

Social and Emotional Adjustment of Adolescents Extremely Talented in Verbal or Mathematical Reasoning

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Perceptions of self-esteem, locus of control, popularity, depression (or unhappiness), and discipline problems as indices of social and emotional adjustment were investigated in highly verbally or mathematically talented adolescents. Compared to a group of students who are much less gifted, the highly gifted students perceive themselves as less popular, but no differences were found in self-esteem, depression, or the incidence of discipline problems. The gifted students reported greater internal locus of control. Comparisons between the highly mathematically talented students and the highly verbally talented students suggested that the students in the latter group perceive themselves as less popular. Within both the gifted and comparison groups, there were also slight indications that higher verbal ability may be related to some social and emotional problems.

INTRODUCTION

The issue of whether gifted individuals have a greater degree of social and emotional maladjustment than those with average ability has been a con-

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cern for many years. The stereotype of the gifted child as socially immature and emotionally maladjusted was fostered in the early part of this century by the writings of Lombroso (1895) and Nisbet (1895), who linked genius with insanity, as well as by case studies of gifted individuals who showed evidence of emotional problems (e.g., Witty and Lehman, 1929).

This myth was refuted by Terman (1925) in his monumental study of 1,528 gifted children with IQs of at least 135. He found that his sample of gifted children tended to be superior to the general population in social and emotional adjustment. In a follow-up study of these subjects into adulthood, Terman's group showed less emotional instability, personal maladjustment, insanity, or delinquency than was evident in the general population, although of course some individual cases of emotional problems were found (Terman and Oden, 1947).

More recent studies of gifted children have also shown the gifted, as a group, to have a high level of personal and social maturity, and no unusual incidences of emotional problems and maladjustment (Haier and Denham, 1976; Hogan *et al.*, 1977; Kennedy, 1962; Lehman and Erdwins, 1981; Lessinger and Martinson, 1961; Pollins, 1983; Warren and Heist, 1960; Weiss *et al.*, 1974). Concern about a high rate of suicides among the gifted has been raised (e.g., Lajoie and Shore, 1981), but the degree to which this is a problem, as well as its relationship to giftedness, remains unclear.

It has been suggested, however, that students scoring in the highest ranges of intelligence may experience greater adjustment difficulties than less gifted individuals (Hollingworth, 1929, 1942). A subsample of the Terman subjects who had scored 170 or above on the Stanford-Binet intelligence test was found to have considerably more difficulty making social adjustments than less able members of the gifted group (Burks *et al.*, 1930). Hollingworth (1929, 1942) studied children who had scored over 180 on the Stanford-Binet, and she found evidence of difficulty in school and social adjustments. She suggested that a student leader is likely to be intelligent but not too intelligent. Moreover, a child with an IQ greater than 160 was seen as having only a small chance of being a popular leader, unless the child was placed in an environment where the mean IQ is well above average (Hollingworth, 1929). Others have also noted reduced popularity with peers among students with very high IQs (Austin and Draper, 1981; Freeman, 1979; Gallagher, 1958).

Adolescence is a time of biological and social change (Mussen *et al.*, 1979), during which the establishment of an identity becomes a central task (Erikson, 1950). Moreover, relations with peers become increasingly important at this time (Coleman, 1961). The resulting peer interactions contribute to the maintenance and/or enhancement of self-esteem (Elkind, 1980). Since highly gifted adolescents may have difficulty finding a peer group to which they can relate, they may experience more than the usual difficulties. Indeed,

Hollingsworth (1942) attributed at least some of the adjustment problems that extremely gifted children experience to the great intellectual disparity between themselves and their chronological-age peers. Janos *et al.* (1985) found that gifted students who view themselves as different from their age peers had lower self-esteem and reported more difficulty in peer relations than those who did not perceive themselves as different. It seems reasonable to suggest that poor peer relations might cause loneliness, and loneliness has been found to correlate with more negative self-concepts, less adjustment, and depression (Goswick and Jones, 1981; Kaiser and Berndt, 1985).

In addition to the theory that differences between highly gifted adolescents and their peers may contribute to social or emotional problems, developmental stage theories have also been proposed to explain maladjustment among gifted students. Some gifted children have been found to enter Piaget's stage of formal operations earlier than others (Keating, 1975; Keating and Schaefer, 1975). If the child or adolescent is in a more advanced cognitive stage than an affective stage, emotional stress or dysplasia can result (Gowan *et al.*, 1981). Thus, disparities within the gifted adolescent, as well as disparities between the gifted adolescent and his or her peer group, can make the task of developing an identity especially difficult. This can lead to stress and emotional problems.

