before schools started to see some negative effects of the system. Between 1965 and 1975 many urban schools dissolved formal tracking programs and by 1981 a majority of high schools had no formal program (Lucas, 1999). The 1980's saw a big push to end tracking as research showed the negative effects of these formal programs (Oakes, 1985). However, even with the push to end tracking, 80% of schools do some form of tracking in 7th grade and 92% of schools track 8th grade students in mathematics (Hoffer, 1992).

Types of Tracks

Tracking or grouping systems take many different forms in the American education system based on the grade level, subject matter, and the need of the school.

Most elementary classes have within ability grouping, where students are split into different groups in their classroom based on ability in certain subject matter, which is most likely reading and arithmetic (Hoffer, 1992; Slavin, 1988). Then in middle school, students start to be separated into between-class ability grouping where students are separated into different classes based on their ability. At these grade levels, the tracking usually occurs for language arts and mathematics. The in-between grouping continues throughout high school where more formal grouping systems may emerge (Hoffer, 1992; Slavin, 1990).

There are normally three different tracks in a school system that splits the class population into thirds. Learners are classified as fast, average, or slow learners. Therefore, they are put into classes that are fast, average, or slow (Oakes, 1985). However, in different grade levels the tracks can be classified differently. In middle school the tracks are normally defined as advanced, basic, or remedial; whereas in high school the tracks become academic, general, and vocational. The determination of placement of students in the tracks depends on prior achievements, test scores, and teacher and administration judgments (Slavin, 1990).

In some subjects the courses might have the same content, but taught at different levels. However, in mathematics this is often not true. The fast-tracked students can be accelerated to a completely different math course. For example, in ninth grade some students might be taking Algebra I while the lower students take general math (Slavin, 1990).

Although the majority of schools do some form of tracking, their systems may vary from district to district. Gamoran (1992) explains that there are four main

dimensions that schools use to diversify in the creation of their tracking system. First, is how the school selects their students for each track. Higher tracks tend to be more selective. The second dimension is the involvement of students in the selection process of their track. Some high schools will have the students determine their own track; however several researchers have determined their choices are greatly influenced by school authorities. The next dimension is the number of students that are included in a track where the students are more likely to be college bound. The final dimension is the amount of students that are in the same track level among different subjects areas. Most students when assigned to a track do not move to a different track. The majority of the movement between tracks is downwards. In addition, those who move down rarely rise again (Lucas, 1999).

Type of Students in Each Track

In a tracked school system the make-up of each level is different. When it comes to socioeconomic status, students from the middle and upper socioeconomic strata of society are more likely to be placed in the middle and high tracks. Parents of these students might put more pressure on schools to have their child placed in these tracks (Lucas, 1999; Oakes, 1985).

The race of students can affect their likelihood of being in a particular track. In Oakes' (1985) study of the twenty-five schools, she found that the distribution of race was disproportionate in tracking. There were a greater number of White students in the higher level classes and a greater number of minority students in the lower tracks in both math and English classes. Lucas (1999) also found this distribution to be true. However, when aspirations, achievement, and requirements were controlled for Black students the

race disadvantage turned into an advantaged, and for Latinos the disadvantage just disappeared.

Why Schools Track their Students

Educators believe there are many benefits to tracking their students. First, they believe the main reason to separate their students by ability is to deal with the diversity of learners in each school system. If schools group by ability, they believe they can better accommodate their students. It gives the high achievers a chance to receive more difficult material to enrich their education and move at a faster pace and the low-ability students a chance to have slower instruction and increased support (Oakes, 1985; Slavin, 1990).

The second belief of tracking is that students will learn better when they are in homogeneous groups. They believe the high achievers will be stimulated by other learners like themselves (Slavin, 1990). The slower learners might develop more positive attitudes about themselves since they are among other learners like themselves (Oakes, 1985). The last reason why schools track their students is the belief that if classes were heterogeneous, then the slow learners will hold back the high achievers. Schools fear teachers will have to teach at the pace of the low ability learners, so they are not left behind. In addition, teaching at the pace of the low ability learners might cause the high achievers to become bored with school (Oakes, 1985; Slavin, 1990).

