ABSTRACT

Title of Document: THE INFLUENCES OF TRACKING IN MATH ON 7TH-GRADE STUDENTS' SELF-CONCEPTS OF ABILITY AND SELF-ESTEEM

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This study examined how 7th-grade students' self-esteem, self-concepts, and social comparisons were affected by math track placement and gender. Based on 170 students surveyed and 15 interviewed, initial results showed that higher-track students had significantly higher ability self-concepts in math, English, and school. Math track did not influence students' self-esteem. After controlling for students' grades in math, track no longer affected students' self-concepts of ability. Students stated they most frequently compared to other students performing similarly to them within the same track. Boys were significantly more likely than girls to compare themselves to students doing better. There were no gender differences in self-esteem or self-concepts related to whether boys and girls compared themselves to others within their track or in different tracks.

THE INFLUENCES OF TRACKING IN MATH ON 7TH-GRADE STUDENTS' SELF-CONCEPTS OF ABILITY AND SELF-ESTEEM

Team TRACK: Team Research on the Academic Classification of Kids

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Chapter 1: Introduction

Definition of Tracking

Tracking, or ability grouping, is the separation of students into different classrooms, or tracks, based on ability. The theoretical rationale for tracking is that the separation of students allows teachers to effectively address the needs of students with varying learning abilities (Nicholson, 1998; Redd, Brooks & McGarvey, 2002). Tracking is used based on the belief that it operates in the best interest of students and relies on four assumptions. The first is that students of higher ability are held back when placed in classes with lower ability students. The second is that the shortcomings of lower ability students are better addressed when those students are grouped together. The third is that placing students in tracks is an accurate reflection of their achievements and abilities. The fourth assumption is that teachers can better accommodate the needs of students when they are in homogeneous classes (Reuman, 1989). Generally, schools use standardized test scores, grades, and teacher recommendations to place students into these tracks (Freeman, 2003; Hallinan, 1994; Rosenbaum, 1976).

History of Tracking

Tracking is a practice that has been long ingrained into the school system. The development of tracking and ability grouping can be traced back to the mid-19th Century. Before 1860, public schooling was only available to a small sect of prosperous Americans. Attendance at these schools was sporadic and few went on to secondary school. The United States experienced a population boom at the turn of the century as many immigrants arrived to the country. As a result, the number of schools increased

dramatically, and as Anglo-Saxons fled from urban areas, conditions of schools rapidly deteriorated. Public high schools were developed to address this problem and were instituted to impose social control on new immigrants. They were termed comprehensive high schools and ensured that students would receive an education (Oakes, 1985).

Education was increasingly seen as an industry, and out of efforts to improve efficiency, tracking and ability grouping emerged. In order to be most efficient, it was believed that different children needed to be separated and educated differently. Students were split by ethnic, racial, and economic backgrounds, and this was justified by educational testing that proved that minority and poor children did not learn as well as their white, more affluent counterparts (Oakes, 1985).

Controversies About the Use of Tracking

Today, tracking remains a controversial practice. Advocates of tracking and ability grouping, mainly teachers and parents, argue that by reducing heterogeneity in the class instructional group, it is possible to increase the pace and level of instruction for high achievers and provide more review and corrective feedback for low achievers, thereby optimizing achievement gains for most students (Reuman, 1989). Opponents of tracking believe that low-ability students receive lower quality of instruction, are held to lower expectations, and have teachers with less experience. These researchers believe that low-track students do not do as well as they would have if they were grouped heterogeneously with students doing better in school (Gamoran, 1989; Oakes, 1985; Persell, 1977; Rosenbaum, 1980). Opponents also believe tracking can have negative effects not just on students' performance but also on their psychological well-being. Relevant variables here include students' overall self-esteem and their beliefs about their

abilities in different subject areas (see definitions of these terms below). More generally, opponents of tracking argue that the negative attitudes toward school often displayed in low-track students are attributable to the track placement itself.

Tracking in Math

Math classes are often heavily tracked; once students are placed in a certain level math class, they tend to follow that track through high school. Further, the U.S. Department of Education found that taking advanced mathematics in high school is "more strongly associated with successful completion of college than any other factor, including high school grade point average and socioeconomic status" (Burris, Heubert, & Levin, 2006, p. 106). Additionally, there is a positive relationship between advanced mathematics and higher earning power; there is a strong correlation between studying mathematics beyond Algebra 2 and future educational and financial success (Adelman, 1999; Burris et al., 2006).

Despite these studies citing the importance of mathematics, many students are failing math before high school and not pursuing further study. According to the National Research Council, large proportions of students are failing mathematics and thus abandoning its study early in their high school careers (Burris et al., 2006; Pendergast, 1989). This creates a need to better understand why this is occurring, and whether tracking in math contributes to these problems.

More broadly, the state of education in today's society necessitates an improved understanding of how tracking and ability grouping affect students' beliefs about their abilities. If low-tracked students have lower self-esteem than their higher-tracked counterparts, it is quite possible that they will not succeed in math and be less likely to

pursue higher education.

Link to Motivation

Along with self-esteem and self-concept, motivation is a major part of a child's psychological well-being that is greatly influenced by tracking. Motivation is the part of one's psyche that influences the tasks one attempts and the amount of energy put into achieving the goals of an activity (Wigfield, Eccles, Schiefele, Roeser, & Davis-Kean, 2006). Motivation is included in discussions about academic achievement because it is often a determining factor in the academic activities that a child attempts, the amount of effort he or she expends, and the diligence with which he or she takes on a task (Eccles, Wigfield, & Schiefele, 1998; Pintrich & Schunk, 1996; Renninger, Hidi, & Krapp, 1992; Wigfield, Eccles, & Rodriguez, 1998; Wigfield et al., 2006).

Children's beliefs about their capability of completing certain tasks, or their self-concepts (see definition below), strongly correlate with their motivation and level of achievement (Eccles, Adler, Futterman, Goff, Kaczala, Meece, & Midgley, 1983; Meece, Wigfield, & Eccles, 1990; Nicholls, 1979a; Wigfield et al., 1998). When a child has positive ability beliefs and expects that he or she can achieve a certain task or a goal, he or she is more likely to do it (Wigfield et al., 1998). It seems that children's ability beliefs determine whether they believe they will succeed, which is related to choice of activities and achievement. While the focus of this study is the effect of tracking on self-concept and self-esteem, it is important to note the link between motivation and self-concept because any detrimental effects of tracking on students' self-concepts might decrease students' motivation and, consequently, levels of achievement in school.

While ability beliefs affect achievement, achievement also affects ability beliefs,

or a person's self-concept. There are many different types of self-concepts, one of which is academic self-concept (Harter, 1998; Marsh, 1990). This academic self-concept is influenced by many factors; a person's previous achievements are shown to have an impact on his or her academic self-concept. As children get older, their beliefs about accomplishing future goals and tasks are more reflective of their past successes and failures (Wigfield et al., 1998). Many researchers found that past accomplishments impact how capable a person feels in mastering different tasks. Those who succeed tend to have more positive self-concepts and perhaps higher levels of motivation (Redd et. al., 2002). Those who experience more problems in educational settings have fewer positive forms of motivation (Connell & Halpern-Felsher, 1997; Redd et. al., 2002). Extending this to tracking, this work suggests that students in high tracks who generally do well in school will have positive beliefs about their ability. Students in lower tracks who do poorly in school likely think they lack the ability to succeed in school.

Gender and Tracking

Some previous research focused on the differential effects that tracking has on boys and girls. Generally speaking, this research suggests that boys benefit more from tracking. In addition, research indicates that girls often have lower self-esteem than do boys (Belenky, Clinchy, Goldberger, & Tarule, 1986; Block, 1984; Gilligan, 1982; Harter, 1998, 2006; Jackson, Hodge, & Ingram, 1994; Markus & Oyserman, 1988; Miller, 1985; Stewart & Lykes, 1985). These differences surface during early childhood and develop further during middle school years (Guimond, 2006; Harter, 1998, 2006; McGuire and McGuire, 1988; Oakes, 1990; Rankin, Lane, Gibbons, & Gerrard, 2004).

Given these two sets of findings, it is important to address further whether there are gender differences in tracking's influences on children's self-concepts and self-esteem.

Tracking and Social Comparisons

Some researchers noticed the role that social comparisons play in the way students view their abilities. Social comparison is defined as a student's evaluation of his or her perceived ability in comparison to the perceived ability of another student (Skaalvik & Skaalvik, 2002). Students' self-esteem can be greatly affected by the social comparisons they make. With respect to tracking and social comparison, if students in low tracks compare themselves to those in higher tracks, they could be particularly vulnerable to having lower self-concepts of ability and self-esteem (Eitzen & Zinn, 2003).

Team Goals

Although much research has been done on tracking and how it influences students' self-concepts and self-esteem, many important issues have not been addressed fully in the literature. Not enough research has been done to examine the effect tracking has on students' self-concepts and self-esteem; oftentimes, research has confused the two constructs and not differentiated the specific aspects of self-concept. Another issue that needs to be further researched is how students in different tracks evaluate their ability through comparisons to others. Do they compare themselves to others in their own tracks or across tracks? An additional issue is how boys and girls in different tracks differ in their self-concepts and self-esteem, and also how they differ in their social comparisons. These three topics are the focus of this thesis and below are the five research questions

our team developed.

Limitations

A few limitations to our study prevent our results from being generalized to other school systems that utilize tracking. The sample for the study is limited in a number of ways. Although our sample size has a similar number of boys (86) and girls (87), the number of students from each track has some variability. There were fewer students in Pre-Algebra (43) than in Math 7 (66) and Algebra (64). Additionally, students were only allowed to participate if they returned a signed parental consent form. In our study, 173 of 295 7th-grade students (59%) returned the form and participated. This may have been representative of a subset of the 7th-grade population and may not have reflected the entire grade.

Another concern is how representative our sample was as compared to other students across the country. The students at the school where we conducted our survey consistently outperformed students at other schools on standardized testing in mathematics. Furthermore, the county in which the school is located consistently outperformed students throughout the state. To that end, the school placed students in one of three math classes: Math 7, Pre-Algebra, and Algebra. There were no below-level math courses, and this might have affected students' perceptions of being in an above- or below-level class.

A more general concern with our study involves the methods we chose. We administered the surveys, and the students might have answered the questions misleadingly to provide data they believed would be best for the study. Answers to the questions in the survey may not have reflected the students' actual beliefs because there

may not have been enough time to accurately answer the questions. The second method we employed was oral interviews. Personal biases on the part of the interviewers might have played a role in interpreting the impact of tracking on self-concept and self-esteem.

Research Questions

1. What type of social comparisons do students in different tracks make more frequently — those within tracks or across tracks?

2. How do students in various tracks differ in their self-esteem and self-concept?

3. Do students who make more frequent comparisons within their track differ in their self-concept and self-esteem from students who make more frequent comparisons across tracks?

4. Do the self-esteem and self-concept of boys and girls differ by track or by subject?

5. Does the frequency of social comparisons made within or across tracks differ by gender?

Glossary

Tracking/ability grouping – the separation of students based on ability in different subject areas

Self-esteem – an individual's overall assessment of his or her value or worth (i.e. "I am a good/bad person.")

Self-concept – an individual's assessment of his or her competence in a specific area (i.e. "I am good in math/English/school.")

Social comparison – comparisons that an individual makes between him- or herself and other individuals, in order to assess his or her own abilities, skills, and attributes relative to others'

Chapter 2: Literature Review

The effect of tracking on students has long been a source of controversy within the educational sphere. This review of the literature will begin by exploring the varying criteria used to track students, as the procedures and measures for tracking have changed over time and long been debated in terms of their validity. This review will then explore the history of research concerning the possible psychological effects of tracking on students' self-esteem and self-concepts, which have been found to strongly correlate with students' motivation and level of achievement (Eccles et al., 1983; Meece et al., 1990; Nicholls, 1979a; Wigfield et al., 1998). Researchers have found evidence showing a wide range of effects of tracking on students, from positive effects on higher-level students and negative effects on lower-level students to negative effects on higher-level students and positive effects on lower-level students.

These differential effects of tracking on students' self-esteem and self-concepts could be explained by the way in which students engage in social comparisons, which is the next issue addressed in this literature review. Social comparison research focuses on the direction of comparison (upward or downward), the effects of comparison (assimilation or contrast), and the underlying reasons for comparison (i.e. self-improvement, self-enhancement, etc.). Some research has also examined the effect of tracking on social comparisons, though the majority of this research has focused on within-track comparisons, again examining assimilation and contrast effects on self-esteem and self-concepts. The little research that has been done on across-track social comparisons and its potential effects on self-esteem and self-concepts is also explored in this literature review. Lastly, this literature review presents a summary of research

conducted on gender differences in self-esteem and self-concepts based on both track level and subject area. It also explores gender differences in social comparisons in terms of the frequency of comparison types (upward or downward) and of the effects of these comparisons (assimilation or contrast).

Tracking Criteria

Defining Tracking

Tracking, or the assignment of students to instructional groups by ability in different subject areas, is a method of education that is routinely used within schools. In the past, the most commonly used form of tracking, or ability grouping, was in a three-track structure categorized by academic, general, and vocational tracks. In more recent years, however, tracking systems have become more diversified, comprised of courses such as honors, Advanced Placement, and on-level classes, and criteria for placing students in tracks have also begun to vary more from school to school (Hallinan, 1994).

The United States Department of Education has an official position on how students should be assigned to tracks. In 1964, the U.S. Congress passed Title IV of the Civil Rights Act, which prohibits discrimination on the basis of race, color, or origin in the assignment of students to schools, classes, and courses of study in programs that receive federal assistance. Thus, based on this law, it is the responsibility of a school to make sure that the basis for track assignments is not discriminatory. Furthermore, students have to be given the chance to move from one track to another in accordance with their progress. Despite the parameters placed on tracking under law, however, many experts believe that there are still flaws in the way that tracking is used within schools, claiming that serious disparities in educational experiences and psychological

experiences occur for students in the different tracks. Researchers such as Eitzen and Zinn (2003) argue that students in lower tracks are disadvantaged due to inadequate curriculum, negative labels, and low self-esteem. These topics will be discussed later in more detail.

If such disparities do indeed exist, it has proven difficult to remedy them. One reason for this is that various school systems use different methods to track their students. Upon conducting an extensive study on a collection of schools and their tracking systems, Hallinan (1994) concluded that no two schools implement tracking in the same way and that the results of these different tracking schemes vary as well. The way in which variation occurs is extensive; track assignment, structure, criteria, flexibility, and priorities all vary across schools, and all can affect academic achievement. Learning opportunities within a track, instructional variance, and class and school demographics all play roles in the outcome of a tracking program. As no two schools are the same, differences in the effects of tracking are also inconsistent, and educators must be aware of the specifics of a particular school in order to decrease the inequalities associated with tracking.

Variation in Tracking Identification Procedures

The identification of students for placement in upper-level tracks depends on the definition of "high-ability students" and the assessment methods used. Just as the structures and organizational methods of tracking systems have changed over the years, so has the process of identifying students who should be placed in high tracks. Regardless of the year, states vary widely with respect to program elements, such as the definition of "gifted" and the preferred identification procedures. Policies regarding identification

procedures are not uniform or even necessarily similar from district to district or state to state. These policies range from broad guidelines to specific standards to very detailed lists of instruments that are to be used in student identification (Freeman, 2003).

A key part of student identification is the definition of a "high-ability" or "low-ability" student. The definition of a child's ability depends on that which is measured. Consequently, the type of child designated as gifted is affected by the reason for the search as much as, if not more than, the methods of identification. It has been found that the most popular criterion is exceptionally high intelligence, as measured by Freeman (2003). Currently, there is a move from recognizing "general intelligence" and IQ (a.k.a. Intelligence Quotient) to recognizing "talent" and the idea that gifted students can excel in just one area, instead of across the board (Schwartz, 1997).

This movement is evident in a similar change in identification procedures used to assign students to tracks in school. Historically, many tracking decisions were based on a student's performance on tests that were used to measure general intelligence, commonly known as IQ tests, and a student's results from other standardized tests. However, methods have recently progressed from the exclusive use of IQ and standardized testing as an indicator of intelligence to methods that help with the recognition of single talents, learning ability, and learning potential (Schwartz, 1997). Identification procedures are being designed to recognize diverse gifts and talents and to be able to identify these gifts and talents through multiple criterion (Freeman, 2003). In addition to standardized tests, modern assessment methods include the following: observations by educators, parents, and classmates; self-identification; and portfolios of student accomplishments. Portfolios are designed to allow the assessment of progress and overall achievement, to evaluate

areas such as exceptional learning and the use and generation of knowledge, and to permit assessment of students' creativity (Schwartz, 1997). Furthermore, grouping is often conducted in individual subject areas (e.g., math or English), rather than in all aspects of the curriculum. These methods have come a long way from the classification of students based solely on test scores and IQ.

Validity of Tracking Measures

Part of the reason for this shift, which is still a cause of much contention in the educational community, is the validity of the measures used to classify students. Several studies have been conducted to investigate which variables, if any, best determine track placement and success therein. Rosenbaum (1976) conducted an in-depth study of the tracking system used by a high school in a town near Boston, Massachusetts. In his study, he paid special attention to the criteria used by the school in their track placement. His analysis revolved around the three basic criteria categories that the district used: ability, effort, and achievement. Each category was judged based on how stable it was over a period of time and how well the variable correlated with other variables. Among the ability variables (IQ scores and standardized test scores), Rosenbaum (1976) found that none of the variables were very stable, with a student's IQ as the most stable over time. In general, Rosenbaum found that tested IQs can change over a set time interval: an early score correlates well with a later score only about 63 percent of the time (Rosenbaum, 1976). The only other criterion Rosenbaum (1976) studied that had any stability over some amount of time was standardized test scores. All of the other variables changed significantly over a two- or four-year period of time. Correlations between variables, such that different variables would indicate similar track placements, were also rare. These

correlations only occurred between test scores and IQ scores and between grades and the industry evaluations completed by teachers. Therefore, Rosenbaum (1976) concluded that there were no clear criteria that could be used properly to place students into tracks.

Other researchers have also concluded that no one criterion is effective enough to determine track placement. The combination of several criteria has been assumed to improve the validity of track placements. However, the measures used to place students into higher tracks depend on the reason for tracking as much as the specific criterion used (Freeman, 2003). A student's label as "gifted" can change depending on the weight given to different criteria, and these weights are not uniform within a single school district, let alone across the country. Even within single schools, the criteria are often not administered evenly. In his study, Rosenbaum (1976) found that there is only a weak correlation between the different criterion variables and tracking placements. Thus, the variables used to place students in tracks were used on an individual basis; there were no universal criteria used to determine placements for all students. He also found that there was no clear cutoff point for track placement in any of the indicators. For instance, if IQ were most heavily weighted in making placement decisions, the vast majority of students in the highest track should have the highest IQs among all students. Likewise, students in the lowest track should have the lowest IQs among all students. Rosenbaum (1976) failed to find this correlation in all of the tracks he studied.

Tracking is a widely used educational practice designed to separate students by their ability levels in an attempt to meet their specific needs and provide more targeted instruction. However, the procedures used to separate students into different tracks are still widely varied and debated in terms of their validity. Much research has been

conducted in an attempt to address this question of whether tracking accomplishes its originally specified goal, as the research community has increasingly grown concerned about the effects of identifying students as either of high ability level or not.

Tracking and Students' Psychological Well-Being

Defining Self-Concept and Self-Esteem

Along with the concern about the criteria used to assign students to tracks, researchers and educators have been concerned about the possible psychological effects of tracking. Research on tracking's effect on the psychological well-being of students has primarily focused on its impact on students' self-concepts and self-esteem. Self-concept is often defined as the way in which a person evaluates his or her competence in a specific area, and self-esteem constitutes a person's overall assessment of his or her value or worth (Harter, 1988, 2006; Wigfield & Karpathian, 1991). Therefore, self-esteem is a much broader category in which self-concept plays an important role because a person's beliefs in his or her abilities contribute to his or her overall sense of adequacy as a person. Harter (1998, 2006) identified eight central domains that contribute to an individual's overall self-esteem, including scholastic competence, employment competence, social acceptance, athletic competence, physical appearance, behavioral conduct, romantic appeal, and close friendship. Although younger children have a difficult time evaluating their self-worth, those who enter middle childhood develop the ability not only to make judgments about their self-esteem but also to make self-evaluations across various domains (Harter, 1998, 2006; Harter & Pike, 1984).

An important component of children's self-concepts is their beliefs about their ability in different areas. Researchers have found that children's beliefs about their

capability of completing certain tasks, or their ability beliefs, strongly correlate with their motivation and level of achievement (Eccles et al., 1983; Meece et al., 1990; Nicholls, 1979a; Wigfield et al., 1998). Children are more likely to attempt a certain task when they have positive ability beliefs and expect that they can achieve that task or goal (Wigfield et al., 1998). It seems that children's choice of activities and achievement are related to their ability beliefs, which determine whether they believe they will succeed.

While ability beliefs affect achievement, achievement also affects ability beliefs, or a person's self-concept. The academic self-concept in particular is influenced heavily by a person's previous achievements (Harter, 2006; Marsh, 1990). As children get older, their beliefs about accomplishing future goals and tasks are more reflective of their past successes and failures (Wigfield, et al., 1998). Many researchers have found that past accomplishments impact how capable a person feels in mastering different tasks. Those who have succeeded tend to have more positive self-concepts of ability and perhaps higher levels of motivation (Redd et al., 2002). Those who have experienced more problems in educational settings have less positive forms of motivation (Connell & Halpern-Felsher, 1997; Redd et al., 2002).

Development of Self-Esteem and Self-Concept

Researchers have found that children's views of themselves change over time. At a younger age, children have a very positive perception of themselves because they cannot distinguish between desired and actual competence and thereby only see their ability levels as what they want them to be (Harter, 1998, 2006). As they enter middle and late childhood, however, their perception becomes less positive and more realistic as bi-dimensional thought emerges and both positive and negative self-evaluations are

entertained. The decline in self-perception at this age may also be attributed to the socializing environment during late childhood and adolescence (Harter, 1998, 2006).

Another factor that influences the development of ability beliefs in different areas is social comparisons, or comparisons individuals make between themselves and other people. Children begin to use social comparison as a way to evaluate how well they are doing around age six or seven (Ruble, 1983). When students are grouped into grades by age, they further their social comparisons with age-mates. At this time, social comparisons become more salient to self-evaluation and are used by children to assess their competence, skills, and attributes (Harter, 1998, 2006).

There is some debate in the field about the time when self-esteem emerges. Harter (1998) believes a concept of global self-esteem or self-worth ("how much one likes oneself as a person") develops during middle childhood as children develop the ability to form concepts of traits and construct a more general evaluation of themselves as a person (p. 572). Marsh, Craven, and Debus (1998) believe self-esteem develops somewhat earlier than this. In either case, the middle childhood and early adolescent years are when children's self-esteem emerges and becomes established as an important psychological construct.

Tracking's Influences On Students' Self-Concepts And Self-Esteem

Some researchers have found that tracking positively affects the self-esteem and self-concepts of higher-level students and negatively affects the self-esteem and self-concepts of lower-level students (Black, 1993; Ireson, Hallam, & Plewis, 2001; Kelly, 1975; Nicholson, 1998; Oakes, 1985; Redd et al., 2002; Schafer & Olexa, 1971; Zeleke, 2004). One possible reason for this difference is that higher-level students are often

praised, while the lower-level students are not as highly regarded (Black, 1992; Zevenbergen, 2003). On the other hand, other researchers have concluded that tracking lowers the self-esteem and self-concepts of higher-level students and raises the self-esteem and self-concepts of lower-level students because the students are grouped with others of similar ability (Goldberg, Passow, & Justman, 1969; Hallam & Ireson, 2003; Kulik & Kulik, 1992; Nicholson, 1998; Wigfield et al., 1998; Zeleke, 2004; Zevenbergen, 2003). According to these researchers, the higher-level students face more competition, which leads to lower self-esteem and self-concepts, while the lower-level students are separated from those with higher ability and thereby experience greater self-esteem and self-concepts. We next review each set of studies in more detail.