Related to good emotional stability and a strong identity is self-esteem. High self-esteem suggests that a person likes him- or herself and perceives him- or herself as competent in dealing with the environment. In contrast, low self-esteem suggests that a person does not value him- or herself and does not feel competent in dealing with the environment (Fitch, 1970). Low self-esteem has been found to correlate with anxiety and to contribute to feelings of isolation and to an unstable self-concept (Rosenberg, 1965). For adolescents, self-esteem is generally most negative during early adolescence but increases during the adolescent years. It has been found to be fairly stable over time, however, in terms of each adolescent's position relative to others (Petersen *et al.*, 1984).

Studies of self-esteem in gifted students have produced inconsistent results. Some studies suggest that gifted students have higher self-esteem than comparison groups (Karnes and Wherry, 1981; Lehman and Erdwins, 1981), while other studies have found no appreciable differences (Bracken, 1980; Milgram and Milgram, 1976; Trotter, 1971). A study of mathematically gifted boys suggested that their self-image was somewhat unfavorable, yet less unfavorable than comparison groups of adolescent boys (Haier and Denham, 1976). Powell and Haden (1984) suggested that the highly gifted may experience low self-esteem because their superior abilities may lead to their generating an unattainable ideal self.

Locus of control refers to an individual's perceived power to control the events in his or her life. A belief in external control indicates that such

factors as luck, chance, and fate are viewed as likely determinants of an outcome, while a belief in internal control maintains that the individual's own actions or relatively permanent characteristics (such as ability) are the main determinants of the outcome (Rotter, 1975). Studies have suggested relationships between external locus of control and anxiety, adjustment problems, and lower self-confidence, although the possibility has also been suggested that people with internal locus of control may repress unpleasant experiences (Joe, 1971; Rotter, 1975). Positive correlations have also been found between internal locus of control and school achievement, although causality is not clear (Bartel, 1971; Joe, 1971; Messer, 1972; Stipek and Weisz, 1981). Studies of gifted students have found the gifted to have greater internal locus of control than comparison groups (Fincham and Barling, 1978; Milgram and Milgram, 1976; Tidwell, 1980).

Although numerous studies investigating the relationship of specific abilities in the verbal and quantitative areas to socialization practices and personality variables have been conducted (e.g., Bing, 1963; Carlsmith, 1964; Cattell, 1945; Fergusson and Maccoby, 1966), most studies of gifted students that have explored the issue of social and emotional adjustment have not distinguished between students with different specific abilities. Fergusson and Maccoby (1966), however, found highly verbal children to be less socially outgoing than students gifted in numerical ability. Similarly, D'Heurle *et al.* (1959) showed elementary-aged, high-reading achievers to have less self-confidence and more anxiety than high-arithmetic achievers. Although these studies did not involve adolescents, they are consistent with results reported by Nelson and Maccoby (1966). In the latter study of college freshmen, both males and females who reported having many friends and some close friends were found to have generally a high mathematical-low verbal ability pattern. Thus, Nelson and Maccoby (1966) concluded that a high verbal-low mathematical pattern was perhaps associated with withdrawal and/or dependency on parents.

The present study investigates the relationship between very high ability in the verbal or quantitative areas and social and emotional adjustment in adolescence. There is no one generally accepted definition of what constitutes "good" social or emotional adjustment. The literature, however, suggests that reasonably high self-esteem and acceptance by peers may be important, especially for adolescents. Internal locus of control may also be relevant. We suggest that evidence of depression and discipline problems in school may be symptoms of social or emotional difficulties. This study thus examines indices of self-esteem, locus of control, popularity, depression (or unhappiness), and discipline problems in a very select group of subjects, some of whom exhibit high verbal ability and the others of whom exhibit high mathematical ability. Comparisons are made with a group of students who are considerably less gifted.

METHODS

Subjects

Beginning in 1972, the Study of Mathematically Precocious Youth (SMPY) at Johns Hopkins University used the Scholastic Aptitude Test (SAT) to measure mathematical (M) and verbal (V) reasoning ability in young adolescents. The SAT was designed to predict success in college for above-average high-school students. Currently, over 70,000 seventh and eighth graders take a SAT annually in talent searches sponsored by the John Hopkins Center for the Advancement of Academically Talented Youth (CTY) and other universities, including Northwestern University, Duke University, and the University of Denver.

