Academic and psychosocial perspectives on giftedness during adolescence

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Academic and psychosocial perspectives on giftedness during adolescence

Swiatek, Mary Ann, Ph.D.
Iowa State University, 1993
Academic and psychosocial perspectives on giftedness during adolescence

by

Mary Ann Swiatek

A Dissertation Submitted to the
Graduate Faculty in Partial Fulfillment of the
Requirements for the Degree of
DOCTOR OF PHILOSOPHY

Major: Psychology

Approved:

Signature was redacted for privacy.

In Charge of Major Work

Signature was redacted for privacy.

For the Major Department

Signature was redacted for privacy.

For the Graduate College

Iowa State University
Ames, Iowa

1993
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GENERAL INTRODUCTION

In the literature pertaining to gifted children and adolescents, there appear to be two general types of studies. First, there is research that focuses on students' academic abilities and the educational methods that may best develop those abilities. This type of study can be called "academic". Second, there is research that considers the social and emotional characteristics of gifted individuals. This type of study can be called "psychosocial". Both the academic and the psychosocial studies yield important insights into the needs and functioning of gifted individuals. This dissertation is comprised of one study from each of the categories described above.

The first article focuses upon academic acceleration as a means of educating highly able students. A longitudinal design is used to compare both academic and psychosocial variables between a group of individuals who, earlier, had accelerated their educations and a comparison group of nonaccelerates who were matched with the accelerates for gender and ability level. Because the independent variable is acceleration status, the study can best be placed in the academic category.

The second article is based upon findings indicating that gifted adolescents perceive themselves as unpopular, yet maintain strong social self-concepts. The main purpose of the article is to explore various approaches that such students may take to their giftedness in order to develop and preserve positive self-evaluations despite perceived negative feedback from others. Clearly, this study can best be described as psychosocial in nature.

The different types of information obtained from these two studies are both helpful in developing an understanding of the needs of gifted individuals. It is constructive to search for ways to offer highly able students an appropriate education;
in this search, it is necessary to be sure that the alternatives provided to students do not have adverse long-term consequences. Also, it is important to recognize that the social experiences, as well as the academic experiences, of many gifted students may differ from those of average-ability students. Social experiences may influence gifted students' cognitive and/or behavioral approaches to being gifted in an academic setting. An awareness of individuals' approaches to giftedness can be useful to teachers and counselors who work with gifted adolescents. Thus, it is important to acknowledge both the academic and the psychosocial sides of gifted individuals, as does the combination of studies in this dissertation.

Explanation of Dissertation Format

This dissertation is comprised of two articles. The first follows a general introduction and is entitled "A Ten-Year Longitudinal Follow-Up of Ability-Matched Accelerated and Unaccelerated Gifted Students". This paper was published in the December, 1991 edition of the Journal of Educational Psychology, under the authorship of Swiatek and Benbow. The second article immediately follows the first and is entitled "How Gifted Adolescents Cope with Self-Perceived Unpopularity". This paper will be submitted for publication as soon as possible. Following the two articles is a general summary. At the end of the dissertation are several appendices, all of which pertain only to the second article.
PAPER I: A TEN-YEAR LONGITUDINAL FOLLOW-UP OF ABILITY-MATCHED ACCELERATED AND UNACCELERATED GIFTED STUDENTS
ABSTRACT

Gifted students identified by the Study of Mathematically Precocious Youth who underwent academic acceleration in their educations were longitudinally compared across several domains with a group of equally gifted students who were never accelerated. The groups were matched for gender and for ability and were studied for ten years. At age 23, few significant differences were found between the groups for the individual academic and psychosocial variables studied. Both the accelerates and the nonaccelerates reported impressive academic achievements, as well as high personal satisfaction with school and self. When academic variables are considered as a group, the performance of accelerates is slightly higher than that of nonaccelerates. In both accelerated and unaccelerated groups, male students pursued mathematics/science more vigorously than did female students, but there was no differential response to acceleration on the basis of gender. The findings do not support the common concern that gifted students may be harmed by accelerative experiences.
INTRODUCTION

The appropriateness of academic acceleration for meeting the needs of gifted students is a controversial topic in education. A great deal of empirical research indicates that acceleration provides academic settings that are well suited to the needs of high-ability students (Benbow, 1991; Terman, 1954; VanTassel-Baska, 1989). Nevertheless, many educators and administrators resist its implementation in their schools (Feldhusen, 1989; Southern, Jones, & Fiscus, 1989). Daurio (1979) suggested that the continuing controversy is due, in part, to preconceived notions and irrational grounds rather than to an examination of the evidence. Perhaps, however, the controversy is sustained by a lack of data from experimental or quasi-experimental designs comparing accelerates and equally able nonaccelerates on academic and psychosocial/attitudinal variables. This study was designed to address such concerns with data obtained from a 10-year longitudinal investigation.

Acceleration can take many forms. Paulus (1984), however, provided a useful overall definition: "[academic] flexibility based on individual abilities without regard for age". Some common forms of acceleration are early entrance to school, grade skipping, advanced placement in certain subject areas, college course enrollment while in high school, and special, fast-paced classes (Copley, 1961; Gold, 1982). Regardless of the type of acceleration used, positive benefits have been noted for students (Benbow, 1991).

Nevertheless, two primary academic concerns regarding the use of acceleration are expressed by some professionals: (a) students may burn out if they are placed in classes that are advanced for their chronological age (Compton, 1982) and (b) acceleration may lead to gaps in the knowledge of participants or poor retention of
material learned at an accelerated pace (see Hildreth, 1966; VanTassel-Baska, 1989). An example of a general policy on acceleration that reflects these objections is the one currently in effect in the National Council of Teachers of Mathematics (see Belcastro, 1990). These concerns about acceleration may not be well founded, however.

Dealing with the question of burnout is rather cumbersome; it involves integrating a variety of points of view. A number of researchers, for example, have concluded that the risk of burnout is offset by an even higher risk of underachievement due to boredom if a gifted student is forced to remain in regular classes (Compton, 1982; Copley, 1961; Freeman, 1983; Manaster & Powell, 1983; Paulus, 1984).

Underachievement, in turn, is seen as a sign of maladjustment among students (Schauer, 1976). Furthermore, in the case of the gifted, it has been noted that boredom in the classroom may lead to other adjustment difficulties, such as social withdrawal (Compton, 1982) or lack of self-discipline (Compton, 1982; Paulus, 1984).

The possibility of gaps in knowledge due to grade skipping has been acknowledged as a valid concern by supporters of acceleration (Hildreth, 1966; VanTassel-Baska, 1989). Feldhusen, Proctor, and Black (1986) noted that this difficulty can be avoided through the careful evaluation of a student to ensure that he or she is well prepared for advanced grade placement, however. Moreover, no studies have yielded evidence that students who have been accelerated exhibit deficits in knowledge or achievement (e.g., Feldhusen, et al., 1986; Janos, 1987; Mercurio, 1980; Proctor, Black, & Feldhusen, 1988; Proctor, Feldhusen, & Black, 1988; Robinson & Janos, 1986; Stanley & Benbow, 1983; Swiatek & Benbow, 1991).
Literature reviews (e.g., Feldhusen, 1989; Paulus, 1984) and a sophisticated meta-analysis (Kulik & Kulik, 1984) have yielded similar conclusions: when acceleration is properly used, it works academically.

The psychosocial reasons for hesitation in implementing accelerative programs are more numerous than are the academic reasons. The psychosocial concerns have a common foundation with academic concerns, however, in the belief that gifted students who are placed in classes with older students will be unable to adjust to the new setting (Copley, 1961). Specific among these concerns are the following: (a) gifted students have deficient or retarded psychosocial development and, therefore, will not fit in with more mature classmates (Jung, 1954; Miller, 1985); (b) gifted students who are enrolled in special classes will lose the ability to function in the larger world of average people (Jung, 1954; Miller, 1980; Smith, 1984); (c) accelerative programs emphasize the differences between gifted and average students, thereby jeopardizing the social acceptance of the gifted student (Smith, 1984); (d) special educational opportunities lead gifted students to become conceited and self-centered (Jung, 1954; Miller, 1980), and (e) the self-concepts of gifted students will suffer if such students are set apart from their average counterparts (see Coleman & Fults, 1985).

Research into the psychosocial characteristics of gifted children has failed to support the first four of these concerns. Rather, the research has amply demonstrated that most gifted children are psychosocially mature (Delp & Martinson, 1977; Hildreth, 1966; Hollingworth, 1942; Schneider, Clegg, Byrne, Ledingham, & Crombie, 1989; Terman & Oden, 1947; Tidwell, 1980), perhaps even surpassing average children in this regard (Janos & Robinson, 1985). Also, gifted students have
been shown to be popular with other students (Delp & Martinson, 1977; Schneider, et al., 1989) and highly involved in extracurricular activities (Janos, 1987; Napolski, 1989; Terman & Oden, 1947; Tidwell, 1980). These findings suggest that gifted students are able to accept and be accepted by their average-ability peers. Gifted students appear to be well adjusted, especially during the preadolescent years; acceleration does not seem to affect that adjustment (Benbow, 1991).