The majority of research on tracking lies on the first side of the issue, finding that students in lower tracks have lower self-esteem and self-concepts than those in higher tracks (Black, 1993; Gallagher, 1993; Ireson et al., 2001; Nicholson, 1998; Oakes, 1985; Zeleke, 2004). Most researchers have focused on the negative effects of tracking on lower-ability groups rather than the positive impact on higher-ability groups. Oakes (1985, 1990) conducted some of the most prominent research that focuses on these adverse effects of tracking. She used data collected from questionnaires and interviews with thousands of students in 25 American secondary schools that differed in all demographic aspects. Three self-concept scales were used in the student surveys to determine exactly how the students viewed themselves generally (self-esteem), in relation to their peers, and in relation to academics (self-concepts). Oakes' (1985) results showed that students in low-tracked classes displayed negative self-esteem and self-concepts that can be directly attributed to their lower track placement. While the low-track students

experienced negative effects on their self-concepts and self-esteem, she also found that those students who had been placed in high tracks experienced positive effects with higher self-esteem and self-concepts due to their track placement (Oakes, 1985).

There are other researchers who also found similar results in their studies on the effects of tracking on self-esteem and self concepts. In his review of the literature on tracking and self-esteem, Nicholson (1998) concluded that almost all researchers agree that one of the dangers of ability grouping is the loss of self-esteem by those in the lower tracks. In particular, Gallagher (1993) observed in his study that low-track students had low self-esteem and harbored negative attitudes toward school. Hallam and Ireson (2003) reached similar conclusions about the effects of set ability groups on students' notions of themselves. Along with previous findings of low self-esteem in lower groups, Hallam and Ireson (2003) also found that the higher-level students saw themselves as better people than their lower-level counterparts.

In their theoretical hypotheses, Schafer and Olexa (1971) weighed heavily the "self-fulfilling prophecy" and the effects of stigmatization and theorized that students in lower-level tracks would experience negative effects on their self-esteem. They supported their theory with qualitative data from unstructured interviews with a female student who was in a non-college-bound track, citing the shame and humiliation the student felt as a result of her low-track placement. Using data collected from 1,227 male high school sophomores in western Oregon, Kelly (1975) conducted an empirical study on the effects of tracking on self-esteem. About half of the students surveyed were identified as college-bound, and the other half identified as non-college-bound. Kelly (1975) measured the students' self-esteem by asking them to compare themselves with their classmates in

terms of their spelling ability, language usage, and general intelligence, on a scale from one to 10. Kelly's (1975) findings confirmed Schafer and Olexa's (1971) hypothesis that track position is directly related to self-esteem, finding that non-college-bound students were more likely than college-bound students to exhibit a low evaluation of themselves and their abilities. Kelly (1975) concluded that self-esteem decreases as track position decreases. It is important to note that from the definitions of self-esteem and self-concept presented above, Kelly (1975) appears to have measured self-concepts of ability rather than general self-esteem.

Some studies also looked more specifically at self-concept and the way in which students in different tracks assess their abilities. Zeleke (2004) found that children in lower-level math classes rated themselves more negatively in mathematics than their higher-level peers. Skaalvik and Rankin (1996) found that when the individual level of math achievement was controlled, average classroom math ability negatively affected math self-concept. In a longitudinal study that followed 955 students from eighth grade to 10^{th} grade using the National Education Longitudinal Survey data, Turner (1998) found that moving to a higher track greatly raised self-concept and self-esteem, while moving to a lower track somewhat lowered self-concept and self-esteem. Black (1992) also found that teachers gave labels to different ability groups, such as "aces" and "zeros," which the students then adopted for themselves. Subsequently, these labels respectively raised and lowered the self-esteem and self-concepts of higher- and lower-level students. The consensus among all of these researchers is to avoid tracking because of its negative effects on children's self-esteem and self-concepts; however, they offer few counterarguments or alternative explanations for these negative effects.

Ireson et al. (2001) found that students who experienced moderate levels of tracking, with tracking taking place in no more than two subjects during the seventh year of schooling and in up to four subjects by the ninth year, had higher self-esteem and general school self-concepts. This conclusion was determined by evaluating the results of questionnaires adapted from the Marsh Self Description Questionnaire (Marsh, 1990), a measure of self-concepts of ability in different areas. The questionnaires were administered to year nine students in 45 schools. Students were selected based on tests that were taken in their sixth year, the last year of primary school. There were some proposed explanations for the influence of tracking level on general school self-concept, but these effects were not studied directly and were suggested for further research. The first was that schools with higher levels of tracking, which have tracking in place for more than four subjects during the seventh year of school, tend to be more competitive, possibly making track placement more important and a basis for comparisons among students. The other possible explanation would take the amount of social mixing into account. In moderately tracked schools, students could have more bases for comparing themselves and therefore make more positive self-judgments (Ireson et al., 2001).

Numerous researchers have offered the same general conclusions regarding lower-level students, but they have also looked at other dimensions of the issue. Some studies have attempted to identify the key factors involved in tracking that would negatively impact the self-esteem of lower-level students. Using data from the first follow-up of the High School and Beyond Study (HSB) conducted in 1982 on 14,825 high school students as they moved from 10^{th} grade to 12^{th} grade, Vanfossen, Jones, and Spade (1987) grouped the students into three tracks – academic, general, and vocational –

based on the students' reports of their tracks, which were verified with the types of classes the students took. These researchers focused solely on those students who remained in the same track from 10th grade to 12th grade. In this study, self-esteem was measured using four items from the Rosenberg scale. Students were asked "whether they had a positive attitude about themselves, whether they believed they had worth or were equal to others, whether they believed they were able to do things as well as most other people, and whether they were generally satisfied with themselves" (Vanfossen et al., 1987, p. 118). They found that the academic track variable had a modest and statistically significant effect on self-esteem, with the level of self-esteem for students in the academic track increasing slightly from sophomore to senior year, the level of self-esteem for students in the general track remaining stable, and the level of self-esteem for students in the vocational track decreasing. Vanfossen et al. (1987) also found that data on student perception suggested variations between tracks in discipline problems and in teacher treatment of students, with students in the academic track experiencing fewer discipline problems in the classroom and better teacher treatment. Although these findings were only based on student report and not a direct measure of the classroom climate, these researchers suggested that these differences might help to explain the differential effects on self-esteem experienced by students in different tracks.

In summary, this body of research shows that students in different tracks differ in their self-concepts and self-esteem, with students in higher tracks having more positive self-concepts and self-esteem. Based on these results, these researchers suggest that tracking should not be used extensively in schools.

The second, less-supported camp finds the opposite, concluding that self-esteem

and self-concepts are raised in lower tracks and lowered in higher tracks (see Kulik & Kulik, 1992, for review). The rationale for this position is that when students are grouped with others of similar ability, they are able to rate themselves using a more realistic scale (Goldberg et al., 1969). As such, the students with higher ability are challenged by students of similar ability, while the students with lower ability can work at a slower pace without any pressure (Nicholson, 1998). Therefore, those students who are in the higher tracks will find themselves competing with others of a higher ability and may experience lower levels of self-esteem and self-concepts than they would experience if they were grouped with lower-ability students. Using the same rationale, those students who are in the lower tracks will find themselves competing with others of a lower ability and may experience higher levels of self-esteem and self-concepts than they would experience if they were grouped with higher-ability students.

In a meta-analysis of 13 studies on the effects of ability grouping on self-esteem, Kulik and Kulik (1992) found no overall effect on self-esteem. Although it is not clear whether the different studies measured self-esteem, self-concept or both, they did observe that ability grouping tended to raise the self-esteem of students in the lower levels and reduce the self-esteem of students in the higher levels. This idea is often referred to by theorists as the "Big-Fish-Little-Pond Effect": Students who are grouped with those of higher ability than themselves will have a lower academic self-concept than students who are grouped with others of lower ability (Marsh, 1987, 1991). Proponents of this theory argue that when students compare themselves to higher-level students, their self-concepts are lowered, and when they compare themselves to lower-level students, their self-concepts are raised (Davis, 1966; Marsh, 1987, 1991). Based on this theory, students who

do well in a low track would have higher self-concepts when comparing themselves to others within their track.

Fuligni, Eccles, and Barber (1995) conducted a large-scale, longitudinal study on 1139 students in Michigan to determine the long-term effects of ability grouping in mathematics on students' math self-concepts. The researchers measured students' math self-concepts when they were in sixth, seventh, and 10^{th} grades. Fuligni et al. (1995) asked the students to rate on a seven-point scale how good they were in math, how they thought they ranked in their math class, and how good they were in math compared to other school subjects. Although the researchers found a difference in the math self-concepts of high-ability and low-ability students, they concluded that these differences were not a result of tracking. As a result, they did not find any long-term effects of ability grouping on students' math self-concepts. The researchers noted that their findings contradict the popular belief that students in low-level math classes have lower self-concepts due to the negative labels assigned to low tracks. Fuligni et al. (1995) explained their findings by stating that math self-concept is more likely to be affected by "more absolute indicators of performance and immediate within-classroom social comparison processes rather than by the labeling associated with between-classroom ability grouping experiences" (p. 85). We will discuss the impact of social comparison in a later section.

While most researchers have either concluded that tracking raises the self-esteem and self-concepts of higher-level students or that it lowers them, one study conducted in Australia straddled the fence and found that higher-level students experience times of both raised and lowered self-concepts due to tracking (Zevenbergen, 2003). Zevenbergen (2003) interviewed 96 students and compiled the students' responses into a single report.

She found that a typical response of higher-level students was that they knew they were smart because they were in the higher-level class. However, these same students also expressed times of lower self-concept, saying their teachers made them feel dumb when they asked a question because they were "supposed to be smart and know this" (p. 4). Therefore, Zevenbergen (2003) concluded that tracking raised the self-concepts of higher-level students because they knew they were in the smarter class, but that this grouping also raised expectations of the students and sometimes made them feel inadequate, thereby lowering their self-concepts.

However, although Zevenbergen (2003) agreed with conclusions in both camps about the effects of tracking on higher-level students, she found that tracking only negatively affected lower-level students' self-concepts. The typical response from a lower-level student about his or her academic ability was negative: One student commented that he felt "like a retard" in his lower-level math class because his teacher treated his class "as if we know nothing," while another said that he was "so dumb at [math]" (p. 6). Therefore, Zevenbergen's (2003) study also showed that a teacher's impression of a class, based on how it has been labeled according to ability, can have a major impact on student self-concept.

Interpreting the Conflicting Findings

Based on Zevenbergen's (2003) study, it is possible that both sides are correct. While tracking may have an overall positive impact on higher-level students who know they are in a high class and an overall negative impact on lower-level students, higher-level students may also experience lower self-esteem and self-concepts if they are not doing as well as their higher-level counterparts and lower-level students may experience

higher self-esteem and self-concepts if they are doing better than their other lower-level counterparts. Based on this theory, it is important to understand more clearly whom students in different tracks compare themselves to, a factor that is examined in this study.

Another important issue to consider with respect to tracking's effects is how individuals' self-concepts and self-esteem relate to one another. Harter (1986, 1990) has shown that even when children perform similarly in a domain, their self-esteem varies depending on how much they value the domain. Harter (1986, 1990) concluded that competence in domains deemed important is more highly correlated with global self-esteem (r = .70) than competence in domains judged unimportant (r = .30). Those students who do poorly only experience a lower self-esteem if they value that domain. Other researchers have supported this argument, finding that having a positive self-concept will positively impact self-esteem, but that the size of this impact will depend on the domain's importance to the individual (Coopersmith, 1967; Hoge & McCarthy, 1984; Marsh, 1986b; Rosenberg, 1965, 1979; Wylie, 1979). Harter (1998, 2006) also found that individuals with high self-esteem are able to discount the importance of domains in which they are not competent, whereas low self-esteem individuals are unable to devalue domains in which they are inadequate. On the other hand, other researchers have found the opposite, concluding that the importance of a domain does not have a substantial impact on general self-esteem (Marsh, 1986b, Wigfield & Karpathian, 1991). Although previous research is still unclear on this aspect, it does suggest that importance may be a factor in determining the way self-concept and self-esteem interrelate.

Another possible explanation for differences in students' self-concepts and self-esteem in different tracks is the effect of grades. Recent research has shown that students

in higher tracks have higher self-concepts as a result of having higher grades. Trautwein, Ludtke, Marsh, Koller, & Baumert (2006) found that there was no effect of track level on self-esteem and self-concept when the analysis controlled for grades. The researchers conducted two studies on ninth-graders in Germany. In the first study, students were tracked into different schools: college-bound, middle, and lower. Results of this study show that high self-concept in the low-track school was a function of grades. The second study measured math self-concepts of students in schools that had two tracks: high and low. Results of this study showed that students in the higher track had higher grades and had higher self-concepts. It appeared that tracking had an effect on students' self-concepts. However, when grades were taken into consideration in the analysis, the effect of tracking disappeared. Overall, Trautwein et al. (2006) concluded that differences in students' self-concepts were caused by grades rather than track level. This issue is examined further in the present study.

Social Comparison Processes and Students' Self-Evaluations

One of the ways in which tracking may influence students is through the effect it has on how they compare themselves to others; this possibility was discussed above in the section on the Big Fish-Little-Pond-Effect theory. Students make social comparisons for several reasons, including for self-evaluation and self-enhancement purposes. Researchers have found that social comparisons are inevitable in any social environment (Brickman & Bulman, 1977; Wood & Wilson, 2003). Festinger (1954a, 1954b) was the first theorist to propose the role of social comparisons in forming self-evaluations (Suls & Wheeler, 2000). He hypothesized that individuals evaluate their abilities through comparisons with others when they cannot evaluate their abilities through direct testing in

the environment, and that the comparisons lead to pressures toward uniformity.

Social comparisons are often highly valued because they give people information that they are not able to obtain with objective feedback (Wood & Wilson, 2003). Festinger (1954a, 1954b) further hypothesized that human beings have a "unidirectional drive upward," where they want to do slightly better than others (Suls & Wheeler, 2000). This drive creates a desire in people to evaluate their abilities, and one of the ways they accomplish this is through comparing themselves to similar others (Festinger, 1954a, 1954b; Suls & Wheeler, 2000).

Social comparisons occur when students compare their own ability beliefs to what they perceive to be the ability level of other students. Students use these judgments as a basis for their self-concepts (Skaalvik & Skaalvik, 2002). If they compare themselves to someone of higher ability, they are engaging in upward comparisons, and if they compare to someone of lower ability, they are engaging in downward comparisons.

Social comparisons can affect students' self-concepts of ability. Children determine their ability beliefs by their own perceived successes or failures as well as by comparing their abilities to their peers (Aspinwall & Taylor, 1993; Higgins, Ruble, & Hartup, 1983; Levine, Mendez-Caratini, & Snyder, 1982; Marsh, 1987, 1991; Wigfield, et al., 1998). In fact, success or failure is often determined by comparing one's performance in school to the performances of one's classmates (Levine, 1983; Reuman, 1989; Richer, 1976).

Development of Social Comparison Processes

The types of comparisons made, as well as the reasons why children make comparisons, change over time as children develop. At a younger age, children make

comparisons for “task mastery” purposes rather than for determining competence level (Wigfield et al., 1998). For this reason, they tend to focus on making temporal comparisons, where they evaluate how they are performing at the present time in comparison with how they were performing at a younger age (Harter, 1998, 2006). It is not until later on in childhood that children begin to make social comparisons.

Around the age when children begin to enter school and they are grouped into classes by age, they start to focus more on making social comparisons with their age-mates (Dumas, Huguet, & Monteil, 2005: Harter, 1998, 2006; Ruble & Frey, 1991). While children in early to middle childhood do make social comparisons, they use them more to evaluate whether they have received a “fair share of rewards” rather than for self-evaluation purposes (Harter, 1998, 2006). From about age seven and on, social comparisons play a larger role in shaping a child’s self-concept and ability beliefs and begin to outweigh temporal comparisons (Albert, 1977; Higgins et al., 1983; Ruble & Frey, 1991; Suls & Mullen, 1982; Wigfield et al., 1998; Wood & Wilson, 2003).

Research indicates that social comparisons play an increasingly larger role in students’ lives when they enter middle school. Research shows that individuals often make general social comparisons during times of uncertainty, including periods of stress, novelty, or change, all of which tend to classify the middle-school experience (Aspinwall, 1997; Buunk, 1994; Gibbons & Buunk, 1999; Molleman, Pruyn, & Van Knippenberg, 1986; Schachter, 1959). Researchers have also found that middle-school students, compared with elementary-school students, are more aware of and concerned about how they are performing relative to others (Eccles, Midgley, & Adler, 1984; Marshall & Weinstein, 1984; Nicholls, 1979; Rosenholtz & Simpson, 1984).

Feldlaufer, Midgley, and Eccles (1988) confirmed that middle-school students make more social comparisons than those in elementary school. The researchers performed a longitudinal study of students' transition from elementary school to middle school, based on 117 sixth-grade elementary school classrooms and 138 seventh-grade junior high school classrooms. They used student and teacher observations to conclude that students engage in more social comparisons about how they are doing in math after the transition from elementary school to middle school.

Direction of Social Comparisons

Students can make several types of comparisons, including upward and downward comparisons. When a student makes a comparison to someone doing better than him or her, he or she is making an upward social comparison. When a student makes a comparison to someone doing worse than him or her, he or she is making a downward comparison. The effect that social comparisons have on students' self-concepts and self-esteem may depend on the frequency and direction of comparisons made. In a comprehensive review of studies, Skaalvik and Skaalvik (2002) found that few studies have investigated the prominence of upward and downward comparisons in classroom situations. However, Festinger (1954) theorized that people in general tend to compare to others whom they perceive to be like themselves or slightly better than themselves, thereby indicating that people tend to engage in upward social comparisons.

Wheeler (1966) supported Festinger's (1954) claim that people tend to make upward comparisons to those individuals who are doing slightly better than them. In his study, Wheeler (1966) had participants complete a performance task and gave them false feedback with a list of other participants rank ordered by performance level. The

participants were given this list so that they would know those individuals who were more similar to them than others, but they did not know how similar in terms of scores. Wheeler (1966) concluded that, when permitted to see another participant's score, the majority preferred to view a participant that was next to them in ranking and much more likely to choose a person ranked just higher than themselves than a person ranked just lower than themselves.

While several studies have found that students prefer making upward comparisons, other studies have found that individuals have different preferences for upward or downward social comparisons. In one study, Spencer, Josephs, and Steele (1993) offered adult participants the option of listening to other interviews that either made a favorable or unfavorable impression in preparation for their own interview. These researchers found that low self-esteem individuals chose to listen to the less favorable interview, while high self-esteem individuals chose to listen to the more favorable interview. The results of this study indicated that individuals with low self-esteem want to feel better about themselves, while individuals with higher self-esteem want to improve.

Some researchers have made the assumption, based on Festinger's (1954) social comparison theory, that the most accurate self-evaluation is achieved by comparing to a similar other doing slightly better than oneself (Aspinwall & Taylor, 1993; Wood, 1989). In addition to accurate self-evaluations, other researchers have found that social comparisons, in particular comparisons made to someone doing slightly better, can also be used for self-improvement and self-enhancement purposes (Gibbons & Buunk, 1999; Suls & Wheeler, 2000; Thornton and Arrowood, 1966; Wood, 1989; Wood & Wilson,

2003).

The idea that upward comparisons result in self-improvement was confirmed by a 1999 study conducted on Dutch ninth-graders (Blanton, Buunk, Gibbons, & Kuyper, 1999). The researchers found that students' performance was more likely to improve when they compared to others doing slightly better than themselves. In the study, 876 students were given questionnaires at the end of their second and third trimesters. The questionnaires asked students to evaluate their ability in different subject areas relative to the majority of their classmates. Students were also asked to list students with whom they preferred to compare grades. The researchers also monitored students' grades throughout the school year. The results of the study found that students did better in the subject if they compared to people doing better than them and if they believed that they were better in that subject than most of their classmates.

Several researchers have found that middle-school students tend to make upward social comparisons when they compare their school performance to that of others (Blanton et. al, 1999; Dumas et al., 2005; Huguet, Dumas, Monteil, & Genestoux, 2001). One study in particular, conducted by Huguet et al. (2001), studied 12- to 14-year-old students over the course of an entire school year. Students were given questionnaires that asked them to give the first and last names of two students they usually compare their exam grades to in each subject. The researchers then evaluated the comparison by comparing the participant's grades to the grades of his or her comparison-target. Analysis of the results found that the students tend to compare to others doing slightly better than them in the different subjects. The findings of Huguet's research confirmed findings from previous research, including a study conducted by Blanton et al. (1999), and also verified

Festinger's theory that students have a unidirectional drive upwards.

Effect of Upward Social Comparisons on Self-Concept And Self-Esteem

The way in which students engage in social comparisons may have differing effects on their self-concepts and self-esteem. One explanation for this is that students may experience different social comparison effects, known as contrast and assimilation effects. With the contrast effect, the individual making the comparison feels different from his or her comparison target (Mussweiler, Ruter, & Epstude, 2004). Therefore, if the individual makes an upward comparison to someone doing better than him or her and contrasts him or herself to his comparison target, the comparison results in the individual feeling worse about him- or herself. The individual experiences the opposite effect when making a downward social comparison. In this situation, the individual contrasts him- or herself from the worse-off comparison target and feels better about him- or herself as a result (Mussweiler et al., 2004).

The assimilation effect is different from the contrast effect because in this situation, the individual feels similar to his or her comparison target and therefore identifies with him or her (Mussweiler et al., 2004). If an individual makes an upward social comparison, he or she would identify with the comparison target and thereby feel better about him- or herself as a result of the comparison. On the other hand, when the individual makes a downward social comparison, he or she identifies with the worse-off comparison target and experiences negative effects from the comparison (Mussweiler et al., 2004).

In general, both the individual who makes an upward comparison and experiences the contrast effect and the individual who makes a downward comparison and

experiences the assimilation effect feel worse about themselves as a result of the comparison. On the other hand, both the individual who makes an upward comparison and experiences the assimilation effect and the individual who makes a downward comparison and experiences the contrast effect feel better about themselves as a result of the comparison.

There is a general assumption that upward comparisons negatively affect self-concept and self-esteem because individuals see someone doing better than them and feel negatively about themselves as a result. (Aspinwall & Taylor, 1993). In addition to lowered self-evaluations, researchers have also found that upward comparisons lead to jealousy, hostility and frustration (Aspinwall & Taylor, 1993; Marsh & Parker, 1984; Martin, 1986; Morse & Gergen, 1970; Salovey & Rodin, 1984; Testa & Major, 1990).

Some researchers have verified this assumption, finding that low self-esteem participants made more upward comparisons, which negatively affected them (Miyake, 1993; Wheeler, 2000). In comparing themselves to others who were better than them, these participants felt worse about themselves. This can be explained by the contrast effect, where students do not identify with successful others and thereby feel worse about their own abilities (Catsambis, Mulkey, & Crain, 2001).