Effects of Tracking on Achievement

There are two main perspectives with respect to tracking and achievement. The first is how achievement in a homogeneous setting compares to achievement in a heterogeneous setting. When comparing schools of mixed-ability to same-ability,

Braddock and Slavin (1995) found that the performance of students in the low track diminished significantly when compared to a non-track system. However, when comparing the high and average tracks, there was no consistent corresponding benefit of ability grouping.

Similarly, Linchevski and Kutscher (1998) compared students in a mixed-ability group versus students in a same-ability group, and found comparable results. In a junior high school, the researchers randomly selected students and teachers to either be a part of a mixed ability or same-ability mathematics class. After one year, Linchevski and Kutscher (1998) administered two tests to the students. One was a common test taken by all the students and the second was a test whose difficulty reflected each student's ability level. The test results showed that high ability students did slightly better, but not significant enough, in the homogeneous setting on both tests. The homogeneous group scored 3% higher on both test than those students in the heterogeneous group. In contrast, the middle and low groups showed significantly lower scores on both tests in the same-ability setting. The low-ability homogeneous grouped students handed in almost empty tests while the heterogeneous grouped students had a mean score of 54% on the common test. The study allowed the researchers to come to the conclusion that students in the middle and low tracks perform much better in a same-ability setting.

Thomas Hoffer (1992) also examined achievement in mathematics and science in the middle grades to see if there was any benefit to the three tracking groups. He collected and analyzed data from the Longitudinal Study of American Youth (LSAY) from fall 1987 to fall 1989. He found negative effects in mathematics ability grouping when comparing to non-grouped schools. Hoffer also explained that the higher achieving

grouped students learned more than the non-grouped students but those results were not as strong when compared to the homogeneous low-group students' results to their counterparts. There was a significant negative effect on achievement when ability grouping was in place for the lower track.

In Slavin's *Achievement Effects of Ability grouping in Secondary Schools: A Best-Evidence Synthesis* (1990), he reported on a study done by Mikkelson that randomly selected high achieving students who were placed in either a heterogeneous or homogeneous classroom. The seventh graders were given the same content, but the homogeneous group received more enrichment activities, while the homogeneous eighth graders took ninth grade Algebra. The results were clear that there was no significant achievement difference between the two groups in seventh grade. On the other hand the homogeneous eighth grade group did substantially better on the Algebra test but showed similar performance to the heterogeneous group on the eighth grade math test.

A second way to look at achievement is to examine how the high group achievement scores compare to the bottom group achievement scores in the same school setting. In the National Survey Analyses, over the course of high school education, students assigned to high and low tracks grew farther and farther apart in achievement. This result creates an achievement gap that widens as the age of the students increases (Gamoran, 2009; Slavin, 1990). The achievement gap is the most significant in mathematics because of accelerated classes, for example, having the high track take Algebra I in eighth grade (Slavin, 1990).

One main reason for the widening of the gap is the type of curriculum that low track students are given. While the high and average achievers advance in their studies,

the low-ability usually backtrack to material they should have learned in previous years. In addition, the bottom track usually moves at a slower pace than the upper tracks, thus making it harder to cover the same amount of material in the allotted time (Oakes, 1985).

There is other evidence that tracking affects achievement of students. If two students have very similar ability and are put on two different tracks, the student on the lower track is more likely to achieve less than the other (Linchevski & Kutscher, 1998; Oakes, 1985). Tracking also has effects on the future of the students. Students placed in the lower track are less likely to do post-secondary education and are more likely to drop out of school even when they have similar socioeconomic status, test scores, grades, and post-high school plans as to students in other tracks. In addition, low-income students who take Algebra and Geometry are three times more likely to attend college as those who did not (Oakes, 1985).

Students' Self-Concept in Tracking Systems

Another important aspect of tracking is how students perceive themselves in a specific setting. Chiu et al. (2008) studied 295 11- and 12-year old math students in the Mid-Atlantic States. He first looked at whether students compare themselves with other students within their track or in a different track. He found in every track and in both genders, that students are more likely to compare within their track. Because it is just easier. In addition, Chiu et al. (2008) found that students tend to compare themselves with other students that have higher ability. The final conclusion they made was students in the higher track tend to have higher self-concept in math and in school. However once they controlled the grades, this result was null, which showed that grades play an important role in students' self-concept.

