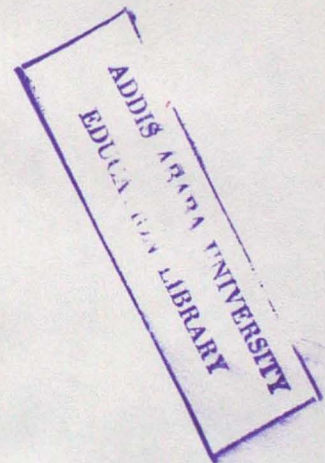


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THE SELF-CONCEPT OF CHILDREN WITH AND  
WITHOUT MATHEMATICS DIFFICULTIES IN  
AWASSA PRIMARY SCHOOL

FIKIRTE PETROS

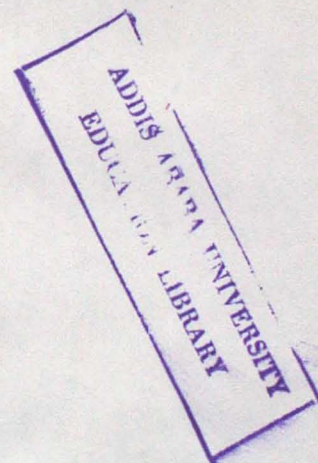


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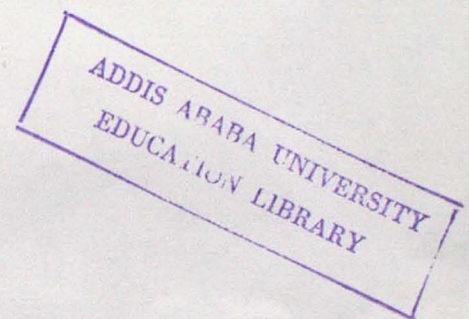
FIKIRTE PETROS



JUNE, 2006

**THE SELF-CONCEPT OF CHILDREN WITH AND  
WITHOUT MATHEMATICS DIFFICULTIES IN  
AWASSA PRIMARY SCHOOL**

**A THESIS SUBMITTED TO THE SCHOOLS OF  
GRADUATES STUDIES OF ADDIS ABABA  
UNINVERISITY**



**IN PARTIAL FULFULMENT OF THE REQUIRMENTS  
FOR THE DEGREE MASTERS OF ARTS IN  
SPECIAL NEEDS EDUCATION**

**FIKIRTE PETROS**

**JUNE, 2006**

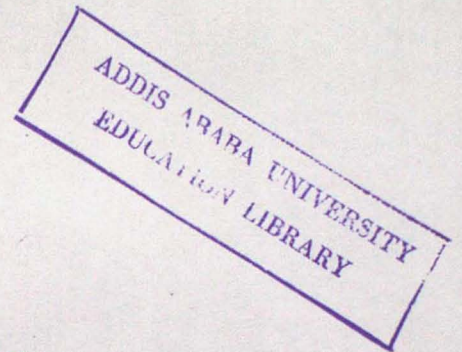
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THE SELF-CONCEPT OF CHILDREN WITH AND WITHOUT  
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BY  
FIKIRTE PETROS

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## ACKNOWLEDGMENT

Above all praise is to God for His will be all things possible.

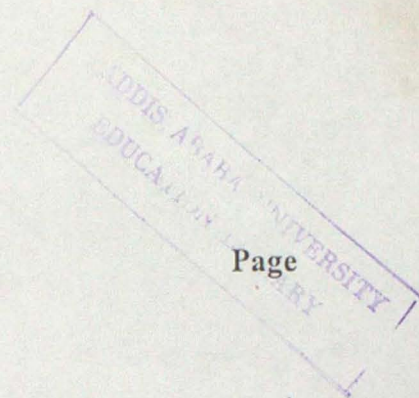
My best regards go to Dr. Seleshi Zeleke my advisor, for his persistent guidance, valuable comments and suggestions in shaping the content and form of the study. His kindness and patience in offering constructive advice, honest criticisms and encouragements is highly appreciated.

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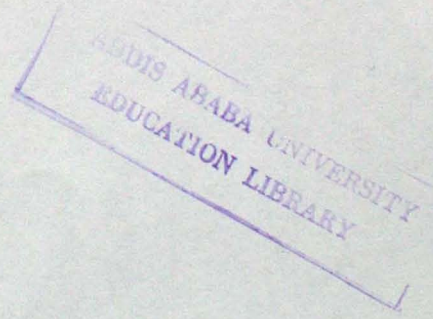
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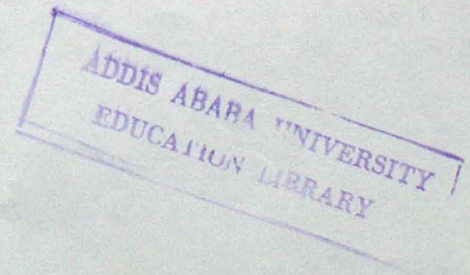


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## ACRONYMS

LD	Learning Difficulties
MLD	Mathematics learning difficulties
ASC	Academic Self-concept
MSC	Mathematics Self-concept
GSC	General Self-concept

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## Abstract

Several investigations have studied related to children with disabilities. No research related to the area of learning difficulties or mathematics difficulties has been done particularly in Ethiopia. The development of self-concept has a great impact in the area of mathematics difficulties. Creating awareness and providing valuable information related to the self-concept of children with mathematics difficulties was the main objective of the study. The study investigated the difference in self-concept of children with and without mathematics difficulties based on the response of CFSEI-2. Twenty grade five children were chosen in each group depending on the criteria of children with and without mathematics learning difficulties. Statistical methods such as Pearson r chi square and t-tests were used to analyze the data. In accord with previous research, children with mathematics difficulties were found to hold lower opinions of their mathematics abilities than children without mathematics difficulties. Also, children with mathematics difficulties held less favorable perception of their academic abilities. However children with and without mathematics difficulties did not differ in ratings of general self-concept. These results indicate that children with mathematics difficulties maintain general positive self-evaluations, despite their recognition of limitations in some areas.

# CHAPTER ONE

## INTRODUCTION

### 1.1 Background of the study

The difficulties faced by young people on the rocky road to adulthood and the impediments placed in their way by the world around them is harrowing and disturbing to hear. On the other hand, it is enlightening and inspiring to hear the positive potential inherent within all children and the ways in which this can be and has been brought out through the work of selfless, caring and responsible adults.

Education is the main way to build up the future of the child and the society (United Nations, 1994). Formal education is becoming accessible to increasing the number of children. But school attendance does not necessarily mean that effective learning is taking place or the education that schools provide is relevant to the needs of their students. Education has not always been seen as a right of the child, especially for children with disabilities (United Nation, 1992).

According to smith (2003), it is essential to provide the necessary treatment using the proper approach and material which fits the particular child, the disorder and its severity. Traditional instruction is not always sensitive to individual differences in learning rates and styles. Although individuals differ in strengths, weaknesses and

personalities, all children with learning difficulties (LD) or mathematics learning difficulties (MLD) have difficulties that result in poor academic performance as well as behavior characteristics that interfere with the school performance (Mussen, Conger, Kagan & Huston, 1984).

Teachers often view children with MLD as fewer task oriented and less motivated. They are frequently assumed of being lazy, not trying hard enough to be successful at school. These perceptions can result in negative interaction between teachers and students. It is more likely to contribute to children with MLD to rebel and act out at school. Demonstrating negative talks and misinterpretations lead to irrational thinking regarding oneself and the world, Mussen, et al. (1984) noted that teachers contribute to their students' faulty attribution and learned helplessness.

From daily observations and experience, children with specific MLD did not get due attention in Ethiopian schools. The pressure to perform in school is often a major source of problematic stress for young people (United Nation, 1994). These children, who perform less and consider themselves as incapable, display inattentive and deviant behavior in schools. Most teachers, including the researcher herself had poor perception of these children. During her study in special needs education, the researcher has got better knowledge and understanding of learning difficulties. Children who experience prolonged failure in school may develop a diminished self- concept, low achievement expectation and a feeling of helplessness. At the same time, children with poor self- concept are less likely to attempt on tasks at which they could be successful.

Although these children may have difficulties, they will perform better if they are identified and provided with appropriate support. Self-concept contains both the present view and a possible view of the future. How competent an individual feels about himself can contribute to the development of general self-concept. The feeling of competence comes largely from the individual's perception of control over the situation. That is why some people do actively and willingly deal with difficulties while others fail to act.

Identifying difficulties, assessing needs and providing support as early as possible is essential to prevent accumulation of problems encountered by children with MLD or LD. The most important thing for a person (specifically for children with difficulties) starting out on the road to success is work with the person's self-concept. Self-concept is a critical factor in school performance; leading towards happier and more successful life. Self-concept is a primarily motivating force in human behavior (Seleshi, 2004c). It is central ingredient in human personality and personal adjustment.

Identifying these children at an earlier stage and assessing the area of their problem will be useful in two ways. First, it helps concerned persons to intervene before it overhand the individual. Second, it provides information and indicates solutions for parents and teachers, it paves way to help the children before they develop secondary problem (e.g. poor self-esteem, deviant behavior, etc...) which causes school dropouts, juvenile delinquency (i.e. a hindrance for the development of the country).

MLD is common in young children and has serious educational consequences (Jordan & Hanich, 2000; Smith, 2003; Hanich, Jordan, Kaplan & Dick, 2001; Jordan & Montanii,

1997). They noted that it has impact on children's future educational opportunity and success. The problem encountered by a girl in one high school may clearly reveal the problem of LD. How poor self-perception or the feeling of inadequacy affects the child's motivation and interest to attempt tasks, which seem difficult, may be well understood from the following case that the researcher came across while she was a teacher in Akaki Adventist School. Hirut was a girl in this school. Besides her good grades and being the first in her class on overall average grade points, she was forced to repeat in grade 11 just because she had low final score in math (which was the policy of the school then). There was a great confrontation between Hirut and her math teacher. Even in the year that followed while she was studying in grade 11 for the second time, her math teacher insisted to dismiss her from school due to the negative attitude they had developed towards each other. Fortunately, with the help of other teachers who understood her problem, she finished her school work. What I always felt about this girl is that she was interested to be a medical doctor but due to her poor math ability she was forced to join the Faculty of Law.