The fifth concern, on which hesitation to use acceleration is often based, concerns the possibility that the self-esteem of gifted students may decline as a result of accelerative experiences. Decreases in self-esteem are indeed frequently found on enrollment in acceleration as well as enrichment programs. Some researchers (e.g., Richardson & Benbow, 1990; Swiatek & Benbow, 1991), however, have noted that these decreases can be interpreted as indications of greater realism in students’ self-concepts rather than as indications of a dangerous decline. Also, slight decreases might be explained by Festinger’s (1954) theory of social comparison (i.e., self-concepts are the result of comparisons of self with peers). These interpretations are reasonable, but not universal. The state of empirical research as it relates to self-esteem cannot, at the present time, be said to strongly support either the use or the avoidance of acceleration.

In addition to studies that have focused on specific measures of psychosocial adjustment such as self-esteem, studies have been conducted using multiple variables to explore psychosocial outcomes of acceleration. One study compared radically accelerated male students with equally gifted unaccelerated male students and found no significant differences on variables associated with personality, career interests and aspirations, and values (Pollins, 1983). Another study compared early entrants to
college with average-age students and found no differences in the general areas of social and psychological adjustment (Robinson & Janos, 1986). The results least favorable to accelerates in the area of psychosocial comparisons were reported by Kulik and Kulik (1984), who described their results regarding the question of psychosocial adjustment as "sketchy and inconclusive" (p. 88). The predominance of findings that are either neutral or in favor of accelerates suggests that most gifted students have strong personal resources and are unlikely to experience psychosocial harm from acceleration.

Thus, the majority of existing empirical research suggests that acceleration is an appropriate method of educating gifted students (Benbow, 1991). Nevertheless, because the use of acceleration continues to be viewed with caution, and because information on some issues is ambiguous, research is needed that addresses two basic topics.

The first of these topics concerns global relationships between acceleration and various aspects of the lives of participants. Most past research has addressed primarily either the achievement (e.g., Benbow, 1983; Compton, 1982; Feldhusen, et al., 1986; Janos, 1987; Mercurio, 1980; Robinson & Janos, 1986; Stanley & Benbow, 1983) or the psychosocial adjustment (e.g., Brody & Benbow, 1986; Coleman & Cross, 1988; Coleman & Fults, 1985; Janos, Fung, & Robinson, 1985; Kelly & Colangelo, 1984; Lehman & Erdwins, 1981; Richardson & Benbow, 1990; Schneider, et al., 1989; Tidwell, 1980) of accelerated students, but not both. Therefore, conclusions regarding more general relationships, encompassing both academic and psychosocial domains, have been forced into the realm of inference. This article compares students' self-reports on both academic and
psychosocial/attitudinal variables and, thereby, provides direct evidence for the assessment of more global effects of acceleration on gifted students' lives.

The second topic that must be addressed concerns the attributions made for differences between accelerated and unaccelerated students. Much of the existing research has involved comparisons of gifted students who are enrolled in special programs with average students, gifted students not matched for ability, or national norms (e.g., Coleman & Fults, 1985; Kelly & Colangelo, 1984; Lehman & Erdwins, 1981; Richardson & Benbow, 1990; Tidwell, 1980; Werner & Bachtold, 1969). Such research has confounded the effects of special programs with the effects of giftedness itself (c.f. Brody & Benbow, 1986). It is important for research on acceleration to avoid this confound by comparing gifted accelerates with equally gifted nonaccelerates. For this purpose, ideal research designs would require the random assignment of gifted students to accelerated and unaccelerated groups. Such designs are impractical, however, because students cannot ethically be forced into different educational groups for the convenience of an experimenter. Moreover, Benbow (1991) has recommended that only students who want to accelerate should do so (Benbow, 1991). The best ethical design, therefore, appears to be quasi-experimental (Campbell & Stanley, 1963; Cook & Campbell, 1979). Students who, for reasons of their own, either have or have not accelerated should be matched for ability and then compared. This procedure was followed in the present study.

An additional important feature of the present research is its longitudinal nature. The majority of the existing matching studies have considered only the short-term effects of acceleration on gifted students. The longitudinal data used in this
study, however, allowed for the assessment of acceleration 10 years after the students were identified as gifted and at least five years after they were accelerated.

In sum, we compared students who chose to accelerate their education before college with equally able students who did not choose this route. These groups were compared on both academic and psychosocial/attitudinal variables.
METHOD

Subjects

Subjects were drawn from Cohorts 1 and 2 of the Study of Mathematically Precocious Youth (SMPY). All subjects had participated in an SMPY talent search and, therefore, had taken the Scholastic Aptitude Test (SAT) at the age of 12 or 13 years. Qualification for inclusion in the longitudinal study was based on scores on the SAT Mathematics subtest (SAT-M), the SAT Verbal subtest (SAT-V), the Test of Standard Written English (TSWE), or a combination of the three tests, which were designed for above-average high school students (not seventh or eighth graders).

Members of Cohort 1 participated in a talent search in 1972, 1973, or 1974. Minimum qualifying scores for this cohort, obtained when students were in 7th or 8th grade, were 390 on the SAT-M or 370 on the SAT-V. These scores corresponded to those of the average 11th- or 12th-grade female student (Admissions Testing Program, 1979). We estimated that the ability of these students is in the top 1.0% of American students their age.

Members of Cohort 2 were 7th graders at the time of their participation in a talent search in 1976, 1978, or 1979. Their minimum qualifying scores varied according to the year of their participation. In 1976, the total of twice the SAT-M score plus the SAT-V score was required to meet or exceed 1330 (Cohn, 1977):

\[ 2\text{(SAT-M)} + 1\text{(SAT-V)} \geq 1330 \]

In 1978, there were a number of ways in which a student could qualify for participation in the SMPY longitudinal study (Benbow, 1978): (a) SAT-M \geq 500 and SAT-V \geq 430, (b) SAT-M \geq 550 (no SAT-V requirement), (c) SAT-V \geq 580 (no SAT-M requirement), or (d) TSWE \geq 58 (no SAT-V or SAT-M requirement).
In 1979, qualification for the longitudinal study was a minimum score of 500 on the SAT-M and a minimum composite score (SAT-M + SAT-V) of 1000 (Bartkovich & Mezynski, 1981). Nationally, the scores of Cohort 2 participants placed them in the top 0.5% of students their age with regard to mathematical ability.

At the time of this study, subjects from both cohorts had reached a minimum age of 23 years. Two groups of subjects were formed for this study. One group was comprised of accelerates, defined in this study as students who enrolled in college at least one year early. The other group was comprised of nonaccelerates—those students who pursued a traditional educational route, as reflected by enrollment in college at the typical age. Members of these two groups were matched for gender. To match for ability across the groups, SAT scores at time of talent search were used. SAT-M scores were matched within 10 points; SAT-V scores were matched within 20 points. The resulting two groups were each composed of 107 students, 69 of whom were male and 38 of whom were female. The mean 7th-grade/8th-grade SAT-M score in each group was approximately 560; the mean 7th-grade/8th-grade SAT-V score was approximately 460. These scores were not significantly different between the groups.

Procedure

When subjects were approximately 23 years of age, the longitudinal after-college questionnaire was mailed to them. Those who did not respond initially were reminded, first by mail and then by telephone if necessary, to complete the survey. Those who did not respond after telephone reminders were telephoned again and requested to verbally answer the survey questions. This procedure resulted in a response rate of approximately 75% for Cohort 1 (N = 1,247). Data collection is
currently in progress for Cohort 2. At the time when subjects for this study were selected and matched, the response rate for this group was 33% (N = 207). The final subject group of 107 pairs of students, matched in terms of ability and gender, was drawn from the total pool (N = 1,454) of Cohort 1 and Cohort 2 students who had returned an after-college questionnaire. (The approximate age range of the subjects, in completion of the survey, was 23 to 25 years.) Cohort 2 students were included to maximize the number of pairs available for study. In neither cohort did after-college respondents differ from nonrespondents in ability, socioeconomic status, or college attendance.

