# A STUDY OF GIFTED HIGH, MODERATE, AND LOW ACHIEVERS IN THEIR PERSONAL CHARACTERISTICS AND ATTITUDES TOWARD SCHOOL AND TEACHERS

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*This study examines the problem of underachievement among gifted high school students. Low achievers were compared to high and moderate achievers on their motivation, self-regulation, and attitudes toward their school and teachers. Participants were all highly able students from grades 10 and 11 in an academically selective gifted high school in Australia (n=197). Teachers were asked to rank the students into high, moderate, and low achievers in terms of their performance in two subjects English and Mathematics. Participants were asked to respond to two surveys that measured their personality characteristics. The results indicate that math achievement and not language achievement may be used with confidence to classify gifted students; high achiever had higher mean scores than moderate and low achievers on all study variables; intrinsic motivation then extrinsic motivation had the highest correlation with math achievement and can be used to differentiate males and females performance.*

Gifted underachievement has been a focus of research for over 35 years, with many researchers pointing to the tremendous waste of human potential, socially as well as personally, that it represents (Emerick, 1992). Statistics have shown that as many as 50% of gifted students underachieve (Heacox, 1991; Hoffman, Wasson, & Christianson, 1985). Personality factors have been considered one of the significant factors that lead gifted students to underachieve (Reis & McCoach, 2000). Research has shown, for example, that motivation and self-regulation are important characteristics in differentiating gifted high achievers from low achievers (Ablard & Lipschultz, 1998; Albaili, 2003; Lau & Chan, 2001b; McCoach & Siegle, 2003a).

Defining intelligence and giftedness are considered a challenge for many psychologists and researchers. Through the literature there are many definitions of giftedness. In fact, the definition of giftedness varies from one country to another and even from one state to another (Reis & McCoach, 2000). One recent definition that has influenced the literature on giftedness is the Differentiated Model of Giftedness and Talent by Gagné (1995).

Gagné (1995) proposed a set of aptitudes or gifts which the child develops into talents through interaction with a range of intrapersonal and environmental catalysts. In the intrapersonal catalysts, motivation plays a crucial role in initiating, guiding and sustaining the process of talent development. In the environmental catalysts, school environment and teachers play an integral role in recognizing and developing giftedness. Gagné (1995) describes giftedness as the possession and use of untrained and spontaneously expressed superior natural abilities or aptitudes at levels significantly above average in one or more of the following domains of human ability: intellectual, creative, social and physical. Gagné (1995) suggested that at least 10% of the population could be considered gifted in the intellectual domain. In contrast, talent is linked to being above average in one or more areas of the following domains of human performance: arts in all forms, business and commerce, caring services, communications, media, science, technology and sport (Gagné, 1995). This definition provides a key to understanding underachievement, suggesting that gifts that do not develop into talents represent underachievement.

Most researchers agreed that underachievement was related to a discrepancy between expected and actual performance (Clark, 1992; Davis & Rimm, 1998, Dowdall & Colangelo, 1982; Emerick, 1992; Lau & Chan, 2001a; McCoach & Siegle, 2003a; Reis & McCoach, 2000; Rimm, 1995, 1997; Seely, 1993; Supplee, 1990; Stoeger & Ziegler, 2005; Whitmore, 1980). The problem in operationalizing this definition of underachievement is related to the complexity of measuring both ability and performance, along with the discrepancy between them (McCall, Beach, & Lau, 2000; Peters, Grager- Loidl, & Supplee, 2000).