Children who have the potential but perform below the expectations in mathematics are unable to continue their education in the field which they are interested in. Mathematics is a compulsory subject in Ethiopian schools as well as in higher education, which is also true in most parts of the world. Fuchs and Fuchs (2002) said that currently the world is becoming more and more technical and the study of mathematics and the resulting skills have become increasingly valuable. According to Hanich, et al. (2001) avoidance of mathematics is no longer inconsequential in our technology oriented culture but the area of MLD has received little attention relative to reading difficulties. In

our country there is no research undertaken in the area of MLD or LD except the one recently done by Seleshi (2004c) to the researcher knowledge.

### **1.1.1. THEORETICAL BACKGROUND**

#### **Definition of Learning Difficulties**

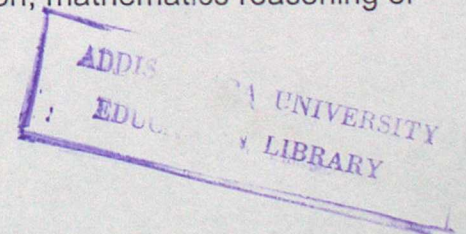
Sattler and Weyandt (2001:282) stated that "the term learning difficulties can be used in both broad and narrow sense". They also explained the term more specifically, in its broad sense, it refers to any form of learning difficulties; in its narrow sense, it refers to specific learning difficulties, which does not include learning problems that are primarily the results of sensory problem, motor disability, mental retardation, emotional disturbance or economic or cultural disadvantage. Kloomok and Cosden (1994) noted that the law of California State defined specific learning difficulties as a severe discrepancy between intellectual ability and achievement in one or more of the following academic areas: oral expression, listening, written expression basic reading skill, reading comprehension, mathematics calculation or mathematical reasoning. Children with learning difficulties have normal intelligence but suffer from information processing (Swanson, 1993).

Studies indicated that children with learning difficulties had an average or above average intelligence score, but they are significantly underachieving in one or more school subject areas (Chapman, 1988; Seleshi, 2004a). For example, Seleshi (2004a)

noted that there is a general agreement among researchers in the area of learning difficulties that these children are underachievers.

According to Smith (2003), learning difficulties are academic difficulties experienced by children and adults of average to above average intelligence. This means that there are discrepancies between a child's potential for learning and what the child actually learns. Thus, being diagnosed as having a learning disorder does not imply low intelligence (Bartholomay & Keen, 2000; Kloomok & Cosden, 1994).

The American Psychiatric Association guideline states that mathematics difficulties can be measured by individually administered standardized tests of math calculation and reasoning that fall substantially below the expected age, measured intelligence score and age appropriate education (Sattler & Weyandt, 2001). Various terms such as dyscalculia and developmental arithmetic disorder have been used synonymously with mathematics learning difficulties (Bartholomay & Keen, 2000). Children with mathematics learning difficulties have problems recognizing and counting numbers correctly and they have difficulty using numbers in everyday settings. Mathematics difficulties are considered as deficits in arithmetic calculation, mathematics reasoning or both (Lyon, 1996).



Disagreement over the definition of the term LD as well as MLD and the wide variation in the criteria used to identify children with LD or MLD make the synthesis of the research difficult (Chapman, 1988; Seleshi, 2004a). Even though there is no agreed

upon and precise definition of MLD, there is a consensus on the exclusion criteria. That is, MLD cannot be primarily attributed to hearing, vision, emotional disturbance, economic disadvantage or cultural differences (Lyon, 1996; Jordan & Montanii, 1997; Liyod, Kameenui & Chard, 1997).

## **Identification and Prevalence of Learning Difficulties**

There are a number of conceptual and methodological barriers to the accurate identification of learning difficulties and these obstacles lead to confusion concerning definition, diagnostic issues and prevalence rate (Short, Feagans, Mckinney & Appelbaum, 1986). Although no consensus has been reached regarding acceptable criteria or defining the specific psychological processes that produce learning difficulties, most of the proposed revisions in the LD eligibility criteria involve the concept of a significant discrepancy between general ability and achievement (Short, et al., 1986).

Consistent with the above definition, Individuals with Difficulties Education Act (IDEA) also set criteria for evaluation procedure pertaining to the specific learning difficulties (Herr and Bateman, 2003). According to IDEA, the specific learning difficulty involves: the presence of severe discrepancy between achievement and ability; the child does not reach his or her age and ability levels in one or more receptive and expressive skills such as written expression, listening, reading skill or mathematics.

Most investigators frequently used IQ-achievement discrepancy (Siegel, 2003). However, the level of discrepancy, the formula to obtain the discrepancy level was not consistently used. As a result, variation in the magnitude of ability-achievement discrepancy is seen (Chapman, 1988; Seleshi, 2004a). In general, comparison of various procedures suggests that no method is completely satisfactory in addressing all the issues involved in identifying learning difficulties (Seleshi, 2004a; Lyon, 1996; Short et al., 1986, Fletcher, Morris & Lyon, 2003).

A number of researchers have argued that mathematics difficulties are relatively common in young children (Jordan & Hanich, 2000; Jordan & Montanii, 1997), but there is no precise figure that indicates how common it is in the school population (Seleshi, 2004a). The prevalence of mathematics difficulties among school age children are reported in different studies. According to Bartholomay and Keen (2000), the prevalence rate is estimated to be one to five percent of the school age children. Geary (1996) reported that 6-7% of the school aged population has learning difficulties in mathematics. Seleshi (2004a), after reviewing different studies, indicated that most studies revealed from the total school population, 8.5% had comorbid problem and 6.5% had specific MLD. On the other hand, Gonzalez and Espinel (1999) pointed out that a prevalence of 6.4% of mathematics difficulties have been reported in different countries.

Many investigators have also accepted that 6-7% of school aged (6-17 years) children suffer from mathematics deficit (Fuchs & Fuchs 2002; Seleshi, 2004a; Smith, 2003). Lyon (1996:4) states "Valid prevalence estimate depends up on a set of criteria which

are clear, observable, measurable and agreed upon." The real prevalence of MLD, its validity and genuineness is subject to much dispute, because there is no consensus on the definition of LD.

A child usually shows signs of mathematics difficulties by the age of 8 years or when he reached grade three (Geary, 1996). In some children, the disorder does not occur until the age of 10 or by the time he/she reaches grade 5 or after ward (Bartholomay & Keen 2000).

### **Conceptualization of Self-concept**

The term self-concept and self-perception are used in the literature synonymously to discuss ideas about how people view themselves (Elbaum & Vaughn, 2003; Solomon, 1999; Battle, 1992; Seleshi, 2004b). There are also studies which make a distinction between self-concept and self-esteem (see Bahiru, 1999). In a review of studies of self-concept of learning difficulties, Seleshi (2004b) showed that there is an agreement in using self-concept and self-perception as similar terms to refer to a domain specific area of self-concept. Seleshi also noted that self-esteem, general self-esteem and global self-worth are used synonymously to refer to the global sense of well being.

Solomon (1999), in his review of the literature, on self-concept, suggested that self-esteem is an individual's own perception in different life activities. According to Solomon, self-concept is one's evaluation of his/her perceptions in reference to

significant others and perceived effectiveness in achieving goals. The common theme in the different definitions of self-esteem seems to be a perception of an individual about himself or herself, which is formulated through his or her experience and one's attribution to one's own behavior (Bahiru, 1999). Patel (2004) noted that self-esteem is an important aspect of the self. He added that it refers to one's overall assessment of one's worth as a person.

Self-concept is considered as a critical variable and become most popular in psychological as well as in educational research (Byrne, 1984). Educators have become more interested in the implication of Self-perceptions among special populations within the school setting (for example, for those identified as learning difficulties) (Harter, Whitesell & Junkin, 1998).

Self-concept by itself and in relation to other variables is considered as an important construct which also intervenes with other significant outcomes like academic achievement (Elbaum & Vaughn, 2003; Chapman, 1988; Haager & Vaughn, 1995; Seleshi, 2004b; Fletcher et al., 2003). A general view of the self is a critical factor in determining human behavior (Garuma, 1999; Seleshi, 2004b).

Children with LD who are undiagnosed or are improperly treated may never achieve functional literacy; they often develop serious behavior problems (Elbaum & Vaughn, 2003) or dropout of school prior to graduation (Lyon, 1996). Although moderate, learning difficulties may result in school dropout, delinquency and life long underachievement (Jordan & Hanich, 2003). Supporting this view, many researchers

pointed out that academic failure is highly linked with poor self-esteem. For example, 36% of adults studied in an LD clinical sample continued to receive counseling or psychotherapy for low self-esteem, social isolation, anxiety, depression and frustration (Garnett, 1998).

## **Self-concept Model**

Global Versus Domain Specific models are the most important distinctions that differentiate various conceptualization of self-concept. Self-concept can be viewed as global characteristic of the person (i.e. unidimensional) or as a set of evaluation to a specific domain (i.e. multidimensional) (Elbaum & Vaughn, 2003; Seleshi, 2004b; Byrne, 1984; Harter, Whitesell & Junkin, 1998; Kloomok & Cosden, 1994).

Early models of self-concept were one-dimensional which emphasize global self-concept, assessed and reflected as a single score (Harter, whitesell & Junkin, 1998; Seleshi, 2004b; Cosden, M., Elliott, K., Noble, S. & Kelemen, E., 1999). For example, Harter, Whitesell and Junkin (1998) pointed out that initially, most investigators focused on general self-esteem anticipating that learning difficulties and related academic failures of special education would negatively affect the overall sense of personal worth.

Recently most studies clearly show the multidimensionality of self-concept. There is consensus that self-concept comprises a number of facets (Seleshi, 2004b; Battle,

1992; Bahiru, 1999). Extensive and empirical research in developmental and educational psychology strongly support the multidimensional view (Kloomok & Cosden, 1994). Moreover, recently published self-concept instruments emphasize domain specific self-concept (Byrne, 1984; Battle, 1992; Harter, Whitesell & Junkin, 1998).

Self-concept is established as a multidimensional construct based on the evidence that individuals view themselves differently in different settings and at various domains of functioning (Elbaum & Vaughn, 2003; Kloomok & Cosden, 1994). Marsh & Ayotte (2003) mentioned that the relation between self-concept and other variables can not be adequately understood if the multidimensional nature of self-concept is ignored.