Data pertaining to the dependent variables were obtained from a subset of items included on the SMPY after-college questionnaire, which addressed many issues in the subjects' academic and psychosocial lives. The academic variables of particular interest for the present research were the following: educational level completed, educational aspirations, undergraduate grade point average, undergraduate awards and honors earned, graduate school attendance, quality of schools (both undergraduate and, if applicable, graduate), academic or creative accomplishments, publications, and research participation. The majority of these items were formatted as multiple-choice or free-response questions. We obtained variables reflecting the quality of schools attended by using national rankings of institutional quality. At the undergraduate level, Astin's (1977) rank ordering of United States colleges and universities was used. At the graduate level, departments were ranked according to Gourman's (1983) listing of graduate and professional programs. In both of these systems, lower numbers indicate higher status.
The psychosocial and attitudinal variables studied included two six-item scales, one assessing self-esteem and one assessing locus of control. The items from these scales are listed in Table 1. Both scales were rated with a five-point response format and were taken from the National Longitudinal Study (NLS) questionnaire (Conger, Peng, & Dunteman, 1976; Peng, Fetters, & Kolstad, 1981). For our subject group, the values of Cronbach's alpha were 0.74 for the self-esteem scale and 0.59 for the locus of control scale. We also analyzed original individual items assessing participation in undergraduate extracurricular activities, attitudes toward college, and attitudes toward mathematics and science. These variables were assessed on five-point scales, with two exceptions: (a) participation in extracurricular activities was measured by the number of activity areas in which students reported involvement and (b) usefulness of mathematics and science to students' planned careers was rated on a four-point scale. In addition to considering the individuals variables regarding attitudes toward mathematics and science, we standardized and combined these variables to form two scales: one reflecting attitudes toward mathematics and one reflecting attitudes toward science. The resulting scales were reliable for the students in our sample ($\alpha = 0.77$ for attitudes toward mathematics; $\alpha = 0.83$ for attitudes toward science).

We compared the two groups on the academic and psychosocial/attitudinal variables described above. In addition, we made comparisons between male and female students and between those students who had entered college only one year early and those who had entered college two or more years early. First, we examined the variables separately with t-tests (median tests for college and graduate school
Table 1. Items on the self-esteem and locus of control scales

<table>
<thead>
<tr>
<th>Scale</th>
<th>Item</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self-esteem</td>
<td>I take a positive attitude toward myself.</td>
</tr>
<tr>
<td></td>
<td>I feel I am a person of worth, on an equal plane with others.</td>
</tr>
<tr>
<td></td>
<td>I am able to do things as well as most other people.</td>
</tr>
<tr>
<td></td>
<td>On the whole, I'm satisfied with myself.</td>
</tr>
<tr>
<td></td>
<td>At times I think I am no good at all.</td>
</tr>
<tr>
<td></td>
<td>I feel I do not have much to be proud of.</td>
</tr>
<tr>
<td>Locus of control</td>
<td>Good luck is more important than hard work for success.</td>
</tr>
<tr>
<td></td>
<td>Every time I try to get ahead, something or somebody stops me.</td>
</tr>
<tr>
<td></td>
<td>Planning only makes a person unhappy, since plans hardly ever work out.</td>
</tr>
<tr>
<td></td>
<td>People who accept their condition in life are happier than those who try to change things.</td>
</tr>
<tr>
<td></td>
<td>What happens to me is my own doing.</td>
</tr>
<tr>
<td></td>
<td>When I make plans, I am almost certain I can make them work.</td>
</tr>
</tbody>
</table>

Note: The items on these scales were adapted from the National Longitudinal Study questionnaire.
rankings). Because of the large number of individual comparisons involved in this design, we modified the alpha levels indicating statistical significance by the Bonferroni method. The resulting alpha levels were .002 for academic variables and .004 for psychosocial/attitudinal variables.

Second, we examined the variables in the two groups (i.e., academic and psychosocial/attitudinal), with stepwise discriminant function analyses. The discriminant function analyses focusing on academic variables included most of the variables listed in Table 2. Excluded from these analyses were (a) college and graduate school rankings, because they are expressed in medians rather than means, (b) educational aspirations, because several subjects were missing data for this item, and (c) age attending graduate school, because the inclusion of this item would have limited the analysis to only those students who had attended graduate school; this variable was replaced by the graduate school attendance variable (see Table 3). SAT-M score at age 13 years also was included in these analyses; SAT-V score at age 13 years was excluded because of missing data. The sample size necessitated limitation of the number of academic variables included in the discriminant function analyses. We chose to exclude the majority of variables from Table 3 because there was little variance with which to work; few students had achieved the distinctions represented. The analyses focusing on psychosocial/attitudinal variables included variables that are listed in Table 4: liking for college, extracurricular activity areas, locus of control, self-esteem, and attitudes toward mathematics and science (as measured by scales, not by the individual items).
Table 2. Means and standard deviations for academic variables, according to group

<table>
<thead>
<tr>
<th>Variable</th>
<th>Accelerates</th>
<th>Nonaccelerates</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean (SD)</td>
<td>Mean (SD)</td>
</tr>
<tr>
<td>Educational level</td>
<td>3.36 (0.75)</td>
<td>2.95 (0.77)</td>
</tr>
<tr>
<td>Educational aspirations</td>
<td>4.63 (0.54)</td>
<td>4.52 (0.64)</td>
</tr>
<tr>
<td>Undergraduate GPA</td>
<td>3.50 (0.52)</td>
<td>3.51 (0.44)</td>
</tr>
<tr>
<td>Number of undergraduate mathematics courses taken</td>
<td>4.31 (4.41)</td>
<td>3.93 (3.92)</td>
</tr>
<tr>
<td>Number of undergraduate physical science courses taken</td>
<td>5.84 (7.50)</td>
<td>4.77 (6.46)</td>
</tr>
<tr>
<td>Number of undergraduate natural science courses taken</td>
<td>2.15 (3.59)</td>
<td>2.51 (5.45)</td>
</tr>
<tr>
<td>Number of undergraduate computer science courses taken</td>
<td>1.67 (3.20)</td>
<td>1.18 (1.93)</td>
</tr>
<tr>
<td>Number of unrequired mathematics courses taken</td>
<td>1.62 (2.30)</td>
<td>0.89 (1.42)</td>
</tr>
<tr>
<td>Number of unrequired science courses taken</td>
<td>2.09 (2.96)</td>
<td>1.53 (2.20)</td>
</tr>
<tr>
<td>Age attending graduate school(^a)</td>
<td>21.13 (1.10)</td>
<td>22.36 (0.76)</td>
</tr>
<tr>
<td>Astin college rank (median)</td>
<td>46.00</td>
<td>95.00</td>
</tr>
<tr>
<td>Gourman graduate department rank (median)</td>
<td>13.00</td>
<td>17.00</td>
</tr>
</tbody>
</table>

Note: GPA = grade point average

\(^a\) The differences between the two groups on these measures were significant at \(p \leq .001\).
Table 3. Proportions of students involved in academic activities, according to group

<table>
<thead>
<tr>
<th>Activity</th>
<th>Percent responding</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Accelerates</td>
<td>Nonaccelerates</td>
<td></td>
</tr>
<tr>
<td>Attending college</td>
<td>99</td>
<td>98</td>
<td></td>
</tr>
<tr>
<td>Majoring in mathematics/science as an undergraduate</td>
<td>59</td>
<td>61</td>
<td></td>
</tr>
<tr>
<td>Earning honors as undergraduate</td>
<td>28</td>
<td>28</td>
<td></td>
</tr>
<tr>
<td>Attending graduate school</td>
<td>75</td>
<td>63</td>
<td></td>
</tr>
<tr>
<td>Majoring in mathematics/science as graduate student</td>
<td>51</td>
<td>52</td>
<td></td>
</tr>
<tr>
<td>Creating original invention or process</td>
<td>13</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td>Editing a publication</td>
<td>23</td>
<td>22</td>
<td></td>
</tr>
<tr>
<td>Presenting a paper; participating in a colloquium</td>
<td>32</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>Publishing a book</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Publishing a journal article</td>
<td>20</td>
<td>13</td>
<td></td>
</tr>
<tr>
<td>Publishing a magazine article</td>
<td>9</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Publishing a newspaper article</td>
<td>10</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>Having probably publications in preparation</td>
<td>34</td>
<td>18</td>
<td></td>
</tr>
<tr>
<td>Contributing to a research project</td>
<td>48</td>
<td>30</td>
<td></td>
</tr>
</tbody>
</table>

Note: No individual item yielded statistically significantly different proportions for the two groups as $p \leq .002$. 
Table 4. Means and standard deviations of psychosocial variables, according to group