In the literature, a number of contributing factors to gifted underachievement have been identified. Researchers attribute underachievement to a combination of several factors that come together and cause students to underachieve (Baker, Bridger, & Evans, 1998; Clark, 1992; Davis & Rimm, 1998; Emerick, 1992; Pendarvis, Howley, & Howley, 1990; Peters et al., 2000; Seely, 1993). Therefore, the causes of underachievement can be organized as follows: first, researchers have suggested that underachievement might be related to school factors (Baker et al., 1998; Davis & Rimm, 1998; Emerick, 1992; Matthews & McBee, 2007; McCoach & Siegle, 2003a; Rimm, 1997; Seely, 1993; Whitmore, 1980). Second, other researchers argued that underachievement might be related to family factors (Baker, et al., 1998; Clark, 1992; Reis & McCoach, 2000; Rimm, 1997). Third, other groups of researchers indicated that underachievement might be related to more serious physical, cognitive, or emotional issues such as learning disabilities, attention deficits, emotional disturbances, psychological disorders, or other health impairments (Dowdall & Colangelo, 1982; Pendarvis, et al., 1990; Reis & McCoach, 2000). Fourth, underachievement might be related to peer influence (Reis & McCoach, 2000; Peters et al., 2000). Finally, underachievement might be related the personality characteristic of gifted students such as low motivation, low self-regulation, and low self-efficacy (McCoach & Siegle, 2003a; Peterson & Colangelo, 1996; Reis & McCoach, 2000). Indeed, personality factors like motivation and self-regulation were considered important variables in gifted achievement for two reasons. First, these variables were emphasized in the definitions of giftedness such as in Renzulli's (1978) and Sternberg's (1997) definitions. Second, the literature has shown the importance of these variables in differentiating gifted underachievers from achievers (McCoach & Siegle, 2003a).

This study seeks to investigate differences among high achieving, moderate achieving, and low achieving high school students in terms of motivation, self-regulation and attitudes of gifted students toward school and teachers. This study was intended to examine the problem of underachievement among gifted high school students. Low achievers were compared to high and moderate achievers on their personality characteristics. Participants were all highly able students from grades 10 and 11 in an academically selective high school in Australia. Participants were chosen from these grades since research has shown that students' motivation, interest in subject area, and achievement decreased in high school (Eccles & Midgely, 1989; Gottfried, Marcoulides, Oliver & Guerin, 2007).

*Significance of the Study*

Although numerous studies have investigated personality factors such as motivation and self-regulation using a comparison design, most of these studies compared gifted achievers and underachievers (McCoach & Siegle, 2003a), or compared gifted students and non-gifted students (Davis & Connell, 1985; Ford, 1995). In contrast, little research has compared three levels of gifted achievers. Also, most of these studies either focused on one variable such as motivation (Valhovick-Stetic, Vidovic, & Arambasic, 1999), self-regulatory strategies ( Muir-Broaddus, 1995; Ruban & Reis, 2006), or goal orientations (Dai, 2000; Mattern, 2005) or combined two variables such as motivation and self-regulation (Lau & Chan, 2001b; Yumusak, Sungur, & Cakiroglu, 2007) or self-regulation and goals (Ablard & Lipschultz, 1998; Albaili,1998). By contrast, little research has compared high achievers, moderate achievers, and low achievers combining motivation, self-regulation, and attitudes toward school and teachers then explore how these variables are related to gifted students' achievement.

The present study will be an important study in the literature on gifted students' education for several reasons. First, it represents an important step toward identifying the differences among high, moderate, and low achievers on motivation, self-regulation, and attitudes toward the school and teachers. Second, the outcomes of this study may help educators to create programs that meet the needs of gifted students. Also, investigating motivation and self-regulation together will help to understand more clearly the picture of gifted students' achievement since all these variables are related and may combine in explaining gifted students' achievement (Pintrich & De Groot, 1990; Pintrich, Roeser, & De Groot, 1994). Finally, investigating the feeling of belonging to school and the relationship between teachers and

students based on the students' attitudes will help these schools to work on these issues that affect students' achievement.

*Purpose of the Study*

The main purpose of this study was to investigate the differences among tenth and eleventh grade high achieving, moderate achieving, and low achieving gifted students in terms of motivation, self-regulation, and their attitudes toward school and teachers. This study addressed the following questions:

Q1: *To what extent do high achievers, moderate achievers, and low achievers differ in their motivation, self-regulation, and attitudes toward school and teachers?*

Q2: *What are the relationships among math achievement, language achievement, motivation, self-regulation, and attitudes toward school and teachers?*

Q3: *Which set of the personal characteristics factors best predicts students' achievement?*

Q4: *To what extent there will be mean differences between males and females in the variables measured in this study?*

**Method**

Two standardized tests were used to assess students' motivation, self-regulation, and attitudes toward their school and teachers. The explanatory variables are achievement in terms of English and Mathematics in Australia and gender. The responses variables are motivation, self-regulation, and attitudes toward their school and teachers.