The development of self-concept instrument based on multidimensional model enabled researchers: (1) to examine the relationship between domain specific and general self-evaluation, (2) to determine if some domains are more predictive than others and (3) to examine a pattern of perceived strength and weaknesses across the particular domain identified (Elbaum & Vaughn, 2003; Harter, Whitesell & Junkin, 1998). Harter, Whitesell and Junkin (1998) reviewed studies on of self-concept of children with and without LD and pointed out two major advantages of multidimensional instrument of self-concept. It provides separate scores for each specific domain and also preserves the concept of global self- concepts. More specifically, the multidimensional model allows investigators to evaluate how children with LD judge differently on the general self-concept and on academic self-perceptions (Kloomok and Cosden, 1994).

## Assessment of Self-concept

Examining the self-perception of students with learning difficulties is one way of determining the impact of academic and social difficulties on students emotional well being (Liyod, Kameenui and Chard (1997). The self-concept instrument should be developmentally appropriate; it should also measure and differentiate the specific domain of interest (Liyod, et al. 1997). According to Liyod et al. (1997) the measurement of self-concept should be self-reporting, which allows the individual to reflect his or her thinking of events and experiences. In supporting the self-reporting measure, Mussen, et al. (1984) noted that it reveals the children's self-concept better, but if the report is given by others, the result become incompatible with the children's perception. Self-concept assessment must keep several considerations in mind which are the technical adequacy of the instrument and the demand characteristics of self-reporting measures (Strien, 1993).

Seleshi (2004b) noted that self-perception tends to remain stable at least across the elementary grades. Children with learning difficulties younger than 7 or 8 years of age may not have well defined self-perception (Priel & Leshen, 1990 cited in Liyod, et al., 1997). Harter (1983) cited in Osborne R.E. (1996) noted that by age 9 or 10, children do have a clearly formulated sense of their worth and competence in different areas, and their feelings remain relatively stable within the range of 10-12 years of age.

Based on the above literature, one can conclude that the two terms self-perception and self-concept can be used interchangeably to refer to individual's own perception of himself or her self to a specific domain, whereas, self-esteem refers to general self-concept. Self-concept is an important variable in many aspects of human life. The multidimensional model has more advantages and useful in order to conceptualize the idea of self-concept.

### **Self-concept and Learning Difficulties in Mathematics**

Emotional and behavioral problems are commonly reported as concomitants of learning difficulties (Black, 1974). Black also noted that increasing underachievement is associated with increasing poor self-concept. Similarly, early calculation difficulties can erode children's confidence in their mathematical abilities (Jordan, Levine & Huttenlocher, 1995).

In their study on the self-concept of children with learning difficulties, Elbaum and Vaughn (2001) explained that children's experience in school affects their perception of academic ability and that the perception of academic ability in turn can affect their performance, motivation and future success on academic tasks. They also added that children's later development and psychological well being is also affected.

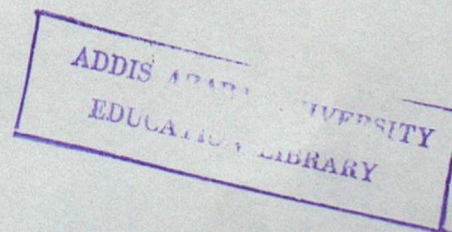
Black (1974) has noted that the feeling of inadequacy and poor self-concept in children are secondary to academic failure and inability to meet the expectation of parents,

teachers and peers. Children with low self-concept may not attempt tasks if they experience difficulty and their self-concept becomes more negative (Kloomok & Cosden, 1994).

Thrulow (1980) cited in Elbaum & Vaughn (2001) made an investigation on people who had close relationship with children with LD (e.g. teachers, special education supervisors, coordinators). Thrulow's findings reveals that for the question asked to indicate the greatest need of students with LD, 47% of the participant's rank "improved self-image" as the area of greatest need. Most studies indicate that children with learning difficulties have problems in social and emotional areas as well as in their academic performance. In general, one can say that self-concept and learning difficulties have a reciprocal relation which means that repeated failure experiences affect the self-concept of the children and those who had low self-concept also fail to attempt academic tasks.

### **1.1.2. SELF-CONCEPT OF CHILDREN WITH AND WITHOUT LEARNING DIFFICULTIES**

There is a general agreement that underachievers as a group tend to have less adequate self-concept than normal achievers do and this inadequate self-concept is more related to learning difficulties (Black, 1974; Smith & Luckasson, 1995). Most studies have found consistent results regarding self-concept of children with and without LD (Elbaum & Vaughn, 2001; Wattenberg & Clifford, 1964; Cosden, et al., 1999; Battle, 1992, Rothman & Cosden, 1995; Harter, Whitesell & Junkin, 1998; and



Seleshi, 2004c). More specifically, the studies showed that children with LD have less favorable self-concept than children without LD do.

Elbaum and Vaughn (2001) made investigation on the self-concept of children with and without learning difficulties. Their findings revealed that children with LD take a more negative view and possess less confidence about their self-worth. The actual and perceived academic achievement are important and there was significantly positive relationship between mathematics achievement and the self-perception score of children with learning difficulties (Cosden et al., 1999).

Wattenberg and Clifford (1964) also found positive and significant relations between the self-concept score and grade point average of children in grades 4, 5, 6 and 11. They also noted that immature self-concept is related to LD and a change in self-concept is positively associated with remedial programs to LD. Another study conducted on children who were academically successful (functioning above the expected grade level) and unsuccessful (experience deficits of two years or more) found that successful students earned self-esteem scores that were significantly higher than did their counterparts (Battle 1992)

Specific learning difficulties have a tendency to co-occur with behavioral problems and children with LD are more likely to exhibit low self-esteem as compared to non disabled peers (Smith & Luckasson, 1995). Self-esteem is also recognized as an important variable in the mathematics performance of students with learning difficulties.

Repeated academic failure results in low self-esteem, mathematics anxiety, confused thinking and avoidance behavior (see Miller & Mercer, 1997).

In studying the self-concept of children with learning difficulties, the dimensions of self-concept that are especially relevant are academic, social and general self-concept (Elbaum & Vaughn, 2003). Others like Marsh and Holmes (1990) and Seleshi (2004c) noted that domain specific academic self-concept (for example, mathematics, verbal) are more related to specific learning difficulties. The more closely particular facets of self-concept are linked with specific situations, the closer the relationship between self-concept and behavior in the specific situation (Chapman, 1988). Thus, self-concept of ability should be more closely related to academic achievement than to ability in social and physical situation (Kistner & Osborne, 1987). Following these suggestions, the present study aims at examining mathematics self-concept (MSC), academic self-concept (ASC) and general self-concept (GSC) of children with and without MLD. Accordingly, the following paragraphs review the literatures that pertain to MSC, ASC and GSC.

### **Mathematics Self-concept (MSC)**

Marsh and Holmes (1990) concluded that ASC cannot be understood adequately only from a general academic measure. Accordingly, they recommended to researchers the use of at least verbal and mathematics self-concept scales. Bachman (1970) studied the relation between ASC and mathematic achievement and showed that mathematics self-concept was significantly related to their math achievement score. Bahiru (1999)

noted that a large number of studies have shown that better math skills are associated with better math self-concepts.

Brooker, Patterns and Thomas (1962) cited in Bachman (1970) pointed out that MSC was a significantly better indicator of seventh grade achievement in math than any other self-concept measure. Mathematics difficulty often accompanies a sense of shame and humiliation because of the child's continuing failure and subsequent frustration, and tends to a continuing poor self-esteem (Bartholomay & Keen, 2000).

Among researchers who have examined the effect of success and failure on the individual's self-concept, there appears to be a general agreement that those who underachieve scholastically (or those who do not meet their own academic expectation) suffer significant losses in their self-esteem (Byrne, 1984). According to Byrne (1984), the academic achievement measures were more highly correlated with the specific academic self-concept measures to which it was most logically related (e.g. correlation between mathematics achievement & mathematics self-concept).

Studies support that children with learning difficulties make distinction between their GSC and other domain specific self-concept like verbal or mathematics (see Kloomok & Cosden, 1994). Children with specific learning difficulties (math difficulties) have been seen to experience lack of confidence in approaching academic tasks (Harter, Whitesell & Junkin, 1998). They also noted that the presence of negative self-concept in a certain academic skill area can affect the child's future development of that skill.

Seleshi (2004c) investigated the MSC of children with MLD and normally achieving peers. He found that the MSC score of children with MLD was substantially lower than that of the normal achievers. Using different statistical analysis, Seleshi reveals that the main variation in self-concept between the two groups was accounted more by MSC than by any other self-concept domain.

### **Academic Self-concept (ASC)**

Battle (1992) stated that ASC is the aspect of self-esteem that refers to individual's perception of their ability to succeed academically. Byrne's (1984) review of experimental and correlational studies across a variety of population revealed that self-concept and academic achievement are positively correlated. She found only one study which shows no relationship. Byrne also noted that many studies show the relationship between academic self-concept and academic achievement to be stronger than the relationship between GSC and academic achievement.

In a longitudinal study of students with learning difficulties in grade 5 through 8 and their comparison group without learning difficulties, Kistner, Haskett, White and Robbins, (1987) found that children with learning difficulties rated their academic self-concept more negatively than their non-disabled peers. Chapman (1988) reviewed 20 studies addressing academic self-concept. The review revealed that students with learning difficulties have lower self-concept scores than those without learning difficulties, and the average difference between students with and without learning

difficulties was large, as indicated by mean effect size (ES)=-0.81. Kloomok and Cosden (1994) found that children with learning difficulties rated themselves as less competent in their scholastic abilities than did children without learning difficulties. In their study, most of the children (85%) of the population had negative ASC.

Elbaum and Vaughn (2003) noted that a strong ASC may be related to the interest of students with learning difficulties, in attempting challenging course work and participating more fully in general education curriculum. Based on the review of studies related to self-concept of children with and without learning difficulties, they also concluded that children with learning difficulties were significantly below that of their peers without difficulties.

Seleshi (2004b) recently reviewed 28 studies that compared the academic self-concept of children with and without learning difficulties, those studies which were not included in Chapman's review. From the 28 studies he reviewed 89% of the studies revealed that the Academic self-concept of children with learning difficulties was more negative than their normally achieving peers. Seleshi's (2004c) finding was also consistent with the above findings.

### **General Self-concept (GSC)**

General self-esteem is the aspect of self-esteem that refers to the individual's over all perception of her/his worth (Battle, 1992). Bachman (1970) pointed out that GSC was

significantly related to their achievement in math. This indicates that underachieving in specific areas like math is related to GSC.