Similarly, Trautwein, Ludtke, Koller, Marsh, and Baumert (2006) conducted a study in Germany, which has a well-defined tracking system, where students attend different schools and are tracked according to their ability. They also found that grades affect self-concept more than the track in which the students were placed. In addition they found that the assimilation effect played a minor role in the students' self-concept, which means if students are in the upper track, then they don't necessarily believe they are also good students.

Students' Self-Esteem in Tracking Systems

Tracking can have an effect on students' overall view of themselves and their academic ability. In her study of 25 schools, Oakes (1985) states that the high track students had positive attitudes of themselves and high aspirations for their educational future. She explained that this was not surprising since these were the students that had been told that they are smarter because they were in the high track. The low track students, even though the students were satisfied with their schooling and liked the classes they were taking, had negative attitudes about themselves and were not well regarded by other people. The middle track students' overall view of themselves and their academic ability was halfway between the other two groups. Similarly, Braddock and Slavin (1995) found in their study, the low-tracked students had lower self-esteem than did similar non-tracked students. In addition they had a markedly less positive perception of intergroup relations in their school.

Teacher Quality and Instruction in the Different Tracks

The quality of teachers can differ between the tracks. Experienced teachers often teach the higher tracks, which leaves the lower track with less experienced and poorer

quality teachers (Oakes, 1985). Thus, the low-ability settings can lead to low quality teaching. Teachers set goals for the lower tracks to learn classroom procedure and to improve their behavior. While the average and high tracks were encouraged to develop: critical thinking, independent work, self-direction, active participation, and creativity. The low track received remedial work with more drill and practice while the average track were given work similar to the high track (Linchevski & Kutscher, 1998; Oakes,1985).

The ways in which teachers perceive a group in a tracking system can vary among the tracks. Reed (2008) specifically selected two mathematics teachers and examined their teaching practice for an entire school year. Both teachers taught the same class at two different levels of students, an honors and a regular group. He found that in the regular class the two teachers shortened tasks and changed instructional methods, for example, providing more scaffolding for a task. When working in small groups or in class discussion, the teachers changed the role of the students between the tracks. In the honors class, the students had to provide more justification for their answers versus their peers in the average track. The two teachers also described the students in the average track to be lazy, unmotivated, more prone to off-task behavior, and often less mathematically capable.

Another discovery of Reed's (2008) was that his two teachers acknowledged that teenagers were bound to cause problems and that there were more problems in the regular class. The significance of the discovery was that when it came to behavior problems in the regular class, the teacher assigned the blame to the students, but in the honors class,

the two teachers took the blame upon themselves for not providing enough challenging material.

In Belgium, Houtte (2006) studied teacher satisfaction in the well-defined tracking system where they track within schools and between schools. Teachers in the general school were slightly more satisfied with their job than teachers in technical/vocational school. Two reasons were found for the higher satisfaction rates among the teachers in the general school: a more studious environment and more trust of their students.

Detracking Schools

Despite the fact that the majority of schools track their students, there are some schools that have detracked their students. In 1990, the Rockville Centre School District which had a disproportional amount of minority students in their lower tracks, set a goal to have 75% of its students earn a New York State Regents diploma. The administration and school board realized that tracking stood in their way. They dismantled their formal tracking programs, and had all their students take higher level math courses. The results were astonishing with 90% of incoming freshman including special education students passed the first Regents math exam. Over the next twelve years, the positive results continued and by 2003 82 % of African American and Latino students and 97% of white and Asian-American students graduated with a Regents diploma (Burris & Welner, 2005; Oakes, 1985).

There are other success stories of detracking. Jeannie Oakes and fellow researcher Amy Stuart Wells (1985) researched the detracking process of ten racially mixed secondary schools. At the completion of the study in all ten schools, the remedial or

basic courses were removed and all students were enrolled in “honor” or more challenging curriculum. Thus, the low-income students received a more enriched curriculum, and the educators were becoming convinced that those students were capable of higher-level curriculum. Unfortunately, these ten schools did not achieve the same level of results as experienced by the Rockville Centre School district, but did see improvements. Similar resulting improvements occurred when a UCLA research team examined at sixteen middle schools that were also in the process of detracking.