*Participants*

The sample was drawn from a selective high school in regional New South Wales (NSW). Selective high schools in NSW have specific criteria for entry. Entry into these schools is determined by the student's results in the Selective High Schools Test in English (including reading and writing), Mathematics, and general ability, together with their primary school's assessment of their performance in English and Mathematics. The curriculum at the school has been described as a broad, sound and balanced curriculum. The development of the curriculum model was based upon the desire to allow students to progress at their own rate through a course of study rather than being locked into a specific year group throughout their secondary education.

The sample of the study consisted of 197 gifted high school students from grades 10 and 11 in an academically selective high school. These students enrolled in the second semester of 2007/2008. There were 94 participants from grade 11 and 103 participants from grade 10. Regarding their age, there were 92 participants who were 16 years old, 73 who were 15 years old, 31 participants who were 17 years old and 1 participant who was 14 years old. The mean age of the participants was 15.78. English and Mathematics teachers were asked to rank the participants into high, moderate and low achievers. They were told to consider the top 5% of the class as high achievers and the low 5% of the class as low achievers. In fact, if it is asked who is the best who can evaluate students 'achievement? The answer will be teachers particularly the one who are teaching them. Accordingly, five teachers were involved in the study two of them were math teachers and the other two were English teachers in addition to the contact teacher. To insure that teachers' ranking was not biased students were asked to rank themselves into three levels of achievers in terms of their achievement in Math and English. The results show that students' ranking was highly correlated to the teachers' ranking. In terms of their achievement in English, there were 39 low achievers, 87 moderate achievers, and 71 high achievers. In terms of their achievement in Mathematics there were 41 low achievers, 88 moderate achievers, and 68 high achievers. Overall, there were 101 males and 96 females.

*Measures*

In this study, two instruments were used to assess students' motivation, self-regulation, and their attitudes toward school and teachers. First, intrinsic motivation, extrinsic motivation, and participants' learning strategies were measured using the Motivated Strategies for Learning Questionnaire (MSLQ-R: Pintrich, Smith, Garcia & Mckeachie, 1991). Second, participants' attitudes and preferences toward school and teachers were measured using the School Attitude Assessment Survey-R (SAAS-R: McCoach & Siegle, 2003b). Brief descriptions of the measures are followed:

*The Motivated Strategies for Learning Questionnaire (MSLQ-R)***.** The MSLQ is a self-report instrument designed to assess students' motivational orientations and their use of different learning strategies (Pintrich, Smith, Garcia, & Mckeachie, 1993). The MSLQ consists of two main scales: the Motivation scale and the Self-Regulation scale. The instrument utilizes a 7-point Likert scale ranging from 'not at all

true of me' to 'very true of me'. The Motivational scale proposes three general motivational constructs: expectancy, value, and affect (Pintrich et al, 1993). For the purpose of this study, the self regulation skills of rehearsal, organization, elaboration, critical thinking, and meta-cognition were measured. In addition, self regulation average was obtained by calculating the sum of self regulation skills and then dividing by the number of the skills, in this case five. Motivation average was calculated by adding the intrinsic motivation to the extrinsic motivation then divide them by two. Research showed the coefficient alphas for all the scales demonstrate good internal consistency that varied from (.90) to (.54) (Pintrich et al., 1991; Pintrich et al., 1993; Yumusak, et al., 2007).

*The School Attitude Assessment Survey (SAAS-R).* The SAAS-R contains 43 items designed to measure students' attitudes toward school and teachers, motivation, self-regulation, goal valuation, and academic self-perception. The instrument utilizes a 7-point Likert-scale. It ranges from strongly disagree to strongly agree. In this study only attitudes toward teachers and attitudes toward school scales were used. Attitudes average was calculated by adding the school attitude to the teachers' attitude then divide them by two. The attitudes toward school and teacher factors measure students' self-reported satisfaction with their school environments by measuring the intensity of their positive or negative affect for or against school and objects associated with school (McCoach & Siegle, 2003b).

Researchers (McCoach & Siegle, 2003b; McCoach, 2002; Suldo, Shaffer, & Shaunessy, 2008) provided evidence of the construct validity and reliability of the instrument. It was 0.85 for the 4-item attitude toward teachers subscale and 0.92 for attitude toward school subscale (McCoach & Siegle, 2003b). Most importantly, this instrument was able to differentiate between gifted achievers and underachievers. Finally, Table 1 presents a summary of all the above mentioned variables in order.