Concerning the general self-concept of children with and without LD, most researchers (Kistner et al., 1987; Chapman, 1988; Kloomok & Cosden, 1994; Seleshi, 2004b) found no significant differences between the two groups. These researchers noted that negative general self-concept is not the characteristic of children with LD. For example, Kloomok and Cosden (1994) found that 67% of the population in their study had positive general self-concept. Chapman (1988) reviewed 21 studies conducted on the general self-concept of children with and without learning difficulties. Chapman found that students with learning difficulties tended to have general self-concepts that were lower than those of their peers without learning difficulties but within a normal range.

Seleshi (2004b) reviewed 28 studies that examined group differences in general self-concept of children with and without learning difficulties. Seleshi reported that 68% of the 28 studies found no significant differences between the two groups.

Rothmans and Cosden (1995) noted that studies using general self-concept instrument have yielded an equivocal results; although it appears that the presence of learning difficulties has a significant impact on students ASC, this impact does not always generalize to their GSC. Byrne (1984) investigated the bipolar relation among the facets of self-concept. Byrne interpreted the results as self-concept that contains compensatory components. According to Byrne, one can balance a perception of poor

performance on one specific domain with that of a good performance on another specific domain hence, maintains an overall positive self-concept.

In general the results have been contradictory. Some studies have found that the general self-concept of children with learning difficulties is more negative, while others report no differences. This contradiction may be due to methodological differences and the use of different instruments to measure self-concept (Seleshi, 2004b).

## 1.2. STATEMENT OF THE PROBLEM

The main purpose of this study was to examine differences between children with and without MLD in their self-concept. A number of studies raised questions whether or not children without LD have better self-concept than children with LD. To date, results have been contradictory; some studies have found that self-concept of children without LD is better than children with LD (Elbaum & Vaughn, 2001). Others (e.g., Kistner et al., 1987) report no differences between the groups.

Concern on the self-concept of children with LD has been raised because of the potential impact of the academic failure on their global perception of themselves (Chapman, 1988). When examining research results of children with LD, it would seem important to consider the distinctive character of self-concept. Based on the multidimensional nature of self-concept, this study investigated how children with and

without MLD differ on their MSC. The study also examined whether the effect of MLD is limited to MSC or whether it generalizes to other Self-Concept domains.

**Accordingly, this study attempts to answer the following basic questions.**

1. Do children with and without MLD significantly differ in their mathematics self-concept?
2. Do children with and without MLD differ significantly in their academic self-concept?
3. Is the general self-concept of children without MLD significantly better than children with MLD?

### **General Objectives:**

The general objective of the present study was to investigate the difference in self-concepts of children with and without MLD. Based on the result obtained the study provides suggestions which may help to pave ways to prevent and provide remedial support.

### **Specific Objectives**

- To investigate the difference in MSC of children with and without MLD.
- To investigate the difference in ASC of children with and without MLD.
- To investigate the difference in GSC of children with and without MLD.

- To create awareness within the school society on how to give appropriate support for children with MLD.
- To provide information on how to assist children with MLD.
- To initiate other researchers to do more in the area of MLD/LD.

### **1.3. SIGNIFICANCE OF THE STUDY**

As mentioned earlier, little is known about the self-concept of children with MLD/LD in Ethiopian context. The present study is therefore believed to have the following theoretical and practical contributions.

- The result will shed light on the relationship between learning difficulties and self-concept in our context where there are no remedial services for children with learning difficulties
- This study helps to create awareness among the parents and the school community on how forcing children beyond their level of ability and not identifying the individual needs of the children create more problems and cause another secondary problem which hinders the teaching-learning process.
- It also provides information for concerned bodies who would like to help the children by planning and implementing intervention strategies.
- The study may provide basic information for further research

#### 1.4. OPERATIONAL DEFINITIONS

**Children with Mathematics Difficulties:** are those who have a cognitive ability score greater or equal to 85 and exhibit a discrepancy of more than 15 points (more than one standard deviations) between their mathematics achievement score and cognitive ability score as measured by WJ-III (Woodcock, McGrew & Mather ,2001).

**Children Without Mathematics Difficulties:** are those who have a cognitive ability score greater or equal to 85 and exhibit a discrepancy of less than 15 points (less than one standard deviations) between their mathematics achievement score and cognitive ability score as measured by WJ-III (Woodcock, McGrew & Mather ,2001).

**Mathematics Self-Concept (MSC):** children's perception of themselves related to their mathematics ability as measured by MSC subscale developed by Seleshi (2004c) based on the multidimensional model of ASC.

**Academic Self-Concept (ASC):** Children's perception about their academic ability in the classroom and during different instructional process as measured by a translated version of Culture-Free Self-Esteem Inventories (Battle, 1992).

**General Self-Concept (GSC):** Children's perception of themselves related to every setting in life as measured by a translated version of Culture-Free Self-Esteem Inventories (Battle, 1992).

## 1.5. LIMITATIONS

Mathematics learning difficulties may manifest itself in children either alone or comorbid with other learning difficulties such as reading difficulties. In the present study, the children with MLD may or may not have additional learning difficulties. The result of this study may not be generalized to children with MLD who have comorbid reading difficulties.

## CHAPTER TWO

### METHODOLOGY

One of the major problems of research in the areas of learning difficulties is lack of consensus on what exactly constitutes LD (Seleshi 2004a). Researchers use different criteria to identify children with LD. There is no single classification which is suitable for all purposes (Fletcher et al., 2003) because LD consists of heterogeneous groups (Sattler & Weyandt, 2001).

Generally, the methods used to identify children with LD can be classified in to two sub categories: ability –achievement discrepancy and low achievement for grade /age (Seleshi 2004a). Researchers criticized strongly the use of ability–achievement discrepancy criteria in the identification of children with LD (Sattler & Weyandt 2001). One limitation of the discrepancy criterion according to Sattler and Weyandt (2001) is that because children's achievement cannot be reliably measured before the age of 9, they will not receive services at early school years, the time when they need them most.

The second criterion, low achievement for grade /age, was also criticized by researchers (Sattler & Weyandt, 2001; Fletcher et al., 2003). Relying solely on academic achievement measure would mean that every one with low score would be eligible for special education service, and these low scores do not

reflect unique disability, rather simply represent the lower end of distribution of scores (Sattler & Weyandt, 2001).

After reviewing different critiques on both criteria, Sattler and Weyandt (2001) noted that although it has its own limitations, the traditional discrepancy model, which is comparing an intelligence test score with achievement test score, is useful and more objective. Supporting the above idea, Fletcher et al. (2003) stated that the intra-individual model (IQ-achievement discrepancy) is the strongest when the focus is on the primary manifestations of LD which involve reading, math and writing. Following the latter suggestion, this study employed the IQ-achievement discrepancy criterion to identify children with mathematics LD.

## **2.1. SETTING**

The present study was conducted in Awassa, although the education system in Ethiopia does not formally recognize LD. As a result, schools do not identify children with LD, nor provide remedial service for these children. Children with LD in this study attend general education classes without receiving any supportive instruction for their learning problem. They have not been formally identified or labeled as LD. So the study provides an opportunity to examine the self-concept of children with LD in the absence of remedial service. The result

could thus provide some clues as to how self-concept of children with MLD in such a system is compared to those children without MLD.

In light of the research setting, the present study may be considered as an extension of Seleshi's (2004c) study which was the first to examine differences in self-concept between unlabelled children with MLD and without MLD in Ethiopia.

## **2.2. PARTICIPANTS**

### **Pilot**

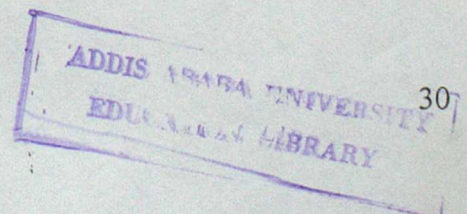
A pilot study was carried out on 40 grade five students (18 male and 22 female) with mean age of 11years and 10 months. The participants were selected using systematic random sampling from one elementary school. The objectives of the pilot study were (1) To evaluate the technical adequacy of the instruments (that is its reliability); (2) To check whether or not the wordings are appropriate for reading at the children's level, and (3) To check whether or not the items were fair with regard to their culture.

## Main study

The main study was conducted on 240 grade five students of one elementary school in Awassa. The school was selected using purposive sampling technique. The parents send these children to this school because they have a better understanding about the importance of education and that they can afford the tuition fee. This indicates that these children are more unlikely to be economically disadvantaged group.

The study area was selected purposefully. Due to a relatively long working experience in the organization, the researcher knows the school system and the instructional policy quite well. Most of the students in this school are not economically disadvantaged group except those whose education is subsidized by the school (charity students). It is also a place where the researcher can get easy access in collecting the data.

Among the 240 students, 173 students (79 males and 94 females) completed the measures. The remaining 67 were excluded due to different reasons: 32 of them (20 males and 12 females) for providing incomplete data, 24 (9 males and 15 females) for economic problems and 11(7 males and 4 females) for sensory problems. Of the total sample who had completed, 40 participants (19 males and 21 females) with mean age of 11years and 4 months were selected for analysis based on the operational definitions of the two groups in this study.



Accordingly, 20 of the children had MLD (8 males and 12 females) and 20 of them did not have MLD (11 males and 9 females).

Grade five students were selected because the instrument used to assess self-concept was a self-report scale and it was assumed that this group can complete the measures without any help or problems. It was also assumed that the children are matured enough to differentiate their self-concepts. Byrne (1984) noted that by age 9 or 10, children do have a clearly formulated sense of their worth and show markedly differentiated perception in different domains.

### **2.3. MEASURES AND PROCEDURE**

#### **Measures of Children's Self-concept**

The culture free self-esteem inventories (2<sup>nd</sup> Ed) (CFSEI-2) (Battle, 1992) were used to assess children's self-concept. The CFSEI-2 is a multidimensional scale, designed to measure self-concepts in specific domain as well as general self-concept. This inventory consist Form A and Form B for children and Form AD for adults. The present study used Form A which is divided in to four subscales that measure general (20 items), social (10 items), academic (10 items) and parental (10 items) self-concepts.

This study used a translated version of the academic and general subscales of CFSEI-2 which were used by Seleshi (2004c). The mathematics self-concept subscale that was developed by Seleshi (2004c) was used in this study. The items of each subscale were rated on a five-point scale ranging from 'strongly agree' to 'strongly disagree', with higher scores reflecting more favorable self evaluations.