<table>
<thead>
<tr>
<th>Variable</th>
<th>Accelerates Mean (SD)</th>
<th>Nonaccelerates Mean (SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Liking for college</td>
<td>1.62 (0.84)</td>
<td>1.71 (0.84)</td>
</tr>
<tr>
<td>Number of extracurricular activity areas</td>
<td>2.30 (1.32)</td>
<td>2.24 (1.40)</td>
</tr>
<tr>
<td>Confidence in mathematics&lt;sup&gt;a&lt;/sup&gt;</td>
<td>4.18 (0.95)</td>
<td>4.07 (1.12)</td>
</tr>
<tr>
<td>Confidence in science&lt;sup&gt;b&lt;/sup&gt;</td>
<td>3.95 (1.00)</td>
<td>3.77 (1.07)</td>
</tr>
<tr>
<td>Perceived ease of mathematics&lt;sup&gt;a&lt;/sup&gt;</td>
<td>3.87 (1.12)</td>
<td>3.81 (1.07)</td>
</tr>
<tr>
<td>Perceived ease of science&lt;sup&gt;b&lt;/sup&gt;</td>
<td>3.61 (0.97)</td>
<td>3.59 (1.08)</td>
</tr>
<tr>
<td>Interest in mathematics&lt;sup&gt;a&lt;/sup&gt;</td>
<td>3.97 (1.02)</td>
<td>3.79 (1.29)</td>
</tr>
<tr>
<td>Interest in science&lt;sup&gt;b&lt;/sup&gt;</td>
<td>4.40 (0.86)</td>
<td>4.36 (0.99)</td>
</tr>
<tr>
<td>Usefulness of mathematics for planned career&lt;sup&gt;a&lt;/sup&gt;</td>
<td>2.98 (1.00)</td>
<td>2.89 (1.04)</td>
</tr>
<tr>
<td>Usefulness of science for planned career&lt;sup&gt;b&lt;/sup&gt;</td>
<td>2.93 (1.06)</td>
<td>2.87 (1.15)</td>
</tr>
<tr>
<td>Attitudes toward math scale (z-score)</td>
<td>0.06 (0.71)</td>
<td>-0.06 (0.82)</td>
</tr>
<tr>
<td>Attitudes toward science scale (z-score)</td>
<td>0.04 (0.77)</td>
<td>-0.05 (0.86)</td>
</tr>
<tr>
<td>Locus of control scale</td>
<td>4.01 (0.57)</td>
<td>4.12 (0.45)</td>
</tr>
<tr>
<td>Self-esteem scale</td>
<td>4.19 (0.59)</td>
<td>4.16 (0.64)</td>
</tr>
</tbody>
</table>

<sup>a</sup> Responses were converted to standard scores and used in the attitudes toward math scale.

<sup>b</sup> Responses were converted to standard scores and used in the attitudes toward science scale.
RESULTS

Academic Variables and Acceleration

Means and standard deviations of both in-class academic variables (e.g., college ranking, area of study, and grade point average) and out-of-class achievement variables (e.g., publications and presentations) are presented in Table 2; proportions are presented in Table 3. Level of achievement in college had been high for both accelerates and nonaccelerates. Students who entered college at least one year early and those who entered at the typical age had attended prestigious colleges, had earned grade point averages between the levels of B+ and A-, and aspired to obtain further education. A majority of students in each group (59% of accelerates and 61% of nonaccelerates) had majored in mathematics or science as undergraduates. Many students in each group had taken several mathematics and science courses that were not required for graduation. A majority of students from each group (75% of the accelerates and 63% of the nonaccelerates) attended graduate school. In both groups, the graduate schools attended were highly ranked. Also, many students in both groups had taken advantage of out-of-class academic opportunities, such as working on a research project.

For all comparisons between accelerates and nonaccelerates on individual academic variables, there were only two statistically significant differences, both of which occurred with variables presented in Table 2. First, the accelerates reported a higher average level of educational attainment at the time of the survey than did nonaccelerates ($t (211) = 3.90, p < .001$). Second, the accelerated students who attended graduate school began their graduate studies at a younger age than did the unaccelerated students who attended graduate school ($t (134) = 7.73, p < .001$).
Thus, at age 23, as at age 18, the accelerates had gained at least one year in their educational development.

We conducted a stepwise discriminant function analysis to predict membership in the accelerated and unaccelerated groups by academic variables. Although the groups were very similar across the variables (Wilks's $\lambda = 0.91$), there were significant differences between them ($p < .0005$). The variables that contributed most to the prediction of acceleration group membership were the following (in order of entry): educational level, number of unrequired mathematics courses taken, and undergraduate grade point average. With the exception of grade point average (for which the mean difference of less than .02 favored the nonaccelerates), these variables favored accelerates. The canonical correlation of the function was small ($r = 0.31$); the discriminant function correctly classified approximately 64% of the students (as opposed to the 50% that would be expected by chance).

Psychosocial/Attitudinal Variables and Acceleration

We also compared accelerates with nonaccelerates with regard to their liking for college, participation in extracurricular activities, attitudes toward mathematics and science, locus of control, and self-esteem (Table 4). On the average, students in both groups liked college, were active in extracurricular areas, and expressed positive attitudes toward mathematics and science. Locus of control for both groups was internal; mean self-esteem scores for both groups were high. No significant differences between the two groups were found for any of these individual attitudes or aspects of psychosocial life. Furthermore, the differences between the groups across the psychosocial/attitudinal variables were not sufficient for a discriminant function to be calculated.
Subgroup Comparisons

Gender differences. Tables 5, 6, and 7 summarize the results of gender-separate comparisons of all academic and psychosocial/attitudinal variables. We conducted two types of comparisons with these individual variables. First, we explored within-group gender differences. Among the accelerates only, male students reported having taken more college mathematics courses that were not required for graduation than did female students ($t (104) = 3.17, p < .005$). Among nonaccelerates only, male students rated science as being more important to their planned careers than did female students ($t (102) = 4.17, p < .001$). In both the accelerated and the unaccelerated groups, talent search SAT-M scores were higher among male students than among female students ($t (105) = 5.29, p < .001$ for accelerates; $t (105) = 5.16, p < .001$ for nonaccelerates). Also, in both groups, male students reported that they felt more confident about working out science problems than did female students ($t (102) = 3.00, p < .005$ for accelerates; $t (104) = 4.14, p < .001$ for nonaccelerates). Additionally, in both groups, male students reported that they found science to be easier than did female students ($t (101) = 3.86, p < .001$ for accelerates; $t (102) = 4.13, p < .001$ for nonaccelerates). In fact, gender comparisons in both acceleration groups indicated that general attitudes toward science (i.e., scores on the standardized attitudes toward science scale) were more positive among male students than among female students ($t (100) = 3.12, p < .005$ among accelerates; $t (60) = 3.96, p < .001$ among nonaccelerates).

Second, between-groups comparisons were made separately for male and female students to explore possible differential responses to acceleration by gender.
Table 5. Means and Standard Deviations for Academic Variables, According to Acceleration Status and Gender

<table>
<thead>
<tr>
<th>Variable</th>
<th>Accelerated students</th>
<th>Unaccelerated students</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Male Mean (SD)</td>
<td>Female Mean (SD)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Male Mean (SD)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Female Mean (SD)</td>
</tr>
<tr>
<td>SAT-M score at age 12 or 13</td>
<td>580 (55.8)</td>
<td>520 (53.9)</td>
</tr>
<tr>
<td>SAT-V score at age 12 or 13</td>
<td>450 (70.7)</td>
<td>460 (71.7)</td>
</tr>
<tr>
<td>Educational level</td>
<td>3.38 (0.73)</td>
<td>3.32 (0.78)</td>
</tr>
<tr>
<td>Educational aspirations</td>
<td>4.75 (0.44)</td>
<td>4.38 (0.65)</td>
</tr>
<tr>
<td>Undergraduate GPA</td>
<td>3.50 (0.61)</td>
<td>3.48 (0.30)</td>
</tr>
<tr>
<td>Number of undergraduate math courses taken</td>
<td>4.67 (4.74)</td>
<td>3.66 (3.69)</td>
</tr>
<tr>
<td>Number of undergraduate physical science courses taken</td>
<td>6.39 (7.30)</td>
<td>4.84 (7.84)</td>
</tr>
<tr>
<td>Number of undergraduate natural science courses taken</td>
<td>2.19 (3.95)</td>
<td>2.08 (2.87)</td>
</tr>
<tr>
<td>Number of undergraduate computer science courses taken</td>
<td>1.93 (3.60)</td>
<td>1.21 (2.28)</td>
</tr>
<tr>
<td>Number of unrequired math courses taken</td>
<td>2.06 (2.59)</td>
<td>0.84 (1.37)</td>
</tr>
<tr>
<td>Number of unrequired science courses taken</td>
<td>2.65 (3.26)</td>
<td>1.08 (2.01)</td>
</tr>
<tr>
<td>Age attending graduate school</td>
<td>21.20 (1.08)</td>
<td>20.96 (1.15)</td>
</tr>
<tr>
<td>Astin college rank (median)</td>
<td>23.0</td>
<td>180.5</td>
</tr>
<tr>
<td>Gourman graduate department rank (median)</td>
<td>10</td>
<td>14</td>
</tr>
</tbody>
</table>

Note: SAT-M = Scholastic Aptitude Test--Mathematics
      SAT-V = Scholastic Aptitude Test--Verbal
      GPA = grade point average
Table 6. Proportions of students involved in academic activities, according to acceleration status