*Procedures of Data Collection*

Prior to the implementation of the study, the researchers obtained permission from a number of different parties for conducting the study. Permission was sought from NSW Department of Education, from the participating school's principals and participants' approval. English and Mathematics teachers in Australia were asked to rank the students into high, moderate, and low achievers in terms of their performance in class. The contact teachers in the selective school facilitated the distribution and collection of the informed consent forms with the students' parents or guardians. Students' participation was voluntary and parental consents were provided. The Questionnaires were completed under the supervision of the first author and teachers in the school during one regular class periods. Standardized instructions were read aloud to students and they could ask questions. Students were reassured that all the collected data would be confidential and used for research only. The whole procedure took about 40 minutes. The participants completed the questionnaires at the beginning of the second semester in July of 2007.

*Procedures of Data Analysis*

Data was entered into the Statistical Package for the Social Sciences (SPSS Inc., Chicago IL, 2008). The first step in the data analysis strategy was to compute descriptive statistics for all questions. The second step was conducting the reliability analysis of all the scales used in this study. Third, we conducted a series of one-way independent analysis of variance (ANOVA) tests to compare the means of the three levels of gifted achievers on each of the three scales and their sub skills (12 factors). Then, Pearson moment correlations were conducted to determine the relationship among the study variables. Next, hierarchical regression analyses were used to determine the best predictive model for students' achievement. Finally, several independent *t* tests were performed to examine the mean differences between males and females in the variables measured in this study.

**Results**

Overall, all the scales used in this study were reliable. Table 1 shows the internal consistency estimates of reliability for the scales and subscales used in this study. Generally speaking, the scales used in this study showed moderate to high internal consistency, as indicated by Cronbach's coefficient alpha. The highest Alpha was recorded in the School Attitude Assessment Survey particularly in the Students' Attitudes toward School subscale, which was .94. Similarly, the Students' Attitudes toward Teachers subscale was also high (.91). Finally, all the scales in the Motivated Strategy for Learning Questionnaire showed high internal consistency which ranged from .81 to .72. The highest alpha was recorded in the Extrinsic Motivation subscale (.81) and the lowest alpha was recorded in the Rehearsal subscale (.72).

Several analyses explored the differences among gifted high, moderate, and low achievers on motivation, self-regulation, and attitudes toward school and teachers. First, to assure that there were no violations of assumptions in ANOVA tests, a set of statistical tests were administered. No violations of normality and homogeneity of variance were detected. Then, we conducted a series of ANOVA tests to compare the means of gifted achievers with the three levels on each of the three scales and their sub skills (12 factors). The ANOVA tests of all related factors to the math achievement indicated that high achievers, moderate achievers, and low achievers exhibited statistically significantly different scale scores on each of the 12 factors ($p<.001$). In every case, high

**Table 1. Reliability of the School Attitude Assessment Survey and the Motivated Strategies for Learning Questionnaire**

| **The school Attitude Assessment Survey** | **Cronbach's Alpha** | **Number of Items** |
|---|---|---|
| 1. Students' attitudes toward school | .942 | 7 |
| 2. Students' attitudes toward teachers | .905 | 8 |
| **The Motivated Strategies for Learning Questionnaire** | **Cronbach's Alpha** | **Number of Items** |
| 1. Intrinsic Motivation | .764 | 4 |
| 2. Extrinsic Motivation | .814 | 4 |
| 3. Rehearsal | .719 | 4 |
| 4. Elaboration | .780 | 6 |
| 5. Organization | .789 | 4 |
| 6. Critical Thinking | .781 | 5 |
| 7. Meta-cognition | .767 | 12 |

achievers had higher mean scores than moderate and low achievers. For example, high and moderate achievers were more positive in their attitudes toward school and teachers than low achievers. Furthermore, the mean differences of all achievers on all factors exhibited medium to large effect sizes. Table 2 depicts the results of the ANOVA tests, including effect sizes for each of the factors.