Other researchers have found evidence that contradicts this assumption. Pelham and Wachsmuth (1995) conducted a prospective study on 118 pairs of same-sex roommates from the University of Texas at Austin. In study one, participants' views of themselves increased with exposure to a roommate who had poor abilities and decreased with exposure to a roommate who was highly skilled, thereby demonstrating a contrast effect (Pelham & Wachsmuth, 1995). However, participants only experienced the

contrast effect when they were relatively unsure of their own ability level. When individuals were highly certain of their self-views, the reverse was true, where exposure to a highly skilled roommate improved self-perceptions and exposure to a less skilled roommate decreased self-evaluations (Pelham & Wachsmuth, 1995). These participants experienced the assimilation effect, where their self-concepts were enhanced by identifying with successful others (Marsh, Kong, & Hau, 2000; Suls & Wheeler, 2000). In study two, individuals who had received prior feedback about their own abilities and were certain about their own abilities experienced the assimilation effect when an acquaintance received favorable or negative feedback (Pelham & Wachsmuth, 1995). On the other hand, individuals who received no prior feedback and were uncertain about their abilities experienced the contrast effect (Pelham & Wachsmuth, 1995).

Pelham and Wachsmuth (1995) also concluded that people who make upward social comparisons have higher self-esteem and self-concepts. These researchers suggested that this positive effect results from students feeling good about themselves because they are at a level where they can compare to someone of high ability, thereby demonstrating the assimilation effect (Suls & Wheeler, 2000).

Some researchers have also suggested that people make upward social comparisons in order to get information about how to improve themselves, to increase their motivation, and to give them an idea of their potential (Blanton et al., 1999; Buunk, Collins, Taylor, VanYperen, & Dakof, 1990; Dumas et al., 2005). Buunk et al. (1990) conducted a set of empirical studies that suggested that social comparisons can produce positive or negative feelings independent of direction. In two of their studies, cancer patients who had low self-esteem and perceived that they had little control over their

symptoms were more likely to experience negative consequences of downward comparisons and fewer benefits of upward comparisons, while patients who had high self-esteem experienced more benefits from both upward and downward comparisons. Buunk et al. (1990) argued that both upward and downward comparisons can be self-enhancing and that some people are more likely to reap the benefits of these social comparisons.

Effect of Downward Social Comparisons on Self-Concept And Self-Esteem

It is often assumed that students who make downward social comparisons have higher self-concepts and self-esteem because comparing to individuals doing worse than oneself may cause the individual to think one's performance is adequate. Several researchers have found evidence that supports this assumption (i.e. Aspinwall & Taylor, 1993; Dubé, Jodoin, & Kairouz, 1998; Gilbert, Giesler, & Morris, 1995; Kemmelmeier & Oyserman, 2001; Pelham & Wachsmuth, 1995; Tesser, 1988; Wheeler & Miyake, 1992; Wood & Wilson, 2003). Wheeler and Miyake (1992) were the first to use the social comparison record (SCR) technique in order to determine the type of social comparisons that people with varying levels of self-esteem make. They asked men and women enrolled in the University of Rochester, the majority of whom were first-semester freshmen, to record every social comparison made over an extended period, usually 10 to 14 days. Participants listed the dimension of comparison (i.e. academic, physical appearance), the relationship to the comparison target (i.e. close friend, stranger), similarity to the target (i.e. much better, much worse), and affect just before and just after the comparison. Wheeler and Miyake (1992) found that high self-esteem participants made more downward comparisons, which in general produced an increase in positive

affect. High self-esteem individuals also reported less negative affect from lateral and upward comparisons.

Wood, Michela, and Giordano (in press) replicated the findings of Wheeler and Miyake (1992) and suggested that although low and high self-esteem people may equally want to make downward comparisons, those with high self-esteem are more likely to come across targets they see as inferior to themselves. This effect is often explained by social comparison theories that suggest that people make downward comparisons for self-enhancement purposes.

Wood, Giordano-Beech, Taylor, Michela, and Gaus (1994) devised a new social comparison measure where participants select which tests of various abilities they will take and which tests another person will take. If the participants select the same tests for themselves as the other person, they demonstrate evidence of comparing with that person. In two experiments, low self-esteem participants who were told they succeeded in the test chose to compare with another person, while low self-esteem participants who were told they had failed the test chose not to compare with another person (Wood et al., 1994). On the other hand, high self-esteem participants showed no difference between success and failure conditions in one study and engaged in more social comparisons after failure in another study. Wood et al. (1994) concluded that low self-esteem individuals engage in social comparisons for self-enhancement purposes when it appears safe to do so, while high self-esteem individuals use social comparisons to compensate for their failure. This can be explained by the contrast effect — when students compare themselves with others who are worse off, they see themselves as different from them and thereby feel better about themselves (Brickman & Bulman, 1977; Hakmiller, 1966; Kemmelmeier &

Oyserman, 2001; Wills, 1981).

Other researchers found the opposite, associating downward social comparisons with lower self-concepts and self-esteem. If people identify with the worse-off comparison other, they might make downward adjustment of their own chance of success or failure (Buunk & Ybema, 1997; Kemmelmeier & Oyserman, 2001). This is often explained by the assimilation effect, where students identify with another's failure. However, some researchers have found that downward assimilation does not occur often, much less than upward assimilation (Brewer & Weber, 1994; Brown, Collins, & Schmidt, 1988; Brown, Novick, Lord, & Richards, 1992; Collins, 2000). These researchers explain this finding by suggesting that people do not want to identify with those of lower ability and instead form lower levels of expected similarity with these comparison others, thereby diminishing the likelihood of downward assimilation.

In summary, while research has found that individuals engage in upward, downward, and lateral social comparisons, it provides conflicting evidence concerning the frequency of these types of comparisons. Furthermore, it is unclear whether an individual engaging in these comparisons experiences the assimilation or contrast effect, thereby making it difficult to determine the precise effects of social comparisons on self-esteem and self-concept.

Other Factors Contributing to Effect of Social Comparison Direction

Increasingly more research has found that both upward and downward comparisons can have both positive and negative effects on individuals' self-concepts and self-esteem (Brewer & Weber, 1994; Brown et al., 1992; Lockwood & Kunda, 1997; Smith, 2000; Wood & VanderZee, 1997). Most of this work has been done with college

students. In one study, Brewer and Weber (1994) found that upward comparisons result in more positive effects when comparing with others within their social group, while downward comparisons result in more positive effects when comparing with members outside of their groups. These researchers created social categories and showed undergraduates a videotape of another student who was portrayed as either more or less academically competent than most undergraduates. Some students were told that the individual was a member of the same group as themselves, while others were told that the individual was a member of the out-group. Half the participants were also told that members of their group were in the minority, while the other half were told that they were majority group members. Brewer and Weber (1994) found that upward comparisons led to more positive self-evaluations than downward comparisons did when members of minority groups compared themselves with other in-group members, while downward comparisons were more self-enhancing when majority group members made in-group comparisons. A second study found that upward comparisons to fellow members of a minority group were more self-enhancing than upward or downward comparison to out-group majorities.

Furthermore, Brewer and Weber (1994) found that upward comparisons increase self-evaluations when individuals share a distinctive attribute with their comparison target, while upward comparisons decrease self-evaluations when there is no shared attribute. Some researchers have suggested that the effects of upward and downward social comparisons on individuals' self-concepts and self-esteem may differ because these effects are not necessarily intrinsic to the direction of comparison (Aspinwall & Taylor, 1993; Buunk et al., 1990). These effects may vary based on multiple factors

identified by researchers, including an individual's level of self-esteem, similarity to the comparison target, and perceived control (Buckingham & Alicke, 2002; Wheeler, 2000).

Some studies have shown that students with high self-esteem respond less negatively to upward comparisons than those with low self-esteem (Wheeler, 2000). This might occur because those with high self-esteem are more able to avoid explicit self-evaluations when making upward comparisons and instead are able to focus on methods of self-improvement (Collins, 1996, 2000; Dumas et al., 2005; Taylor & Lobel, 1989). In addition, researchers have found that individuals with high self-esteem receive more benefits from downward comparisons than those with low self-esteem (Buunk et al., 1990; Suls & Wheeler, 2000). Another study found that individuals were more likely to engage in downward comparisons when they felt their self-esteem was threatened, such as when their academic performance was declining (Hakmiller, 1962, 1966; Levine & Green, 1984; Suls & Wheeler, 2000; Wood & Wilson, 2003). At the same time, other researchers argue that individuals with low self-esteem are more likely to make downward comparisons because they have a greater need for self-enhancement (Suls & Wheeler, 2000; Wills, 1981).

An individual's perceived degree of similarity between himself or herself and the comparison target is another factor that contributes to determining the effects of upward and downward comparisons on self-concept and self-esteem. Downward comparisons have a positive effect when an individual contrasts himself or herself to the comparison target, whereas upward comparisons have a negative effect (Buckingham & Alicke, 2002; Buunk & Ybema, 1997; Dumas et al., 2005). On the other hand, an individual experiences positive effects from making upward comparisons and negative effects from

making downward comparisons when he or she assimilates with the comparison target (Aspinwall & Taylor, 1993; Blanton et al., 1999; Brickman & Bulman, 1977; Buunk & Ybema, 1997; Dumas et al., 2005; Taylor & Lobel, 1989). Some researchers have suggested that when a person sees little similarity with his or her comparison other, the comparison has no impact, whereas comparisons with a person at a moderate level of expected similarity result in a contrast effect and comparisons with a person at higher levels of expected similarity result in an assimilation effect (Collins, 1996, 2000).

The extent to which an individual believes he or she can improve his or her situation also helps to determine whether he or she makes upward or downward social comparisons. Huguet et al. (2001) conducted a study on 264 French students age 12 to 14 and found that students who felt they had a high degree of control over their status relative to their comparison targets were more likely to make upward comparisons (Dumas et al., 2005; Huguet et al., 2001). In these situations, the upward social comparison provides motivation for the student to perform better instead of discouraging them and negatively affecting their self-evaluations (Aspinwall & Taylor, 1993; Buunk et al., 1990; Major, Testa, & Bylsma, 1991; Taylor & Lobel, 1989; Testa & Major, 1990).

In overall summary of the work on upward and downward comparisons, research varies widely concerning the frequency of these types of comparisons in relation to one another. Some researchers find upward comparisons to be more frequent, especially upward comparisons made to an individual slightly better than oneself, while other researchers find downward comparisons to be more frequent. In addition, the effects of these comparisons are still widely contested, with research documenting evidence of both assimilation and contrast effects for both upward and downward comparisons. These

effects may vary based on the individual's reason for engaging in social comparisons, level of self-esteem, similarity to the comparison target, and perceived control. Therefore, the types of social comparisons that individuals engage in and the effects of these social comparisons are still unclear.

Tracking and Social Comparison

Tracking may affect how students make social comparisons. Students can make social comparisons either within tracks (i.e., "I am the best in my class") or across tracks (i.e., "I am better than those in the low track"). The type of comparison used may have a different effect on students' self-concepts of ability and self-esteem. The majority of research on social comparisons focuses on within-track comparisons, while little research has been done on across-track comparisons. One purpose of this study is to address this gap in the literature.

Within-Track Comparisons

One widely referenced theory for within-track comparisons is the Big-Fish-Little-Pond Effect (BFLPE), which (as discussed earlier) argues that when students of relatively high ability within their track compare themselves to students of lower ability, their self-concepts are raised (Davis, 1966; Marsh, 1987, 1991; Marsh, Chessor, Craven, & Roche, 1995). If a student were placed into a lower track and were one of the most successful in his or her class, then based on BFLPE, he or she would have a high self-esteem and self-concept. This can be explained by the contrast effect, where the student of high ability sees him- or herself as being different from the low-ability comparison target. On the other hand, if the assimilation effect were to take place, the student would identify with

being in the lower track and his or her self-esteem would decrease. This assimilation effect was observed by Turner (1998) in a longitudinal study that followed 955 students from eighth grade to 10th grade using the National Education Longitudinal Survey data. Turner (1998) found that students who moved to a lower track had much lower academic self-concepts and self-esteem than they had when they were in higher tracks.

However, the majority of research states that the contrast effect is greater than the assimilation effect, thereby supporting the BFLPE theory. Marsh and Craven (2000) found that tracking affects students' self-concepts. In their study, students placed in a high-ability classroom, as opposed to a mixed-ability classroom, at first had higher self-concepts of ability that later decreased. Marsh and Craven (2000) explained their findings as due in part to the fact that students engage in social comparisons and also because students assimilate into their classroom context, based on the labeling of the track they are placed in. However, they also suggested that the contrast effect predominates over the assimilation effect. Their findings with the BFLPE suggested that while high-track students may experience an initial assimilation or reflected glory effect when they are grouped with other high-ability students, the contrast effect outweighs the assimilation effect when the students begin to compare themselves with equally able peers. Marsh and Craven (2000) argued that their conclusion explains why high-ability students have higher academic self-concepts in mixed-ability classrooms, where they are considered the most able, as opposed to high-ability classrooms, where all the students are very bright.

A corollary to the BFLPE theory is the Small Fish in a Big Pond Effect (SFBPE), which suggests that when students of relatively low ability in their track compare to students of higher ability in the same track, their levels of self-concept and self-esteem

are lowered (Marsh, 1986, 1988; Suls & Wheeler, 2000; Turner, 1998). If a student were placed into a higher track and were one of the least successful in his or her class, then based on SFBPE, he or she would have a low self-esteem and self-concept. This can be explained by the contrast effect, where the student of low ability sees him- or herself as being different from the high-ability comparison target. Marsh et al. (1995) confirmed the contrast effect in one empirical study that found lower math self-concepts for 20 students, ages nine to 11, in a newly established Gifted and Talented class, when compared to 80 students in regular, mixed-ability classes.

On the other hand, if the assimilation effect were to take place, the student would identify with being in the higher track and his or her self-esteem would increase. In a longitudinal study, Turner (1998) observed this assimilation effect and found that students who moved to a higher track had higher academic self-concepts and self-esteem. Furthermore, Turner (1998) found that while movement to a higher track greatly raised self-concept and self-esteem, movement to a lower track only somewhat lowered self-concept and self-esteem. As previously stated, however, most researchers have found that the contrast effect is greater than the assimilation effect, thereby supporting the SFBPE theory.

Across-Track Comparisons

Little research has been done on social comparisons made across tracks, and research on the effects of tracking on self-esteem and self-concept has produced conflicting results. As discussed above, the majority of researchers have found that tracking positively affects the self-esteem and self-concepts of high-track students and negatively affects that of low-track students (Ireson et al., 2001; Redd et al., 2002;

Zeleke, 2004). One possible explanation for these results is that the students based their self-esteem on social comparisons made across tracks. However, other researchers have found that tracking negatively affects the self-esteem and self-concepts of high-track students and positively affects that of low-track students (Hallam & Ireson, 2003; Kulik & Kulik, 1992; Wigfield et al., 1998; Zevenbergen, 2003). This could possibly be explained by the idea that social comparisons made within tracks have the larger effect on self-esteem and self-concept. However, little empirical research has addressed this possibility. Thus, the present study examines the extent to which middle school students compare within and across tracks.

In a review of social comparison studies, Skaalvik and Skaalvik (2002) theorized that students who compare to others outside of their classroom target these students not because of their level of achievement but because of their relationship to that student (i.e. a friend, sibling, etc.). Instead of analyzing within-track and across-track comparisons, Skaalvik and Skaalvik (2002) suggested that future research should focus on the differential effects of within-track comparisons and of labels of the particular track that the student is in on a student's self-concept. Skaalvik and Skaalvik (2002) also called for more research on the effects of within-classroom social comparisons and of classroom labels assigned by the tracking system on students' self-concepts.

Hogg (2000) recently began to draw some connections between the social identity theory and social comparison theory that may have implications for comparisons made between one group and another, or between one track and another. Tajfel (1972) defined social identity as an individual's knowledge that he or she belongs to certain social groups, coupled with the individual's idea of the significance of having this group

membership (Hogg, 2000). Social identity theory suggests that individuals construct a sense of themselves and how they are evaluated by making comparisons between their own group, also known as the in-group, and other groups, also known as the out-group (Hogg, 2000). Hogg and Abrams (1988) argued that individuals often identify with the groups they are in, causing their self-evaluations to become depersonalized as they self-stereotype and take on group characteristics (Hogg, 2000). They specifically suggested a self-esteem hypothesis that identifies lower self-esteem as a motivation for an individual to identify with his or her group and take on group characteristics, thereby raising self-esteem (Hogg & Abrams, 1988). However, empirical research on this hypothesis has resulted in inconsistent and unreliable findings (Hogg, 2000).

In relation to social comparisons, Tajfel (1972) also suggested that because all groups live among other groups, the social value of a specific group membership only has meaning when compared with other groups. Therefore, he concluded from his research that social comparisons between groups focus on evaluating differences, not similarities, in order to set one group apart from another (Brewer & Campbell, 1976; Hogg, 2000; Sumner, 1906; Tajfel, 1972). In addition, Turner (1975) suggested that an individual comparing his or her group to other groups is likely to highlight differences that favor his or her own group, thereby serving the comparisons' function of self-enhancement (Hogg, 2000). Furthermore, Turner (1975) argued that because individuals usually cannot pass from one group to another, they often try to compare downward with relatively lower groups, though upward comparisons are possible if groups are vying for a higher status and thereby select comparison dimensions that favor them so they will achieve that higher position.

Although no specific research has been done on the extent to which students engage in across-track comparisons, the above research could be related to tracking, if an individual identifies his or her track placement as his or her group membership (Pallas, Entwisle, Alexander, & Stulka, 1994). This membership would suggest that students identify with the track they are in, along with the characteristics and social value assigned to that track. Theoretically, the above research would also suggest that students would tend to compare their own track with lower tracks, which would raise their individual self-concepts and possibly their self-esteem by raising the status of the track. Those students who are in the lowest track, without a lower track to compare to, might experience the lowest levels of self-esteem and self-concept because they do not have a lower reference group to feel better than. This theory would support other research discussed above that finds low-track students have lower ability beliefs than higher-track students.

Since research has shown that individuals engage in various types of social comparisons and experience differing effects from these comparisons, more research is needed regarding the specific effects of tracking on students' social comparisons. Only a few studies have been completed in this area, but all have found that within-track and across-track comparisons have different effects on students' self-esteem and self-concepts. Thus, further research on the frequency of within- and across-track comparisons, as well as on their effects on self-esteem and self-concept, is considered necessary.

Gender, Self-Beliefs, and Tracking

Gender Differences in Self-Esteem and Self-Concept of Ability

Up until this point, we have discussed overall effects of tracking on individuals' self-concepts and self-esteem. There is also evidence that tracking may affect boys and girls' self-concepts and self-esteem differently. Before discussing that evidence, we review research on how boys' and girls' self-concepts and self-esteem differ.

In general, researchers have found that boys generally have higher self-esteem than girls (Harter, 1998, 2006; Slavin, 1987; Turner, 1998; Wigfield, Eccles, MacIver, Reuman, & Midgley, 1991). This disparity between boys and girls usually emerges in early childhood and further develops during the middle school years (Guimond, 2006; Harter, 1998, 2006; McGuire & McGuire, 1988; Oakes, 1990; Rankin et al., 2004). Wigfield et al. (1991) found that seventh-grade boys had higher levels of self-esteem than seventh-grade girls. Catsambis et al. (2001) also found that eighth-grade boys had higher levels of self-esteem than eighth-grade girls when analyzing data from the National Education Longitudinal Study. These researchers measured self-esteem by using composite measures developed by the National Center for Education Statistics. With Pearson correlation coefficients, Catsambis et al. (2001) observed the strongest association between gender and self-esteem ($r=0.17$), with males having higher self-esteem than females. Furthermore, in a study of 1,886 high school students, Rosenberg, Schooler, Schoenbach, & Rosenberg (1995) found that 12^{th}-grade girls had significantly lower self-esteem than 12^{th}-grade boys.

In a meta-analysis of studies, Kling, Hyde, Showers, & Buswell (1999) conducted two analyses of previous studies on gender and self-esteem to examine gender differences in global self-esteem. The results of the analysis showed a small difference in the self-esteem of boys and girls, with boys having higher self-esteem. The second analysis was

based on data taken from the National Center for Education Statistics (NCES). NCES conducted three longitudinal studies from the years of 1971-1992, and the Rosenberg (1979) test was used to measure self-esteem. The results of the second analysis also showed that males have a slightly higher self-esteem than girls.

Some suggest that this disparity results from different socialization processes for boys and girls (Belenky et al., 1986; Block, 1984; Gilligan, 1982; Harter, 1998, 2006; Jackson et al., 1994; Markus & Oyserman, 1988; Miller, 1985; Stewart & Lykes, 1985). While boys are taught to be more independent and to separate themselves from others, girls are encouraged to maintain relationships with others (Jackson et al., 1994; Schwalbe & Staples, 1991). Cultural stereotypes further these gender differences by encouraging competence, control, and power in males, while encouraging dependency, passivity, and helplessness in females (Cross & Madson, 1997; Guimond, 2006; Harter, 1998, 2006). In a study of 301 high school students with a mean age of 15 years, Guimond (2006) also found that more male participants defined themselves as agentic, while more female participants defined themselves as relational. Some researchers also suggest that girls tend to have lower self-esteem because they are taught to please others; when they fail to meet outside standards, their self-esteem decreases (Harter, 1998, 2006).

In addition to differences noted in self-esteem, researchers have also found that boys and girls differ in their self-concepts of ability in different areas. Researchers have found that these differences in self-concept emerge in early adolescence (Eccles, 1987; Eccles et al., 1984; Jacobs, Lanza, Osgood, Eccles, & Wigfield, 2002). In terms of general academic self-concept, some researchers found that boys have higher academic self-concepts than girls, at least in adolescence (Cranston & Leonard, 1990; Ireson et al.,

2001; Jackson et al., 1994; Skaalvik, 1990; Vollmer, 1986). However, other researchers found no difference between boys and girls (Jackson et al., 1994; Marsh, Smith, & Barnes, 1985; Skaalvik, 1990; Zuckerman, 1989).

In terms of specific self-concepts, studies have shown that boys generally have higher math self-concepts than girls, while girls have higher English self-concepts than boys, especially at the middle-school age (Crain, 1996; Jackson et al., 1994; Jacobs et al., 2002; Marsh, 1986b, 1989; Marsh, Trautwein, Ludtke, Köller, & Baumert, 2005; Wigfield et al., 1991; Wigfield, Eccles, Yoon, & Harold, 1997). Ireson et al. (2001) recognized that boys think more positively about themselves with regard to their abilities in mathematics and science, while girls think more positively about their abilities in English, regardless of actual ability. Similarly, other researchers have found that the math self-concepts of girls in grades five through 11 were lower than those of boys, whereas girls' English self-concepts were higher than boys' (Eccles et al., 1983; Jacobs et al., 2002). In a similar fashion, boys also tend to have higher expectations for their abilities in math, while girls tend to have higher expectations for their abilities in English (Jackson et al., 1994; Jacobs et al., 2002). These researchers, however, did not look to see how boys and girls' track placement affected their self-concepts of ability in different subjects.

Although many researchers have documented a difference between boys and girls in their self-esteem and self-concepts, some researchers have also begun to observe that these gender differences are getting smaller through the high school years (Jacobs et al., 2002; Kling et al., 1999). In their meta-analysis of previous studies on gender and self-esteem, Kling et al. (1999) found only a slight difference between the self-esteem levels of boys and girls, with boys having a slightly higher level of self-esteem. Based on their

review, Kling et al. (1999) found that some researchers explained this smaller than expected difference in self-esteem as a result of gender roles. In general, character traits associated with masculinity are also related to high self-esteem individuals (Kling et al., 1999). However, these gender roles may actually serve as a source of psychological stress for boys, thereby causing a decrease in their self-esteem (Kling et al., 1999).

Another explanation offered for the smaller difference in levels of self-esteem between the genders is that it is a result of the positive effects that the increase in educational opportunities for girls, due to the Women's Movement in the 1970s, has had on girls' levels of self-esteem (Kling et al., 1999). A meta-analysis of the Attitude Toward Women Scale (Spence & Helmreich, 1972) showed a trend toward more equal attitudes toward women from 1970 to 1995. Therefore, girls may have higher feelings of self-worth as a result of their increased educational and political opportunities (Kling et al., 1999).