<table>
<thead>
<tr>
<th>Activity</th>
<th>Percent responding</th>
<th>Percent responding</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Accelerated</td>
<td>Unaccelerated</td>
</tr>
<tr>
<td></td>
<td>Male</td>
<td>Female</td>
</tr>
<tr>
<td>Attending college</td>
<td>99</td>
<td>100</td>
</tr>
<tr>
<td>Majoring in math/science as undergraduate</td>
<td>68</td>
<td>42</td>
</tr>
<tr>
<td>Earning honors as undergraduate</td>
<td>30</td>
<td>24</td>
</tr>
<tr>
<td>Attending graduate school</td>
<td>80</td>
<td>66</td>
</tr>
<tr>
<td>Majoring in math/science as graduate student</td>
<td>60</td>
<td>32</td>
</tr>
<tr>
<td>Creating original invention or process</td>
<td>17</td>
<td>5</td>
</tr>
<tr>
<td>Editing a publication</td>
<td>22</td>
<td>26</td>
</tr>
<tr>
<td>Presenting a paper; participating in a colloquium</td>
<td>35</td>
<td>26</td>
</tr>
<tr>
<td>Publishing a book</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>Publishing a journal article</td>
<td>26</td>
<td>8</td>
</tr>
<tr>
<td>Publishing a magazine article</td>
<td>12</td>
<td>5</td>
</tr>
<tr>
<td>Publishing a newspaper article</td>
<td>9</td>
<td>13</td>
</tr>
<tr>
<td>Having probably publications in preparation</td>
<td>38</td>
<td>26</td>
</tr>
<tr>
<td>Contributing to a research project</td>
<td>51</td>
<td>42</td>
</tr>
</tbody>
</table>
Table 7. Means and standard deviations of psychosocial variables, according to acceleration status and gender

<table>
<thead>
<tr>
<th>Variable</th>
<th>Accelerated students</th>
<th>Unaccelerated students</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Male</td>
<td>Female</td>
</tr>
<tr>
<td></td>
<td>Mean (SD)</td>
<td></td>
</tr>
<tr>
<td>Liking for college</td>
<td>1.75 (0.85)</td>
<td>1.40 (0.79)</td>
</tr>
<tr>
<td>Number of extra-curricular activity areas</td>
<td>2.19 (1.33)</td>
<td>2.50 (1.29)</td>
</tr>
<tr>
<td>Confidence in math(^a)</td>
<td>4.33 (0.79)</td>
<td>3.92 (1.15)</td>
</tr>
<tr>
<td>Confidence in science(^b)</td>
<td>4.17 (0.89)</td>
<td>3.58 (1.08)</td>
</tr>
<tr>
<td>Perceived ease of math(^a)</td>
<td>4.08 (1.03)</td>
<td>3.51 (1.19)</td>
</tr>
<tr>
<td>Perceived ease of science(^b)</td>
<td>3.88 (0.84)</td>
<td>3.16 (1.03)</td>
</tr>
<tr>
<td>Interest in math(^a)</td>
<td>4.00 (0.95)</td>
<td>3.92 (1.15)</td>
</tr>
<tr>
<td>Interest in science(^b)</td>
<td>4.45 (0.84)</td>
<td>4.32 (0.90)</td>
</tr>
<tr>
<td>Usefulness of math for planned career(^a)</td>
<td>3.15 (0.88)</td>
<td>2.68 (1.13)</td>
</tr>
<tr>
<td>Usefulness of science for planned career(^b)</td>
<td>3.09 (0.95)</td>
<td>2.65 (1.21)</td>
</tr>
<tr>
<td>Attitudes toward math scale (z-scores)</td>
<td>0.19 (0.59)</td>
<td>-0.17 (0.83)</td>
</tr>
<tr>
<td>Attitudes toward science scale (z-scores)</td>
<td>0.21 (0.70)</td>
<td>-0.26 (0.80)</td>
</tr>
<tr>
<td>Locus of control scale</td>
<td>4.00 (0.60)</td>
<td>4.02 (0.53)</td>
</tr>
<tr>
<td>Self-esteem scale</td>
<td>4.31 (0.48)</td>
<td>4.00 (0.71)</td>
</tr>
</tbody>
</table>

\(^a\) Responses converted to standard scores and used in the attitudes toward math scale.

\(^b\) Responses converted to standard scores and used in the attitudes toward science scale.
For both male and female students, accelerated students began attending graduate school at a younger age than did unaccelerated students ($t (93) = 5.31, p < .001$ for male students; $t (36) = 6.07, p < .001$ for female students). For male students only, accelerates reported having obtained a higher level of education at the time of the survey than did nonaccelerates ($t (136) = 3.37, p < .001$). No other statistically significant differences between acceleration groups were found for either gender.

We conducted stepwise discriminant function analyses to predict gender group membership on the basis of academic and psychosocial/attitudinal variables. In these analyses, we included the entire subject pool to maximize power. The differences between the groups were statistically significant (Wilks’s lambda = 0.72, $p < .0001$ for the academic variables; Wilks’s lambda = 0.88, $p < .0001$ for the psychosocial/attitudinal variables).

The academic variables that contributed most to the prediction of gender group membership were the following (in order of entry): talent search SAT-M score, the number of unrequired undergraduate mathematics courses taken, the number of physical science courses taken as an undergraduate, undergraduate grade point average, graduate school attendance, the number of unrequired undergraduate science courses taken, the number of computer science courses taken as an undergraduate, and the overall number of mathematics courses taken as an undergraduate. Male students scored higher on all of the variables in the discriminant function. The canonical correlation resulting from the analysis was rather substantial ($r = 0.53$); the function classified approximately 70% of the students into the correct gender group.
The psychosocial/attitudinal variables that contributed most to the prediction of gender group membership were, in order of entry, attitudes toward science and liking for college. Male students expressed more positive attitudes toward science; female students expressed greater liking for college. The canonical correlation resulting from this analysis was small ($r = 0.35$); the discriminant function correctly classified approximately 70% of the students into gender groups.

**Differences according to extent of acceleration.** In addition, we conducted individual t-tests and chi-square analyses to compare students who accelerated only one year (N = 84) with students who accelerated their education by more than one year (N = 23 accelerated by two to five years; modal acceleration = two years). Only one statistically significant difference was found between these two groups: responses of students who had accelerated more than one year reflected more internal locus of control than did those of students who entered college only one year earlier than is typical ($t (55) = 3.04$, $p < .005$). Discriminant function analyses could not be conducted for these groups because of limitations in power.
DISCUSSION

We investigated the relationship between acceleration and both academic achievement and psychosocial development at least five years after acceleration had occurred. Academically, both the students who entered college at least one year early and those who were matched for ability, but enrolled at an older age, demonstrated high achievement. Also, the students in both groups appeared to be satisfied with their educational experiences and psychosocially well-adjusted.

We considered exploring the relationship between academic achievement and psychosocial adjustment among the gifted students in our sample. Because of the lack of variability in both academic and psychosocial/attitudinal areas, however, this analysis proved to be impossible. Therefore, we separately discuss our findings for academic and psychosocial/attitudinal variables.

**Academic Variables and Acceleration**

Few significant differences between accelerated and unaccelerated students were found in the academic domain when individual variables were considered. When the academic variables were aggregated, however, the results tended to favor the accelerates. This pattern of results appears to refute many common concerns about the effects of acceleration.

On neither the undergraduate level nor the graduate level were there differences between accelerates and nonaccelerates in the quality of schools attended. This finding indicates that the accelerates in this subject group were able to compete successfully for admission to schools with good reputations despite the difficulties that young students frequently encounter in this area (Brody & Stanley, 1991). Furthermore, the lack of significant differences with regard to the various
undergraduate academic variables indicates that, once enrolled in college, the accelerates were able to perform as successfully as the nonaccelerates, even though the accelerates were at least one year younger. These findings are inconsistent with the claim that acceleration leads to gaps in the knowledge of participants or poor retention of material learned at an accelerated pace (see Hildreth, 1966; VanTassel-Baska, 1989).

There was no difference between the two groups in the level of education to which students aspired, but the accelerates had attained a higher educational level at the time of the survey and had entered graduate school at a younger age than had the nonaccelerates. Because the students in the accelerated group had been accelerated prior to beginning their undergraduate educations, it is noteworthy that they were still advanced approximately five years later. The accelerates did not appear to slow their college educations, take time off before pursuing graduate studies, or plan to curtail their educational pursuits. These findings mitigate the concern that accelerated students may be more likely than unaccelerated students to experience burnout (Compton, 1982). If accelerated students were burnt out on academics, they would not equal their unaccelerated counterparts in either graduate school attendance or extent of educational planning, as they did in our evaluation.