On the other hand, the ANOVA tests of all related factors to the language achievement indicated that high achievers, moderate achievers, and low achievers exhibited very comparable performance. The differences observed on the 12 factors among the three groups were not statistically significant ($p >.01$).Table 3 reports the results of this analysis.

Pearson correlations among the study variables were presented in Table 4. In general, all study variables had significant correlations but language achievement. The correlation matrix is extremely useful for getting a rough idea of the relationships between predictors and the outcome. The results indicate that motivation variables correlate best with the outcome (math achievement) and so it is likely that these variables will predict math achievement in the regression analyses.

Next, several hierarchical regression analyses were performed to find out the best predicted model of math achievement using the personal characteristics factors and attitudes. Assumptions were tested by examining normal probability plots of residuals and a scatter diagram of residual versus predicted residual. No violations of normality, linearity, or homoscedasticity of residuals were detected. In addition, box plots revealed no evidence of outliers. Intrinsic motivation was entered in the first block. Motivation average, self regulation average, and attitudes average were entered in the second block. Regression analyses revealed that just using intrinsic motivation was good enough to predict math achievement and the motivation average, self regulation average, and attitudes average did not add a

significant contribution to this model. $R^2$ = .24 for Step 1, and R square change = .01 for Step 2. Table 5 reports the results of this analysis.

**Table 2. ANOVA Tests on Each of the 12 Factors According to Math Achievement**

| Factors | High Achievers (n=68) | | Moderate Achievers (n=88) | | Low Achievers (n=41) | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | *M* | *SD* | *M* | *SD* | *M* | *SD* | *F* | *P* | *r* |
| MOTIVATION | 5.26 | .92 | 4.86 | .94 | 3.56 | 1.32 | 32.25 | <.001 | .52 |
| Intrinsic Motivation | 5.01 | 1.01 | 4.37 | 1.06 | 3.29 | 1.21 | 26.64 | <.001 | .50 |
| Extrinsic Motivation | 5.52 | 1.12 | 5.36 | 1.17 | 3.95 | 1.65 | 20.71 | <.001 | .43 |
| SELF REGULATION | 4.26 | .86 | 3.92 | .85 | 3.29 | 1.04 | 13.00 | <.001 | .37 |
| Rehearsal | 4.08 | 1.13 | 3.92 | 1.14 | 3.13 | 1.46 | 7.46 | <.001 | .28 |
| Elaboration | 4.32 | 1.03 | 3.85 | 1.11 | 3.42 | 1.09 | 8.24 | <.001 | .29 |
| Organization | 4.32 | 1.23 | 4.03 | 1.19 | 3.15 | 1.49 | 10.25 | <.001 | .32 |
| Critical Thinking | 4.14 | 1.11 | 3.82 | 1.03 | 3.30 | 1.14 | 6.97 | <.001 | .27 |
| Meta-cognition | 4.25 | .80 | 3.98 | .79 | 3.41 | .94 | 12.37 | <.001 | .35 |
| ATTITUDES | 5.58 | .82 | 5.32 | 1.07 | 4.95 | 1.00 | 4.84 | <.001 | .23 |
| School Attitudes | 5.80 | .87 | 5.64 | 1.25 | 5.15 | 1.26 | 4.08 | <.001 | .21 |
| Teacher Attitudes | 5.36 | .89 | 5.02 | 1.00 | 4.76 | .97 | 4.66 | <.001 | .22 |

*Note.* M=Mean, SD=Standard Deviation, F=Observed F Value, p= Significance Level, *r*=Effect Size.