Some researchers have found that there is no difference in the level of self-esteem for boys and girls. Maccoby and Jacklin (1974) conducted a review of research on the self-esteem of boys and girls. The results of their analysis found that boys and girls have equivalent levels of self-esteem. Wylie (1979) also conducted a review of research on gender differences in self-esteem. Wylie concluded that the results of the studies she reviewed were too inconsistent to come to a conclusion about the presence or absence of a gender difference in self-esteem.

Gender Differences in the Effects of Tracking

Some research focusing on tracking has found differential effects on boys and girls. In their study analyzing data from the 1988 eighth-grade cohort of the National

Education Longitudinal Study, which includes about 1,052 schools and 24,500 students, Catsambis, Mulkey, & Crain (1999) compared students in schools using tracking to similar students in schools not using tracking, rather than the typical comparison between students in high and low tracks. In order to accurately assess the effects of tracking, this adjustment in comparison was made to eliminate selection bias in track placement and other differences that may exist between students in high and low tracks in addition to academic performance, including levels of motivation and ability to change. Catsambis et al. (1999) assigned each student a propensity for placement into a high or low track based on academic performance and social background. Students with high probabilities of placement in a particular track who were in schools that used tracking in English were compared with students with similar probabilities of track placement in schools that did not use tracking in English. Self-esteem was evaluated using composite measures developed by the National Center for Education Statistics (Ingels, Abraham, Karr, Spencer, & Frankel, 1989).

Catsambis et al. (1999) found that tracking in English had more positive effects on the self-esteem of girls in the high track than it did on high-track boys. They suggested that this conclusion could be explained by the fact that boys are more likely than girls to lose their competitive edge when they are grouped with other students of similar high ability (Catsambis et al., 1999). They also found that low-track girls had lower self-esteem than low-track boys. The largest single effect found in this study was the negative impact of tracking in English on the self-esteem of low-track females. Researchers attributed these effects of tracking on self-esteem to the assimilation effect documented by Marsh et al. (1995) in their BFLPE and social comparison theory. Furthermore, this

study also suggested that placement in a low English track severely affects the self-esteem of female students because girls are traditionally expected to do well in English (Catsambis et al., 1999). These findings indicated that girls' self-esteem is more affected by tracking than boys' self-esteem, at least in English.

A second study by the same researchers analyzing the same set of data and using similar methods found that middle-school girls were neither positively nor negatively affected by tracking in math classes, while boys were much more highly affected by their track placement (Catsambis et al., 2001). They found that being in school with tracked math classes had a very small positive effect on the self-esteem of females with a high-track propensity and an equally small but negative effect on the self-esteem of females with a low-track propensity. These researchers explained this finding with the rationale that math is a "male domain" that females do not value and do not expect to succeed in, thereby decreasing their effort in the subject area (Catsambis et al., 2001). Catsambis et al. (2001) also found that boys with a propensity for a high track tended to have a much lower self-esteem if they were in schools that use tracking, as opposed to schools that do not use tracking, while boys with a propensity for a low track had a higher self-esteem if they were in schools that use tracking. These researchers explained these findings with the contrast effects documented by Marsh et al. (1995) in their BFLPE and social comparison theory.

With their two studies on tracking in English and mathematics, Catsambis et al. (1999, 2001) have concluded that the use of tracking has unequal effects on boys and girls and that these unequal effects may be especially pronounced in middle school when gender differences in social psychological development coincide with a new form of

tracking — between-classroom ability grouping — that is not used in elementary schools. Another study, which focused on students' opinions of tracking, found that while boys favor tracking, girls oppose it (Sweet & Nuttal, 1971). This study also found that girls more strongly oppose tracking than boys favor it, which may be explained by the stronger effects of tracking on girls' self-esteem (Catsambis et al., 1999; Sweet & Nuttal, 1971).

Findings by another group of researchers indicated that tracking may have an effect on girls' self-esteem, but not on boys'. Harper and Marshall (1991) conducted a study on 201 students between the ages of 14 and 16. The researchers used The Mooney Problem Checklist and Rosenberg's Self-Esteem Scale to measure the participants' levels of self-esteem. Harper and Marshall looked at how factors, including health and physical development, adjustment to schoolwork, aspects of home and family, and matters involving curriculum and teaching procedures, differentially affect boys and girls. They found that adjustment to schoolwork, curriculum, and teaching procedures all had an effect on the self-esteem of girls, but not on that of boys. Although these researchers did not specifically investigate the effect of tracking on self-esteem, their results suggested that girls would be affected by tracking and boys would not (Houtte, 2005).

Other researchers have found that there is no difference in tracking's effect on the self-esteem of boys and girls. Cheung and Rudowicz (2003) surveyed 2720 eighth- and ninth-graders in Hong Kong from 23 different schools. In Hong Kong's educational system, students are separated into different schools based on ability — high-, middle-, and low-ability schools. The researchers used Rosenberg's Self-Esteem Scale, which was translated from English to Chinese, to measure the students' self-esteem. The results of their research found that there was no variation in the effect of tracking on students' self-

esteem based on gender. Some researchers believe that the results of Cheung and Rudowicz (2003) may be attributed to cultural factors (Houtte, 2005). Houtte suggested that their results may be a result of the fact that the study was conducted in Hong Kong, where cultural traditions put little emphasis on the promotion of self-esteem.

Malmberg and Trempala (1995) also found that the effect of tracking on self-esteem did not differ by gender. In their study, Malmberg and Trempala surveyed 352 17-year-old students from general secondary and vocational schools in Finland and Poland. The researchers used six items of Rosenberg's (1965) scale to measure self-esteem. The results of their study found no significant difference in the effect of tracking on the self-esteem of boys and girls.

Gender Differences in Social Comparisons

Researchers have also found that boys and girls differ in the way they make social comparisons. Rankin et al. (2004) found that girls reported more frequent social comparisons about how well things are going for them in general (socially, personally, etc.). In a longitudinal study of about 400 eighth- and tenth-graders, these researchers asked each student to rate how often they compared themselves with others on a 135-mm line from *never* to *a lot* every year for three years. Rankin et al. (2004) suggested that the more frequent social comparisons by girls may both reflect the girls' greater self-consciousness and contribute to it.

Furthermore, Kemmelmeier and Oyserman (2001) found in a study of 60 undergraduate students with a mean age of 20 years old that women adjusted downward and men adjusted upward after a downward academic comparison, suggesting that women assimilate with their comparison targets and men contrast themselves to their

comparison targets, especially when comparing in terms of the academic domain. As a result, when making downward social comparisons, boys experience higher self-esteem and self-concepts due to the contrast effect and girls experience lower self-esteem and self-concepts due to the assimilation effect, as similarly suggested by Catsambis et al. (1999, 2001).

To explain these gender differences, Catsambis et al. (2001) posited that boys tend to make social comparisons for self-enhancement purposes due to the socialization process that encourages boys to be more concerned with independence. On the other hand, girls are taught to focus more on maintaining relationships, thereby making them more likely to relate to their comparison target (Kemmelmeier & Oyserman, 2001). For this reason, the researchers argued that girls tend to be more affected by social comparison information than boys because girls are less able to shield themselves from the failure of others (Kemmelmeier & Oyserman, 2001; Lenney, Gold, & Browning, 1983).

Because research has shown that tracking seems to differentially affect boys' and girls' self-esteem and that there are gender differences in self-concepts of ability for different subject areas, more research is needed regarding the different effects of tracking on the self-esteem of boys and girls. Only a few studies have been completed in this area, but all have found that boys' and girls' self-esteem differs in different tracks. Even less is known about gender differences in self-concepts of ability in different tracks and in social comparisons. Thus, further research on these gender differences in self-esteem, self-concept, and social comparisons is considered necessary.

Chapter 3: Methods

Participants

The participants in our study were 11- and 12-year-old seventh-grade students from a school in a mid-Atlantic state. There were 1,062 students enrolled in the school and 295 students in the seventh grade. Of all seventh–graders, 173 participated in the study (59% of the total seventh grade). In our sample, 86 were male and 87 were female. To participate in the study, students had to return both a parental consent form and a student assent form.

Our study focused on students in their math classes. There were 11 classes altogether: five Math 7 classes comprised of 66 students who participated in the study, three Pre-Algebra classes comprised of 43 participating students, and three Algebra classes comprised of 64 participating students. For the purposes of our study, students in Math 7 were considered below the level appropriate for their grade, students in Pre-Algebra were on-level, and students in Algebra were considered above-level.

Students at this school participated in the Maryland School Assessment (MSA), a standardized test given to all elementary and middle school students in the state. The test is administered each year in March from the third through eighth grades. The MSA fulfills the requirements of the federal No Child Left Behind Act and measures math and reading achievement at each grade level from third through eighth grade. The MSA scores students at a basic, proficient, or advanced level. The school in our study consistently produced a higher percentage of students with proficient and advanced scores than that of the state. In math, 48.4% and 20.7% of seventh-graders scored proficient and advanced, respectively, compared to 41.6% and 13.8% at proficient and

advanced for the state. In reading, seventh-graders at this school had 44.8% of students who scored proficient and 35.7% of students who scored advanced, while 39.0% scored proficient and 28.2% advanced for the entire state (Maryland State Department of Education, 2006).

There are various criteria used to determine placement in Math 7, Pre-Algebra, or Algebra in the school district in which the participating school is located. In seventh-grade math classes, students are placed based on their fifth-grade MSA scores, performance on the Iowa Algebra Prognosis Test, and the grade in their sixth-grade math class. The fifth-grade MSA scores are used because the test is administered in March and the sixth-grade scores are not reported soon enough to determine seventh-grade placement. The Iowa Algebra Prognosis Test is taken in January of the students' sixth-grade year, and students are scored using a Stanine scale.

Students who score a Stanine 7, 8, or 9 are automatically placed in Algebra. Students who score a Stanine 6 can be placed in Algebra if they receive a grade of an "A" or "B" in their Advanced Math 6 class. Otherwise, those who score a Stanine 6 are placed in Pre-Algebra. If students score a Stanine 5 or below, they may be placed in Pre-Algebra if they scored advanced or proficient with a scaled score greater than 425 on the MSA. Students who score a Stanine 5 or below and proficient or basic with a scaled score below 425 on the MSA are placed in Math 7.

Procedure

Our study consisted of two components: a written survey and an oral interview (see Appendices A and B). All students in the study completed the written survey in their math classes during the month of October. After preliminary analyses, 18 students were

chosen to be interviewed the following January.

Questionnaire administration

Students completed the 61-item survey during their math period. In some classes, the number of students participating in the study was significantly smaller than the class size. In that case, students were taken to the media center and completed the survey there. In all other instances, students completed the survey in their classroom. At least one team member was present to administer the survey. We allocated 45 minutes for the survey, but all students completed it within 30 minutes. To maintain anonymity, each survey had an alphanumeric code to denote the students' class and student number. Prior to administration, an index card with the students' name and code number was clipped to the corresponding survey. After the surveys were distributed, the cards were collected and set aside. All surveys were collected over two days at the beginning of October 2005.

Interview administration

After data was entered and cleaned, our team ran preliminary analyses to determine appropriate candidates for an in-depth interview. The team attempted to include an even number of students with differing math levels, self-concept scores, and kinds of social comparisons. We defined low and high self-concept as the math self-concept mean plus or minus one standard deviation. For example, of all Math 7 students, the math self-concept mean was 10 with a standard deviation of 2.3. Self-concept scores between five and seven were considered low, while scores between 13 and 15 were considered high. Of those students who had either high self-concepts or low self-concepts, we then determined whether students compared to students doing better than

them, the same as them, or worse than them. Using this method, we chose 18 students to interview.

The intention of the interview was to supplement our survey data with more information about students' self-concepts and self-esteem. The interview contained 20 questions, and the questions were ordered according to topic: general self-esteem and self-concept, school self-concept, subject self-concept, math level, social comparisons, and gender. Interviewers were instructed to take notes on the interviewee's body language and other important non-verbal cues. Interviewers read the questions exactly as they were written and made sure not to interrupt the student mid-sentence. Some questions contained prompts or follow-up questions to ensure that all aspects of the question were addressed. The interview length ranged from 10 to 15 minutes. Each interview was scheduled for 30 minutes but were much shorter than expected. This may have been a result of intimidation on the part of students, causing them to answer questions quickly, despite interviewers emphasizing that students take time in responding to each question.

Questionnaire Measure

Questionnaire overview

To assess various domains of self-concept, self-esteem, and kinds of social comparisons students made, the team developed a questionnaire composed of previously developed measures and self-generated questions (see Appendix A). There were two parts to the survey; Part A was taken from Harter's (1985) Self-Perception Profile for Adolescents. Part B consisted of both self-generated and previously developed questions to assess math self-concept and self-esteem, English self-concept and self-esteem, and

social comparison. The entire questionnaire contained 61 questions: Part A contained 35 questions and Part B contained 26 questions.

Harter's Self-Perception Profile

This measure is one of the most widely used measures of self-concept and self-esteem in the developmental psychology literature. It assesses nine areas or domains of self-concept as well as general self-worth (or self-esteem). Our team chose to assess student responses to seven of the nine domains: scholastic competence, social acceptance, athletic competence, physical appearance, behavioral conduct, close friendship, and global self-worth (also known as self-esteem). We wanted to collect responses to these domains to explain any other influences on students' self-esteem outside of math track placement. The other two domains, job competence and romantic appeal, were not included because they did not pertain to seventh-grade aged students. Most of the analyses presented in the results chapter of this thesis focus on the general self-worth and scholastic competence scales from the Harter measure.

Each domain had five questions, and for each question, two statements were presented. Because earlier self-concept scales presented questions that tended to elicit socially desirable responses, Harter attempted to correct for this by formatting the questions differently. As an example, one question concerning general self-esteem read, "Some students are often disappointed with themselves BUT Other students are pretty pleased with themselves." The student picked the statement that most accurately described them and decided whether that statement was "really true for me" or "sort of true for me." Each question provided the student four choices; this allowed students to determine the extent to which the statement applied or did not apply to themselves. Each

question was then scored on a scale of one to four with a one indicating the most negative response and a four indicating the most positive response. The scores for each domain were summed to give a total score for that domain.

There is a great deal of research on Harter's (1985) Self-Perception Profile, and it is shown to have good psychometric properties. For our primary analyses, we used the self-esteem items and these had an internal consistency reliability of 0.77 (alpha) and 0.78 (standardized alpha). Harter reports a reliability of 0.80. We also used the scholastic competence items and these had an internal consistency reliability of 0.74 (alpha) and 0.75 (standardized alpha). Harter reports reliabilities between 0.77 and 0.91.

Math self-concept

To assess math self-concept, we generated a series of questions dealing with perception of math level and perception of ability in math. Question 36 first asked students to identify if they were above-level, on-level, or below-level in math and how being in that level made them feel. In our analyses, we used this question to determine perceived math level. Question 40 asked students if they thought they were one of the best math students in their class and in the seventh grade.

In addition to these team-generated questions, questions 45, 46, and 47 were items developed by Eccles, Wigfield, and their colleagues to measure children's math self-concepts of ability (Eccles, Wigfield, Harold, & Blumenfeld, 1993; Wigfield et al., 1997). Questions 45 asked students to assess how good they thought they were in math. Question 46 asked students to determine if they were one of the worst students in their math class, in the middle, or one of the best students in their math class. Question 47 asked students to compare their ability in math to other school subjects; they could

answer that they were a lot worse in math than in other subjects, a little worse, about the same, a little better, or a lot better in math than in other subjects. Each of these questions was answered on a one to seven answer scale. They were combined to form a math self-concept of ability scale.

Lastly, we developed question 57 to assess the impact that being in a certain math class had on self-esteem. This question contained four parts and asked students how being in a particular math class affected how they felt about themselves and how their math teacher, parents, and friends viewed them. For each of the four parts, students could respond that being in their particular math class had a positive effect, a negative effect, or no effect on their self-esteem.

The math self-concept of ability scale was a combination of our team-generated questions (questions 40a and 40b) and those generated by Eccles and Wigfield (questions 45 and 46); the scale had a reliability of 0.79 for our sample. The sample by Eccles and Wigfield reported a reliability of 0.78 (Eccles et al., 1993).

English self-concept

To assess English self-concept, we incorporated questions from Eccles and Wigfield's studies (Eccles et al, 1993; Wigfield et al., 1997) that were similar to the questions regarding math self-concept. Question 48 asked how good students felt they were in English. Question 49 asked students if they felt they were one of the worst, in the middle, or one of the best students in their English class. Question 50 asked students to compare their ability in English to other school subjects; they could answer that they were a lot worse in English than in other subjects, a little worse, about the same, a little

better, or a lot better in English than in other subjects. Students answered these items on one to seven answer scales.

Self-esteem in English was assessed similar to math self-esteem. Question 58 contained four parts and asked students how being in a particular English class affected how they felt about themselves and how their English teacher, parents, and friends viewed them. For each of the four parts, students could respond that being in their particular English class had a positive effect, a negative effect, or no effect on their self-esteem.

For our sample, a scale based on the English self-concept items had reliabilities of 0.82 (alpha) and 0.85 (standard alpha). The study that developed these questions reported a reliability of 0.82 (Eccles et. al, 1993).

Social comparison

To assess social comparison, we generated questions dealing with comparisons to other classmates both within and outside of the students' math class. Question 37 asked students how they compare themselves to other students in math; students could compare to students doing better than themselves, the same as themselves, or worse than themselves. As a follow-up, question 38 was split into two separate sub-questions. Question 38a asked specifically about upward social comparisons and whether those comparisons were made within the students' math class or in a higher level math class. Conversely, question 38b asked about downward social comparisons and if those comparisons were made within the students' math class or in a lower level math class. Though the intention of question 38 was to have students choose either 38a or 38b based on their answer to question 37, most students answered both questions. To gauge

preference for math placement in terms of social comparison, question 39 asked whether students would rather be one of the best students in a lower level math class or an average student in the highest math class.

We also formulated question 41 to gauge frequency of comparisons to other students doing better or worse than the student both within and outside of the students' math class. The purpose of this question was to gauge the direction of social comparison both within and across track. The question consisted of four parts: comparisons to students doing better than themselves in their math class, students doing worse than themselves in their math class, students doing better than themselves in other math classes, and students doing worse than themselves in other math classes. The scores ranged from one (Never) to five (Always). These items were used individually in the analyses reported later, so we did not report reliabilities for them.

Some additional items of the questionnaire asked about the importance of school subjects and whether there are gender differences in children's abilities. These items were not used in the analyses, and thereby are not discussed further.

Interview Measure

The interview contained 20 questions, and each was developed to help answer the team's five main research questions (see Appendix B). Questions one through 14 pertained to the second research question regarding self-esteem and self-concept differences across tracks. For example, question one asked what student's considered most important in determining how they felt about themselves; school, friends, sports, and appearance were examples. Students were also asked how good they thought they were in school and in math and how smart they thought they were overall. Question six

asked how good students thought they were in math. As a follow-up question, students were asked how happy they were with how they performed in math and how it made them feel. Additionally, question 10 referred to the students' perceived math level from the survey and asked what they thought about being in that math class.

Questions 15, 16, and 17 pertained to the first and third research questions regarding types and frequencies of social comparisons and the effect those comparisons have on self-concept and self-esteem. All three questions asked students to explain why they answered social comparison items from the survey the way they did. Questions 18, 19, and 20 pertained to the fourth research question regarding differences in self-esteem and self-concept between boys and girls. These questions asked students whether being a boy or girl made them more or less able to do well in math, English, and school.

Interview Coding

Before interviews were coded, they were first transcribed from recorded conversations. Each interview was coded by at least two team members, and after preliminary coding was completed, three of the team members met to discuss findings and categories. The coding system that was developed was a combination of Analytic Induction (LeCompte & Preissle, 1993) and Open Coding from Grounded Theory (Strauss & Corbin, 1990). The purpose of the coding was to develop categories of responses.

Each interview was first read through for quotes that were related to research questions, were important to the student, or were recurring points made by the student. A list of categories was generated from the initial reading. The categories were broad enough that quotes to both support and refute the category could be included. Some of the

categories included the importance of school on self-concepts and self-esteem, grades determining happiness or ability, and parent and teacher influences on self-concepts and self-esteem. The interviews were then read a second time by the same coder, specifically looking for positive and negative support for the categories as well as possible new categories. Relevant quotes and line numbers were recorded, and interviews were read a last time to include all possibilities for categories.

Each interview that was subsequently read by another team member was coded for the preexisting categories as well as any new categories; previously coded interviews were then reviewed for any new category that was developed. Both positive and negative instances of a particular category were recorded. In addition to coding each interview individually, various groupings were made to look for overall ideas or trends expressed by particular groups. Students were grouped by their math level, gender, and math self-concept. Trends were defined as a topic or idea expressed by the majority of the group. Quotes were chosen based on most clearly expressing the idea or trend of the group as a whole, and viewpoints that opposed the trend were included for completeness.

Chapter 4: Results

Before proceeding to the research questions, descriptive statistics were calculated for the primary variables in the five research questions. The chart below provides the means, standard deviations, and ranges for self-esteem and the three domains of academic self-concept (math, school and English) included in the research questions (Table 1).

Table 1

Means, Standard Deviations, and Ranges of the Primary Variables

Variable (N)	*M*	*SD*	Range (min-max)
Self-esteem (169)	16.34	3.07	5-20
Math self-concept (172)	10.42	2.32	5-15
School self-concept (167)	15.64	2.95	5-20
English self-concept (173)	9.27	1.92	3-12

Additionally, Pearson product-moment correlations were computed for the variables of actual math level, perceived math level, self-esteem, math self-concept, school self-concept, and English self-concept (see Table 2). Actual math level and perceived math level were positively and strongly correlated (.78 significant at the $p<0.01$ level). Self-esteem was positively and significantly correlated to the three domains of academic self-concept (math, school and English); however, these correlations were in the low to moderate range. Actual math level and perceived math level were also significantly correlated to the three domains of academic self-concept. There was not a

significant correlation between self-esteem and actual or perceived math level. School self-concept was positively and significantly correlated with math self-concept and English self-concept, although math and English self-concept of ability were not correlated significantly.

Table 2

Correlations of Primary Variables

	Actual Math Level	Perceived Math Level	General Self-Worth	Math Self-Concept	School Self-Concept
Perceived Math level	.783(**)				
General Self-Worth	.007	.039			
Math Self-Concept	.184(*)	.263(**)	.260(**)		
School Self-Concept	.345(**)	.376(**)	.283(**)	.569(**)	
English Self-Concept	.190(*)	.236(**)	.213(**)	.070	.248(**)

** Correlation was significant at the .01 level (2-tailed)

* Correlation was significant at the .05 level (2-tailed)

Before proceeding to the research questions, correlations were also run for the six self-concept domains from the Harter instrument, math self-concept, English self-concept, and self-esteem (Table 3). Body and behavior self-concept were most strongly correlated with self-esteem. As mentioned above, all three domains of academic self-concept were correlated to self-esteem. Social, athletic, and friend self-concept were also correlated to self-esteem.

Table 3

Correlations of Self-Concept Domains and Self-Esteem

	Behavior	School	Social	Athletic	Body	Friend	Math	English
School	.471(**)							
Social	0.001	0.004						
Athletic	0.012	.181(*)	.308(**)					
Body	.298(**)	.168(*)	.346(**)	.331(**)				
Friend	0.14	0.026	.474(**)	0.065	0.124			
Math	.293(**)	.569(**)	0.029	.179(*)	.206(**)	0.104		
English	.298(**)	.248(**)	0.037	.179(*)	.225(**)	0.109	0.07	
Self-Esteem	.471(**)	.283(**)	.387(**)	.305(**)	.702(**)	.186(*)	.260(**)	.213(**)

** Correlation was significant at the .01 level (2-tailed)

* Correlation was significant at the .05 level (2-tailed)

Research Question One

Quantitative Results

Research Question One asked whether students compare more frequently within or across tracks. To understand this question, two approaches were used to look at within- or across-track comparisons. First, frequencies for a forced-choice set of variables about direction of comparison and within/across comparisons were considered. Then, a set of scalar variables about comparisons was examined.