Overall, few differences between the acceleration groups were noted for individual variables. Nevertheless, when academic variables as a whole were considered, the performance of the accelerates appeared to be slightly stronger than that of the nonaccelerates.
Psychosocial/Attitudinal Variables and Acceleration

The lack of significant differences between accelerated and unaccelerated students across multiple psychosocial and attitudinal variables suggests that the accelerated students in our sample are as well adjusted as the unaccelerated students. It is possible that some studies may find gifted students to score lower in some of these areas than do average students. Although it is beyond the scope of this article to examine this relationship, the results obtained in this study indicate that any such differences that may be found are unlikely to be due to acceleration among members of the gifted group.

Subgroup Comparisons

When scores on individual variables were compared by gender within each acceleration group, we noted several differences. In addition, there are several within-group gender differences that did not achieve statistical significance, but appear to be large enough to contribute to an interpretation of the pattern of results by gender (e.g., differences in undergraduate college rankings and in mathematics/science majors both at the undergraduate and graduate levels). Generally, these differences (both those that were statistically significant and those that were not) suggest that male students may pursue mathematics and science more vigorously than do female students. The results of the discriminant function analysis with academic variables also support this interpretation. Nevertheless, the result of between-groups comparisons for individual variables, conducted separately by gender, indicate that accelerative experiences did not have differential impact on the male and female students in our sample. Although we have noted gender differences, analysis of such differences did not constitute the primary focus of this article. Gender
differences in achievement are discussed in greater detail by Sanders, Benbow, and Albright (1991).

In addition to gender, we explored extent of acceleration as a possible factor in academic and psychosocial/attitudinal outcomes. The only difference between students who accelerated only one year and those who accelerated more than one year was that students who accelerated to a greater extent scored higher than did one-year accelerates on our scale of locus of control. Because both groups reported internal locus of control and because there were not other differences between the groups, the appropriate conclusion appears to be that students who desire to accelerate their educations by several years are affected no differently by their educational experiences than are students who choose to accelerate by only one year.

**Conclusion**

This study is limited in three ways. First, self-reported follow-up data were used. Second, the students studied were highly gifted and, therefore, may not be representative of the total population of students who are identified as gifted in American school systems. It is important to note, however, that acceleration is not recommended for all gifted students, but only for those who are highly gifted and who desire acceleration. Third, the groups in this study were matched only for ability as measured by a single test (i.e., the SAT). Therefore, there may be characteristics not investigated in this study (e.g., motivation) that distinguish the accelerates from the nonaccelerates.

Although the self-selection of students into their respective groups can be considered a limitation of the study, it has important implications for the interpretation of the results, as well. As has been recommended previously, students
who do not wish to accelerate should not be accelerated (Benbow, 1991). The converse may also be true; that is, that students who wish to accelerate should not be denied the opportunity to do so. Some individuals might argue that the results of this study indicate that acceleration is useless because there are few significant differences, over time, that favor the accelerates. Perhaps, however, the students who wished to accelerate would have suffered if they had been denied the opportunity to do so. Ethical considerations prevent the direct empirical investigation of this possibility.

This study is unique in that both academic and psychosocial/attitudinal aspects of gifted students' lives were explored. This approach enabled consideration of gifted students in a more global way than is permitted by the designs used in most research, and matching of students on the basis of ability avoided the confounding of ability and acceleration. Furthermore, the longitudinal design of this study allowed for the empirical investigation of long-term achievement and adjustment among gifted students who have used different methods of education.

The results of this study suggest that the common beliefs that acceleration puts bright students at a disadvantage academically (Compton, 1982; see Hildreth, 1966; VanTassel-Baska, 1989) or psychosocially (see Coleman & Fults, 1985; Copley, 1961; Jung, 1954; Miller, 1980; Smith, 1984) should be reconsidered. Avoidance of the implementation of acceleration in the education of gifted students, whether male or female, does not appear to be supported by the present study or by earlier empirical research. Rather, accelerated students appear to benefit by gaining at least one year that they can devote to their own interests, such as professional or advanced educational development. We conclude that highly gifted students who desire to
accelerate may benefit from being permitted to advance in their academics as far as they are willing and able to go.
REFERENCES


PAPER II: HOW GIFTED ADOLESCENTS COPE WITH SELF-PERCEIVED UNPOPULARITY
ABSTRACT

The literature regarding the social lives of gifted adolescents indicates that such students perceive themselves as unpopular, yet maintain strong self-concepts, even in the social realm. Such findings appear to be incompatible with the common characterization of adolescence as a time during which positive social interactions are extremely important, perhaps even necessary, to successful personality development. Nevertheless, the findings were replicated in this study. Also, the methods by which gifted adolescents may preserve positive self-concepts despite believing themselves to be unpopular were investigated. Factor analysis of a survey addressing beliefs and activities related to the social aspects of giftedness yielded five factors: a) denial of giftedness, b) popularity/conformity, c) peer acceptance, d) fear of failure, and e) activity level. The relationships between students' scores on these factors and indicators of self-perceived popularity and self-concept were explored. Results include indications that the most highly able students may be those most likely to deny their giftedness, that verbally gifted individuals may perceive themselves to be less accepted by their peers than do mathematically gifted individuals, and that girls may have particular difficulty in simultaneously accepting their giftedness and maintaining positive self-concepts. In addition, some unexpected results suggested that peer acceptance may be inversely related to some types of self-concept and that, for boys, extensive involvement in structured activities also may relate negatively to self-concept in some areas. The results of this study are preliminary and require replication; nevertheless, they provide several potential topics for future research.
INTRODUCTION

A review of psychological and educational literature yields seemingly incongruent findings regarding aspects of the social lives of gifted children. First, gifted children often perceive themselves as unpopular or as less popular than their average-ability classmates. Second, gifted students score at least as high as do average-ability students on measures of self-concept and self-esteem. Given the importance of peer group acceptance during the teenage years (e.g., Buescher, 1985; Seiffge-Krenke, 1990; Seltzer, 1982, 1989), this set of findings seems especially surprising when reported for adolescents. A question arises, therefore, concerning the means by which gifted adolescents preserve positive self-concepts in the face of what is, from their own perspective, a lack of popularity.

Students' Perceptions of Being Gifted

Research investigating students' feelings about being labelled "gifted" has yielded inconsistent results. Some studies indicate that gifted individuals evaluate positively special academic programs and the practice of identifying gifted students (Guskin, Zimmerman, Okolo, & Peng, 1986; Hershey & Oliver, 1988). Yet, along with their apparently positive general findings, Guskin, et al. (1986) note some indications that the children in their sample were not entirely comfortable with their acknowledged giftedness. The authors concluded their article by stating that "The gifted and talented label is apparently seen as a mixed blessing. ...while these students are quite willing to view themselves as highly competent, personable, etc., they do not want to be seen as outstanding or too different from others. ...Although most of these students do not report negative consequences of the label, they seem very aware of the potential for rejection if they are set apart as an elite" (p. 64).
Other authors also suggest that gifted students are aware of possible social rejection. Johnson (1981) summarized the views conveyed by the gifted students he interviewed by stating that "average students sometimes perceive high academic achievers as weird" (p. 29). Karnes and Oehler-Stinnett (1986) investigated gifted adolescents' rankings of stressful events and found that although being labelled gifted was not rated as stressful, items related to social status were rated as quite stressful. The effects of pressure to conform socially have been observed even in very young gifted children (i.e., age five; Roedell, 1986), although the demand for social conformity with average-ability peers may be most strongly felt during adolescence (Coleman, 1985). Therefore, research indicates that gifted students may believe that their abilities could distance them from others.

The perception of potentially negative social consequences of being gifted does not necessarily imply the perception of actual social difficulties. There is additional research, however, indicating that gifted students may view themselves as unpopular. Such a view has been supported by statements from gifted individuals (Coleman & Cross, 1988; Rimm, 1988) and empirical studies of gifted students' self-rated popularity (Tidwell, 1980). In addition, research indicates that extremely gifted individuals and verbally gifted students may perceive themselves to be lower in social status than do modestly gifted individuals and mathematically gifted students (Dauber & Benbow, 1990). Generally, it appears that highly able students may perceive a reality in which they are lacking in popularity or social status because of their giftedness.

Thus, some of the literature implies that gifted students are comfortable with the acknowledgement of their abilities, whereas other work suggests that gifted
students perceive drawbacks in being identified as gifted. These apparently incongruent findings are integrated by Kerr, Colangelo, and Gaeth (1988), who note that gifted students may perceive their giftedness positively from a personal point of view, but simultaneously believe that others view it negatively. This theory fits much of the data that is available.