Previous research has provided evidence of convergent and discriminant validity of the CFSEI-2, along acceptable test retest reliability (Battle, 1992). For the translated versions and the newly developed sub-scale the reliability coefficients were closer to those reported by Battle (1992). More specifically, the coefficient alpha reliability of CFSEI-2 for the main study was found to be .72 (mathematics self-concept), .85 (academic self-concept) and .70 (general self-concept).

### **The Wood-Cock Johnson Psycho-Educational Battery (WJ-III)**

For complete, accurate and equitable measurement, the researcher needs to administer the assessment tools in the participants' native language. Unfortunately, there was no assessment tools used to identify children with mathematics learning difficulties in the participants' native language. The researcher used commercially available standardized test battery (The Wood-

Cock Johnson Psycho-Educational Battery III) which is commonly used in recent studies in the area of learning difficulties.

The Wood-Cock Johnson Psycho-Educational Battery III (WJ-III) (Woodcock, McGrew & Mather, 2001) consists of two co-normed batteries: the WJ-III test of cognitive Abilities (WJ-III COG) and the WJ-III test of achievement (WJ-III ACH). This co-norming procedure enables the batteries to function together as an accurate and valid diagnostic system for evaluating domain-specific skills with related cognitive abilities (Mc Grew & Woodcock, 2001).

The WJ-III has been used extensively to identify learning problems, both clinically and for research (Jordan, Kaplan & Hanich, 2002). Most recent studies used the WJ-III to screen children with mathematics learning difficulties (e.g., Jordan, Kaplan & Hanich, 2002; Hanich, et al., 2001; Sofie & Ricco, 2002; Jordan & Hanich, 2003).

More specifically, the present study used the WJ-III Brief Intellectual Ability (BIA) cluster, the Broad math cluster and the Quantitative concepts cluster (Gq) to measure the potential quantitative knowledge and the performance of mathematics reasoning abilities of the children. Maximum effort was exerted to make the translated and adopted versions appropriate to the culture and experiences of the participants.

Before piloting, the instrument was translated into Amharic with the help of two professional language instructors at Addis Ababa University. One of the instructors translated it into Amharic and the other translated the Amharic version back into English. Some differences that appeared in the forward and backward translations were resolved by discussion of the instructors in the presence of the researcher.

### **WJ-III test of mathematics achievement**

This test was selected because it can be used for different purposes (clinical, educational, research) and can be administered in different settings (Mather & Woodcock, 2001b). Sofie and Ricco (2002) stated that the basal and ceiling values of WJ-III ACH are most appropriate for young children. Also Salivia and Ysseldke (1998, cited in Mather & Woodcock, 2001b) reported that the reliability and validity of the WJ-III mathematics achievement portion were well established, and the procedure used to develop and standardize have produced an instrument that can be used with confidence in a variety of settings.

The WJ-III ACH tests have clusters, but the most commonly used were those which measure basic mathematics skills. There was an argument in different studies that the assessment of calculation skill without quantitative concepts is not enough to label children with mathematics difficulties (see Seleshi, 2004a).

In line with this argument, the present researcher administered both the broad math cluster measure of basic mathematics skill and the mathematics reasoning cluster which includes the measure of quantitative concepts.

The tests were administered to the pilot sample. The reliability coefficients of the pilot mathematics achievement sub tests were .69 (calculation), .86 (Math fluency), .55 (applied problems) and .74 (Quantitative concepts).

Based on the analysis of items and informal discussion held with the participants of the pilot study, some improvement was made in terms of clarity of items. Accordingly, the wordings of several items of applied problems were improved.

The reliability coefficients in the main study were generally good. Alpha coefficients for the subtests were .79 (calculation), .86 (math fluency), .87(applied problems) and .84 (quantitative concepts). These were very close to .86 (calculation), .89 (math fluency), .92 (applied problems), and .90 (quantitative concepts) as reported in the technical manual (McGrew & Woodcock, 2001).

## WJ-III Cognitive Ability Test

The WJ-III test of cognitive ability has different clusters. "The Brief Intellectual Ability (BIA) is appropriate for research purpose when short and reliable measure of intelligence is needed" (Mather & Woodcock, 2001a:17). Following this suggestion, BIA was used in the present study.

The tests were administered to the pilot sample. The reliability coefficients for the BIA clusters were in the range of .65 to .86. More specifically, the alpha coefficients of the subtests for the pilot sample were .65 (comprehension), .86 (concept formations) and .80 (visual matching).

Each item was analyzed using descriptive statistics and short informal discussion made with the assistant invigilators and some of the participants of the pilot study. Based on information obtained from the discussion and item analysis, the researcher changed the pictures to clear and visible pictures. Some improvements were also made in the instructions so as to make them very clear and easily understandable.

Finally, the tests for the main study were sufficiently reliable .83 (comprehension), .89 (concept formation) and .86 (visual matching) compared to the ones reported in the manual which were .90 (comprehension), .94 (concept formation) and .84 (visual matching) (Mc Grew & Woodcock, 2001).

## 2.4. DATA COLLECTION PROCEDURES

First, the classroom teachers and the school vice principal were contacted to arrange testing dates and room accommodations at school.

In order to familiarize the children with the task, examples and exercise questions were done with the participants before administration. With the help of the assistants under the supervision of the researcher, and by following the guidelines presented in the examiner's manual the participants were tested in a quiet room, one student at a time.

The participants were administered the self-concept measure before any other measurement was administered. The achievement and cognitive tests were administered in two sessions each lasting 30 to 45 minutes. Between sessions, the researcher provides cookies and candies to motivate the participants.

To insure standardized administration and to circumvent potential reading problems among the participants, all the three measures were presented orally while the participants silently read the items. Participants were instructed to listen to the single auditory presentation of each problem. The participants were encouraged to ask any question that they could not understand.

## 2.5. METHODS OF DATA ANALYSIS

The data obtained from the two tests of WJ-III were corrected and scored using WJ Compu-Score program and interpreted. The self-concept subscales were corrected manually. Pearson product moment correlation coefficients were used to see the relationships between self-concept domains. Comparative analyses of the variables were computed using chi-square and t-test using SPSS program. The significance level of the difference obtained was tested at  $P < 0.05$  level and its magnitude of variation also tested using  $R^2$ . In addition to this, based on the data analysis, interpretations were made. Finally, conclusions and possible solutions were recommended.

## CHAPTER THREE

### RESULTS

This section presents the results of the statistical analyses carried out to answer the basic questions of the present study. The descriptive statistics are presented first followed by correlation analysis of the variables. Finally, the differences between children with and without MLD in mathematics self-concept, academic self-concept and general self-concept are presented.

#### 3.1. DEMOGRAPHIC CHARACTERISTICS OF THE SAMPLE

This section of the study presents the profile of participants in each group. The profile provides a comparison of the participants who are included in this study in terms of their age, gender, cognitive ability and achievement.

Table 1: Gender Distribution in the sample

Gender	Children with MLD		Children without MLD	
	No.	%	No.	%
Female	12	60	9	45
Male	8	40	11	55
Total	20	100	20	100

As indicated in Table 1, among the participants, 52% were female and 48% male. The percentages of female and male participants in this study were very close to each

other. The difference in the gender proportions was tested using chi-square test and was found non-significant ( $\chi^2 = 0.91$ ,  $df = 1$ ,  $p > 0.05$ ).

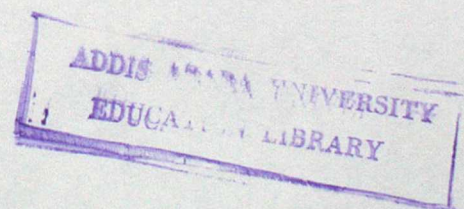
**Table 2: Age Distribution of the sample**

Group	Age in months		
	Mean	SD	N
Children with MLD	138.75	11.0	20
Children without MLD	134.95	8.43	20

Table 2 shows the mean age of children with MLD ( $M=138.75$ ,  $SD=11.00$ ) and the mean age for children without MLD ( $M=134.95$ ,  $SD=8.43$ ). Here also the t-test result reveals no significant difference in age between the two groups but was not significant ( $t=1.45$ ,  $df = 38$ ,  $p > 0.05$ ).

### 3.2. DIFFERENCES IN ACHIEVEMENT AND COGNITIVE ABILITY

The result obtained from the tests of cognitive ability and mathematics achievement tests are presented below.