Between 1980 and 1983, SMPY sought those youths from among the high scorers nationally who before age 13 scored at least 700 on SAT-M; CTY sought those students who scored at least 630 on SAT-V before age 13. These scores represent the 95th percentile for college-bound male 12th graders. Clearly, students who score at this level before age 13 possess superior abilities in verbal and/or mathematical reasoning. They are estimated to represent the top 1 in 10,000 of their age group.

During this period, 268 males and 23 females who scored at least 700 on SAT-M before age 13 were identified, and 98 males and 67 females who scored at least 630 on SAT-V before age 13 were identified. An additional 15 females who scored above 700 on SAT-M before age 13 were identified after 1983 and added to the group, since the initial number of females identified was small. Of those identified, 173 700M males, 35 700M females, 44 630V males, and 48 630V females participated in this study by completing a questionnaire. Students who qualified for both the 630V and 700M groups by virtue of their scores were not included.

A comparison group of 205 students, 87 males and 118 females, was selected from CTY's 1983 talent search. These students, though they could be considered gifted since they had qualified for the talent search by scoring at the 97th percentile or above on an in-grade test, scored 540 or less on the combined SAT (SAT-M + SAT-V). This is approximately a chance score. Clearly, their ability level is far lower than the other students in this study. Fifty males and 61 females from this comparison group chose to participate in this study.

For the combined 700M and 630V groups (designated the total gifted group), the mean SAT-M score was 678 ($SD = 91$) and the mean SAT-V score was 546 ($SD = 100$). For the comparison group, the mean SAT-M was 272 ($SD = 26$) and the mean SAT-V was 244 ($SD = 26$). The percentile ranks for college-bound male high-school seniors (College Board, 1984) for the mean SAT-M and SAT-V scores for the total gifted group are 92 and

83, respectively, and for the comparison group are 2 and 3, respectively. Thus, there is a considerable difference in ability between these two groups.

The average age of the gifted students was 13.7 years when they participated in this study. The verbally talented students were, on the average, slightly older than the mathematically talented students (13.9 years compared to 13.6 years). There was no age difference by sex. The comparison group participated in the study approximately two and one-half years after the talent search, when they were 14 to 15 years old and completing the ninth grade.

Procedures

Questionnaires were developed and mailed to all students in the 700M, 630V, and comparison groups, as well as their parents. Only the student questionnaires were used in this study. Of the 440 questionnaires sent to the extremely gifted groups, 340 were returned, a response rate of 78%. Of the 205 questionnaires sent to the comparison group, 111 were returned, a response rate of 57%. The response rate was somewhat lower for the comparison group because they were sent only one reminder and were given an absolute deadline for returning the questionnaires (but they were paid five dollars), while the gifted students were sent multiple reminders over a longer period of time.

Linear discriminant function analyses were performed using SAT-M and SAT-V scores, sex, and group to determine if these variables could distinguish between the respondents and nonrespondents. For the gifted students the resulting discriminant function was statistically significant ($p \leq .01$) for SAT-M, SAT-V, and sex, but this was due to the greater response rate among the 700M girls (92% as a result of extra efforts with this group because it was small). A linear discriminant analysis performed without the 700M girls was not significant. The discriminant analysis for the comparison group on these variables was not significant. Thus, the extent of nonrespondent bias in this study is considered to be negligible.

The questionnaires inquired about home and school environments, educational experiences, leisure activities, achievements, and attitudes. For this study, items related to feelings about self, feelings of unhappiness or depression, perception of popularity, feelings about locus of control, and report of discipline problems were selected for analysis as measures of social and emotional adjustment. The items were adapted from those used in the sophomore questionnaire of the High School and Beyond National Longitudinal Study conducted by the National Center for Education Statistics (Conger *et al.*, 1976; Peng *et al.*, 1981). Questions were combined into scales by the investigators, and these scales were analyzed for reliability using Cron-

bach's coefficient alpha. The appendix to this report lists the actual questions utilized and how they were grouped into scales. The eight-item self-esteem scale was found to have an alpha coefficient of .76. Alpha for the three-item depression scale was .66, while for the four-item popularity and locus of control scales it was .81 and .54, respectively. Four items that asked about discipline problems were also analyzed. Since the incidence of students who reported problems was small, these items were examined individually rather than as a scale. These questions are also shown in the appendix.