Support for the positive nature of gifted students' personal perception of giftedness and gifted programs is gained from studies in which gifted individuals rate gifted programs and the identification of giftedness positively (Colangelo & Kelly, 1983; Guskin, et al., 1986; Hershey & Oliver, 1988). Conversely, students' concern with others' perceptions of them is illustrated by the finding that gifted students rank social items as more stressful than other categories of items (Karnes & Oehler-Stinnett, 1986). Also, Kerr (1985) noted that gifted students are aware of and sensitive to others' perceptions at an early age. A study by Colangelo and Brower (1987a) provides more direct support for the theory. These researchers found that a sample of students who evaluated their gifted programs positively and reported that they would participate again if given the opportunity also indicated beliefs that their parents and "nongifted" siblings were not positive about their giftedness. Thus, gifted students may feel that their abilities do not generate approval and/or support from others, although they themselves recognize the benefits of being highly able.

The difficulties associated with the belief that giftedness does not earn social approval may be especially pronounced during adolescence. According to Erikson (1965; 1983), the developmental stage of adolescence involves the formulation of an identity—a task that may be difficult for people with "deviant endowments" (p. 437) because American adolescence is characterized by "the standardization of individuality..."
and the intolerance of 'differences'" (p. 437). The application of this point to gifted students is supported by several authors (Buescher, 1985; Coleman, 1985; Coleman & Cross, 1988; Delisle, 1984; Guskin, et al., 1986; Janos, Fung, & Robinson, 1985) who suggest that feelings of "differentness" may be problematic for gifted adolescents. The nonconformity that is inherent in being gifted may complicate identity formation for gifted individuals.

In addition, Erikson (1965) states that the process of identity formation is often promoted by the establishment of well-defined peer groups. Dunphy (1983) notes that many other authors agree with this statement and defines a peer group as one in which "members are of similar [chronological] age and regard each other as acceptable associates" (p. 376). Unfortunately, this definition can be difficult to apply to gifted students.

Dunphy's (1983) definition rests upon the assumption that children of approximately equal chronological age are also approximately equal in their levels of functioning and, therefore, are socially compatible. The precocity that is often evident in intellectually gifted children (Feldhusen, 1991), however, may render the majority of children who are similar in chronological age inappropriate for inclusion in a gifted child's peer group (Silverman, 1990). Not surprisingly, it has been found that gifted students tend to prefer older students for friends (see Janos & Robinson, 1985). A further complicating factor is that, although adolescents may accept high ability in their classmates, they are unlikely to accept a demonstrated interest in academic pursuits (Tannenbaum, 1991).

For reasons such as those above, same-age students of average ability may not qualify as an appropriate peer group for gifted adolescents. In effect, gifted children
who are not involved in special programming may be left with no suitable peer group. To some extent, therefore, the concerns of gifted students regarding their potential for social alienation may be valid. Given the importance of membership in an appropriate peer group during adolescence, these concerns (and, perhaps, realities) may be particularly troubling during the adolescent years. One might, therefore, expect the self-concepts of these adolescents to reflect their uncertainties.

**Self-Concept**

*Definition of the construct.* Historically, self-concept research has been marred by the lack of a consensual definition of self-concept; therefore, a multitude of operational definitions of the construct have emerged (Byrne, 1984; Harter, 1982; Shavelson, Hubner, & Stanton, 1976). Many of the instruments that are commonly used to measure self-concept (e.g., Coopersmith, 1967) derive from a unidimensional theory of self-concept, yielding one overall score (Harter, 1986). Some research, however, indicates that domain-specific scores, which reflect a multidimensional theory of self-concept, may more accurately reflect people's views of themselves (e.g., Cornell, Pelton, Bassin, Landrum, Ramsay, Cooley, Lynch, & Hamrick, 1990; Harter, 1982, 1986; Marsh & Goumner, 1989; Shavelson & Bolus, 1982; Shavelson, Hubner, & Stanton, 1976). In contrast, other research endeavors have indicated that domain-specific self-concepts may not demonstrate acceptable levels of discriminant validity (Marx & Winne, 1978; Winne, Marx, & Taylor, 1977). Marsh and Goumner (1989), in an effort to resolve this dilemma, note that the more successful demonstrations of construct validity for domain-specific self-concepts were undertaken more recently than were the failed attempts. They suggest that the reason for this pattern may be that the design strategies for newer measures of domain-
specific self-concept are more sophisticated and theoretically-driven than were the first attempts in this area.

One model of self-concept, which utilizes elements of both the unidimensional and the multidimensional approaches, is the hierarchical theory of self-concept. In this model, general self-concept neither stands alone nor breaks down into domain-specific "pieces". Rather, it is viewed as an independent construct that is hierarchically related to domain-specific constructs, holding a position that is superordinate to them (Harter, 1982, 1986; Marsh, 1987; Marsh & Shavelson, 1985; Shavelson, Hubner, & Stanton, 1976). Among elementary-school children, this hierarchical structure has been shown to become more distinct with age (Marsh & Shavelson, 1985). Harter (1986) acknowledges that there are difficulties with hierarchical theories, especially with regard to the manner in which the subordinate, domain-specific self-concepts combine to form the superordinate, general self-concept. Nevertheless, she notes that hierarchical models "have heuristic value as an aid in organizing our thinking about the possible dimensions of the self-system" (pp. 140-141).

Further complicating the study of self-concept, proponents of multidimensional self-concept theories use different instruments and propose different specific self-concept domains. For example, three domains are cited by Harter (1982): cognitive, social, and physical. The emotional domain is added to this list in work by Shavelson, Hubner, and Stanton (1976) and others (see Byrne, 1984). Hoge and McSheffrey (1991) describe an unpublished modification of Harter's (1982) Perceived Competence Scale for Children in which five domains are represented: Scholastic
Differences of opinion exist regarding the makeup of academic self-concept, as well. Some researchers (e.g., Marsh, 1987; Marsh, Byrne, & Shavelson, 1988; Marsh & Gouvernet, 1989; Marsh & Shavelson, 1985) believe that academic self-concept is best represented in separate verbal/academic and mathematical/academic domains, although this position has been disputed (Skaalvik & Rankin, 1990). Marsh, Byrne, and Shavelson (1988) have theorized that even more specific self-concepts may exist (e.g., subordinate to mathematical self-concept may be specific algebra, geometry, and calculus self-concepts), and Marsh (1992) has begun to empirically demonstrate the usefulness of such subject-specific self-concepts. Clearly, the delineation and description of meaningful types of self-concept is a difficult task. The cognitive (academic), social, and physical domains (Harter, 1982) appear to be commonly accepted, but the majority of research with gifted children has involved general, academic, and social self-concepts.

Various terms referring to self-perception and self-evaluation are often used interchangeably in the literature (Shavelson, Hubner, & Stanton, 1976), perhaps partly due to the lack of a common definition of "self-concept". These terms include "self-concept" (Harter, 1982, 1986; Karamessinis, 1980), "self-esteem" (Karamessinis, 1980), "self-worth" (Harter, 1982, 1986), and "perceived competence" (Harter, 1982, 1986). Gresham, Evans, and Elliott (1988) discuss academic and social "self-efficacy", but refer to them as types of self-concept. Obviously, a literature review that is limited to work that specifies "self-concept" per se risks omitting important information. Therefore, the following review of the
literature on self-concept and giftedness includes work citing any of the constructs listed above. Also, because of the disagreement in the literature concerning appropriate models of self-concept (i.e., unidimensional or multidimensional), any studies including general, academic, or social self-concept are included.

**General self-concept.** Gifted students appear to be at least equal to average-ability students in general self-concept. In some cases, gifted children have been reported to demonstrate higher general self-concept than do average-ability comparison groups (Chan, 1988; Janos, Fung, & Robinson, 1985; Tidwell, 1980). A minority of studies present results in which gifted students score lower on measures of general self-concept than do average-ability students (Klein & Cantor, 1976), at least at some ages (Milgram & Milgram, 1976). Methodological design issues, patterns of results, and the types of data that are reported render these studies difficult to interpret, however.

Citing Coleman and Fults (1982), Janos and Robinson (1985) caution that when the Piers-Harris Children’s Self-Concept Scale (Piers & Harris, 1969) is used in research, differences favoring gifted students over the norm group may be attributable to inaccurate norms. Supporting this possibility is the finding that, in the majority of studies reviewed here, no differences were found in the area of general self-concept between gifted and average-ability children (Chan, 1988; Colangelo & Brower, 1987b; Li, 1988; Schneider, Clegg, Byrne, Ledingham, & Crombie, 1989; Tidwell, 1980) or between moderately gifted and highly gifted individuals (Brody & Benbow, 1986). Also, Karamessinis (1980) conducted a literature review in which he found studies demonstrating general self-concept differences favoring gifted students and studies showing no differences, but no research favoring average-ability students.
Thus, it appears that gifted students are at least equal to average-ability students in general self-concept.