Even though the schools decided to detrack their students, they faced criticism about removing the tracking system and some schools couldn’t remove a portion of their tracking programs. A portion of the tracking continued due to the negative reactions to detracking by the parents of the high achieving students. These parents felt that their students would be held back when grouped with lower-ability students. To assure these parents some schools still provided AP and honor classes for those selected students. In addition some educators tried to resist the reform by clinging to their belief that students of different abilities need to be taught at different levels. This resistance made it difficult to implement the change to detracking (Oakes, 1985).

Chapter 3: Results

What are the Advantages and Disadvantages of Tracking on Students' Learning?

One central key observation emerges from the analysis of the research behind tracking in American schools. The disadvantages clearly outnumber the advantages. The advantages of tracking focus on allowing schools to separate students by ability and allowing the students in the higher track to be exposed to a more enriched curriculum. For example, advance eighth grade math students take Algebra I, while the other eighth grade students take a regular eighth grade math class. Another advantage provides benefits to the teacher. Educators do not have to differentiate their pedagogy that would be required in a heterogeneous classroom.

The disadvantages of tracking include impeded academic growth in lower tracked students, reduced productive academic performance in lower tracked students, diminished self-esteem in the lower tracked students, causes fewer students in the lower track to aspire to obtain a post-secondary education, hampered movement from a lower track to a higher track, assigning less qualified instructors to the lower track, and preventing outside influences on tracking assignments. An example of the last disadvantage is having a student's track placement controlled by the teacher and administration and not by the student.

What Types of Tracking Systems do Schools use?

At the high school level the majority of schools use in-between class tracking systems, which means that students in different tracks attend different classes. Some schools may only separate students by abilities in certain subjects, for example math and language arts, while other schools will separate the students in all their classes.

Most tracking systems have three track levels. The highest track is meant for students with the highest ability and who can accelerate their learning. Schools are more selective when determining which students are placed in this track. The middle track is for the average ability students, either overall ability or in certain subject areas. The lowest track is for the students with the lowest ability students where the students do more remedial work. In mathematics, some schools will advance the highest track a year forward in the math curriculum.

Other ways school districts vary among their tracking systems are as follows: the methods by which schools assign the students to each track, the number of students who are in a track that more likely lead to college, the probability that students will be in the same track for all their classes, and the extent to which a student is able to choose their track placement. Most students when placed on a track stay on that track throughout their high school career. If a student is moved from a track, they are usually moved to a lower track and they are unlikely to rise again to a higher track.

What Measures and/or Criteria do Schools use to Assign Students to Each Track?

When schools decide the placement of students in the tracks, they might examine several criteria. The first criterion they might scrutinize would be the student academic record. For example, a student getting an A in a class could lead to the student being placed into the highest track while a student who gets a D or F might be placed in the lowest track. Thus, if the student does well in math, then they might be placed into a higher track. As a second criterion, standardized test scores can influence the placement of students to a certain track. As a third criterion, a teacher's, administration, and/or counselor's judgment can determine upon which track a student maybe placed. This

allows schools to consider motivation and behavior when placing a student. As a final criterion, the student or the student's parent can influence the placement a track. They might persuade or inform the school that they want their child to be placed in a certain track.

What Effects has Tracking had on Achievement of Different Ability Groups?

There are two ways the research on achievement can be examined to observe the effect of tracking on achievement. First when researchers compared students in a homogeneous setting versus a heterogeneous setting, the researchers found the middle and lower grouped students suffered significantly in achievement. Linchevski and Kutscher (1998) found in their study that low students in the same-ability setting returned completed blank common tests while the low mixed-ability students got a mean score of 54%. Some researchers found that there was not sufficient evidence of significant difference among the high achievers to state that tracking affected them academically. There was research which showed that the higher tracked students excelled significantly when compared to similar students in a non-tracked system. Hoffer (1992) found in his study that the high achieving tracked students did perform substantially better than high achieving non-grouped students.