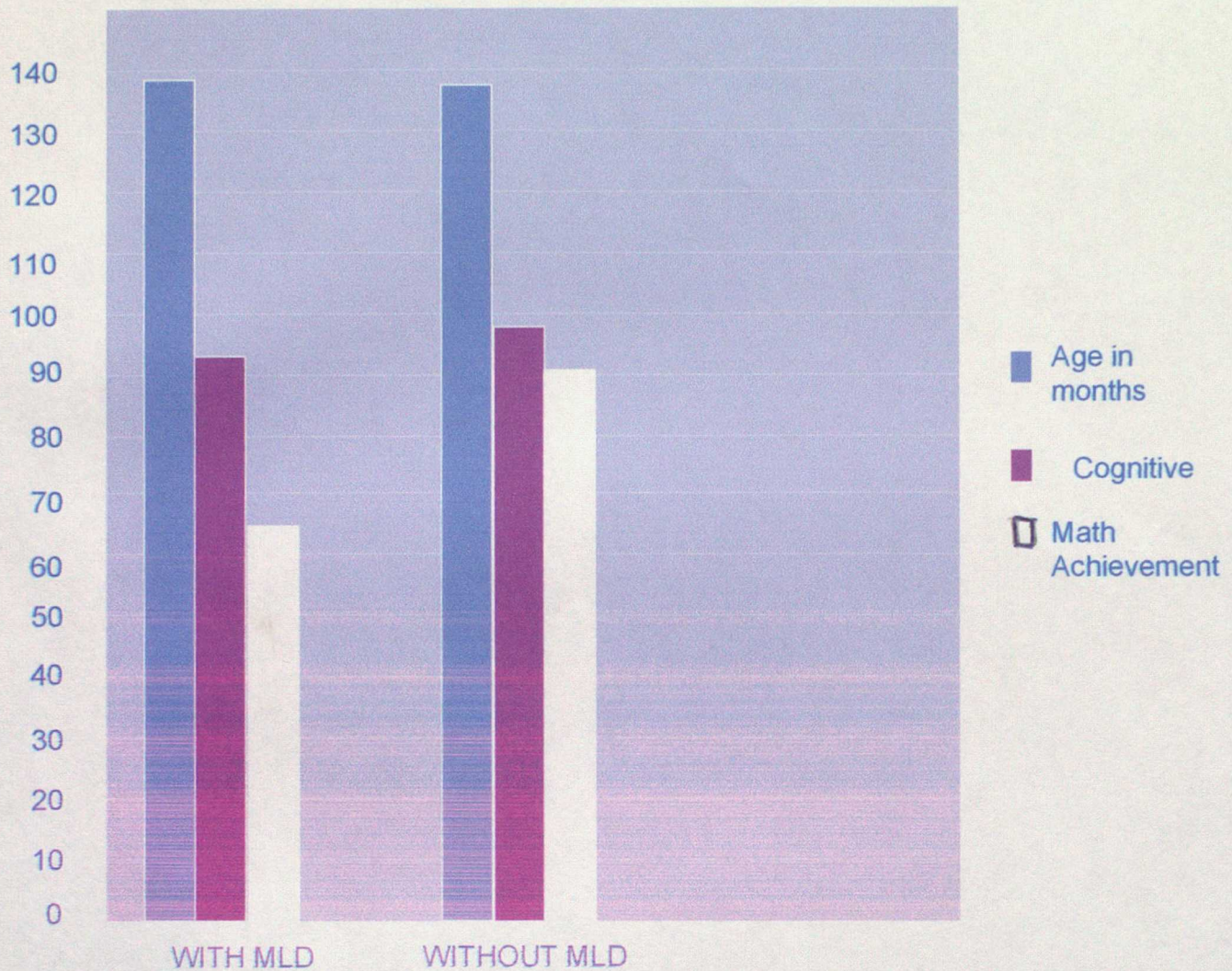


**Table 3: Means and Standard Deviations of Cognitive ability and Achievement Scores.**

	Children with MLD			Children without MLD		
	N	Mean	SD	N	Mean	SD
Cognitive ability	20	93.00	8.45	20	92.65	9.84
Mathematics achievement	20	65.00	11.17	20	87.25	9.34

The means and standard deviations of cognitive ability and achievement scores of each group are presented in Table 3. The data indicate that children with MLD and without MLD had similar cognitive ability scores. The means of the two groups were tested using t-test. The result indicates no significant difference between the two groups in cognitive ability ( $t = 0.121$ ,  $df = 38$ ,  $p > 0.05$ ).

As can be seen in Table 3, the two groups differ substantially on their achievement scores. The mean for achievement score for children with MLD was 65.00 (SD=11.17) whereas it was 87.25 (SD=9.34) for the comparison group. The difference was examined using t-test and was found statistically significant ( $t = -6.83$ ,  $df = 38$ ,  $p < .001$ ). This means that the two groups had substantially different achievement scores. The graph below clearly shows the difference between the two groups.



**Graph.1. GROUP DIFFERENCES**

### 3.3. CORRELATION ANALYSES OF THE VARIABLES IN THE STUDY

The main interest of this study was to examine whether or not mathematics learning difficulties creates differences in children's mathematics self-concept, academic self-concept and general self-concept. To this end, the relationships between these variable were first explored.

Table 4: Inter correlation between MSC, ASC and GSC in the study.

Self-Concept Subscale	1	2	3
1. Mathematics self-concept	--		
2. Academic self-concept	.439**	--	--
3. General self-concept	.278	.494**	--

n=40

\*\* Correlation is significant at the 0.01 level (2-tailed).

Pearson r was computed for each pair of the self-concept domains (subscales). As shown in Table 4, there was no statistically significant relationship between mathematics self-concept and general self-concept ( $r = 0.278, p > 0.05$ ). But the relation between mathematics self-concept and academic self-concept was found to be statistically significant ( $r = 0.439, p < 0.01$ ). Academic self-concept had also statistically significant relationship with general self-concept ( $r = 0.494, p < 0.01$ ). All the correlations were positive.

A correlation between MSC and ASC is also statistically significant ( $r = 0.586, p < 0.01$ ) within the group of children with MLD.

### 3.4. GROUP DIFFERENCES IN SELF-CONCEPT

In this section, the self-concepts of the children with and without MLD are compared. More specifically, differences are examined in academic, mathematics and general self-concepts between children with and without MLD.

Table 5: Self-Concept Scores by Group and Subscales

Self-concept subscale	Children with MLD			Children without MLD		
	N	M	SD	N	M	SD
MSC	20	27.95	5.916	20	33.35	6.532
ASC	20	34.25	6.584	20	39.70	4.943
GSC	20	72.10	7.953	20	74.00	8.736

- ❖ The maximum and minimum possible scores for (MSC and ASC) were 50 and 10, respectively.
- ❖ The maximum and minimum possible scores in GSC were 100 and 20, respectively.

### Difference in Mathematics Self-Concept

The main focus of the present investigation was to examine whether or not mathematics difficulties result in less positive MSC relative to the MSC of children without MLD. Also, whether or not the effect of MLD is limited to MSC or extends to other self-concept facets is another focus.

Table 5 shows the number of observations, means and standard deviations of mathematics self-concept score for each group. As could be seen in Table 5, the mean score on the mathematics self-concept subscale for children without MLD (M = 33.35, SD=6.532) was better than the mean mathematics self-concept score for children with MLD (M=27.97, SD=5.916). There was statistically significant difference between children with and without MLD in mathematics self-concept in favor of children without MLD ( $t = -2.74$ ,  $df = 38$ ,  $p < 0.01$ ). The proportion of variance in MSC that was accounted for by the group differences was 17 percent (or  $R^2 = .17$ ).

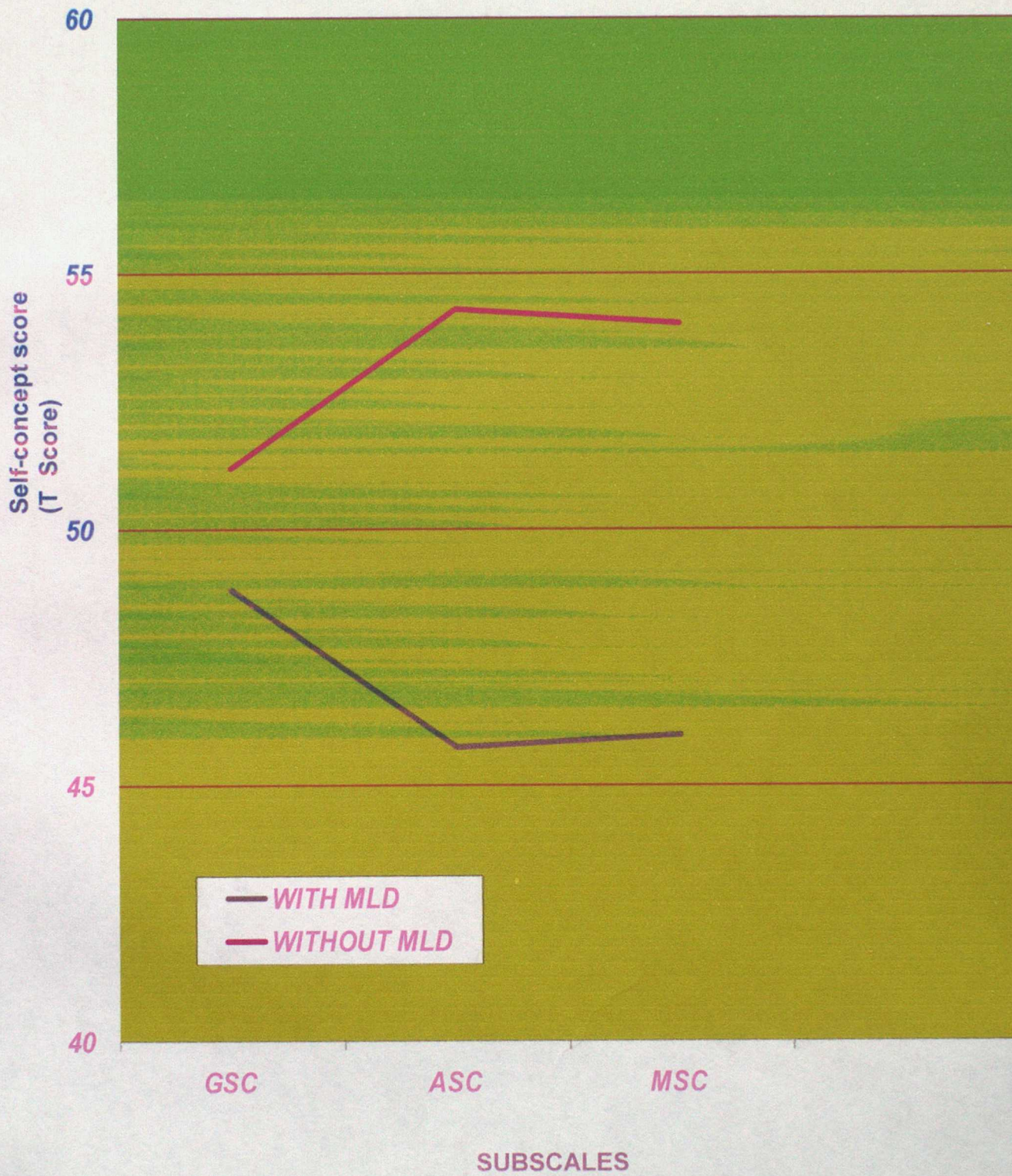
## **Difference in Academic Self-concept**

The other objective of this study was to compare the mean scores of the two groups on the academic self-concept subscale. As can be seen in table 5, mean scores of the groups in academic domain reveal that there was a difference. The mean score of children without MLD (M = 39.7, (SD=4.94) was better than the mean score of children with MLD (M=34.25, SD=6.58). The statistical analysis revealed that there was significant difference between the two groups in favor of the children without MLD ( $t = 2.960$ ,  $df = 38$ ,  $p < 0.01$ ). The proportion of variance in ASC that was accounted for by the group differences was 18 percent (or  $R^2 = .18$ ).

## **Difference in General Self-concept**

The other research question focused on general self-concept of the two groups. As indicated in Table 5, although the general self-concept mean scores of children with MLD (M=72.10, SD=7.95) was slightly lower than that of children without MLD (M=74.00, SD=8.74), the t-test revealed no statistically significant difference between the two groups ( $t = 0.719$ ,  $df = 38$ ,  $p > 0.05$ ,  $R^2 = .01$ ). The group differences in the three self-concept domains are shown in the following graph.