In the survey, students were asked whether they compared most frequently to students doing worse than them (downward comparison), the same as them, or better than them (upward comparison). Then, students who compared upwards were asked whether those comparisons were made more frequently to students within their class or to students in a higher-level class. Students who compared downwards were asked whether those

comparisons were made more frequently to students within their class or to students in a lower-level class. Students who compared to students doing “the same” were assumed to make within-track comparisons. The responses to these questions were organized by track and students were placed in one of 15 social comparisons categories (see Tables 4-6).

Table 4

Frequencies for Types of Comparisons of Math 7 Students

Type of comparison	Frequency	Percent
Worse/Outside	1	1.5
Worse/Within	6	9.1
Same	37	56.1
Better/Within	13	19.7
Better/Outside	9	13.6

Table 5

Frequencies for Types of Comparisons of Pre-Algebra Students

Type of comparison	Frequency	Percent
Worse/Outside	0	0
Worse/Within	2	4.5
Same	23	52.3
Better/Within	15	34.1
Better/Outside	4	9.1

Table 6

Frequencies for Types of Comparisons of Algebra Students

Type of comparison	Frequency	Percent
Worse/Outside	3	4.8
Worse/Within	2	3.2
Same	32	50.8
Better/Within	23	36.5
Better/Outside	3	4.8

Among Math 7 students, seven (10.6%) generally compared to students performing worse than them, 37 (56.1%) compared to students performing the same as them, and 22 (33.3%) compared to students doing better than them. Of the students who compared downwards, six compared within their class and one compared to a lower-level class. Of the students who compared upwards, 13 compared within the class and nine compared to students in a higher-level math class. Thus, 10 of 66 students (15.15%) compared to students outside of their math track and 56 (84.8%) compared to students within their track.

Among Pre-Algebra students, two (4.8%) generally compared to students performing worse than them, 23 (54.8%) compared to students performing the same as them, and 17 (40.5%) compared to students doing better than them. Of the students who compared downwards, both compared to students within their class. Of the students who compared upwards, 13 compared to students within their class and four compared to students in a higher-level math class. Thus, four of 42 students (9.5%) compared to students outside of their math track and 38 (90.5%) compared to students within their track.

Among Algebra students, five (7.8%) generally compared to students performing worse than them, 32 (50.0%) compared to students performing the same as them, and 27 (42.2%) compared to students doing better than them. Of the students who compared downwards, two compared within their class and three compared to students in a lower-level class. Of the students who compared upwards, 23 compared within their class and three compared to students in a higher level math class. Thus, six of 63 students (9.5%) compared to students outside of their math track and 57 (90.5%) compared to students

within their track.

Thus, overall, 18 of 171 students (10.5%) stated that they compared to students outside of their math track, and 153 (89.5%) stated that they compared to students within their track.

Students were asked again about the direction and type of social comparisons they made most frequently with four additional questions (items 41 a – d; see Appendix A). The questions asked students the frequency with which they made upward and downward social comparisons in and outside of their math classes on a scale from "Never" (0) to "Always" (5). The means and standard deviations for the four types of social comparisons are presented below by track (Tables 7-9). When comparing upwards, 31 (18.6%) students made those comparisons more frequently to students in other math classes, 90 (53.9%) students made those comparisons more frequently to students within their math class, and 46 (27.5%) students made those comparisons outside and within their class at about the same frequency. When comparing to students doing worse, 15 (9.0%) students made those comparisons more frequently to students in other math classes, 70 (41.9%) students made those comparisons more frequently to students within their math class, and 82 (49.1%) students made those comparisons outside and within their class at about the same frequency.

Table 7

Means, Standard Deviations for Types of Social Comparisons (41a-41d) for Math 7 Students (n = 63)

Variable	*M*	*SD*
Compare to students doing better in my math class	2.52	0.86
Compare to students doing worse in my math class	1.92	1.04
Compare to students doing better in other math classes	2.30	1.01
Compare to students doing worse in other math classes	1.75	0.93

Table 8

Means, Standard Deviations for Types of Social Comparisons (41a-41d) for Pre-Algebra Students (n = 40)

Variable	*M*	*SD*
Compare to students doing better in my math class	2.70	0.88
Compare to students doing worse in my math class	2.10	1.03
Compare to students doing better in other math classes	2.20	1.04
Compare to students doing worse in other math classes	1.73	0.85

Table 9

Means, Standard Deviations for Types of Social Comparisons (41a-41d) for Algebra Students (n = 64)

Variable	*M*	*SD*
Compare to students doing better in my math class	3.16	0.76
Compare to students doing worse in my math class	2.25	0.87
Compare to students doing better in other math classes	2.14	1.04
Compare to students doing worse in other math classes	1.52	0.84

Qualitative Results

In the interview portion of the study, students were asked to whom they normally compare themselves in math. Thus the comparisons of interest were for the purpose of students getting information about their performance in math. The interviews revealed results similar to the surveys, indicating that the majority of students compared within their tracks (12 of 15). Of these students, most compared to people doing the same as them (six of 12), as opposed to people doing better or worse than them. They also gave reasons for why they tended to compare within their track rather than to students in other tracks. One possible reason for the majority of the students in both the surveys and the interviews comparing to peers doing the same as them, within their class, is that students may feel unable to compare to students not in their specific class (same teacher as well as same subject). One Math 7 student with high math self-concept indicated that he

compared to people in his same class because "…since they're in the same classes as I'm in, that means…that I can compare myself to them." He also explained that he did not compare to students in a higher class because "…people [in a higher class] than me…would already know stuff I don't know, so I can't really compare myself to them, because they know stuff that I haven't learned yet." An Algebra student with low math self-concept suggested that he could not compare to people in another class because "…if I compare to people that aren't in my class, then they might be doing worse or better [than me] and I wouldn't know really that well."

Although most students said they compared to students doing similarly to them, some students indicated that they compared to others doing better. One possible reason that students compared to those doing better than them seemed to be for the purpose of learning and improving their own work or grades. For example, when asked why he compared mostly to people doing better than him, one Pre-Algebra student with low math self-concept said, "…if you compare yourself to people doing better than you, then…they know more, so…you can maybe…learn from them or something, and you can get better." Another reason for comparing to students doing better was for motivational purposes. When asked why she compared to students doing the same or better than her as opposed to students doing worse, an Algebra student with high math self-concept indicated,

> …if I compared myself to people who were doing worse than me…I'd start to get lazy and my work would drop…I'd rather [compare to] people that are [doing] the same as me or higher than me to encourage my work.

Another Algebra student with high math self-concept responded to the same question, "If they were [doing worse than me], it wouldn't be as much competition to be better than them."

For students who compared to those doing worse than them (four of 15), the main reason seemed to involve self-esteem. This topic is further discussed in the results for research question three.

Research Question Two

Quantitative Results

Research question two asked whether self-esteem and self-concept would differ by perceived and actual math track. In order to examine these relationships, three different analyses were performed. First, ANOVAs were run with all cases to see the effect of perceived math level on the self-concept domains and self-esteem. Then the data file was split by actual math level to look at the effect of perceived math level on the self-concept domains and self-esteem within each track. Last, ANOVAs were run with all cases to examine the effect of actual math level on the self-concept domains and self-esteem. In every case, two-way ANOVAs were used to include gender. The effects of gender will be discussed in questions four and five.

Effects of Perceived Math Level on Students' Self-Esteem and Self-Concepts

To examine the effect of perceived math level, three (perceived math level) by two (gender) ANOVAs were run on students' math self-concepts, school self-concepts, English self-concepts, and self-esteem as dependent variables. Table 10 present the means and standard deviations for math, school, and English self-concept, as well as self-esteem, by perceived level of math class. The ANOVA showed a significant effect of perceived math level on math self-concept, F (2, 165) = 6.277, p = 0.002. Tukey HSD post hoc tests showed that the means of on-level and above-level students differed

significantly (p = 0.006), with above-level students having higher math self-concepts. The analysis also showed a significant effect of perceived math level on school self-concept, F (2, 160) = 13.475, p = 0.000. Tukey HSD post hoc tests showed that the means of the below- and above-level students differed significantly (p = 0.002), with above-level students having higher school self-concepts, and that the means of on- and above-level students differed significantly (p = 0.000), with above-level students having the higher school self-concepts. Additionally, an ANOVA showed a significant effect of perceived math level on English self-concept, F (2, 166) = 6.343, p = 0.002. Tukey HSD post hoc tests revealed a significant difference in the mean English self-concepts of on- and above-level students, p = 0.001, with above-level students having higher English self-concept scores. There were no significant effects of perceived math level on students' self-esteem.

Table 10

Means, Standard Deviations by Perceived Level

Perceived level (N)	Self-esteem *M* (*SD*)	Math self-concept *M* (*SD*)	School self-concept *M* (*SD*)	English self-concept *M* (*SD*)
Below-level (6)	14.33 (4.84)	9.00 (2.10)	12.67 (4.23)a	9.17 (3.13)
On-level (82)	16.48 (2.82)	9.96 (2.10)a	14.80 (2.71)a	8.78 (1.95)a
Above-level (80)	16.31 (3.16)	11.06 (2.38)b	16.74 (2.69)b	9.81 (1.66)b

Note. Different superscript letters in a column denotes a significant difference, $p < 0.05$

To further understand the effect of perceived math level, the data file was split by actual math track. Two-way ANOVAs were used, with perceived math track and gender

as the independent variables. The analyses were performed on self-esteem and the academic self-concept domains. For Math 7, the analysis showed a significant effect of perceived math level on math self-concept, F (2, 59) = 5.290, p = 0.008. Tukey HSD post hoc tests showed a significant difference between the mean self-concepts for below- and above-level students (p = 0.008), with above-level students having higher math self-concepts, and between on- and above-level students (p = 0.011), with above-level students having higher math self-concepts (Table 11). A two-way ANOVA also showed a significant effect of perceived math level on school self-concepts for Math 7 students, F (2, 57) = 5.379, p = 0.007. Tukey HSD post hoc tests showed a significant difference between below- and above-level students' school self-concepts (p = 0.006) and between on- and above-level students' school self-concepts, p = 0.020 (Table 12). There was no significant effect on English self-concept or self-esteem for Math 7 students. Among Pre-Algebra students, none reported being in below-level classes so the ANOVA was two (perceived level) by two (gender) on the self-concept domains and self-esteem. There were no significant effects of perceived level on math self-concept, school self-concept, English self-concept, or self-esteem. Analyses could not be run for Algebra students because no student reported they were below-level and only one student reported they were on-level.

Table 11

Means, Standard Deviations for Math Self-Concept of Math 7 Students

Perceived Level (N)	*M*	*SD*
Below-level (6)	9.00^{a}	2.10
On-level (55)	9.95^{a}	2.16
Above-level (4)	13.25^{b}	1.50

Note. Different superscript letters in a column denotes a significant difference, $p < .05$

Table 12

Means, Standard Deviations for School Self-Concept of Math 7 Students

Perceived Level (N)	*M*	*SD*
Below-level (6)	12.67^{a}	4.23
On-level (53)	14.55^{a}	2.80
Above-level (4)	18.75^{b}	1.50

Note. Different superscript letters in a column denotes a significant difference, $p < .05$

Lastly, students were asked whether being in their math class had a positive effect, negative effect, or no effect on their self-esteem (Question 57; see Tables 13-15 for response frequencies by perceived level). A three (perceived math track) by two (gender) ANOVA was run with the effect on self-esteem, which found no significant effect of perceived math track on students' responses.

Table 13

Frequencies, Percents for Effect of "Being in My Math Class" on Self-Esteem of Perceived Below-Level Students

Effect	Frequency	Percent
Negative effect	0	0
No effect	4	66.7
Positive effect	2	33.3

Table 14

Frequencies, Percents for Effect of "Being in My Math Class" on Self-Esteem of Perceived On-Level Students

Effect	Frequency	Percent
Negative effect	3	3.5
No effect	49	57.0
Positive effect	34	39.5

Table 15

Frequencies, Percents for Effect of "Being in My Math Class" on Self-Esteem of Perceived Above-Level Students

Effect	Frequency	Percent
Negative effect	6	7.5
No effect	29	36.3
Positive effect	45	56.3

Effects of Actual Math Track on Students' Self-Esteem and Self-Concepts

Actual math tracks were determined by class rosters. There were three math tracks in the school: Math 7 (low), Pre-Algebra (middle), and Algebra (high). To examine the effect of actual math track on the different self-concept variables and self-esteem, two-way ANOVAs were used with actual math track and gender as the independent variables. The ANOVA showed a significant effect of math track on math self-concept, F (2, 166) = 3.091, p = 0.048. Tukey HSD post hoc tests showed a significant difference between Math 7 and Algebra students mean math self-concepts (p = 0.041), with Algebra students having higher math self-concepts (Table 16). An ANOVA also showed a significant effect of math track on school self-concept, F (2, 161) = 12.011, p = 0.000. Tukey HSD post hoc tests showed Math 7 and Algebra students (p = 0.000), as well as Pre-Algebra and Algebra students' (p = 0.003) mean school self-concepts differed significantly, with Algebra students having higher school self-concepts (Table 17). Additionally, there was a significant effect of track on English self-concept, F (2, 167) = 3.703, p = 0.027. Tukey HSD post hoc tests showed a significant difference in mean

English self-concepts of Math 7 and Algebra students ($p = 0.033$), with Algebra students having higher English self-concepts (Table 18). The ANOVA did not show a significant effect of actual track on self-esteem.

Table 16

Means, Standard Deviations for Math Self-Concept by Actual Track

Math track (N)	*M*	*SD*
Math 7 (66)	10.00^{a}	2.30
Pre-Algebra (42)	10.21	2.20
Algebra (64)	10.98^{b}	2.35

Note: Different superscript letters in a column denotes a significant difference, $p < .05$

Table 17

Means, Standard Deviations for School Self-Concept by Actual Track

Math track (N)	*M*	*SD*
Math 7 (64)	14.66^{a}	3.08
Pre-Algebra (41)	15.12^{a}	2.51
Algebra (62)	17.00^{b}	2.59

Note: Different superscript letters in a column denotes a significant difference, $p < .05$

Table 18

Means, Standard Deviations for English Self-Concept by Actual Track

Math track (N)	*M*	*SD*
Math 7 (66)	8.77[a]	2.10
On-level (43)	9.53	1.87
Above-level (64)	9.61[b]	1.66

Note: Different superscript letters in a column denotes a significant difference, $p < .05$

Using the responses to Question 57 mentioned previously (in which students were asked whether being in their math class had a positive effect, negative effect, or no effect on their self-esteem), a three (perceived math track) by two (gender) ANOVA was run. The analysis showed no significant effect of actual math track on their responses (see Tables 19-21 for response frequencies by math track).

Table 19

Frequencies, Percents for Effect of "Being in My Math Class" on Self-Esteem of Math 7 Students

Effect	Frequency	Percent
Negative effect	1	1.5
No effect	38	57.6
Positive effect	27	40.9

Table 20

Frequencies, Percents for Effect of "Being in My Math Class" on Self-Esteem of Pre-Algebra Students

Effect	Frequency	Percent
Negative effect	3	7.0
No effect	24	55.8
Positive effect	16	37.2

Table 21

Frequencies, Percents for Effect of "Being in My Math Class" on Self-Esteem of Algebra Students

Effect	Frequency	Percent
Negative effect	5	7.8
No effect	21	32.8
Positive effect	38	59.4

Effect of Actual Math Track Controlling for Students' Grades

Based on a recent study by Trautwein et al. (2006) which showed that tracking's effects on self-concept disappeared when students' grades were controlled statistically, a 2 (gender) by 3 (actual math track) analysis of covariance (ANCOVA) was run with grades as the covariate and with the three domains of self-concept as the dependent variables. Including grades as a covariate essentially controls for the effects grades may have on the dependent variables in the analyses. With grades (math, school and English, respectively) as the covariates, actual math track no longer had a significant main effect

on either math self-concept, school self-concept or English self-concept. This analysis thus indicates that grades rather than actual math track have the stronger influence on students' self-concepts.

Qualitative Results

Research question two involved how tracking affects students' self-esteem and self-concepts. The interviews provided a more in-depth look at how students' perceived math level relates to these psychological constructs. The majority of the interviewed students appeared to believe that the math level someone is placed in affects one's self-esteem and math self-concept. A few students believed that math level only affects self-esteem, while math ability is in one's personal control. A third possible view exhibited by one of the interviewed students is that neither self-esteem nor math self-concept are affected by math level.

Most (12 of 15) of the students who were interviewed expressed beliefs that the math level they were in affected their self-esteem and math self-concepts. Of these students, many said that there is a direct relationship between math level and intelligence. For example, when asked if the level math class a student was in affected what he thought about how good he was in math, one Math 7 student with low math self-concept replied, "Yes, because it's a higher math class than the one I was in before so it makes me feel smarter." Another Math 7 student with high math self-concept said, "…if I'm in like a 7th grade math class, it makes me … average, but if I'm in a higher math class, it would make me like a little bit smarter." An Algebra student with high math self-concept, when asked why he would be proud to be in a higher math level, responded, "Because … I'm in a higher math class, and that means I'm a smarter person."

Two Algebra students with low math self-concept exhibited the view that math level affects self-esteem and self-concept in a different manner. When asked how they would feel about moving down a math level, both indicated mixed feelings. While moving down a level would make them feel disappointed or "feel like less," the move would also make them feel smarter and proud "because I'd probably be doing better than other kids in the class." In relation to research question one, these responses indicated that these students compared both within and across tracks. When they said that moving down a level would make them "feel like less," they were comparing to students in a higher level. However, when they said the move would make them feel smarter, they were comparing to students in the same level with lower ability.

As opposed to level affecting both self-esteem and math self-concept, a few students believed that only self-confidence (which is similar to self-concept of ability) would change with a change in track. For example, one Math 7 student with low math self-concept felt that changing a math level directly affects confidence but reflects effort rather than ability. This student said that moving to a higher math class would make her feel "a bit more confident … because knowing that I'm up there and not down there," This student did not believe that her math ability would change simply because of the move. However, she felt that her math ability would have changed "if [she] would've paid attention more."

A third existing, though uncommon, view exhibited by one of the interviewed students is that math level has no effect on either self-esteem or math self-concept. This Pre-Algebra student with low math self-concept indicated that the math level he was in had no effect on him or his ability. For example, when asked whether his math ability

would change if he were moved to a different math level, he replied, “No, because I didn’t get smarter overnight.” He also indicated that there would be no emotional effects from a change in math level.

Research Question Three

Quantitative Results

Research Question Three asked whether students who compare within their track differ from students who compare outside of their track, with regard to self-esteem and self-concept. To answer this question, students were split by the direction of social comparisons made most frequently (Item 37 in the survey, see Appendix A). Analyses of variance were then run on these groups of students.

Among students who compared upwards most frequently, a two-way ANOVA was run, with the independent variables being gender and whether the student compared more within or across tracks (Question 38a). The dependent variables were self-esteem and the academic self-concept domains. The ANOVA showed no significant effect of the type of social comparisons (within or higher track) on self-esteem, math self-concept, school self-concept, or English self-concept.

Among students who compared downwards most frequently, a two-way ANOVA was run, with the independent variables being gender and whether the student compared more within or across tracks (Question 38b); the dependent variables were self-esteem and the academic self-concept domains. There was no significant effect of social comparisons (within or lower track) on self-esteem, math self-concept, school self-concept, or English self-concept.

A second set of analyses utilized the four scalar questions about the frequency of

four different comparisons (upwards and across, upwards and within, downwards within, and downwards across; items 41 a-d). The difference of 41a and 41c indicates whether students compared more within or across tracks, when comparing to students doing better than them. The difference of variables 41b and 41d indicates whether students compared more within or across tracks when comparing to students doing worse than them. These newly created variables (41a-c and 41b-d) were used as independent variables in two-way ANOVAs, along with gender. Each of these analyses was run on the dependent variables of self-esteem, math self-concept, school self-concept, and English self-concept. The two-way ANOVAs showed no significant effect of upward within- and across-track comparisons on self-esteem, math self-concept, school self-concept, or English self-concept. The second series of ANOVAs showed no significant effect of downward within- and across-track comparisons on self-esteem, math self-concept, school self-concept, or English self-concept.

An ANOVA could not be run with the 15 social comparison groups (based on track, direction and within/across) because the sample sizes were too small in many of the groups.

Qualitative Results

The interviews did not generate a great deal of information relevant to this question. For students who compared to those doing worse than them, the main reason seemed to be to increase self-esteem. When asked why she compared to students doing worse than her, one Math 7 student with low math self-concept said, “I compare myself to them because that makes me feel better because…I think that I’m doing better than them.” As an explanation for why she compared to people doing worse than her as

opposed to people doing better than her, another Math 7 student with low math self-concept said, “Because it doesn’t make me feel bad about myself that other people are doing better than me.”

Research Question Four

Quantitative Results

Research Question Four asked whether the self-esteem and self-concepts of boys and girls differ by track or by subject. First, the ANOVAs reported in Research Question two were used to look at gender and interaction effects on self-esteem and self-concept. Next, the data file was split by gender and one-way (actual math track) ANOVAs were run on the domains. Lastly, with the split file by gender, a paired samples *t*-test was used to look at subject comparisons by gender.

A three (actual math track) by two (gender) ANOVA was run with self-esteem and the three academic self-concept domains. The ANOVA showed no significant effect of gender on the variables. Additionally, there were no significant interaction effects of actual math track and gender on self-esteem, math self-concept, school self-concept, or English self-concept.

The next set of analyses was run on the boys in the sample. One-way ANOVAs were run with the independent variable of actual math level. The ANOVA showed no significant effect of actual math level on self-esteem and math self-concept for boys. The ANOVAs showed a significant effect of actual math level on school self-concept for boys (F (2, 80) = 4.812, p = 0.011). Tukey HSD post hoc tests showed a significant difference in Math 7 and Algebra (p = 0.032) and Pre-Algebra and Algebra (p = 0.022) boys’ self-concepts (Table 22). The ANOVAs did not indicate a significant effect of actual math

level on English self-concept of boys.

Table 22

Means, Standard Deviations for School Self-Concept of Boys by Actual Track

Math track (N)	*M*	*SD*
Math 7 (31)	15.16[a]	2.85
Pre-Algebra (21)	14.86[a]	2.50
Algebra (31)	16.94[b]	2.72

Note: Different superscript letters in a column denotes a significant difference, $p < .05$

The next set of analyses was run on the girls in the sample. One-way ANOVAs were run with the independent variable of actual math level. The ANOVA showed no significant effect of actual math level on self-esteem or math self-concept. The ANOVA showed a significant effect of actual math track on school self-concept (F (2, 81) = 8.286, p = 0.001). Tukey HSD post hoc tests showed a significant difference in Math 7 and Algebra (p = 0.000) girls' self-concepts (Table 23). The final ANOVA showed a significant effect of actual math level on English self-concept for girls, F (2, 84) = 4.544, p = 0.013. Tukey HSD post hoc tests showed a significant difference in the mean English self-concepts of Math 7 and Algebra girls (Table 24).