**Table 3. ANOVA Tests on Each of the 12 Factors According to Language Achievement**

| Factors | High Achievers (n=71) | | Moderate Achievers (n=87) | | Low Achievers (n=39) | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | *M* | *SD* | *M* | *SD* | *M* | *SD* | *F* | *P* | *r* |
| MOTIVATION | 4.73 | 1.21 | 4.81 | 1.18 | 4.34 | 1.16 | 1.13 | .32 | .10 |
| Intrinsic Motivation | 4.34 | 1.27 | 4.41 | 1.31 | 3.95 | 1.05 | 1.01 | .36 | .10 |
| Extrinsic Motivation | 5.12 | 1.43 | 5.24 | 1.27 | 4.75 | 1.54 | .94 | .39 | .09 |
| SELF REGULATION | 3.98 | 1.01 | 3.92 | .92 | 3.45 | 1.04 | 2.37 | .09 | .15 |
| Rehearsal | 3.92 | 1.34 | 3.72 | 1.18 | 3.50 | 1.45 | 1.12 | .32 | .10 |
| Elaboration | 3.92 | 1.24 | 4.05 | 1.06 | 3.50 | 1.21 | 1.65 | .19 | .13 |
| Organization | 4.14 | 1.46 | 3.81 | 1.22 | 3.34 | 1.37 | 3.27 | .04 | .18 |
| Critical Thinking | 3.77 | 1.12 | 4.04 | 1.11 | 3.46 | .99 | 2.38 | .09 | .15 |
| Meta-cognition | 3.99 | .87 | 3.98 | .82 | 3.45 | 1.00 | 3.22 | .04 | .18 |
| ATTITUDES | 5.39 | 1.01 | 5.40 | 1.01 | 4.76 | 1.04 | 3.36 | .03 | .20 |
| School Attitudes | 5.64 | 1.16 | 5.60 | 1.21 | 5.05 | 1.27 | 1.99 | .13 | .18 |
| Teacher Attitudes | 5.15 | 1.01 | 5.40 | 1.01 | 4.47 | .97 | 4.26 | .02 | .14 |

*Note.* M=Mean, SD=Standard Deviation, F=Observed F Value, p= Significance Level, *r*=Effect Size.

Independent *t*-tests were conducted to examine the mean differences between males and females in the variables measured in this study (see Table 6). All assumptions of performing independent *t*-tests were examined. No violations of normality and homogeneity of variance were detected. On average, females scored lower than males in all study variables but organizational skills. However, significant differences between the two groups were just detected for motivation average, intrinsic motivation, extrinsic motivation, and critical thinking.

**Discussion**

The purposes of this study were to: (a) to investigate the differences among high achieving, moderate achieving, and low achieving gifted students in terms of motivation, self-regulation, and their attitudes toward school and teachers; (b) explore the relationships among all study variables; (c) find out the best model for predicting students' achievement; and (d) examine the mean differences between males and females in the variables measured in this study.

**Table 4. Correlation Matrix for All Study Variables**

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1-Math Achievement | 1.00 | | | | | | | | | | | | | |
| 2-Language Achievement | .30** | 1.00 | | | | | | | | | | | | |
| 3-MOTIVATION | .49** | .05 | 1.00 | | | | | | | | | | | |
| 4-Intrinsic Motivation | .49** | .05 | .88* | 1.00 | | | | | | | | | | |
| 5-Extrinsic Motivation | .38** | .03 | .90** | .61** | 1.00 | | | | | | | | | |
| 6-SELF REGULATION | .36** | .13 | .64** | .65** | .50** | 1.00 | | | | | | | | |
| 7-Rehearsal | .25** | .10 | .52** | .52** | .41** | .85** | 1.00 | | | | | | | |
| 8-Elaboration | .29** | .05 | .54** | .54** | .44** | .88** | .62** | 1.00 | | | | | | |
| 9-Organization | .30** | .18* | .51** | .52** | .41** | .85** | .71** | .70** | 1.00 | | | | | |
| 10-Critical Thinking | .27** | .00 | .51** | .55** | .38** | .72** | .48** | .60** | .38** | 1.00 | | | | |
| 11-Meta-Cognition | .34** | .13 | .57** | .58** | .46** | .88** | .69** | .75** | .71** | .62** | 1.00 | | | |
| 12-ATTITUDES | .23** | .13 | .38** | .36** | .31** | .39** | .33** | .37** | .33** | .25** | .30** | 1.00 | | |
| 13-School Attitudes | .20** | .11 | .39** | .31** | .25** | .33** | .31** | .29** | .27** | .19** | .23** | .93** | 1.00 | |
| 14-Teacher Attitudes | .22** | .13 | .31** | .36** | .33** | .40** | .30** | .39** | .34** | .28** | .34** | .91** | .71** | 1.00 |