Another effect that tracking has on academics is related to performance hindrance. For example, if a student who was placed on a lower track than a higher tracked student of comparable ability, then the lower tracked student will not develop at the same academic rate of the higher tracked student. In addition students on the lowest track have a greater chance of dropping out of school and/or not attending college. Oakes

(1985) state that students who take Algebra and Geometry, which are mostly students in the top two tracks, are more likely to attend college.

What Effect has Tracking had on the Achievement Gap between the Different Ability Groups?

The research analyzing the achievement gap between students shows that the gap will widen the more tracking is in place. The researchers explained this consequence is due primarily to the curriculum that is being taught in the different tracks. The highest track has more enriched curriculum and progresses at a fast pace. In addition, as in mathematics, a student might be advanced to a course like Algebra I in eighth grade which increases the achievement gap even more. The lower tracks do more remedial work, and more drill and practice than the other tracks. In addition, the lower tracked classes tend to progress at slower pace, so less of the curriculum is covered in a school year. Slavin (1990) stated that gap is most significant in mathematics because of the advancement of students in the upper classes.

How does Tracking affect the Self-Esteem and Self-Concept of Students in the Different Tracks?

Tracking can have both a positive and a negative effect on the self-esteem of students. Students in the higher tracks have higher self-esteem. Oakes (1985) explains that this is true because these students have been told that they are smarter because they are in the higher track. However tracking has the inverse effect on the lower track students. These students have lower self-esteem and were more likely not to be liked by their peers even though the students liked their classes and were happy with their schooling.

When comparing a student's self-concept and tracking, the researchers found that initially, tracking looked to have a negative effect on self-concept. If students were placed in the lower tracks, then they developed a negative self-concept. However, once the researchers controlled the grades the students received in their studies, they found that grades had a bigger influence on student's self-concept than tracking itself. Chiu et al. (2008) found that if students did compare themselves to students in other tracks, then they were more likely to compare themselves to students in higher tracks.

What Level of Teacher Quality and Instruction does each Track Receive and/or does Tracking Affect the Level of Teacher Quality and Instruction as well as Expectations?

The research showed that the lower tracks have poorer teacher quality than the upper tracks. Some schools have the inexperienced teachers teach the lower tracks while the experienced teachers instruct the upper tracks. In addition, the teachers set lower standards for their students in the lower tracks and focused some class time and goals on behavior instead of academics. In addition to setting high standards for their students, the average and higher track teachers focus on developing critical thinking, independent work, self-direction, active participation, and creativity.

Teachers change their attitude, expectations, and/or strategy for a class depending on the track they are teaching. When Reed (2008) compared the two mathematics teachers who were teaching the same class to two different tracks he found significantly different results. The higher track had greater expectations of the students which included having the students provide more justification for their answers and less scaffolding for tasks. Also, the teachers had a negative perception of the lower tracked

students and believed that the students were to blame for the misbehavior. When comparing this to the positive perception the teachers had of the higher tracked students, the teachers blamed themselves for students' misbehaviors.

Chapter 4: Conclusion

Author's Perspective

The author of this paper has taught in two different school districts in the past seven years. She has taught, first, in a northwestern Minnesota school district which had 7-12 population of approximately 300 students with mostly Caucasian students and a few Native American students, with a large percentage of the students on the free and reduced lunch programs. She then taught in an eastern North Dakota school district which had a 9-12 population of approximately 2200 students who were mostly Caucasian, however, there were a fair amount of English Language Learners (ELL) from all parts of the world, and about 30% of the students were on the free and reduced lunch programs in this second school district.

Tracking systems were in place for mathematics in both school districts. In the first district, tracking in mathematics was started in eighth grade. This was where students were first split into two tracks, and then in ninth grade the students were separated into three tracks. The author taught classes that were in all three tracks. In the second school district, tracking was started in sixth grade where students were placed into two separate tracks. There was also a third lower track meant for Special Ed and/or ELL students in this district. Four tracks were initiated in the ninth grade. The high achievers were to take Geometry in a block schedule for one semester, the next highest achievers were to study Algebra I in a block schedule for one semester, the next lowest level was to take Algebra I in a block schedule for two semesters, and the lowest ability group was to take a remedial class called Algebra Readiness and Pre-Algebra. The author has taught the high achievers Algebra I and the remedial class.