The major method of analysis was analysis of variance (ANOVA). Because of the unequal *NS* in the subgroups, the ANOVAs were nonorthogonal. As a result, the special procedures advocated by Applebaum and Cramer (1974) were followed. We retained the nonorthogonal design rather than reduce the size of some groups to artificially balance the design because the larger *N* in the total group provides greater statistical power (Overall *et al.*, 1975). It was estimated that the power for the analyses was at least .80, so the probability of accepting as null a nonnull hypothesis was no greater than .20. ANOVAs by the classic regression approach, which is sometimes advocated for nonorthogonal designs, were also computed but were not reported since they yielded results similar to the initial analysis. Pearson correlations, linear discriminant analysis, and chi-square tests were also used. Analyses were done using the SPSSX computer program. A difference was considered statistically significant when $p \leq .05$. Effect sizes were also computed using Cohen's (1977) classification of small, medium, and large effect sizes. Medium or large effect sizes were considered important in this study.

RESULTS

Self-Esteem

The means and standard deviations on the 40-point self-esteem scale for the 700M, 630V, total gifted, and comparison groups are shown in Table I. An ANOVA was used to compare the groups (see Table II). No differences were found between the gifted students and the comparison group. A significant difference ($p \leq .01$) was found, however, between the 700M and 630V groups, with the 700M students exhibiting higher self-esteem than the 630V students. The effect size (Cohen, 1977) was small ($f = .19$), however, suggesting that this difference was not important. No sex differences were found, nor was there any interaction effect between group and sex.

Correlation coefficients were computed between the self-esteem scale and SAT-M and SAT-V scores for the gifted group and the comparison group separately. Although all correlations were small (i.e., less than .30), signifi-

Table I. Means and Standard Deviations, by Group and Sex, of Self-Esteem, Locus of Control, Popularity, and Depression Scales

	Self-esteem (40) ^a		Locus of control (20) ^a		Popularity (12) ^a		Depression (12) ^a	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
700Ms								
Males	31.4	4.5	16.0	2.2	7.6	2.1	5.4	2.3
Females	32.3	4.4	15.5	2.3	8.0	2.2	6.0	2.8
Total	31.6	4.5	15.9	2.3	7.7	2.1	5.5	2.4
630Vs								
Males	29.8	6.0	16.1	2.2	6.7	2.6	6.0	2.4
Females	29.2	5.1	16.5	2.5	7.0	2.4	6.3	2.5
Total	29.5	5.5	16.3	2.4	6.8	2.5	6.2	2.5
Total gifted								
Males	31.1	4.9	16.0	2.2	7.5	2.2	5.5	2.3
Females	30.6	5.0	16.1	2.4	7.4	2.4	6.2	2.6
Total	31.0	4.9	16.1	2.3	7.4	2.3	5.7	2.4
Comparison group								
Males	31.0	4.2	14.4	2.4	9.0	1.9	5.8	2.0
Females	30.2	5.1	15.0	2.6	9.3	2.0	6.6	2.2
Total	30.6	4.7	14.7	2.5	9.2	1.9	6.3	2.2

^aTotal points in scale.

cant differences were found between the correlations of self-esteem with SAT-M and of self-esteem with SAT-V. For the gifted group, the correlation with SAT-M was .19, whereas it was $-.10$ with SAT-V. The difference was significant ($p \leq .001$), but the effect size was small ($q = .29$). For the comparison group, $r = .22$ for SAT-M and $-.27$ for SAT-V. This was also significant at the $p \leq .001$ level and the effect size was medium ($q = .46$). For both groups, therefore, self-esteem correlates positively with SAT-M scores and negatively with SAT-V scores.