*Note.* $^{**}p < .001$

The results indicated that math achievement may be used with confidence to classify gifted students to high achievers, moderate achievers, and low achievers. Furthermore, high achiever had higher mean scores than moderate and low achievers on all study variables. Contradictory results were found for language achievement. High achievers, moderate achievers, and low achievers gifted students exhibited very comparable performance. The differences observed on the 12 factors among the three groups were not statistically significant when using language achievement to classify them. These results can be explained by the fact that participants were selected from a school acclaimed for academic achievement. This indicates that Mathematics is highly appreciated in the school. In addition, high achievers are more likely to be involved in external competition such as Mathematics Olympiad. Furthermore, teachers in the school indicated that school's policy is to give a great focus to math achievement more than language achievement. Some teachers stated that *Mathematics is highly appreciated in the school*. Regarding the attitudes' results, it seems that high and moderate achievers were more positive in their attitudes toward

school and teachers than low achievers. This finding is consistent with the literature (Baslanti & McCoach, 2006; McCoach & Siegle, 2003a).

Next, all study variables had significant correlations with each one but language achievement. Language Achievement had very weak correlations with other variables. This could be attributed to the discussion above. On the other hand, intrinsic motivation then extrinsic motivation had the highest correlation with math achievement. Then, the hierarchical regression analyses revealed that just using intrinsic motivation was good enough to predict math achievement. Moreover, significant differences between females and males were detected for motivation average, intrinsic motivation, and extrinsic motivation. The fact that higher levels of intrinsic and extrinsic motivation were related to high achievers was consistent with the literature and suggested that intrinsic and extrinsic motivation contribute to the academic success of gifted secondary students (Philips & Lindsay, 2006; Street, 2001). Further, this study illustrates that intrinsic and extrinsic motivation could coexist to promote gifted students' achievement in a selective school environment. This indicates that intrinsic motivation and extrinsic motivation are not mutually exclusive; they are not necessarily in conflict. This suggests that school should consider both types of motivation when teaching gifted students. Students use both types of motivation to boost their achievement. It is possible to say that teachers make learning more interesting and enjoyable by encouraging extrinsically motivated students through rewarding them and recognizing their achievement. Therefore, this encourages all students whether they are extrinsically motivated or intrinsically motivated to become more involve in learning environment.

**Table 5. Results of the Hierarchical Regression Analyses**

| Predictor Variables | Zero-order r | B | SEB | β |
|---|---|---|---|---|
| Step 1 | | -.16 | .19 | |
| Constant | | | | |
| Intrinsic Motivation | .49 | .29 | .04 | .49 |
| | | | | |
| Step 2 | | -.46 | .31 | |
| Constant | | | | |
| Intrinsic Motivation | .49 | .15 | .09 | .25 |
| MOTIVATION AVERAGE | .48 | .13 | .09 | .21 |
| SELF REGULATION AVERAGE | .36 | .04 | .07 | .06 |
| ATTITUDES AVERAGE | .24 | .01 | .05 | .02 |

*Note*. n = 197. Zero-order r = The ordinary correlations coefficient, B = The un-standardized regression coefficients, SEB = The standard error of B, β = The standardized regression coefficients, $R^2$ = .24 for Step 1 and $\Delta R^2$ (R square change) = .01 for Step 2.

Finally, females scored lower than males in all study variables but organizational skills. Findings in this study were incongruent with the literature. The literature suggested that females would score higher than males in motivation (Tallent-Runnels, Olivárez, Walsh, & Irons, 1994). Also, the literature suggested that gifted girls would use more self-regulatory strategies than gifted boys (Ablard & Lipschultz, 1998; Wolters & Pintrich, 1998; Zimmerman & Martinez-Pons, 1990). Classifying the students based on math achievement may explain these results. In general, males tend to do better in math than females. In addition, it seems that male students in high school focus more on self regulation skills and have higher motivation in school. However, it is expected that females will be more organized than males and then use more organizational skills.

*Implications and Future Research*

The findings in this study indicate a number of theoretical and practical implications. Low achievers in this study reported low levels of intrinsic motivation, extrinsic motivation, self-regulatory strategies, and negative attitudes toward the school and teachers. Therefore, school educators and psychologists are urged to consider different ways to enhance the learning environment based on these variables to establish an adaptive behavior. Also the results indicate that intrinsic motivation is important in the use of self-regulatory strategies. Most importantly, teachers need to consider both motivation and cognition simultaneously and not simply focus on motivating the students without considering the cognitive consequences of motivational enhancement. Therefore, intervention programs must be targeted to increase low achievers' knowledge of self-regulatory strategies.