GRAPH 2: SELF-CONCEPT SCORE BY GRPUP AND SUBSCALES



## CHAPTER FOUR

### DISCUSSION

#### 4.1. CLASSIFICATION OF THE CHILDREN IN THE TWO GROUPS

The main concern of this study was to investigate the difference in self-concept between children with and without MLD. In order to find solutions the following basic questions need to be answered. Does the difficulty in mathematics make any difference in children's self-concept? If so, which facet of self-concept is more affected? Does this influence generalize to general Self-worth? To answer these questions, data were obtained using several instruments.

Before directly comparing the mean scores of the groups on each self -concept domain, it would be necessary to evaluate the group differences and similarities in different variables that might confound the results. The data obtained from the participants indicated that the classification was more or less precise. The study attempted to compare the two groups' in terms of gender, age, cognitive abilities and achievement. The only significant difference that was observed between the two groups was in mathematics achievement.

The participants of this study (children with and without MLD) were initially selected from the same grade level. Chi-square analysis was performed to determine whether

the two groups differed in gender proportion. The gender distribution within the two groups was found proportional ( $\chi^2=0.91$ ,  $df = 1$ ,  $p > 0.05$ ).

The mean age of the two groups were similarly examined. Simple observation of the mean age of the two groups indicates that there is a slight difference in the mean age of children with MLD ( $M= 138.75$ ,  $SD=11.0$ ) and of children without MLD ( $M=134.95$ ,  $SD=8.43$ ). Since children with MLD are more likely to be detained than children without MLD in the same class, the mean age of children with MLD is mostly slightly higher than children without MLD (Kistner & Osborne 1987). However, no statistically significant difference was found in the mean age of the two groups [ $t=1.45$ ,  $df = 38$ ,  $p>0.05$ ).

In the literature reviewed earlier, it was indicated that children with MLD have average or above average cognitive ability. The cognitive scores of the two groups were also examined for possible differences. The comparison shows no significance group difference in cognitive ability. Thus, the mean cognitive ability scores of children with MLD [ $M= 93$ ,  $SD=8.436$ ] and children without MLD [ $M=92.65$ ,  $SD= 9.842$ ] were not significantly different ( $t= 0.12$ ,  $df = 38$ ,  $p>0.05$ ). Furthermore, both groups obtained scores which are within average range (85-115) (see technical manual of WJ-III, McGrew & Mather, 2001).

Moreover, differences in level of achievement between the two groups were assessed. The mean score for children without MLD ( $M =87.25$ ,  $SD=9.341$ ) was much higher than

the mean score for children with MLD ( $M= 65.00$ ,  $SD=11.169$ ). The difference was tested using t-test and was found statistically significant ( $t = -6.83$ ,  $df = 38$ ,  $p<.001$ ). The only observed difference between the two groups was therefore in their mathematics achievement. There was a substantial difference between the mathematics achievements of the two groups.

Overall, the significant difference observed between the two groups in mathematics achievement as well as the non-significant difference between the two groups in cognitive ability generally shows the validity of the classification of the participants in the two groups. The significant difference found in achievement but not in cognitive ability is also consistent with several studies (Rothman & Cosden, 1995; Kistner & Osborne, 1987; Kloomok & Cosden, 1994; Simon & Hanrahan, 2004). Once the validity of the classification is established, the main issue is investigating whether or not the two groups would be different in their self-concepts. Results, pertaining to this basic issue are discussed below.

#### **4.2. MATHEMATICS SELF-CONCEPT**

As mentioned earlier children without MLD has significantly better perception of MSC ( $M=33.35$ ,  $SD=6.532$ ) than children with MLD ( $M=27.95$ ,  $SD=5.916$ ). The difference was found statistically significant [ $t = -2.74$ ,  $df = 38$ ,  $p<.01$ ]. The proportion of variance in MSC that was accounted for by the group differences was 17 percent (or  $R^2 = .17$ ). This result provides an answer to the first research question of the present study. Thus,

children with MLD had less favorable mathematics self-concept than children without MLD. The result suggests that poor mathematics achievement is associated with less favorable mathematics self-concept.

The finding is consistent with what Seleshi (2004c) had found using other instruments. Seleshi's findings revealed that children who are high mathematics achievers had better MSC scores than those children with MLD. Also Byrne (1984) supported the findings in stating that academic competence was more highly correlated with specific academic self-concept to which it was more logically related. There was also some theoretical support for the finding. Researchers reported that Children with low achievement are more vulnerable for negative feeling and poor self-concept (Kloomok and Cosden, 1994), confused thinking, avoidance behavior and math phobia (Miller and Mercer, 1997).

Teachers in regular school give more attention for the majority of the students who are usually average students. As a result, they may overlook these children. One possible reason for these children to have negative feeling towards their mathematics ability could be the pressure imposed on them by their teachers and most probably by their parents as well. There is evidence to support that the expectation that parents and teachers have on the students will have impact not only on the children's feelings or attitudes but also on their performance. For example, if the teacher forces a child to finish a task in equal time with the other child who is competent, makes the child feel inferior and hamper him not to attempt similar tasks next time. It is obvious that for children with MLD, teachers should allot sufficient time. According to Jordan and

Montanii (1997), children with MLD performed as well as children without MLD in Untimed condition, in which they are permitted to complete the test without time limit.

### 4.3. ACADEMIC SELF-CONCEPT

The other main concern of this study was to investigate the difference in ASC of children with and without MLD. The findings indicated a significant difference in ASC between children with and without MLD ( $t = 2.960$ ,  $df = 38$ ,  $p < .01$ ). The results were in favor of children without MLD. The proportion of variance in ASC that was accounted for by the group differences was 18 percent (or  $R^2 = .18$ ). The correlation analyses showed that there is a substantial relation between ASC and MSC. ( $r = .439$ ,  $p < .01$ ). Actual performance in school would seem to have a direct bearing on ASC.

Recent and earlier studies are in agreement with concerning the ASC of children with and without MLD. Children without MLD across studies unequivocally reported better ASC than children with MLD. Thus, the finding reported in this study is consistent with numerous studies (Kistner et al 1987; Kistner and Osborne 1987; Hagborg 1996; Chapman 1988; Seleshi 2004b and Elbaum & Vaughn 2003).

We are living in a society in which academic ability is highly valued and sought after by the majority of children and adolescents. Thus aspirations and standards in these domains are typically quite difficult for those who feel inadequate in these realms to discount their importance (Harter, Whitesell & Junkin, 1998). Given that children with

MLD in the present study were attending in regular school with the normally achieving peers, the researcher anticipated that children with MLD would be unlikely to discount the importance of academic ability.

It should be noted, however, that even though children with MLD significantly differ in their MSC and ASC, a comparison between the two mean scores of the domains reveals that children with MLD rated more positively in their ASC than in their MSC. Among the participants in the group of children with MLD, (2 of the 20 children), only 10% rated their ASC negatively. That is, only 10% of the children with MLD obtained scores that are below the mean score for ASC measure. In other words, 90% of the children with MLD have ASC scores that are in the normal range. Thus, although the children with MLD have less favorable ASC when compared with the children without MLD, one may argue that the ASC of the children with MLD is not deficient. Perhaps most of the children in the comparison group have very high scores on the ASC measure above the mean of the measure on their ASC.

#### **4.4. GENERAL SELF-CONCEPT**

A similar attempt was made to investigate the difference in GSC of children with and without MLD. The findings of the present study indicated that there was no statistically significant difference between children with and without MLD in GSC ( $t = 0.719$ ,  $df = 38$ ,  $p = 0.476$ ,  $R^2 = .01$ ). In addition, the correlation analysis showed that MSC and GSC has no significant relationship ( $r = .278$ ,  $p > 0.05$ ). Although children with MLD rated less

favorably their academic and mathematics self-concept than do children without MLD, they are more unlikely to express poor general self-concept.

The result of the present study is in agreement with the findings of many studies (Kistner et al., 1987; Rothman & Cosden, 1995; Hagborg, 1996 and Seleshi, 2004b). These researchers found out that poor general self-concept is not the character of children with learning difficulties. The explanations given to the non-significant difference in GSC between the two groups included (1) children's GSC is influenced by non-academic factors than by academic factors (Elbaum & Vaughn 2003), (2) understanding the strength in other area helps those children to feel better (Kloomok and Cosden, 1994), and (3) the children may generally discount the importance of school success (Hagborg, 1996).

The findings of the present study support that self-concept is multidimensional and GSC can be interpreted as distinct even though it correlates with ASC. As children grow and accumulate failure over time, it is generally believed that self-concept will decline accordingly. However, at the same time, they are more likely to be able not to transfer the negative experience in one self-concept domain to other domains. For example, a poor mark in mathematics is not likely to influence a physical self-concept or social self-concept. Children can compensate the deficit in the area of mathematics by other area of strength, rationalizing "I am poor in math, but I am good in athletics". Supporting the above explanation, Mussen et al., (1984) noted how children sense about their competence in athletic should not have much effect on their sense of competence in mathematics.

It should be noted that there are some other research findings that are not consistent with the present findings (Kistner & Osborne, 1987; Harter, Whitesell & Junkin, 1998; Chapman 1988. Seleshi's (2004c) and Chapman's (1988) studies revealed that there is a difference in general self-concept of children with and without LD. But in farther analysis Seleshi revealed that the observed difference was due to the fact that MSC correlates with ASC and GSC. When the variation in MSC was controlled, there was no significant difference observed in GSC of the two groups. In addition, the review by Chapman (1988) reveals that despite the observed difference, the GSC scores of children with LD was in the average range (rated their GSC positively) and the instrument used by him was unidimensional.

#### **4.5. INDIVIDUAL DIFFERENCES**

In the present study, the examination of scores on the three self-concept subscales of children with MLD reveals that 70% of them reported more negative MSC (below the average on the measure of MSC) 10% of them rated their ASC negatively and none of them scored below the average on GSC measure. The findings that the ASC scores of children with MLD was found within the average range as compared to the mean score of the measure shows that these children are more likely to have less favorable mathematics self-concept only .The observed difference in ASC may be due to the correlation of MSC and ASC.