Table 23

Means, Standard Deviations for School Self-Concept of Girls by Actual Track

Math track (N)	*M*	*SD*
Math 7 (33)	14.18[a]	3.25
Pre-Algebra (20)	15.40	2.56
Algebra (31)	17.06[b]	2.50

Note: Different superscript letters in a column denotes a significant difference, $p < .05$

Table 24

Means, Standard Deviations for English Self-Concept of Girls by Actual Track

Math track (N)	*M*	*SD*
Math 7 (34)	8.50[a]	2.38
Pre-Algebra (22)	9.64	1.71
Algebra (31)	9.90[b]	1.64

Note: Different superscript letters in a column denotes a significant difference, $p < .05$

The second part of the research question asked whether self-concepts of boys and girls differed by subject. A paired-samples *t*-test (including math self-concept and English self-concept as the variables) was run for the boys and girls' samples. The *t*-test showed that boys' math self-concepts are significantly higher than their English self-concepts of ability, t (85) = 4.634, p = 0.000. The analysis on the girls' sample showed that girls had significantly higher math self-concepts than English self-concepts, t (85) = 6.628, p = .010.

Qualitative Results

The responses from the interviews were so varied that there were no overall trends to report for research question four. Even when the interviews were divided into males and females, there was too much variance in the responses to form a trend.

Research Question Five

Quantitative Results

Research Question Five asked whether the frequency of social comparisons made within or across tracks differ by gender. First, the frequencies generated in research question one were recalculated by gender. Next, a one-way (gender) ANOVA was run with the direction of social comparisons (downwards, same, upwards). A one-way (gender) ANOVA was also run on the relative frequency of within- or across-track comparisons when comparing upwards and when comparing downwards. Finally, students were selected by whether they compared upwards or downwards, and a one-way (gender) ANOVA was run with whether they made those comparisons more frequently within or across tracks.

First, the frequencies of social comparison types considered in research question one (Question 37, 38a, and 38b) were recalculated by gender (see Table 25-26). Out of 85 male students, four compared most generally to students doing worse than them, 42 compared to students doing the same as them, and 39 compared to students doing better than them. Of the four males students who compared downwards, three (75.0%) of those students made those comparisons most frequently within their class and only one (25.0%) made those comparisons to a lower-level math class. Of the 39 students who compared

upwards, 26 (68.4%) of those students made those comparisons within their math class and 12 (31.6%) made those comparisons to students in a higher-level math class.

Table 25

Frequencies for Types of Comparisons of Boys

Type of comparison	Frequency	Percent
Worse/Outside	1	1.2
Worse/Within	3	3.6
Same	42	50.0
Better/Outside	26	31.0
Better/Within	12	14.3

Of 87 female students, 10 compared most generally to students doing worse, 50 compared to students doing the same, and 27 compared to students doing better. Of the 10 female students who compared downwards, seven (70.0%) made those comparisons most frequently within their math class and three (30.0%) made those comparisons most frequently to students in a lower-level math class. Of the 27 female students who compared upwards, 23 (85.2%) made those comparisons most frequently within their math class and four (14.8%) made those comparisons most frequently to students in a higher-level math class.

Table 26

Frequencies for Types of Comparisons of Girls

Type of comparison	Frequency	Percent
Worse/Outside	3	3.4
Worse/Within	7	8.0
Same	50	57.5
Better/Outside	23	26.4
Better/Within	4	4.6

Next, a one-way ANOVA with gender as the independent variable was run with students' responses to the direction of social comparisons question included as the dependent variable (Table 27). The ANOVA found a significant effect of gender on the direction of social comparisons and indicated that boys compared upwards more frequently than girls (see Table 27).

Table 27

Means, Standard Deviations of the Direction of Social Comparisons by Gender

Gender (N)	*M*	*SD*
Boys (85)	2.41^{a}	0.58
Girls (87)	2.20^{b}	0.63

Note. Different superscript letters in a column denotes a significant difference, $p < .05$. Comparing upwards was scored at 3, comparing the same was scored at 2 and scoring downwards was scored at 1. The means indicated that more male students than female students made upward comparisons.

To answer the question of whether there is a difference between boys and girls making within- or across-track comparisons, several additional analyses were run. First, one-way ANOVAs, with gender as the independent variable, were run on students' responses to the scalar questions regarding the frequency of four types of social comparisons: those made to students doing better within the math class, those made to students doing better in a higher math class, those made to students doing worse within the math class, and those made to students doing worse in a lower math class (questions 41a-d, see Appendix A). The scale ranged from "Never" to "Always". The ANOVAs found no significant effect of gender on the frequency of any of the four types of comparisons.

Next, students' responses to questions about these four comparisons were used to determine whether upward comparisons were made more frequently within or outside of the math class. For example, if the student said "Always" for the first type of comparison (those made to students doing better within the math class) and "Sometimes" for the second type of comparison (those made to students doing better in a higher math class), the difference of these variables would indicate that the student made upward comparisons more frequently within their math class. If the student said "Always" to both, the difference would indicate that they made upward comparisons within and outside of their math class at about the same frequency. Thus, the difference between these variables was used as the dependent variable in one-way (gender) ANOVAs. There was no significant effect of gender on within- or across-track comparisons when looking at upwards (41a-41c) or downwards (41b-41d) comparisons.

Next, students who reported comparing upwards most frequently (based on

responses to item 37) were selected. A one-way (gender) ANOVA was run with responses to whether those students compared most to students within their class or to students in a higher-level class. Of the students who compared upwards, there was no significant effect of gender on whether those comparisons were made most frequently within or outside of their track. Students who reported comparing downwards most frequently were then selected. A one-way (gender) ANOVA was run with responses to whether those students compared most to students within their class or to students in a lower math class. There was no significant effect of gender on whether those comparisons were made most frequently within or outside of their track. Thus, overall, it appears that boys and girls do not compare differentially within or across track.

Qualitative Results

Research question five involved the differences in social comparisons by gender. A general trend observed in the interviews was that the majority (12 of 15) of these students compared within their track. Within each gender, the majority of students compared within their track as well. Whereas the majority of boys compared to students doing either the same (four of nine students) or better (three of nine students) than them within their tracks, girls compared more to students doing worse than them (three of six) or doing the same as them (two of six) within their track. Very few students interviewed stated that they compared more frequently to other students outside of their own tracks. Within each gender, one boy compared to students doing better than him outside of his track and one boy compared to students doing worse than him outside of his track. Only one girl compared to students outside of her track, and she compared more frequently to students doing better than her in different tracks.

Supplemental Qualitative Results

The interviews generated responses in areas that were related to, but not addressed by, the research questions. Of these areas, three topics in particular appeared to be noteworthy; almost every interview mentioned all three of these topics at least once. These three topics are worth discussing because they appeared to be important in understanding seventh-grade students' beliefs about achievement, gender differences in abilities, and parental influences on students' self-concepts and self-esteem.

The first area of interest was the idea that grades determine happiness. Happiness and academic achievement are factors that play a role in students' self-esteem, which is a focus of our study. Because this idea was strongly expressed by 14 of the 15 students interviewed, it was noted for further investigation.

The second area of interest was the idea that gender has no effect on ability in math, English, or school overall. Research questions four and five involved the effect of gender on self-esteem, self-concept, and social comparisons. Although the study found that there were gender differences in self-concept, this topic showed that these gender differences do not include the idea that boys and girls have different abilities. This idea was expressed by all 15 of the students interviewed.

The third area of interest was the idea that parental feedback is important to students. Feedback, whether positive or negative, can affect students' self-esteem and self concepts. This idea was also noted because it was expressed by 11 of the 15 interviewees.

Grades Determine Happiness

In the interviews, one trend observed was that grades appeared to be linked to the happiness of students. An overwhelming majority of the students explained that their

happiness was highly influenced by the grades they received in their classes. Only one of the 15 interviewees did not indicate a direct link between good grades and happiness. In response to the question of how happy she was with how well she did in school, one Math 7 student with high math self-concept said, “I’m happy because I get good grades.” The other responses were very similar answers with slight word variations. One Algebra student with low math self-concept phrased his response in the opposite way: “Right now, [I’m] not too happy…because I’m not getting good grades.” As discussed in the literature review, self-esteem is affected by performance in a domain that is valued by the student. When students indicate that the grades they earn affect how happy they are, it suggests that grades are also an important factor in their self-esteem.

Gender Has No Effect On Ability

Students were asked whether being a boy or a girl affects one’s ability to do well in math, English, or school in general. Every student interviewed said that gender has no effect on overall academic ability. Students stated various opinions on why gender has no effect on overall ability. As one girl in Algebra with low math self-concept responded, “Gender doesn’t affect how smart you are.” A male Pre-Algebra student with low math self-concept agreed that “boys and girls have the same ability.” Some students linked ability to effort rather than gender. One female Math 7 student with low math self-concept said, “It doesn’t make any difference of what you are just as long as you study and pay attention and do your work.” A male Algebra student with high math self-concept agreed, saying, “It makes no difference also because you can do as well as you want to if you just study harder.”

Although every student reported that gender does not affect overall academic

ability, a few students believed that girls do better in English. One boy in Algebra with low math self-concept explained that this phenomenon occurs because girls "pay more attention." One girl in Algebra with high math self-concept went on to say that, "Boys mature later than girls [so] they might…not pay attention as well." She also said that girls do better in English because "most of the boys I know don't like Language Arts; they don't like English. They're more into science and math and things along that line." A Math 7 girl with a low math self-concept believed that girls were better in both math and English because "girls have more common sense." However, these opinions were only represented by four of the 15 students. The majority of the students believed that gender makes no difference in ability.

Influence of Parents on Students' Self-Esteem and Motivation

The majority of students that were interviewed mentioned some form of influence from their parents. For example, parental feedback affected the students' self-esteem, self-concepts, and/or motivation to excel in school. One response was particularly illustrative of how parents' feedback can positively influence students' motivation. When asked if parental feedback affected how well he thought he did at math, one Algebra student with low math self-concept said, "If [my parents] give me bad feedback, then I'm going to want to try harder." Other responses showed how students saw their parents influencing their self-concepts and self-esteem. In response to the same question, an Algebra student with high math self-concept said, "One of the reasons I work so hard is so my parents will be proud of me." In a third response to this question, a Pre-Algebra student with low math self-concept said, "If I get a good grade, she [my mother] will give me more confidence."

Most of the students mentioned the impact of parental influence in relation to parental feedback. However, one girl in particular mentioned the effects of parental influence in terms of comparing herself to her parents. When asked how good she thought she was at math, this Math 7 student with low math self-concept answered,

> I'm not that good at math, and I have my dad who's really good at math. But sometimes when I go to him when I get something wrong, we just sit there and argue. So I don't go to him that much.

This was a noteworthy response because it addressed a comparison rather than a response to criticism or praise.

Although parental influence seemed to affect the self-esteem, self-concepts, and motivation of the students interviewed, their responses varied with regard to the effect of teacher feedback. When asked if teacher feedback affected how well she thought she did in English, one Math 7 student with high math self-concept said, "Yes, because she tells me I'm doing well and I'm kind of at the top of the class." However, to the same question, an Algebra student with high math self-concept responded, "Not really, because the teacher is like a person… I met at the beginning of the year, so…I know them, but it doesn't affect me as much as friends or parents." Similar responses indicated that teacher feedback does not affect the self-concepts of students as much as parental feedback, mostly because the teachers are more distant authority figures. At the same time, only three of 15 students believed that peer feedback influenced how well they thought they did in math or English.

In summary, the majority of students believed that parental feedback greatly affects students' self-concepts, very few students believed that peer feedback affects students' self-concepts, and almost half of the students interviewed believed that teacher

feedback affects students' self-concepts.

Chapter 5: Discussion

This study was designed to look at three main issues. The first was how tracking in math during middle school influenced students' self-concepts of ability in different areas and general self-esteem. The second was examining the kinds of social comparisons in which students engage, with a particular focus on whether students compared to other students in their own math class, or to students in other math classes/math levels. The third was examining whether there are gender differences in tracking's influences on self-concept and self-esteem. In this chapter, we discuss the findings of our study in the context of previous related research and present implications for future research. The chapter is organized around the five research questions that guided the study. After discussing the findings for each research question, we present some general conclusions we draw from the work.

Research Question One

Our first research question asked what types of social comparisons students in different tracks make more frequently, those within or across tracks. To the best of our knowledge, no other study has asked students directly whom they compare themselves to in math classes, despite much being written about the possibility that students in low tracks feel bad about themselves because they compare themselves to students in the higher tracks (Black, 1993; Gallagher, 1993; Ireson, et al., 2001; Nicholson, 1998; Oakes, 1985; Zeleke, 2004).

Two sets of questions in our survey were used to measure the frequency of within- and across-track comparisons. The first set of questions first asked students

whether they compared themselves to other students doing better than them, the same as them, or worse than them. If a student chose the better or worse option, he or she was then asked to decide whether those comparisons were made within- or across-track. We found no significant differences in the distribution of responses among the different track levels.

In the first set of questions, we assumed that those students who said they compared to others who performed the same as them made their comparisons within tracks. Our findings indicated that the majority of students (92 of 173 students) said they usually compared to others who were performing at the same level as them. Among the 80 students who said they compared either upward or downward, the majority (61 students, or 75.3%) compared within their track. Very few students (20 students, or 24.7%) said they compared across tracks. There is no specific research on within- or across-track comparisons with which to compare our findings. However, our research supports Festinger's (1954) theory of the "unidirectional drive upward," where individuals want to do slightly better than others, creating a desire in them to evaluate their abilities and thereby compare themselves to others doing similarly (Suls & Wheeler, 2000). Because we found no significant differences in the distribution of responses among students from different track levels, it seems that Festinger's theory holds true for all students, regardless of which track they are on.

Qualitative findings gathered from our interviews with select individuals may shed some light on why students might make within-track comparisons more frequently. Students mentioned that it was simply easier and more practical to compare to students within their classes because comparing across tracks would mean accounting for

differences in teachers and material. Students thought across-track comparisons were impossible due to the differences between classes: “People [in a higher class] than me…would already know stuff I don’t know, so I can’t really compare myself to them, because they know stuff that I haven’t learned yet.” Another student thought across-track comparisons were impractical because he would not know enough about the performance of students in other classes to make valid comparisons: “If I compare to people that aren’t in my class, then they might be doing worse or better [than me] and I wouldn’t really know.” It seems that the greater frequency of within-track comparisons does not mean that students are not making across-track comparisons at all. They are just not making it on a daily basis because it is not an option for them. These findings verify previous research conclusions that comparisons that are made with others of little perceived similarity have no impact (Collins, 1996; Collins, 2000). Data from the student interviews also match the reasons suggested by numerous researchers for making social comparisons. On a micro level, the students in our study were comparing to other students within their tracks for self-evaluation, self-enhancement, and self-improvement purposes (Gibbons & Buunk, 1999; Suls & Wheeler, 2000; Thornton & Arrowood, 1966; Wood, 1989; Wood & Wilson, 2003). For them, across-track comparisons might not be seen as beneficial because they have already been placed into a certain class and must find a way to do well in that situation. However, across-track comparisons may be made on a more macro level, where there is an implicit comparison made in the labeling of the track as below-, on-, and above-level; future research should address this possibility.

Our survey and interview questions did not allow us to determine whether students’ opinions about tracks were made from comparisons between tracks or merely

from implicit societal descriptions of one track as “dumb” or “stupid,” not necessarily worse than another. Furthermore, all of our questions asked what types of comparisons students made to other individuals. Across-track comparisons may have occurred in the context of comparing classes instead of individuals, an aspect we did not measure. Future research should find a way to distinguish between these two reactions to track labels and measure and quantify the across-track comparisons made between groups rather than individuals.

The second set of questions from our survey asked students to evaluate how frequently they made upward within-track comparisons, downward within-track comparisons, upward across-track comparisons, and downward across-track comparisons. Again, we found no significant differences in the distribution of responses among students in the different track levels. Students indicated that they made these types of comparisons in the following order, from most frequent to least frequent: upward within-track comparisons, upward across-track comparisons, downward within-track comparisons, and downward across-track comparisons. Therefore, the direction of comparison (upward versus downward) seemed to be more important than the type of comparison (within- or across-track). Students overwhelmingly chose upward within-track as the most frequent type of comparison they made, but they also chose upward across-track more frequently than downward within-track. Downward across-track comparisons were by far the least frequent type of comparison students said they made.

Our findings support previous research that indicates that middle school children tend to compare upwards when they are engaging in academic social comparisons (Blanton et al., 1999; Dumas et al., 2005; Huguet et al., 2001). Our research

again supports Festinger's (1954) theory of the "unidirectional drive upward," where individuals want to do slightly better than others, creating a desire in them to evaluate their abilities by comparing upward (Suls & Wheeler, 2000). As individuals who want to do better, the students studied would choose to make upward comparisons more frequently. However, when choosing between within- and across-track when either comparing upward or downward, they were still more likely to compare within-track, choosing a similar comparison over a dissimilar one. Our findings also support some researchers' assumptions that the most accurate self-evaluation is achieved by comparing to someone doing slightly better than oneself (Aspinwall & Taylor, 1993; Wood, 1989). Our qualitative data suggested that students make upward comparisons primarily for self-evaluation and self-improvement: "I'd rather [compare to] people that are [doing] the same as me or higher than me to encourage my work," and "If you compare yourself to people doing better than you, then…they know more, so…you can maybe…learn from something, and you can get better." This motivation for upward comparison has been identified in numerous other empirical studies that have found that individuals ranging from children to adults engage in upward comparisons to get information about how to improve themselves, to increase their motivation, and to give them an idea of their potential (Blanton et al., 1999; Buunk, Collins, Taylor, Van Yperen, & Dakof, 1990; Dumas et al., 2005).

In terms of upward and downward comparisons, our findings from the first set of survey questions indicated that the majority of students said they usually compared to others who were performing at the same level as them. The second largest group of students said they usually compared to others who were doing better than them, thereby

making upward comparisons. The smallest group of students said they usually compared to others who were doing worse than them, thereby making downward comparisons. While these findings from the first set of questions indicated that students primarily made comparisons with those who were performing at the same level as them, the discrepancy between previous research and our findings may be due to a difference in measurement. Whereas previous measures only compared upward comparisons with downward comparisons, we chose to offer three options in the first set of questions: upward, downward, or the same. Without taking the "same" option into account in our analysis of the first question, our findings would have supported previous research, just as they did in the second set of questions. Furthermore, choosing the "same" option could also be interpreted as choosing a comparison target who is relatively the same. Therefore, students could be indicating that they compare to those who are doing about the same as them, which could also mean slightly upward or slightly downward within their track. Future research should somehow distinguish between these varying categories of "same," slightly downward and upward.

Research Question Two

Our second research question asked how students in various tracks differ in their self-esteem and self-concepts. We asked this question because previous research on how tracking influences students' self-beliefs produced somewhat inconsistent findings. Also, many previous studies did not clearly distinguish between self-esteem and self-concept as separate constructs, as researchers now suggest should be done (Harter, 2006; Marsh, 1990). In this study, students completed separate measures of their overall self-esteem and self-concepts of ability in different areas.

Analyses of our data showed that the students' actual math level or track significantly affected their academic self-concepts in all three of the domains that were measured (i.e. math, English, and school self-concepts). Students who were in lower tracks had lower math, English, and school self-concepts than students who were in higher tracks. These findings are consistent with some previous studies and contradict others. For example, Skaalvik and Rankin's (1996) study found that average classroom math ability negatively affected math self-concept. Similarly, Zeleke (2004) found that children in lower-level math classes rated themselves more negatively in mathematics than their higher-level peers. Furthermore, Zevenbergen (2003) found that tracking negatively affected lower-level students' self-concepts, which is consistent with our findings. While we did not investigate the reasons behind these negative effects, Zevenbergen (2003) attributed these effects to the teachers' perceptions and interactions with the students. Zevenbergen also concluded that tracking raises the self-concepts of higher-level students because they know they are in the smarter class, but that this grouping also raises the expectations of the students and sometimes makes them feel inadequate, thereby lowering their self-concepts. With higher-level students exhibiting a higher level of self-concept than lower-level students, our findings seemed to indicate that the positive effects on these students' self-concepts outweighed the negative effects.

On the other hand, a study by Hallam and Ireson (2001) contradicts our findings. Based on ninth-grade student responses to a questionnaire, Hallam and Ireson (2001) found that while tracking in English affects school self-concept, tracking in math does not. They suggested that math does not affect a student's school self-concept because math is more distinctive and isolated than other school subjects. However, we found the

opposite to be true, with math track greatly affecting students' school self-concepts. It is possible that the students we studied valued math more highly as an indicator of how well they were performing in school. This finding could also be due to different measures used, or different kinds of experiences in the tracked classrooms in the two studies.

During interviews, a few students also expressed that actual track level affected their self-concepts, as indicated by their beliefs that being in higher math tracks would make them "smarter," or signify their higher ability in the class. Therefore, these students believed that those students who are in a higher math class have higher ability, which is consistent with previous findings that students with high self-concepts tend to perform better (e.g., Eccles et al., 1983; Eccles et al., 1998; Meece et al., 1990; Nicholls, 1979a).

One explanation for why academic self-concepts differed among the various tracks might be due to certain factors such as grades. Analyses of our data showed a significant difference in grades across the tracks, with those students in higher tracks receiving higher grades than those students in lower tracks. Trautwein et al. (2006) found similar results in their study of tracking in German schools. Trautwein et al. also found that controlling for grades resulted in track level having no effect on self-esteem and self-concept. According to this study, even if students have the same level of achievement according to their test scores, those students who are in different tracks have differing grades and self-concepts. Controlling for grades had not been tested in much of the research prior to this study. When we controlled for grades in our study with a covariance test, we also found that track level has no effect on self-esteem and self-concept. The assignment of grades according to track level may be a result of teacher perceptions, where teachers expect their lower-level students to perform at a lower level and thereby

assign grades accordingly, even though students in different tracks may obtain the same level of achievement.

Analyses of our data also showed that the students' actual math level or track has no significant effect on their self-esteem. These findings contradict previous studies that have found that track level affects self-esteem. For example, Kelly's (1975) findings confirmed Schafer and Olexa's (1971) hypothesis that track level is directly related to self-esteem, finding that non-college-bound students were more likely than college-bound students to exhibit a low evaluation of themselves and their abilities. In another study, based on student responses to eight statements regarding the students' general feelings about themselves and interviews with the students in 25 secondary schools, Oakes (1985) concluded that students in higher tracks have higher levels of self-esteem than students in lower tracks.

Vanfossen et al. (1987) found that students who are placed in an upper-level class have slightly higher levels of self-esteem after spending two years in that class, whereas students placed in the average class experience no change in their self-esteem after two years in the class and students placed in the lower-level class have slightly lower levels of self-esteem after two years in the class. Self-esteem was measured based on the students' responses to four items developed in the Rosenberg scales. Students were asked whether they had positive attitudes about themselves and whether they were "generally satisfied with themselves" (Vanfossen et al., 1987, p. 118). These researchers also concluded from student reports that students in the higher-level class experienced fewer discipline problems in the classroom and better teacher treatment. These researchers thereby suggested that these two variables may explain the differing effects on students' self-

esteem. Black (1992) likewise found that teachers gave labels to different ability groups, such as “aces” and “zeros,” which the students then adopted for themselves. Black (1992) subsequently argued that these labels respectively raised and lowered the self-esteem and self-concepts of higher- and lower-level students.

In a meta-analysis of 13 studies on the effects of ability grouping on self-esteem, Kulik and Kulik (1992) found no overall effect on self-esteem, though they did observe that ability grouping tended to raise the self-esteem of students in the lower levels and reduce the self-esteem of students in the higher levels. Gallagher (1993) observed in his study that low-track students have low self-esteem and harbored negative attitudes toward school. In his review of the literature on tracking and self-esteem, Nicholson (1998) concluded that almost all researchers agree that one of the dangers of ability grouping is the loss of self-esteem by those in the lower tracks.