Locus of Control

The means and standard deviations for each group on the 20-point locus of control scale are also shown in Table I. A higher score suggests greater internal locus of control, while a lower score suggests greater external locus of control. No significant differences were found in an ANOVA between the two gifted groups (see Table II). The total gifted group, however, as well as the 700M and 630V groups considered separately, were all found to differ significantly from the comparison group ($p \leq .001$). The gifted students exhibited greater internal locus of control than the comparison group. The effect size for this measure between the total gifted and the comparison groups

Table II. Results of Analysis of Variance for Measures of Social and Emotional Adjustment for Group and Sex

Variable	Groups compared	<i>F</i> s for main effects		<i>F</i> s for interaction
		Group	Sex	
Self-esteem	700M vs 630V	10.4 ^a	.1	1.2
	Total gifted vs comparison	.2	1.2	0.0
Locus of control	700M vs 630V	1.9	.2	2.2
	Total gifted vs comparison	27.5 ^b	.5	0.9
Depression	700M vs 630V	2.7	2.2	0.2
	Total gifted vs comparison	1.8	9.0 ^a	0.1
Popularity	700M vs 630V	9.5 ^a	.8	0.0
	Total gifted vs comparison	42.8 ^b	.1	0.4

^a $p \leq .01$.^b $p \leq .001$.

was $f = .26$, in the medium range. No sex differences were found on this variable, and there was no interaction effect between group and sex.

Again, significant differences were found between the correlation coefficients of this measure with SAT-M and SAT-V. For the gifted group, the correlation of locus of control with SAT-M was $r = -.08$ and with SAT-V was $.12$ ($p \leq .001$); for the comparison group, the correlation with SAT-M was $.17$ and with SAT-V was $.05$ ($p \leq .05$). Effect sizes in both cases were small ($q = .20$ and $.13$, respectively), however, suggesting that the difference was not meaningful. Moreover, the actual correlation coefficients were themselves small and thus probably not important.

Depression or Unhappiness

The depression scale was based on a possible total of 12 points, with a higher score indicating more depression and unhappiness than a lower score. The means and standard deviations for each group on this scale are shown in Table I. No significant group differences were found using ANOVA (see Table II) between the total gifted group and the comparison group, or between the 700M and 630V groups. The 700M group alone, however, was significantly less depressed than the comparison group ($p \leq .05$), while the 630V group more closely resembled the comparison group. The girls in the total group of gifted and comparison subjects were significantly more depressed

(mean = 6.4, $SD = 2.5$) than the boys in the total group (mean = 5.5; $SD = 2.3$; $p \leq .01$). There was no interaction effect between sex and group, however. It may be that adolescent girls in general have a greater tendency to describe themselves as being unhappy than do adolescent boys.

The difference between the correlation of the depression scale with SAT-M ($r = -.12$) and with SAT-V ($r = .06$) for the gifted group was significant ($p \leq .01$), but the effect size was small ($q = .18$). For the comparison group, the correlation with SAT-M was $r = -.22$ and with SAT-V was $.11$. This was significant ($p \leq .001$) and the effect size was medium ($q = .33$). Thus, depression was associated with higher verbal scores and lower mathematics scores, although this was more true for the comparison group than the gifted group. Again, though, the magnitudes of the r s were not great.

Popularity

The means and standard deviations of the 12-point popularity scale for each group are shown in Table I. Higher scores suggest greater perceived popularity with peers. An ANOVA revealed significant differences between the 700M and 630V groups ($p \leq .01$), with the 700M group reporting greater popularity (see Table II). The effect size was medium ($f = .36$). Comparisons using ANOVA, however, found the comparison group to be significantly more popular than the gifted students, including the total gifted group as well as both the 700M and 630V groups considered separately ($p \leq .001$). The effect size was large ($f = .44$). No sex differences were found, and there was no interaction effect between sex and group.

Comparisons between the correlations of popularity with SAT-M and SAT-V were also significant. For the gifted group, the correlation with SAT-M was $r = .19$ and with SAT-V was $r = -.21$ ($p \leq .001$), and the effect size was medium ($q = .41$). For the comparison group, the correlation with SAT-M was $r = .19$ and with SAT-V was $r = -.26$ ($p < .001$), with a medium effect size ($q = .46$). Thus, popularity correlated more positively with SAT-M scores and more negatively with SAT-V scores.

Discipline

Four items on the questionnaire related to discipline problems. The combined items were considered too unreliable for use as a scale because very few students in each group responded affirmatively to any of the items indicating they had been in trouble. Therefore, the questions were examined

Table III. Discriminant Analysis on Measures of Social and Emotional Adjustment

Groups analyzed	N	Eigen value	Canonical correlation	Wilks's lambda	Chi-square	df	Significance
Total gifted vs comparison	359	.26	.45	.79	82.2	3	.000
700Ms vs 630Vs	257	.07	.26	.93	17.7	4	.001
Standardized discriminant function coefficients		Total gifted vs comparison	700Ms vs 630Vs				
Self-esteem		-.31	.61				
Locus of control		-.57	-.61				
Depression		ns	-.31				
Popularity		.90	.40				
		Percent classified correctly					
Total gifted vs comparison		73					
700Ms vs 630Vs		63					

individually. Chi-square comparisons revealed no significant differences either between the gifted group and the comparison group, or between the 700M and 630V groups, on any of the items.