The development of poor MSC in children with LD is more likely due to continuing failure and the subsequent frustration which might be imposed by teachers and parents. Mostly teachers as well as parents force children to do beyond their ability and learning style. Teachers mistreat children in school without understanding their ability and learning style. Failure to meet the parents and teachers' expectation may cause frustration and poor self-concept. Fear of failure also causes children not to attempt tasks which seem difficult, and they become less motivated in school work. The present study suggests that teachers should understand that learning style and understanding level of all children are not equal. It is equally important to identify and know each child in a classroom, set expectations, and provide assistance accordingly. More specifically teachers should provide classroom environment that foster the individual child to accept his weakness and attempt to improve it. It is also equally important to appreciate their effort rather than magnify their mistakes. Accordingly, Smith (2003) noted that it is essential to provide the necessary treatment using the proper approach and material which fits the particular child, his disorder and severity.

Based on the above interpretation, the results of the present study suggest that identification the child's learning style and understanding level is very critical in minimizing school dropouts and repetition. It was noted that Identifying the child's difficulties ,assessing needs and providing supports as early as possible is essential in order to prevent repetition, dropout, and the development of poor self-concept (MOE,2005).

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Although group differences were observed in MSC and ASC of children with MLD, this less favorable experience in academic ability was not transferred to their perception of self-worth. This finding suggests that children with MLD may be realistic about their academic ability but maintain positive feeling and accept themselves despite their academic difficulties. Kistner and Osborne (1987) suggested that mainstreaming special classes may protect them from developing negative GSC.

From the daily observations and experience held while teaching mathematics for a long time the researcher believes that the most failing subject in schools is mathematics. It is common in schools to fail in mathematics. Gonzalez and Espinel (1999) stated that there was empirical evidence which demonstrated that mathematics difficulties are common in most school children. Morse and Gargen (1970) noted that the presence of another person who is more like one self may be sufficient to boost one's evaluation. They also pointed out that a person chooses bases for comparison not all but only those who provide information valuable in assessing the individual position and planning his behavior and deemed useful.

If the above interpretation is correct, these results have both theoretical and practical implications. Theoretically, the theory of comparison and reference group offers the possibility of providing much needed insight in to the impact on children's self-worth of the increasingly emerging trend toward inclusive education. Practically, it appears the availability of multiple comparison and reference groups may facilitate children with MLD to maintain positive self-worth (or general self-concept).

With frequent failure experiences in mathematics, it would not be a surprise to get a significant difference in MSC between children with and without MLD. But the findings of ASC and MSC scores indicate that children compensate their feelings of inadequacy in one subject area with strengths in other school works. This has been supported by Hagborg 1996, who indicated that self-concept had a compensatory nature.

An additional explanation to this is that these children could protect their GSC without necessarily discounting the importance of academic achievement but by emphasizing other domains. Children with MLD may derive general satisfaction from competence in non-academic domain such as athletics, physical appearance social interaction and may thus have positive GSC as their comparison group (children without MLD). It has been also theorized that ASC of children with LD become disconnected from their overall self-worth and related to their non-academic success (Kloomok & Cosden, 1997) probably extended beyond the school.

Inadequacy in domains deemed unimportant to the self should not adversely affect general self-concept. The value children with MLD give more important may be attributed to other non-academic domains or other subjects than mathematics. The effect is more reflected in ASC than to general self-concept, ASC is more closely related to school work than GSC. Children give values depending upon their experience and their comparison groups (Colemon, 1983).

Satisfactions and feelings of accomplishment in alternative non-academic activities (like sport, music and hobbies) may help compensate for academic failure and prevent the

decline in GSC. Failure and success by itself is more unlikely to affect the GSC. But the meaning an individual gives to his/her success and failure, the society and culture value, and the accumulation of failure/success in different areas affect more the development of self-concept. With increasing life experience, self-concept in specific domain should become more differentiated and more accurately reflecting the child's relative strength and weakness. Harter, Whitesell and Junkin (1998) asserted that self-concept was determined by an individual's achievement within a domain and the relative importance placed on that domain by the individual.

The interpretation may have practical and theoretical consideration. Practically, though the other domain of competence is not under investigation from the obtained result it is possible to imply that strengthening their competence in other areas may help the children to maintain positive self-worth. More specifically, if the child performs competently in other academic or non-academic areas the child may develop better ASC and GSC. Supported by Hagborg (1996:124), "...educators must extend the scope of their interventions beyond academic skill and curriculum assistance to the areas of nonacademic personal domains (e.g., body image, social relations, etc.). Theoretically, the study suggests that it would be better to investigate individual's self-concept in different domains so that it gives possible opportunity to know the domain which is considered important and give remedial support accordingly.

## CHAPTER FIVE

### SUMMARY CONCLUSION AND RECOMMENDATION

#### 5.1. SUMMARY

The main objective of the present study was to investigate differences in self-concept between children with and without MLD. The study was designed to answer the following basic questions:

1. Do children with and without MLD significantly differ in their Mathematics self-concept?
2. Do children with and without MLD differ significantly in their academic self-concept?
3. Is the general self-concept of children without MLD significantly better than children with MLD?

To obtain data, the analyses of which would help to answer the above questions, forty children were selected from Adventist elementary school in Awassa. Finally, using criteria for selection, 20 children (12 females & 8 males) with MLD and a comparison group of 20 children (11 males & 9 females) without MLD were chosen from the student population. Different instruments ,mathematics achievement and cognitive ability test of WJ-III Battery (McGrew, Mather &Wood-Cock, 2001), self-concept sub scales of ASC and GSC of CFSEI-2 (Battle, 1992) and MSC subscale developed and used by Seleshi

(2004c) were administered to collect the necessary data for the study. Statistical Methods (such as t-test, chi square, and Pearson r) were used to analyze the data.

Group differences were assessed, and the results indicated that significant difference were observed between the two groups in mathematics achievement, and non-significant difference between the two groups in cognitive ability, gender and age.

The results in self-concepts domain indicated a statistically significant difference with respect to self-concept domains MSC and ASC of children with and without MLD. However, no significance differences were observed in GSC of these two groups.

## 5.2. CONCLUSION

From the above findings one may infer the following conclusions:

1. There was statistically significant difference observed between children with and without MLD in their mathematics self-concept. Therefore, children without MLD have better perception of their mathematics ability than children with MLD.
2. There was a statistically significant difference observed between children with and without MLD in their academic self-concept. Therefore children without MLD have better perception of their academic ability (school work) than children with MLD. The difficulty children with MLD face had affected

their MSC, and this seems to generalize to the perception in their academic ability.

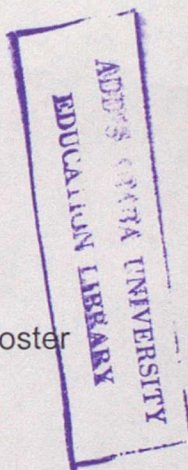
3. There was no statistically significant difference observed between children with and without MLD in their general self-concept. Therefore children without MLD have more or less similar perception in their general self-worth as those children with MLD. The difficulty which they face had affected their MSC and ASC but not transferred to the perception of general self-worth.

### 5.3. RECOMMENDATIONS

Finally, the present findings seem to have practical implications for children with MLD and for further research. These implications are discussed in detail in the preceding chapter (chapter four). In brief, these include the following:

1. As children tend to view their personal worth and adequacy in part by the apparent adequacy of their school performance, effort should be made to deal with both the learning problem and problem of self-concept in a remedial program. Thus, schools should focus not only on the cognitive domain but also on the affective domain when teaching children.
2. Teachers and parents should be aware of the characteristics of children with MLD.
  - Children with MLD can improve their weakness if they get the appropriate support.

- Children have individual differences in their learning style and understanding level.
  - Setting expectations beyond the ability of the child promote the development of poor self-concept.
  - Teachers should appreciate each little effort made by the child without negligence, without comparing him/her with other students.
3. Identifying the individual problem and assessing the need of each child is critical for teachers to support their students, to reduce school dropout and minimize repetition.
- Each child should get his teacher's attention.
  - Each child needs to be identified and get assistance accordingly.
4. Schools and teachers should provide a classroom environment which foster children to exert their maximum potential effort.
- Each child should be free to answer questions in the class room with no frustration.
  - Each child should provide with the necessary teaching materials that can be produced from the available sources.
5. Teachers and parents should help children to maximize their talent even though it is non-academic.



- Appreciate and provide better environment to maximize the child's talent (e.g. athletics, social work and music etc...).
6. The observed non-significant difference in the investigation of GSC domain in the present study call for replication by further research on wider population by including other domains of self-concept and other competence areas which may help to provide better information for the remedial support .
  7. An exploration of the ways how one can build higher self-concept in school subjects and obtain subsequent changes in achievement would appear to be a worthwhile subject for further research.
  8. An exploration of the impact of inclusive education on the self-concepts of children with MLD/LD would appear to be essential for future research.
  9. Educational Administrators should develop a policy which promotes an education system and environment which is open to all learners regardless of their learning difficulties.

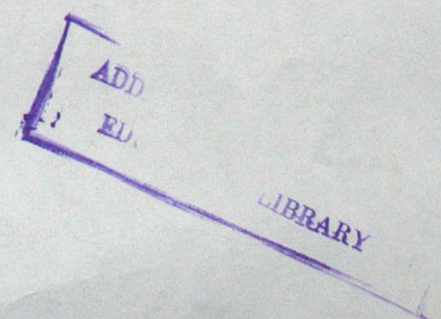
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## APPENDIX

Data obtained from cognitive ,math achievement tests and self-concept subscales

Gender	cognitive	math achievement	age in month	classification	sum of GSC	sum of ASC	sum of MSC
Female	105	83	128	With MLD	60	18	25
Female	89	65	142	With MLD	76	34	19
Female	92	62	127	With MLD	75	33	34
Female	85	60	151	With MLD	64	33	27
Female	90	67	145	With MLD	78	40	20
Female	109	83	124	With MLD	85	39	25
Male	87	53	125	With MLD	68	38	34
Male	98	58	156	With MLD	68	37	24
Male	87	59	146	With MLD	61	33	24
Male	90	62	121	With MLD	60	18	25
Female	102	80	150	With MLD	73	45	28
Male	85	57	137	With MLD	71	35	33
Female	87	64	122	With MLD	80	40	27
Male	95	73	152	With MLD	63	35	26
Male	75	36	150	With MLD	67	34	30
Female	107	56	134	With MLD	86	37	46
Male	94	70	141	With MLD	77	32	32
Female	96	74	139	With MLD	79	40	26
Male	98	73	141	With MLD	76	34	29
Female	89	65	144	With MLD	75	30	25
? Female	121	115	137	Without MLD	73	45	40
Male	97	89	125	Without MLD	72	41	41
Male	91	85	156	Without MLD	87	44	39