One explanation for the discrepancy between our findings and other researchers’ findings might be found in the differentiation of terms. Recently, distinctions have increasingly been made between self-concept and self-esteem, where academic self-concept is identified as only one of many domains that affect general self-esteem (Harter, 2006; Marsh, 1990). As discussed in more detail in the literature review chapter, some researchers made this distinction, whereas others used the terms self-concept and self-esteem interchangeably. Without having made this distinction, previous researchers may have actually observed effects on self-concept, or students’ beliefs about their abilities, rather than effects on self-esteem, or how students feel about themselves overall.

Another explanation for why track level might have an effect on math self-concept but not on self-esteem might be explained by the numerous factors that affect

self-esteem. Harter (1998, 2006) recently identified eight self-concept domains that can contribute to self-esteem, including scholastic competence, employment competence, social acceptance, athletic competence, physical appearance, behavioral conduct, romantic appeal, and close friendship. Our findings, which showed a significant effect of actual math level on academic self-concept but not on self-esteem, could suggest that the three domains of academic self-concept measured (i.e. math, English, and school self-concepts, all of which fall under Harter's scholastic competence domain) do not have as significant an effect on general self-esteem. Instead, another domain identified by Harter (1998, 2006) may have a larger effect on self-esteem. For example, our survey results showed that the students' behavioral conduct and body domains had the strongest correlations to self-esteem (see correlations in Results).

As a third explanation, students might also place less value in academics, thereby diminishing the impact of their academic self-concepts on their overall self-esteem. Harter (2006) suggested that self-concept in a certain domain or area only impacts students' self-esteem if they value that domain (i.e., think it is important). Although not presented in detail in this thesis, analyses of our data showed that students in higher tracks valued math more highly than students in lower tracks.

Along with looking at how actual math level influenced students' self-concepts and self-esteem, we also looked at students' perceptions of which level math they were in. We did this because it is possible that students' perceptions might be as important, or possibly even more important, than their actual placement in influencing their self-beliefs. We found strong correlations between students' actual math level and their perceived math level, which indicated that students had an accurate assessment of their

placement. Analyses of our data also showed that students' perceived math level significantly affected their math, English, and school self-concepts, though not their self-esteem. Those students who perceived themselves to be in a lower math track had significantly lower math, English, and school self-concepts than those students who perceived themselves to be in a higher math track.

Of particular significance were our findings concerning perceived math level among students in Math 7. A significant limitation to our study was that Math 7, although the lowest math level in the school that participated in the study, is considered on-level across the county. Consistent with this fact, students in Math 7 showed the most variation in their perceived track levels. Six students believed they were below-level, 55 students believed they were on-level, and four students believed they were above-level. Within this group, those students who believed they were in a higher math level had significantly higher academic self-concepts than those students who believed they were in a lower math level.

Although we cannot control for all factors, these findings suggested that students' perceptions of their math level or track have a significant effect on their academic self-concepts. Therefore, students' self-concepts might be a reflection of their perception of their math level rather than their actual ability. These findings could also indicate that students' academic self-concepts are affected by the label associated with each track level, which affects the students' perceptions of their own abilities. Students' perceived math level has a significant effect on their academic self-concepts because students might believe track level directly affects their self-concepts. These beliefs were apparent in students' comments during the interviews, as evidenced by one student who said, "If I'm

in like a seventh-grade math class, it makes me…average, but if I'm in a higher math class, it would make me like a little bit smarter." The students directly associated the level of the class with their perceptions of their abilities.

These differences in academic self-concepts based on perceived math level were not evident in other tracks. For those students in Pre-Algebra, 29 students believed they were on-level, while 13 students believed they were above-level. Analyses showed no significant difference in self-concepts between those Pre-Algebra students who perceived themselves as on-level and those who perceived themselves as above-level. Among those students in Algebra, only one student believed he or she was on-level, while all 63 other students believed they were above-level. The Ns were not large enough to run analyses on this data.

The interview data provided some interesting additional information about how track level may impact students' self-concepts and self-esteem. Some students during interviews indicated that track level could have differing effects on their self-esteem and self-concepts, with a lower track level making them "feel like less" while also making them feel smarter because "I'd probably be doing better than other kids in the class." These differing effects could be explained by the students' social comparisons, which would suggest that being in a lower track would make them feel less ability than other students in a higher track but would also make them feel smarter than the students within the lower track.

In summary, in this study, tracking influenced children's self-concepts of ability. However, when students' grades were controlled for statistically, the effects of tracking on self-concept of ability disappeared. Children's self-esteem did not differ across the

different levels of math class.

Research Question Three

Our third research question asked if students who make comparisons within their track have different self-concepts and self-esteem than students who make comparisons across tracks. The purpose of this research question was to address directly whether different kinds of social comparisons influenced students' self-concepts and self-esteem.

We analyzed this question three ways and found fairly similar results. When grouping all students who reported making upward comparisons, there was no difference in the self-concepts and self-esteem of students who made within track or across track comparisons. The same held true for all students who reported making downward comparisons. These findings contradict previous research and review papers that suggest that social comparisons have a direct impact on self-esteem and self-concept (Aspinwall & Taylor, 1993; Marsh, 1987, 1991; Wigfield et al., 1998). Some researchers have found that even if children are performing similarly to one another, their perceptions of how well they are doing in comparison with the perceived ability of their peers affects their self-concepts more than their actual performance (Higgins et al., 1983; Levine et al., 1982).

The second way this question was analyzed was by grouping all students into five groups: those who compared upward and outside their track, upward and within their track, downward and outside their track, downward within their track, and to students doing the same as themselves. This analysis only found that students who made comparisons to others they viewed as the same had higher math self-concepts than those who made upward comparisons within their track; the rest of the comparisons were not

significant.

As discussed earlier, the majority of previous research has found that most students tend to compare to those doing better than themselves (Festinger, 1954). However, some previous research has determined that making these upward comparisons negatively affects students (Collins, 2000; Miyake, 1993). This can be explained by findings and theoretical discussions in the social comparison literature about what is termed the contrast effect. As discussed in the literature review, the contrast effect occurs when students compare to dissimilar others they perceive to be doing better than themselves, which makes them feel worse about their abilities (Marsh & Parker, 1984; Martin, 1986; Morse & Gergen, 1970; Salovey & Rodin, 1984; Testa & Major, 1990). Although this effect has been observed, other research has documented something called the assimilation effect; which is that upward comparisons improve self-concept and self-esteem because some students who compare to a high-achieving student may feel they can do as well as that student, which improves their own self-beliefs (Pelham & Wachsmuth, 1995). Despite these findings, our study indicated that students are not utilizing the contrast or assimilation effects as a means of social comparison. Students may not be comparing to students outside of their track because the comparison is too great to have any significant effect on students' self-concepts and self-esteem.

The third analysis was run under the assumption that students make both upward and downward comparisons. This analysis found no significant difference in the self-concepts and self-esteem of students who made both types of comparison.

Overall, the findings from our study suggested that the different kinds of social comparisons, whether within or across track, students make in math do not seem to

strongly influence their self-concepts and self-esteem. Although previous research suggested that social comparisons play a role in self-esteem and self-concept, generally our results did not support this. This may have occurred because factors other than social comparisons may have stronger influences on students' beliefs about their abilities; for instance, students may value grades more than social comparisons. They may believe that grades are an objective measure of their ability in a certain subject and might value that more than subjective social comparisons. Additionally, teacher attitudes might affect the self-concepts and self-esteem of students more than social comparisons; students may perceive a teacher's attitude toward them as more of an indicative measure of their ability. Another factor in students' self-concepts and self-esteem may be the class itself; students could be relying more on the class label to determine their beliefs about their abilities rather than individual students. Lastly, students may feel that they are unable to accurately compare themselves to those in different tracks because they are too dissimilar. Future research should focus on the effects of social comparisons on the self-esteem and self-concepts of students both in schools that practice tracking and those that do not to clarify the impact of social comparisons.

Research Question Four

Our fourth research question asked how boys and girls differ in their self-esteem and self-concepts with respect to track level or subject. We asked this question because much of the previous work on tracking's effects has not looked at possible differential effects on boys and girls.

Before looking at whether tracking differentially affects boys and girls, we examined whether there were differences in the self-concepts and self-esteem of the boys

and girls in the study. Our data showed no significant difference in the self-esteem and math, English, and school self-concepts of boys and girls. These findings are consistent with some studies and contradict others. Previous research found that middle-school aged boys tend to have higher levels of self-esteem than girls (Catsambis et al., 2001; Kling et al., 1999; Rosenberg et al., 1995; Wigfield et al., 1991). However, some researchers suggested this gap between boys and girls may be narrowing (Kling et al., 1999), and other researchers did not even find any difference at all between genders in self-esteem levels (Maccoby & Jacklin, 1974; Wylie, 1979).

Previous research studied the self-concepts of boys and girls as well. Some studies showed that boys have higher academic self-concepts than girls (Cranston & Leonard, 1990; Jackson et al., 1994; Skaalvik, 1990; Vollmer, 1986), but other researchers found no difference between the genders in academic self-concept (Jackson et al., 1994; Marsh et al., 1985; Skaalvik, 1990; Zuckerman, 1989). With respect to subject-specific self-concept, studies also showed that boys generally have higher math self-concepts than girls, while girls have higher English self-concepts than boys, especially at the middle-school age (Jacobs et al., 2002; Jackson et al., 1994; Marsh, 1986b, 1989; Marsh et al., 2005; Crain, 1996; Wigfield et al., 1991; Wigfield et al., 1997). However, Jacobs et. al. (2002) showed that some of these gender differences are getting smaller, as demonstrated in this study.

Though there was no significant difference found between genders, both boys and girls had significantly higher math self-concepts than English self-concepts in our study. Though this does not answer our research question, we thought it of particular interest to take note because it says something about the nature of the students in this school. This

finding contrasts with the study by Wigfield et al. (1997), who found that boys had significantly higher math self-concepts than English self-concepts but girls had higher English self-concepts than math self-concepts.

In the analyses that looked at whether tracking differentially affected boys' and girls' self-concepts and self-esteem, we found no significant difference in the effects of tracking in math on the levels of self-esteem and math self-concept of boys and girls. Previous researchers also found no gender differences in the effect of tracking on self-esteem. Malmberg and Trempala (1997) conducted a study on students in general schools and vocational schools and found no gender differences in the effects of ability groups on self-esteem. Cheung and Rudowicz (2003) conducted a study in Hong Kong and also found no gender differences in the effects of ability grouping on self-esteem. However, cultural factors may have played a role in these findings because the Chinese culture does not heavily promote self-esteem (Houtte, 2005).

On the other hand, other researchers found that girls' self-esteem is more affected by tracking than boys' self-esteem. In a study on tracking in English, Catsambis et al. (1999) found that high-track girls experience higher levels of self-esteem than high-track boys, while low-track girls experience lower levels of self-esteem than high-track girls. Harper and Marshall (1991) found that while tracking impacts girls' self-esteem, tracking has no impact on boys' self-esteem.

While we found no significant effect of actual math level on the self-esteem, math self-concepts, and English self-concepts of boys, we did find a significant effect on boys' school self-concepts. We also found a significant effect of actual math level on girls' school and English self-concepts. Although we found that tracking impacted both boys'

and girls' school self-concepts, we also found that the impact of tracking on girls' school self-concepts was more significant than the impact of tracking on boys' school self-concepts. This finding suggested that more domains of girls' self-concepts might be affected by tracking than that of boys.

Research Question Five

Our fifth research question asked whether the frequency of social comparisons made within or across tracks differ by gender. The results indicated that there is not much difference in the way boys and girls make social comparisons (those within or across tracks). Results only showed a difference in the way boys and girls make upward social comparisons. We found that boys tend to make more upward comparisons than girls. Previous research stated that boys experience the contrast effect when making social comparisons (Kemmelmeier & Oyserman, 2001). Based on this research, we would expect to see lower levels of self-esteem for boys; however, that did not occur. Previous research also stated that girls experience the assimilation effect when making social comparisons (Kemmelmeir & Oyserman, 2001). Therefore, if girls made fewer upward comparisons, then we would expect to see a lower level of self-esteem for girls. This also did not occur. However, our study was not designed to determine whether or not students experience the contrast or assimilation effects, so we cannot offer very much explanation for why more frequent upward comparisons by boys did not result in differing levels of self-esteem for boys and girls. There is a possibility that social comparisons may not have a large impact on self-esteem because boys may experience a contrast effect when making upward social comparisons, but other factors play a larger role in determining their level of self-esteem. Future research should more closely examine the specific effect

that comparisons have on self-esteem and whether these effects differ by track.

Some previous research indicated that girls are more affected by social comparisons than boys (Lenney et al., 1983; Kemmelmeier & Oyserman, 2001). However, these researchers studied general social comparisons in undergraduate students with an average age of about 20 years old, not any comparisons specific to academics. Our study showed that boys and girls are similar in the ways they make social comparisons, which could suggest that they are not affected differently by social comparisons in this academic setting. The results showing that boys and girls do not differ in self-concept or self-esteem also indicated that they may not be differentially affected by social comparison, at least with respect to these variables. The different results between our study and the previous work probably occurred because of the different kinds of social comparisons measured and different ages of the participants. Future research should look at different-aged students to see if there are gender differences in the kinds of social comparisons students make in academic settings, and whether social comparison differentially affects boys and girls on different measures of well-being.

Conclusion

This research yielded many interesting findings from our three main areas of interest: the effects of tracking on self-concept and self-esteem, the types of social comparisons children in different tracks engage in to learn about their performance in school, and whether there are gender differences in tracking effects and in social comparison. First, we found that tracking does not affect self-esteem, but it does affect all three academic domains of self-concept. Previous studies often did not properly separate

and distinguish between self-esteem and self-concept, which could be the major reason why our results did not show as much of an effect of tracking on self-esteem as previously found. Based on our results, we believe that educators should not be so concerned about how tracking influences overall self-esteem, but should continue to be concerned about tracking's effects on self-concepts of ability. More research needs to be done on tracking's effects on self-esteem and self-concepts of ability using different grade levels in schools with different kinds of tracking systems.

Another important finding with respect to students' self-concept and self-esteem was that controlling for students' grades in our analyses reduced the influence of tracking on students' self-concepts. Most previous research did not control for grades, and like those studies, we found effects of tracking on students' self-concepts of ability when we did not control for grades. However, once we controlled for grades, we found no effect of tracking on students' self-esteem or self-concepts of ability. These findings could indicate that the grades given to students, as opposed to the track they are placed in, affect their self-concepts of ability. Because many previous studies did not control for grades when looking at the effects of tracking, we cannot determine from these studies whether it was grades or tracking that influenced self-concept and self-esteem. More research is needed to look further at tracking's effects when grades are controlled.

More generally, educators should think about why students in lower tracks are receiving lower grades and the negative effects that these lower grades might be having on these students' self-concepts and motivation to do well in school. Because our study was not longitudinal (conducted over time), we do not know if grades have an effect on self-concept or vice versa. It is also possible that tracking affects self-concept, which in

turn affects a student's grades. For example, if tracking has a negative effect on lower-level students and, as a result, lowers their self-concepts and their motivation, it is possible that their lower grades reflect these negative effects. However, we did not collect enough information to determine the relationship between grades and self-concept. While Trautwein et al. (2006) looked at students' grades in relation to their standardized test scores and found that students in lower tracks received lower grades even if their test scores were similar to those in higher tracks, we did not collect data on students' test scores. Further research is needed to determine the relationship among tracking, self-concept, and grades.

With respect to the kinds of social comparisons in which students engage, our research showed that most students engage in within-track social comparisons when they compare to other students to determine how they are doing in math. Students engaging in different kinds of comparisons (within- or across-track) did not differ in their self-esteem or self-concepts. Based on our study, the concerns that some people have — that lower-track students will have lower self-esteem due to across-track comparisons that result in these students seeing themselves as less than other higher-level students — are unfounded. Students mostly compare to other students within their tracks without worrying on a regular basis about where they stand in relation to students in other tracks. Therefore, it is possible that educators, at least those in schools with tracking systems similar to the one we studied, do not have to worry about across-track comparisons and their negative effects on low-track students.

Most of the questions we asked about social comparisons had to do with comparisons to specific students, however. Thus it is possible that the broader "label" of

being in a lower track has an influence on students' self-concepts. Although controlling for grades showed that tracking has no effect on students' self-esteem and self-concepts, it is possible that general comparisons between tracks might still explain the differences in students' self-concepts as measured by track because we cannot specify whether grades determine self-concept or vice versa. The students' general knowledge of academic status based on labels assigned to individual tracks may cause this difference in average self-concept. This possibility would help explain why we found a difference in self-concept by track but no difference in the types of comparisons (within- or across-track) made by students in different tracks. Students might be affected by these overall labels assigned to tracks rather than by specific social comparisons made between individual students. Further research is needed on the effects of labels on students' self-concepts of ability.

Lastly, regarding gender, we found that there are no significant differences by gender in students' levels of self-esteem and self-concepts of ability. Thus, our research is similar to other recent work showing that gender differences in self-concept of ability are lessening (Jacobs et al., 2002). Overall, there were no differences in how track placement influenced boys' and girls' math self-concepts and self-esteem. Thus, unlike some previous work (Catsambis et al., 1999; Harper & Marshall, 1991), tracking did not seem to have a stronger effect on the self-esteem of girls than that of boys in this study. Based on these results, it may not be necessary to separate students by gender for the reason of preserving their self-esteem. We did find that tracking may differentially affect school and English self-concepts for boys and girls. We found that track placement had a more significant effect on school self-concept for girls than for boys. We also found that

track placement had an effect on girls' English self-concepts, while there was no significant effect on boys' English self-concepts. These results indicate that tracking may have a greater impact on girls' self-concepts than on boys'. However, more research at different grade levels and with different kinds of tracking systems is needed.

Although our study does not provide definitive evidence from which to argue for or against tracking as an educational practice, it does show that students in lower tracks have lower grades and lower self-concepts of ability. Further research needs to be conducted to determine exactly which factors are causing these differential effects on the self-concepts of students in different tracks, looking not just broadly at the tracking system but also more specifically at grades, labels, and teacher perceptions and expectations. In terms of the ongoing tracking debate, our research does not provide enough evidence to suggest that tracking should be eliminated in public schools. It is possible that other kinds of tracking systems have stronger effects on students' self-concepts, and still others may have fewer effects than what we found. Therefore, tracking still needs to be evaluated based on the future research directions we outlined in order to answer some of the additional questions that were uncovered about its effects on students.

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Appendix A - Survey

Survey Directions

WHAT I THINK ABOUT MYSELF IN SCHOOL

DIRECTIONS:

The questions in this survey ask you some things about how you think you are doing in school, especially in math and English, and how you feel about yourself as a person. **There are no right or wrong answers to these questions; they are about what you think.** Please answer the questions as honestly as you can. No one except the people giving the survey will see your answers to these questions.

We will start with an example question to make sure you understand how to fill in your responses to the questions. In the first part of the survey, you have to read two statements for each question and decide which of the statements is more true for you. Then choose whether that statement is "really true" or "sort of true" for you, and place an "X" in the corresponding box next to the statement. Be sure to answer each question, even if it is hard to decide. **You should only mark one box per question.** Do not mark more than one box per question.

Here is one to try:

	Really True for Me	Sort of True for me				Sort of True for Me	Really True for Me
a)	☐	☐	Some students like to go to movies in their spare time	BUT	Other students would rather go to sports events.	☐	☐

First, decide which of the statements is more true for you. If you are one of the students who like to go to movies more than sports events, then you would focus only on the left side of the question:

	Really True for Me	Sort of True for Me				Sort of True for Me	Really True for Me
a)	☐	☐	Some students like to go to movies in their spare time	BUT	Other students would rather go to sports events.	☐	☐

Then, choose how true the statement is for you. If you really like to go to the movies, then you would put an "X" in the box in the "Really True for Me" column:

	Really True for Me	Sort of True for Me				Sort of True for Me	Really True for Me
a)	**X**	☐	Some students like to go to movies in their spare time	BUT	Other students would rather go to sports events.	☐	☐

For the second part of the survey, Part B, read each question and place a check mark next to the answer that best fits you. Choose the answer that is closest to the way you feel or act most of the time. Do not mark more than one answer per question. Remember, there are no right or wrong answers. Only you can tell us how you feel about yourself, so answer each question honestly.

I am: ____Male ____Female

Survey

Part A

	Really True for Me	Sort of True for Me				Sort of True for Me	Really True for Me
a)	☐	☐	Some students like to go to movies in their spare time	**BUT**	Other students would rather go to sports events.	☐	☐
1.	☐	☐	Some students feel that they are just as smart as others their age	**BUT**	Other students aren't so sure and wonder if they are as smart.	☐	☐
2.	☐	☐	Some students find it hard to make friends	**BUT**	For other students it's pretty easy.	☐	☐
3.	☐	☐	Some students do very well at all kinds of sports	**BUT**	Other students don't feel that they are very good when it comes to sports.	☐	☐
4.	☐	☐	Some students are *not* happy with the way they look	**BUT**	Other students *are* happy with the way they look.	☐	☐
5.	☐	☐	Some students usually do the right thing	**BUT**	Other students often don't do what they know is right.	☐	☐
6.	☐	☐	Some students are able to make really close friends	**BUT**	Other students find it hard to make really close friends.	☐	☐
7.	☐	☐	Some students are often disappointed with themselves	**BUT**	Other students are pretty pleased with themselves.	☐	☐
8.	☐	☐	Some students are pretty slow in finishing their school work	**BUT**	Other students can do their school work more quickly.	☐	☐
9.	☐	☐	Some students have a lot of friends	**BUT**	Other students don't have very many friends.	☐	☐
10.	☐	☐	Some students think they could do well at just about any new athletic activity	**BUT**	Other students are afraid they might not do well at a new athletic activity.	☐	☐

Part A

	Really True for Me	Sort of True for Me				Sort of True for Me	Really True for Me
11.	☐	☐	Some students wish their body was different	**BUT**	Other students like their body the way it is.	☐	☐
12.	☐	☐	Some students often get in trouble for the things they do	**BUT**	Other students usually *don't* do things that get them in trouble.	☐	☐
13.	☐	☐	Some students do have a close friend they can share secrets with	**BUT**	Other students do not have a really close friend they can share secrets with.	☐	☐
14.	☐	☐	Some students don't like the way they are leading their life	**BUT**	Other students do like the way they are leading their life.	☐	☐
15.	☐	☐	Some students do very well at their classwork	**BUT**	Other students don't do very well at their classwork.	☐	☐
16.	☐	☐	Some students are very hard to like	**BUT**	Other students are really easy to like.	☐	☐
17.	☐	☐	Some students feel that they are better than others their age at sports	**BUT**	Other students don't feel they can play as well.	☐	☐
18.	☐	☐	Some students wish their physical appearance was different	**BUT**	Other students like their physical appearance the way it is.	☐	☐
19.	☐	☐	Some students feel really good about the way they act	**BUT**	Other students *don't* feel that good about the way they often act.	☐	☐
20.	☐	☐	Some students wish they had a really close friend to share things with	**BUT**	Other students *do* have a close friend to share things with.	☐	☐

Part A

	Really True for Me	Sort of True for Me				Sort of True for Me	Really True for Me
21.	☐	☐	Some students are happy with themselves most of the time	**BUT**	Other students are often not happy with themselves.	☐	☐
22.	☐	☐	Some students have trouble figuring out the answers in school	**BUT**	Other students almost always can figure out the answers.	☐	☐
23.	☐	☐	Some students are popular with others their age	**BUT**	Other students are not very popular.	☐	☐
24.	☐	☐	Some students don't do well at new outdoor games	**BUT**	Other students are good at new games right away.	☐	☐
25.	☐	☐	Some students think that they are good looking	**BUT**	Other students think that they are not very good looking.	☐	☐
26.	☐	☐	Some students do things they know they shouldn't do	**BUT**	Other students hardly ever do things they know they shouldn't do.	☐	☐
27.	☐	☐	Some students find it hard to make friends they can really trust	**BUT**	Other students *are* able to make close friends they can really trust.	☐	☐
28.	☐	☐	Some students like the kind of person they are	**BUT**	Other students often wish they were someone else.	☐	☐
29.	☐	☐	Some students feel that they are pretty intelligent	**BUT**	Other students question whether they are intelligent.	☐	☐
30.	☐	☐	Some students feel that they are socially accepted	**BUT**	Other students wished that more people their age accepted them.	☐	☐

Part A

	Really True for Me	Sort of True for Me				Sort of True for Me	Really True for Me
31.	☐	☐	Some students do not feel that they are very athletic	**BUT**	Other students feel that they are very athletic.	☐	☐
32.	☐	☐	Some students really like their looks	**BUT**	Other students wish they looked different.	☐	☐
33.	☐	☐	Some students usually act the way they know they are supposed to	**BUT**	Other students often don't act the way they are supposed to.	☐	☐
34.	☐	☐	Some students *don't* have a friend that is close enough to share really personal thoughts with	**BUT**	Other students do have a close friend that they can share personal thoughts and feelings with.	☐	☐
35.	☐	☐	Some students are very happy being the way they are	**BUT**	Other students wish they were different.	☐	☐

Part B

DIRECTIONS: Put a check mark next to your answer for each question. Choose the answer that is closest to the way you feel or act most of the time.