Discriminant Function Analyses

Linear discriminant analyses were used to investigate whether, all together, the social and emotional adjustment variables distinguish between the groups studied and how accurately. The results are shown in Table III.

In the analysis between the total gifted group and the comparison group, the discriminating function included the self-esteem, locus of control, and popularity variables. The depression variable did not reach the criterion level necessary to be entered into the function. Popularity was the strongest discriminating variable. The resulting discriminant function was significant ($p \leq .001$). This function correctly classified approximately 73% of the students, compared to 50% expected by chance. Thus, there is considerable overlap between the groups, but these variables do help in classifying the students into these two groups.

The 700M and 630V groups were also compared, using a discriminant analysis. All four variables were included in the one significant function ($p \leq .01$). This function was, however, less effective in correctly classifying students—only 63% compared to 50% by chance. Nevertheless, it does indicate that there are differences between mathematically talented and verbally talented students on the social adjustment variables. Those variables are more likely, however, to distinguish the gifted students from the comparison students than they are to distinguish the 700Ms from the 630Vs. (See Table III for statistical details.)

DISCUSSION

The prevailing view in the literature is that the allegations about gifted students being socially and emotionally maladjusted are myths. On the other hand, some studies suggest that the very highly gifted student may be somewhat more at risk in this area, particularly in regard to relationships with peers. The findings reported in this paper support this latter viewpoint.

This study found that highly gifted students report more internal locus of control and less popularity than the comparison students. The higher internal locus of control is consistent with other studies (Fincham and Barling, 1978; Milgram and Milgram, 1976; Tidwell, 1980). It appears that students of high ability feel they have more control over their lives.

The lower popularity in the gifted group compared to the comparison group is also consistent with what others have reported (e.g., Gallagher, 1958). Students whose abilities differ greatly from their age peers, e.g., those students whose abilities are estimated to be in the top 1 in 10,000 in their age group, are likely to have greater difficulty fitting into a peer group and may be less popular. The comparison group in this study, on the other hand, may be perceived by their peers as intelligent but not quite so different. This may contribute to greater popularity.

No differences were found between the comparison and total gifted groups on the self-esteem or depression scales, or in the incidence of discipline problems. The gifted students therefore do not report a greater tendency to be depressed or suffer low self-esteem. Discipline problems were low in both groups and appear to be unrelated to high ability.

Comparisons between the students with high mathematical ability (700Ms) and those with high verbal ability (630Vs) suggested some differences. The 630Vs were somewhat lower in self-esteem, although the effect size was small and thus the difference was probably not important. They were also slightly lower in popularity. It appears, then, that highly verbally gifted students are somewhat more likely to have difficulty interacting with peers than highly mathematically gifted students. The students in the 630V group in this study may be most like those students in studies of high-IQ students (Burks *et al.*, 1930; Hollingworth, 1929, 1942), who exhibited greater difficulties (i.e., verbal reasoning ability is probably a good proxy for IQ).

A possible relationship between high verbal ability, and social and emotional problems, was further supported by the significant differences found between the correlations of the measures of social and emotional adjustment with SAT-M and SAT-V for both the gifted and comparison groups. Mathematical ability correlated positively with popularity for both groups, while verbal ability correlated negatively. In addition, for the comparison group, higher verbal scores were associated with more depression and lower self-esteem compared to mathematics scores. The correlations were low, and we do not want to overemphasize these results. There appears to be a trend, however, that associates more negative social and emotional characteristics with verbal ability, and not with mathematical ability. This warrants further investigation.

This study is limited by the small number of subjects in some groups. This was unavoidable because the incidence of students in the general population who exhibit such a high level of ability as investigated is low. Clearly, the generalizability of the findings is restricted as well because few people possess such a high level ability.