In both schools, the author had observed and experienced the findings which were referenced in the cited research studies. First, the students in the lower tracks created more behavior problems than those in the higher tracks. To improve the behavior problems the author has created behavior systems to enhance control in the classroom environment and facilitate learning. As cited in this paper, the author felt that these systems were not necessary in the higher tracks, and when misbehavior occurred in the higher track, the author mostly felt it was due to inadequate planning on her part. Also, the author believed that the misbehavior in the lower track was because the students could not control their behavior and not her fault. She felt that the students just needed to learn how to behave properly. Proportionally, the lower track students were in trouble more often than her students in the higher track.

Second, the students in the lower track often felt they were there because they were bad at math and would never be able to do well in math. In addition these students were more likely to be on free and reduced lunch. The students in the higher track had more positive attitudes and less discipline problems during the school year. The author would often talk to these students about going to a four year university after high school, whereas she would mention the possibility of getting two-year college degrees to the lower track students.

Thirdly, the students in the lower tracks found it very difficult to switch to a higher track. Students who failed a math class were summarily dispatched to a lower track. However to have a student be promoted in the tracking system, took a lot of work and was very rare. In fact, in the first school district only one of her students was moved to a higher track but was still behind his peers in math. In the second school district, the

author had three of her students who were misplaced to the lower track. The author had to work independently with these students and these students had to attend summer school in order for them to be promoted in the tracking system.

Lastly, the author's attitude and approach to teaching students varied with respect to each track. When teaching the high achieving students, the author would constantly find new ways to challenge these students and had the students explore mathematical concepts more on their own. While in the lower tracks the author expected less of the students and approached the lesson with the belief that she would have to do more to prepare the students. In addition, the author presented less challenging homework and less rigorous examinations. Even when the author was teaching the same lesson, she expected the high achievers to get more from the lesson. The author was also inhibited from doing more projects due to their behavior issues and concerned that the students would not be able to handle the mathematical concepts.

Problems with Reducing Tracking

Research on tracking has shown that tracking does not accomplish its intended goal. Tracking hurts students academically in the middle and lower tracks and can affect students' self-esteem. The research has demonstrated that students taught in a heterogeneous setting increases academic performance in both the middle and the lower tracks, but does not substantially diminish achievement for students in the higher tracks. However, despite this evidence the majority of schools continue to track their students in some form, especially in mathematics.

So why do schools continue to do so? One reason could be that it has been in place for so long in American school systems, and school districts are afraid to change.

Another possibility could be that school leaders and educators are ignorant of the disadvantages of tracking to students. In addition, tracking in mathematics could be seen as very logical, and therefore necessary. Mathematics is often viewed as a very linear subject where students cannot learn new concepts unless the previous concepts are learned. Therefore schools believe tracking needs to be installed to help those students with lagging math skills. For example, it is hard to teach a student Algebra if they don't know their basic math facts.

Another major reason why schools continue to track is the resistance to change the program from parents and teachers. Parents want the best for their children and many parents believe the low achieving students will hold their students back academically. They also want their children to be challenged with the best curriculum possible, and therefore persuade schools to offer advanced or AP classes. Some teachers believe that the low achieving students would not be able to handle a higher level of curriculum and believe that they would have to teach to the level of the lower ability students. In addition, many secondary teachers may not know how to teach in a heterogeneous classroom; therefore they are afraid to make any changes that may challenge them.

Suggestions for Further Research

Though this research paper shows that tracking has negative effects on the American educational system, there are many areas for further research. The first suggestion for further research would be to investigate how schools can successfully detrack their schools. Research should examine in greater detail how schools have successfully detracked and analyze the ways they have fought off the resistance to detracking. In addition, research should demonstrate how to assist and to promote

students' success when they lack the basic skills that are needed for higher mathematics. Great achievements have been made by schools who have detracked, like Rockville Centre School District, and those schools can help other schools with the challenging process.