36. a. Which level math class are you in? (Check one answer.)
    - ____ below level
    - ____ on level
    - ____ above level

    b. Being in this class makes me feel… (Check one answer.)
    - ____ good about myself
    - ____ bad about myself
    - ____ has no effect on how I feel about myself

37. Sometimes students compare themselves to others to help them understand how they are doing in math. When I do this in math, I usually compare myself to other students who are doing… (Check one answer.)
    - ____ better than me
    - ____ the same
    - ____ worse than me

38. a. If you compare to students doing **better** than you, do you compare to students doing **better** within your class or in a higher level math class? (Check one answer.)
    - ____ within my class
    - ____ in a higher level math class

    b. If you compare to students doing **worse** than you, do you compare to students doing **worse** within your class or in a lower level math class? (Check one answer.)
    - ____ within my class
    - ____ in a lower level math class

39. Do you feel that you would rather be one of the best students in a lower level math class or an average student in the highest math class? (Check one answer.)
    - ____ one of the best students in a lower-level math class
    - ____ an average student in the highest math class

40. a. I am one of the best math students in my class. (Check one answer.)
    - ____ strongly agree
    - ____ somewhat agree
    - ____ somewhat disagree
    - ____ strongly disagree

    b. I am one of the best math students in the 7^{th} grade. (Check one answer.)
    - ____ strongly agree
    - ____ somewhat agree
    - ____ somewhat disagree
    - ____ strongly disagree

Part B

41. Circle one word for each line.

I compare myself to students who do **better** than me in *my* math class.	Never	Rarely	Sometimes	Often	Always
I compare myself to students who do **worse** than me in *my* math class.	Never	Rarely	Sometimes	Often	Always
I compare myself to students who do **better** than me in *other* math classes.	Never	Rarely	Sometimes	Often	Always
I compare myself to students who do **worse** than me in *other* math classes.	Never	Rarely	Sometimes	Often	Always

42. Which of these statements do you most agree with? (Check one answer.)

____ Boys do better in **school** than girls.
____ Girls do better in **school** than boys.
____ Being a boy or girl does not make a difference in how well someone does in **school**.

43. Which of these statements do you most agree with? (Check one answer.)

____ Boys are better at **math** than girls.
____ Girls are better at **math** than boys.
____ Being a boy or girl does not make a difference in how good someone is at **math**.

44. Which of these statements do you most agree with? (Check one answer.)

____ Boys are better at **English** than girls.
____ Girls are better at **English** than boys.
____ Being a boy or girl does not make a difference in how good someone is at **English**.

Part B

45. How good in **math** are you? (Check one answer.)
- ____ not at all good
- ____ somewhat good
- ____ pretty good
- ____ very good

46. If you were to list all the students in your class from the worst to the best in **math**, where would you put yourself? (Check one answer.)
- ____ one of the worst
- ____ in the middle
- ____ one of the best

47. Some kids are better in one subject than in another. For example, you might be better in math than in English. Compared to most of your other school subjects, how good are you in **math**? (Check one answer.)
- ____ a lot worse in math than in other subjects
- ____ a little worse in math than in other subjects
- ____ about the same in math as in other subjects
- ____ a little better in math than in other subjects
- ____ a lot better in math than in other subjects

48. How good in **English** are you? (Check one answer.)
- ____ not at all good
- ____ somewhat good
- ____ pretty good
- ____ very good

49. If you were to list all the students in your class from the worst to the best in **English**, where would you put yourself? (Check one answer.)
- ____ one of the worst
- ____ in the middle
- ____ one of the best

50. Some kids are better in one subject than in another. For example, you might be better in math than in English. Compared to most of your other school subjects, how good are you in **English**? (Check one answer.)
- ____ a lot worse in English than in other subjects
- ____ a little worse in English than in other subjects
- ____ about the same in English as in other subjects
- ____ a little better in English than in other subjects
- ____ a lot better in English than in other subjects

Part B

51. For me, doing well in **school** is… (Check one answer.)
    - ____ not at all important
    - ____ somewhat important
    - ____ very important

52. Compared to most of your other activities, how important is it for you to do well in **school**? (Check one answer.)
    - ____ not at all important
    - ____ somewhat important
    - ____ very important

53. For me, being good in **math** is… (Check one answer.)
    - ____ not at all important
    - ____ somewhat important
    - ____ very important

54. Compared to most of your other activities, how important is it for you to be good at **math**? (Check one answer.)
    - ____ not at all important
    - ____ somewhat important
    - ____ very important

55. For me, being good in **English** is… (Check one answer.)
    - ____ not at all important
    - ____ somewhat important
    - ____ very important

56. Compared to most of your other activities, how important is it for you to be good at **English**? (Check one answer.)
    - ____ not at all important
    - ____ somewhat important
    - ____ very important

Part B

57. How has being in your **math** class affected the way…

a. you think about yourself? (Check one answer.)
____ has had a positive effect
____ has had no effect
____ has had a negative effect

b. your math teacher thinks about you? (Check one answer.)
____ has had a positive effect
____ has had no effect
____ has had a negative effect

c. your parents think about you? (Check one answer.)
____ has had a positive effect
____ has had no effect
____ has had a negative effect

d. your friends think about you? (Check one answer.)
____ has had a positive effect
____ has had no effect
____ has had a negative effect

58. How has being in your **English** class affected the way…

a. you think about yourself? (Check one answer.)
____ has had a positive effect
____ has had no effect
____ has had a negative effect

b. your English teacher thinks about you? (Check one answer.)
____ has had a positive effect
____ has had no effect
____ has had a negative effect

c. your parents think about you? (Check one answer.)
____ has had a positive effect
____ has had no effect
____ has had a negative effect

d. your friends think about you? (Check one answer.)
____ has had a positive effect
____ has had no effect
____ has had a negative effect

Part B

59. Overall, I mostly get the following grades in **school**: (Check one answer.)
    - ____ As
    - ____ Bs
    - ____ Cs
    - ____ Ds
    - ____ Es

60. In **math**, I mostly get the following grades: (Check one answer.)
    - ____ As
    - ____ Bs
    - ____ Cs
    - ____ Ds
    - ____ Es

61. In **English**, I mostly get the following grades: (Check one answer.)
    - ____ As
    - ____ Bs
    - ____ Cs
    - ____ Ds
    - ____ Es

Appendix B – Interview

Interview Instructions

General Interview Guidelines:

- Take notes on obvious body language, things that tape recorder cannot pick up. Be careful about this one!

- Don't stray from script, ask questions EXACTLY the way they are written

- Limit facial expressions when conducting the interview

- Be careful, make sure students DO NOT see your notes

- When you want to move on to another question in the interest of time
    - DO NOT interrupt student mid sentence, wait until he or she takes breath
    - Say: "That's good, now let's move on to the next question"

- Keep the interview time to 30-45min

- Keep track of time during the interview

- Definitions
    - Math ability→ how able you are to do math
    - Level
        - certain math classes are more advanced than others
        - type of math: Algebra, Math 7, Pre-Algebra

Interview Key

Logic order of the questions:

General self-esteem and self-concept questions→ school self-concept→ subject self-concept→math level→ social comparisons→ gender

- Question 1
  - Answers research question 2
- Question 2
  - Answers research question 2
  - Self-esteem influenced by school self-concept
- Question 3
  - Answers research question 2
  - General school self-concept
- Question 4
  - Answers research question 2
  - Self-esteem
- Question 5
  - Answers research question 2
  - Self-concept
- Question 6
  - Answers research question 2
  - Math self-concept
  - 6a is a sub-question for question 6, read question 6 first and write down response then ask question 6a
- Question 7
  - Answers research question 2
  - What influences math self-concept
  - When asking this question read first question without the prompts and get initial reaction to question. Then read through each prompt as a question and get response
  - If student asks what feedback means:
    - "what your _____ says or thinks about you"
- Question 8
  - Answers research question 2
  - English self-concept
  - Question 8a is a sub-question for question 8, read question 8 first and get response, then ask question 8a

- Question 9
  - Answers research question 2
  - What influences English self-concept
  - When asking this question read first question without the prompts in order to get student's initial reaction to question. Then go through and read each prompt as a question and get response

- Question 10
  - Answers research question 2

- Question 11
  - Answers research question 2

- Question 12
  - Answers research question 2
  - 12a and 12b are sub-questions to question 12,only ask 12a if response to 12 was "yes", only ask 12b if answer to 12 was "no", do not ask both 12a and 12b

- Question 13
  - Answers research question 2
  - Read this question first without the prompts in order to get student's initial reaction, then go through and read each prompt as a question

- Question 14
  - Answers research question 2
  - Read this question first without the prompts in order to get the student's initial reaction, then go through and read each prompt as a question

- Question 15
  - Answers research questions 1 and 3

- Question 16
  - Answers research questions 1 and 3
  - Questions 16a, 16b, and 16c are sub-questions to question 16, read 16 first, get response, then go through and read 16a then 16b then 16c

- Question 17
  - Answers research questions 1 and 3

- Questions 18-20
  - Answers research question 4

Interview Questions

Hi _____. First, I want to thank you again for agreeing to participate in our study. Now, I am here today to talk to you about some of your experiences with school, classes, and friends. Your name will not be used in any way to present your responses to these questions and anything you say will be kept strictly confidential. If you need me to repeat a question, please let me know and I will be happy to do so. Also, if you do not feel comfortable answering any of these questions just tell me and you do not have to answer it.

1. When it comes to how you feel about yourself, what is most important to you?
   School?
   Friends?
   Sports?
   How you look?
   Are there any other things?

   (Ask them to explain each one that they mention).

2. Does how well you do in school affect how you feel about yourself overall?

3. How happy are you with how well you do in school? Why do you think you feel this way?

4. How smart do you think you are?

5. Are there certain subjects that you feel more confident in than others?

6. How good do you think you are at math?

6a. How happy are you with how well you do in math? Why do you think you feel this way?

7. When you say that you are (good in math, average, or not so good in math), what makes you think that?
   (Prompt:
   Does the level math class that you are in affect what you think about how good you are in math?
   What about teacher feedback?
   What about peer feedback?
   What about parent feedback?
   Are there any other reasons?)

8. How good do you think you are at English and reading?

8a. How happy are you with how well you do in English and reading? Why do you think you feel this way?

9. When you say that you are (good in English, average, or not so good in English), what makes you think that?
(Prompt:
Does the level English class that you are in affect what you think about how good you are in English?
What about teacher feedback?
What about peer feedback? What about parent feedback?
Are there any other reasons?)

10. On your survey you said that you are in (math level), do you feel that this class is for students who are (good, average, not as good) at math.? What makes you think that?

11. Does the math class you are in affect your idea of how good you are at math? Could you explain?

12. If you could, would you choose to be in a different math level?
12a. If yes, which level? (Ask them to explain why they chose that level).
12b. If no, why not?

13. If you were in a higher math class, how would that change how you feel about yourself, if at all?
(Prompt:
Would it make you proud or disappointed?
Would you feel nervous or excited?
Would you feel like your math ability had changed?
Why?)

14. If you were in a lower math class, how would that change how you feel about yourself, if at all?
(Prompt:
Would it make you proud or disappointed?
Would you feel nervous or excited?
Would you feel like you English ability had changed?
Why?)

15. In your survey, you wrote that you compare yourself more to people who you think are doing (better than, worse than, or the same) as you in math. Why do you think you might do this?

16. In your survey you also said that when you compare yourself to people

doing _____ than you, they are in _____ (the same class, different level). Why do you think you compare yourself to these people?

16a. Do you compare yourself to a group or to individuals?

16b. If group: Do you know them or not know them?
If individual: Do you know him/her or not know him/her

16c. Are they friends of yours?

17. On your survey, you said that you mostly compare yourself to people doing (better, the same, worse) than you. Why do you think you compare yourself more to these people, rather than people doing (better, the same worse) than you?

What about people doing (better, the same, worse) than you?

18. Do you think that being a (boy/girl) makes you more able to do well in math? Why or why not?

19. Do you think that being a (boy/girl) makes you more able to do well in English? Why or why not?

20. Do you think that being a (boy/girl) makes you more able to do well in school? Why or why not?

Appendix C – Consent Forms

Child consent form

Initals___Date___

Student Assent Form

Project Title	An Examination of Differences in Self-Esteem, Self-Concept, and Social Comparisons in Relation to Middle-School Track Placement and Gender
Why is this research being done?	This is a research project being conducted by an honors undergraduate research team, under the supervision of Dr. Allan Wigfield in the Department of Human Development, at the University of Maryland, College Park, Maryland. The purpose of this research is to examine seventh grade students' attitudes towards their math classes and their overall academic experiences.
What will I be asked to do?	You will be filling out a 45 minute questionnaire during one period of your math class. You may also be selected to participate in a 45 minute interview conducted by one of the undergraduate researchers. Selection for the interview will be based on your responses to the questionnaire. The questions being asked on the questionnaire will focus on your beliefs about your ability in math, scholastic competence, social acceptance, athletic competence, physical appearance, behavioral conduct, close friendships, general self-worth, and social comparisons. Some questions that you may be asked to answer include: 1) I am good at math ___strongly agree ___somewhat agree ___somewhat disagree ___strongly disagree 2) For me, being good in **English** is…(Check one answer) ___not at all important ___somewhat important ___very important 3) Which of these statements do you most agree with? ___Boys do better in **school** than girls ___Girls do better in **school** than boys ___Being a boy or girl does not make a difference in how well someone does in **school**.

Initials___ Date___

Project Title	An Examination of Differences in Self-Esteem, Self-Concept, and Social Comparisons in Relation to Middle-School Track Placement and Gender
What will my child be asked to do?	The interviews will go more in depth in the previously specified areas; they will be used to supplement the questionnaires. If you are chosen for the interview then you will be recorded in order to ensure that the information is collected accurately.
What about confidentiality?	We will do our best to keep your personal information confidential. To help protect your confidentiality, we will not include your name on any collected data, a code will be placed on the survey and other collected data, through the use of an identification key, the researcher will be able to link your survey to your identity, and only the researchers will have access to the identification key. All data will be stored in a locked cabinet, and will be destroyed five years after the completion of the research study.
What are the risks of this research?	There are no known risks associated with participating in this research project.
What are the benefits of this research?	This research is not designed to help you personally, but the results may help the investigators learn more about how students feel about their math classes and overall academic experience.
Do I have to be in this research? May I stop participating at any time?	Your participation in this research is completely voluntary. You may choose not to take part at all. If you decide to participate in this research, you may stop at any time. If you decide not to participate or to stop participating at any time, you will not be penalized or lose any benefits to which you otherwise qualify.
Project Title	An Examination of Differences in Self-Esteem, Self-Concept, and Social Comparisons in Relation to Middle-School Track Placement and Gender

Initials___Date___

What if I have questions?	This research is being conducted by Dr. Allan Wigfield in the Department of Human Development, at the University of Maryland, College Park, Maryland. If you have any questions about the research study itself, please contact: Dr. Allan Wigfield University of Maryland 3304 Benjamin Building College Park, MD 20742 USA Phone: 301-405-2809 Email: awigfiel@umd.edu If you have questions about your rights as a research subject or wish to report a research-related injury, please contact: Institutional Review Board Office University of Maryland College Park, Maryland 20742 USA E-mail: irb@deans.umd.edu Phone: 301-405-0678 This research has been reviewed according to the University of Maryland, College Park IRB procedures for research involving human subjects.
Permission for participation in research	I _____ (your name) wish to participate in the research being conducted by the honors undergraduate research team, under the supervision of Dr. Allan Wigfield in the Department of Human Development, at the University of Maryland, College Park, Maryland. Please check one box. ☐ **YES** ☐ **NO**
Permission for interviews:	___I wish to participate in the interview portion of the research ___I do not wish to participate in the interview portion of the research

Parent consent form

Initals___Date___

Parent Permission Form

Project Title	An Examination of Differences in Self-Esteem, Self-Concept, and Social Comparisons in Relation to Middle-School Track Placement and Gender
Why is this research being done?	This is a research project being conducted by an honors undergraduate research team, under the supervision of Dr. Allan Wigfield in the Department of Human Development, at the University of Maryland, College Park, Maryland. The purpose of this research is to examine seventh grade students' attitudes towards their math classes and their overall academic experiences.
What will my child be asked to do?	Your child will be filling out a 45 minute questionnaire during one period of math class. Your child may also be selected to participate in a 45 minute interview conducted by one of the undergraduate researchers. The selection of students for the interview will be based on their responses to the questionnaire. The questions being asked on the questionnaire will focus on students' beliefs about their ability in math, scholastic competence, social acceptance, athletic competence, physical appearance, behavioral conduct, close friendships, general self-worth, and social comparisons. Some questions that your child may be asked to answer include: 2) I am good at math ___strongly agree ___somewhat agree ___somewhat disagree ___strongly disagree 2) For me, being good in **English** is…(Check one answer) ___not at all important ___somewhat important ___very important 3) Which of these statements do you most agree with? ___Boys do better in **school** than girls ___Girls do better in **school** than boys ___Being a boy or girl does not make a difference in how well someone does in **school**.

Initials___ Date___

Project Title	An Examination of Differences in Self-Esteem, Self-Concept, and Social Comparisons in Relation to Middle-School Track Placement and Gender
What will my child be asked to do (Continued)?	The interviews will go more in depth in the previously specified areas; they will be used to supplement the questionnaires. The interviews will be recorded in order to ensure that the information is collected accurately.
What about confidentiality?	We will do our best to keep your child's personal information confidential. To help protect your child's confidentiality, we will not include your child's name on any collected data, a code will be placed on the survey and other collected data, through the use of an identification key, the researcher will be able to link your child's survey to his or her identity, and only the researchers will have access to the identification key. All data will be stored in a locked cabinet, and will be destroyed five years after the completion of the research study.
What are the risks of this research?	There are no known risks associated with participating in this research project.
What are the benefits of this research?	This research is not designed to help your child personally, but the results may help the investigators learn more about how students feel about their math classes and overall academic experience.
Does my child have to be in this research? May my child stop participating at any time?	Participation in this research is completely voluntary. Your child may choose not to take part at all. If you decide to allow your child to participate in this research, he or she may stop at any time. If you decide not to allow you child to participate or stop your child from participating at any time, you will not be penalized or lose any benefits to which you otherwise qualify.
Project Title	An Examination of Differences in Self-Esteem, Self-Concept, and Social Comparisons in Relation to Middle-School Track Placement and Gender

Initials___Date___

What if I have questions?	This research is being conducted by Dr. Allan Wigfield in the Department of Human Development, at the University of Maryland, College Park, Maryland. If you have any questions about the research study itself, please contact: Dr. Allan Wigfield University of Maryland 3304 Benjamin Building College Park, MD 20742 USA Phone: 301-405-2809 Email: awigfiel@umd.edu If you have questions about your child's rights as a research subject or wish to report a research-related injury, please contact: Institutional Review Board Office University of Maryland College Park, Maryland 20742 USA E-mail: irb@deans.umd.edu Phone: 301-405-0678 This research has been reviewed according to the University of Maryland, College Park IRB procedures for research involving human subjects.
Statement of Age of Subject	I state that I am over 18 years of age and am the parent or legal guardian of _____(your child's name). I give my child permission to participate in the research being conducted by an honors undergraduate research team, under the supervision of Dr. Allan Wigfield in the Department of Human Development, at the University of Maryland, College Park, Maryland.
Permission for interviews:	___I give my child permission to participate in the interview portion of the research ___I do not give my child permission to participate in the interview portion of the research
Signature and Date	**Name of Parent** | **Signature of Parent** | **Date** |

Appendix D – Measures

Math self-concept

(item 40a)

I am one of the best math students in my class. (Check one answer.)

____ strongly agree
____ somewhat agree
____ somewhat disagree
____ strongly disagree

(item 40b)

I am one of the best math students in the 7th grade. (Check one answer.)

____ strongly agree
____ somewhat agree
____ somewhat disagree
____ strongly disagree

(item 45)

How good in **math** are you? (Check one answer.)

____ not at all good
____ somewhat good
____ pretty good
____ very good

(item 46)

If you were to list all the students in your class from the worst to the best in **math**, where would you put yourself? (Check one answer.)

____ one of the worst
____ in the middle
____ one of the best

English self-concept

(item 48)

How good in **English** are you? (Check one answer.)

____ not at all good
____ somewhat good
____ pretty good
____ very good

(item 49)

If you were to list all the students in your class from the worst to the best in **English**, where would you put yourself? (Check one answer.)

____ one of the worst
____ in the middle
____ one of the best

(item 50)

Some kids are better in one subject than in another. For example, you might be better in math than in English. Compared to most of your other school subjects, how good are you in **English**? (Check one answer.)

____ a lot worse in English than in other subjects
____ a little worse in English than in other subjects
____ about the same in English as in other subjects
____ a little better in English than in other subjects
____ a lot better in English than in other subjects

Global Self-Worth (Self-Esteem)

(item 7)

Some students are often disappointed with themselves **BUT** Other students are pretty pleased with themselves. (Sort of True for Me, Really True for Me)

(item 14)

Some students don't like the way they are leading their life **BUT** Other students do like the way they are leading their life. (Sort of True for Me, Really True for Me)

(item 21)

Some students are happy with themselves most of the time **BUT** Other students are often not happy with themselves. (Sort of True for Me, Really True for Me)

(item 28)

Some students like the kind of person they are **BUT** Other students often wish they were someone else. (Sort of True for Me, Really True for Me)

(item 35)

Some students are very happy being the way they are **BUT** Other students wish they were different. (Sort of True for Me, Really True for Me)

Scholastic Competence

(item 1)

Some students feel that they are just as smart as others their age **BUT** Other students aren't so sure and wonder if they are as smart. (Sort of True for Me, Really True for Me)

(item 8)

Some students are pretty slow in finishing their school work **BUT** Other students can do their school work more quickly. (Sort of True for Me, Really True for Me)

(item 15)

Some students do very well at their classwork **BUT** Other students don't do very well at their classwork. (Sort of True for Me, Really True for Me)

(item 22)

Some students have trouble figuring out the answers in school **BUT** Other students almost always can figure out the answers. (Sort of True for Me, Really True for Me)

(item 29)

Some students feel that they are pretty intelligent **BUT** Other students question whether they are intelligent. (Sort of True for Me, Really True for Me)