We are also aware of the limitations resulting from the use of self-reported data, and of the somewhat limited validity of our brief measures. Self-reported responses seemed appropriate, however, since the subjects' feel-

ings about themselves were of major concern in this study. Longer, more complex scales would probably have increased the validity of our findings, but the study was only one part of a comprehensive assessment of the characteristics and behaviors of this population, and additional items would have made the questionnaire too lengthy. In addition, the use of items from the National Longitudinal Study was intended to make the scales more valid. These limitations, however, do suggest that caution be used in overgeneralizing from our results.

In conclusion, some important implications are suggested by this study. The gifted students, particularly those whose exceptional talents are primarily in the verbal area, do appear to have greater difficulty with peer relations in that they perceive themselves as less popular than the comparison students do. More serious problems of low self-esteem, depression, or discipline problems did not appear to be consequences of the peer difficulties. Perhaps the higher internal locus of control is a factor in helping gifted students cope with a lack of peer acceptance. It may also be that our measures were not adequate in detecting problems in these areas. More study is needed. Meanwhile, counseling and other support services are warranted for those gifted students who may be having difficulties coping because they do not feel accepted by their peers.

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APPENDIX

Self-Esteem Questions

1. How do you feel about each of the following statements? (MARK ONE OVAL FOR EACH LINE.)

	<i>Agree strongly</i>	<i>Agree</i>	<i>Disagree</i>	<i>Disagree strongly</i>	<i>No opinion</i>
a. I take a positive attitude toward myself.	0	0	0	0	0
b. I feel I am a person of worth, on an equal plane with others.	0	0	0	0	0
c. I am able to do things as well as most other people	0	0	0	0	0
d. On the whole, I am satisfied with myself.	0	0	0	0	0
e. At times I think I am no good at all.	0	0	0	0	0
f. I feel I do not have much to be proud of.	0	0	0	0	0

2. How do other students in your school see you? (MARK ONE OVAL FOR EACH LINE.)

	Very	Somewhat	Not at all
a. As important?	0	0	0

3. Are the following statements about yourself true or false? (MARK ONE OVAL FOR EACH LINE.)

	True	False
a. Others think of me as physically unattractive.	0	0

Locus of Control Questions

4. How do you feel about each of the following statements? (MARK ONE OVAL FOR EACH LINE.)

	<i>Agree strongly</i>	<i>Agree</i>	<i>Disagree</i>	<i>Disagree strongly</i>	<i>No opinion</i>
a. Good luck is more important than hard work for success.	0	0	0	0	0
b. Every time I try to get ahead, something or somebody stops me.	0	0	0	0	0
c. Planning only makes a person unhappy, since plans hardly ever work out anyway.	0	0	0	0	0
d. People who accept their condition in life are happier than those who try to change things.	0	0	0	0	0

Popularity Questions

5. How do other students in your school see you? (MARK ONE OVAL FOR EACH LINE.)

	Very	Somewhat	Not at all
a. As popular?	0	0	0
b. As socially active?	0	0	0
c. As part of the leading crowd?	0	0	0

6. Are the following statements about yourself true or false? (MARK ONE OVAL FOR EACH LINE.)

	True	False
a. I am popular with other students in my class.	0	0

Depression Questions

7. During the past two weeks, did you ever feel . . . (MARK ONE OVAL FOR EACH LINE.)

	Never	Once	Several times	A lot
a. Very lonely or remote from other people?	0	0	0	0
b. Depressed or very unhappy?	0	0	0	0

8. During the past month, have you felt so sad, or had so many problems, that you wondered if anything was worthwhile? (MARK ONE.)
- | | |
|-------------------------|---|
| a. Yes, more than once. | 0 |
| b. Yes, once. | 0 |
| c. No. | 0 |

Discipline Questions

9. Are the following statements about your experience in school true or false? (MARK ONE FOR EACH LINE.)
- | | True | False |
|---|------|-------|
| a. I have had disciplinary problems during the past year. | 0 | 0 |
| b. I have been suspended or put on probation in school. | 0 | 0 |
10. How do other students in your school see you? (MARK ONE OVAL FOR EACH LINE.)
- | | Very | Somewhat | Not at all |
|-----------------------|------|----------|------------|
| a. As a troublemaker? | 0 | 0 | 0 |
11. Are the following statements about yourself true or false? (MARK ONE OVAL FOR EACH LINE.)
- | | True | False |
|---|------|-------|
| a. I have been in serious trouble with the law. | 0 | 0 |