Secondly, research needs to be conducted on the relationship of high stakes testing and tracking. Research could examine schools that have dismantled their tracking systems and compare their program's achievements to schools which continue to track their students. In addition, new research could determine whether or not new standards like The Common Core State Standards would produce even greater negative effects on academics and the achievement gap. Conversely, since The Common Core State Standards is being implemented, new research could evaluate how schools have changed their tracking systems to accommodate or adapt to the new standards?

Finally, another area that needs to be researched would be to determine how a teacher who is knowledgeable of the negative effects of tracking and is currently in a school that tracks can help her current students on the lower tracks become more successful? If their school is resistant to changing their tracking system, then a teacher needs ways in which to help reduce the negative effects of this inefficient system. Analyses of successful teaching styles and approaches could illuminate a future pedagogy for greater application in the lower tracks and provide high standards and better curriculum for the lower achieving student.

Overall, tracking students by ability is a very inefficient system in teaching American school and it needs to be dismantled. Tracking is restraining many students from performing to their full potential and is producing many negative effects. Robert

Slavin (1990) said it very well in stating that the burden of proof should fall on the system of tracking. For it to be utilized by American school systems, it should have to be proven successful by showing significant academic achievement. However, the research to date proves that it does not produce significant academic results at any track level. Therefore, for American schools to be successful and to compete internationally, we need to change the norm and start educating our students as one heterogeneous group and hold all students to the highest standard.

References

- Braddock II, J., & Slavin, R. (1995). Why ability grouping must end: Achieving excellence and equity in American education. In H. Pool & J. Page (Eds.), *Beyond tracking: Finding success in inclusive schools* (pp. 7-16). Bloomington, IN: Phi Delta Kappa Educational Foundation.
- Burris, C. C., & Welner, K. G. (2005). Closing the achievement gap by detracking. *Phi Delta Kappan*, 86, 594-598.
- Chiu, D., Beru, Y., Watley, E., Wubu, S., Simson, E., Kessinger, R.,... Wigfield, A. (2008). Influences of math tracking on seventh-grade students' self-beliefs and social comparisons. *The Journal of Educational Research*, 102(2), 125-135.
- Gamoran, A. (1992). The variable effects of high school tracking. *American Sociological Review*, 57, 812-828.
- Gamoran, A. (2009). *Tracking and inequality: New directions for research and practice*. Manuscript in preparation., Department of Sociology, University of Wisconsin–Madison. Retrieved from <http://www.wcer.wisc.edu/publications/workingPapers/papers.php>
- Hoffer, T. (1992). Middle school ability grouping and student achievement in science and mathematics. *Educational Evaluation and Policy Analysis*, 14, 205-227.
- Houtte, M. (2006). Tracking and teachers satisfaction: Role of study culture and trust. *Journal of Education Research*, 99(4), 247-254.
- Linchevski, L., & Kutscher, B. (1998). Tell me with whom you're learning, and I'll tell you how much you've learned: Mixed-ability versus same-ability grouping in mathematics. *Journal for Research in Mathematics Education*, 29, 533-554.
- Lucas, S. (1999). *Tracking inequality: Stratification and mobility in American high schools*. New York, NY: Teachers College Press.
- Oakes, J. (1985). *Keeping track: How schools structure inequality*. New Haven, CT: Yale University Press.
- Reed, J. (2008). Shifting up: A look at advanced mathematics classes in tracked schools. *The High School Journal*, 91(4), 45-58.
- Slavin, R. (1988). Synthesis of research on grouping in elementary and secondary schools. *Educational Leadership*, 46(1), 67-77.
- Slavin, R. (1990). Achievement effects of ability grouping in secondary schools: A best-evidence synthesis. *Review of Educational Research*, 60(3), 471-499.

Trautwein, U., Ludtke, O., Koller, O., Marsh, H., & Baumert, J. (2006). Tracking, grading, and student motivation: Using group composition and status to predict self-concept and interest in ninth-grade mathematics. *Journal of Educational Psychology, 98*, 788-806.

Wheelock, A. (1992). *Crossing the tracks: How "untracking" can save America's schools*. New York, NY: The New Press.