Also, teachers' instructional strategies should promote awareness of their affective orientations in learning, how to implement the instructional strategies that develop quality social environment in the class to reduce the negative attitudes toward the school. Teachers and counselors should explore ways to measure factors that may contribute to low motivation, self-regulation among gifted students. Similarly, teachers should evaluate different approaches used in teaching and how a particular approach might affect students' motivation and self-regulation. In terms of research, this study should be validated with other participants from same age and across multiple grades. In addition, future research needs to investigate the role of gender in terms of all study variables. Future studies should replicate this research with larger samples across different cultures.

**Table 6. Differences between Females and Males in Motivation, Self-Regulation, and Attitudes**

| Variables | Gender | N | M | SD | p | d |
|---|---|---|---|---|---|---|
| MOTIVATION AVERAGE | Female | 96 | 4.40 | 1.34 | .000 | .52 |
| | Male | 101 | 5.02 | .95 | | |
| | Total | 197 | 4.72 | 1.19 | | |
| Intrinsic Motivation | Female | 96 | 3.98 | 1.36 | .000 | .54 |
| | Male | 101 | 4.67 | 1.06 | | |
| | Total | 197 | 4.33 | 1.26 | | |
| Extrinsic Motivation | Female | 96 | 4.86 | 1.59 | .009 | .37 |
| | Male | 101 | 5.38 | 1.11 | | |
| | Total | 197 | 5.13 | 1.39 | | |
| SELF REGULATION AVERAGE | Female | 96 | 3.82 | 1.06 | .278 | .16 |
| | Male | 101 | 3.98 | .91 | | |
| | Total | 197 | 3.90 | .99 | | |
| Rehearsal | Female | 96 | 3.79 | 1.39 | .865 | .02 |
| | Male | 101 | 3.82 | 1.21 | | |
| | Total | 197 | 3.81 | 1.30 | | |
| Elaboration | Female | 96 | 3.76 | 1.25 | .070 | .27 |
| | Male | 101 | 4.08 | 1.09 | | |
| | Total | 197 | 3.93 | 1.18 | | |
| Organization | Female | 96 | 4.09 | 1.50 | .155 | .20 |
| | Male | 101 | 3.81 | 1.26 | | |
| | Total | 197 | 3.94 | 1.39 | | |
| Critical Thinking | Female | 96 | 3.50 | 1.09 | .000 | .58 |
| | Male | 101 | 4.15 | 1.05 | | |
| | Total | 197 | 3.84 | 1.11 | | |
| Meta-cognition | Female | 96 | 3.83 | .93 | .112 | .22 |
| | Male | 101 | 4.03 | .81 | | |
| | Total | 197 | 3.93 | .88 | | |
| ATTITUDE AVERAGE | Female | 96 | 5.23 | 1.12 | .177 | .19 |
| | Male | 101 | 5.43 | .93 | | |
| | Total | 197 | 5.33 | 1.03 | | |
| School Attitudes | Female | 96 | 5.45 | 1.36 | .184 | .19 |
| | Male | 101 | 5.68 | 1.02 | | |
| | Total | 197 | 5.57 | 1.20 | | |
| Teacher Attitudes | Female | 96 | 5.23 | 1.12 | .259 | .19 |
| | Male | 101 | 5.43 | .93 | | |
| | Total | 197 | 5.10 | 1.01 | | |

*Note*. M=Mean, SD=Standard Deviation, p= Significance Level, d= Effect Size according to Cohen's formula

**Limitations**

The results of this study must be interpreted cautiously in the light of the limitations. First, students' abilities were not classified based on intelligence score. In this study, we used the teachers subjective judgment to classify them. Second, this study focused on investigating personality characteristics of gifted students among three levels of achievers. Evidence related to students' learning disability, emotional or psychological problems were not included, even though, literature has shown that underachievement might be related to these factors (Dowdall & Colangelo, 1982; Pendarvis, et al., 1990; Reis & McCoach, 2000). Similarly, other information related to socioeconomic backgrounds was not included and it is possible that socioeconomic background might affect the results. Additional limitation related to the small sample size. Therefore, generalization must be taken cautiously.

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