Academic self-concept. Regarding academic self-concept, the majority of the literature reports that gifted students score higher than do average-ability students (Chan, 1988; Chapman & McAlpine, 1988; Colangelo & Brower, 1987b; Kelly & Colangelo, 1984; Li, 1988; Schneider, et al., 1989; Simmons & Zumpf, 1986; Tidwell, 1980). Also, one study (Kelly & Jordan, 1990) reports finding that academic self-concept increases as a function of academic achievement. Of the articles reviewed here, only one reported different results: Gresham, Evans, and Elliott (1988) found no differences in academic self-efficacy between gifted and average-ability third- to fifth-grade students.

Some authors note that academic self-concept findings may vary among different groups of gifted children, based upon the method of instruction used to educate them. To test this possibility, integrated gifted students (i.e., students who are educated in a "regular" or "mainstream" classroom) have been compared with segregated gifted students (i.e., those who are enrolled in special classes solely for gifted students). The results of such studies frequently show that segregated gifted students score lower on measures of academic self-concept than do integrated students (e.g., Coleman & Fults, 1982; Richardson & Benbow, 1990; Schneider, et al., 1989; Swiatek & Benbow, 1991). The differences cited, however, tend to be small and can be explained by Festinger’s (1954) social comparison theory (Coleman & Fults, 1982; Swiatek & Benbow, 1991). Overall, therefore, gifted students appear to be comfortable with their academic abilities and may, in fact, exceed average-ability students in academic self-concept.
Social self-concept. Research has yielded less consistent findings regarding the social self-concepts of gifted students. The majority of studies suggest that there are no differences in this area between gifted and average-ability children (Chan, 1988; Kelly & Jordan, 1990; Li, 1988; Schneider, et al., 1989; Simmons & Zumpf, 1986; Whalen & Csikszentmihalyi, 1989). Two of the studies reviewed here, however, do report differences between these groups. Unfortunately, one of the reports places the advantage with gifted individuals (Kelly & Colangelo, 1984) and the other finds an advantage for average-ability students (Gresham, Evans, & Elliott, 1988). The small number of studies showing differences in social self-concept between gifted and average-ability students and the inconsistencies between them leave their findings open to question. The consensus appears to be that gifted and average-ability students are equal in terms of social self-concept.

A comparison of academic and social self-concept. There is one study in the literature that compares academic and social self-concept within a group of gifted students (Ross & Parker, 1980). This study, which reports a significant difference favoring academic self-concept, appears to be congruent with the patterns of results from other studies. The scores reported are difficult to interpret, however. They appear to be sums of students' scores across individual items. Because the academic self-concept scale used is comprised of more items than is the social self-concept scale and no mention is made of any means of correcting for the disparate number of items in the two scales, the results and interpretations reported are of questionable value.

Gifted Students' Approaches to Social Self-Perception

As has been shown above, gifted students may believe that they are perceived negatively by others because of their abilities. Nevertheless, they appear to maintain
healthy self-concepts, even in the social realm. Although it has been suggested that researchers explore the methods by which gifted students cope with the stigma they perceive in giftedness (Coleman & Cross, 1988), this literature review failed to locate any studies that were designed to directly address this issue. A close reading of some of the existing research on the self-perceptions of gifted children and the problems they encounter, however, suggests several approaches that students may use to maintain their social self-concepts.

Several authors (Coleman, 1985; Coleman and Cross, 1988; Delisle, 1984; Tannenbaum, 1991; Zigler & Farber, 1985) suggest that gifted students may actively attempt to minimize the visibility of their giftedness. Such attempts may relate to the difficulties that can be encountered by individuals who feel different from their peers (e.g., Buescher, 1985; Coleman, 1985; Coleman & Cross, 1988; Delisle, 1984; Guskin, et al., 1986; Janos, Fung, & Robinson, 1985). Stated differently, gifted students may strive to hide their giftedness in order to fit in better at school and obtain social approval.

Similarly, Buescher (1985), suggests that, partially in response to "the power of peer pressure and conformity" (p. 13), gifted adolescents may deny that they are gifted. There is some indirect evidence that this approach may be productive. Janos, Fung, and Robinson (1985) found lower self-concepts among gifted students who felt different from other students than among those who did not feel different. Thus, an effective coping strategy for gifted students may be to convince themselves that they are not gifted and, therefore, are not different from others.

Another possibility is that gifted students may hide from others, and possibly also from themselves, any uncertainties they have about themselves. Quoting
Herczeg (a professor of psychology and the coordinator of a hospital program for adolescents), Johnson (1981) notes the possibility that "[Intelligent adolescents] use their intellects as a defense" (p. 29). This hypothesis implies that gifted students may hide behind their academic abilities, perhaps by intellectualizing their reactions to any feelings of social rejection.

A related coping technique may be denial of the importance of popularity as it is traditionally understood in school (i.e., "selective evaluation"; Gibbons & Gerrard, 1990; Taylor, Wood, & Lichtman, 1983). Rimm (1988), in a speech to a group of gifted adolescents, encouraged them to discount the importance of popularity: "Popularity...simply reveres the kids who’ve managed to compromise enough values so that lots of people like them. ...It is neither bad nor good in itself to be popular--only unimportant" (p. 44). Gifted students may subscribe to beliefs such as these, deemphasizing popularity and thereby maintaining a strong social self-concept.

Similarly, gifted students may focus upon their own skills, rather than the reactions of others. Tidwell (1980) notes that, although her sample of gifted students considered themselves to be unpopular, they also reported being happy. She suggests that gifted students may experience personal success because of their abilities and, therefore, may not need "applause from their peers" (p. 68) in order to be happy. If this self-reliance generalizes to social self-concept, gifted students may be able to be comfortable with their own social skills and, therefore, maintain positive self-concepts despite perceptions of unpopularity. This possibility seems compatible with the hypothesis that gifted students may have positive personal perceptions of their giftedness, while simultaneously believing that others respond to it negatively (Kerr, Colangelo, & Gaeth, 1988).
In contrast to strategies aimed at hiding their abilities, gifted students may choose to display their talents. For example, highly able students may become involved in many activities (Coleman, 1985). Perhaps, since participation in activities is usually a social endeavor, gifted students may obtain social fulfillment from their ability to juggle many such commitments. Also, groups emphasize the similarities among their members, thereby enhancing feelings of belonging—a function that may be especially important to gifted students, for whom feelings of "differentness" may be problematic (see Janos, Fung, & Robinson, 1985).

Gender Differences

In an article outlining several difficulties that gifted students may face as they mature, Blackburn and Erickson (1986) include a section on the unique difficulties encountered by adolescent girls. These authors note that young women often receive cultural messages that place their social development above their academic or professional development. Other authors, dating at least back to Hollingworth (1931, cited in Silverman, 1990), also have noted that the value that society places upon fulfillment of a traditional feminine role may make the realization of potential and the fulfillment of personal needs particularly difficult for gifted females (e.g., Coleman, 1985; Kerr, 1985). Because of the different societal values with which females and males are confronted, possible differences in self-perception between the genders deserve consideration.

Although the literature contains a number of reports on the self-perceptions of gifted students, not all of the reports include investigations of possible gender differences. Based upon the studies that do explore gender issues, however, a general picture can be constructed of the differences between gifted males and females in
various aspects of self-perception, including perceptions of being gifted, self-concept, and approaches to social self-perception.

**Students’ perceptions of being gifted.** Only three of the studies reviewed here test for gender effects in the perception of giftedness. Two of these studies (Dauber & Benbow, 1990; Janos, Fung, & Robinson, 1985) reported no differences between males and females. The third study (Kerr, Colangelo, & Gaeth, 1988) reported gifted females to be more sensitive to both the positive and the negative social aspects of giftedness than were gifted males in the same age range. No gender differences were found, however, in the students’ own perceptions of giftedness or their views of others’ perceptions of their abilities.

Only tentative conclusions can be drawn from the limited amount of information in this area. Generally, it appears that able young women and men perceive their giftedness similarly. If there are gender differences, they are most likely to be in the area of students’ sensitivity to social consequences that may be related to being gifted, with females being more sensitive than are males.

**Self-concept.** The majority of studies of self-concept that include investigations of possible gender differences report that no such differences are found in gifted samples. Such reports address general self-concept (Brody & Benbow, 1986; Chan, 1988; Harter, 1982; Hoge & McSheffrey, 1991; Janos, Fung, & Robinson, 1985; Milgram & Milgram, 1976), academic self-concept (Gresham, Evans, & Elliott, 1988; Harter, 1982; Hoge & McSheffrey, 1991; Schneider, et al., 1989), and social self-concept (Chan, 1988; Gresham, Evans, & Elliott, 1988; Harter, 1982; Hoge & McSheffrey, 1991; Milgram & Milgram, 1976; Schneider, et al., 1989). The findings in this area are not uniform, however.
One study (Schneider, et al., 1989) revealed gender differences in general self-concept, but only after the elementary school years. These results may indicate that gender differences in general self-concept increase with age, but the findings require replication.

Findings regarding domain-specific self-concept scores are variable. Some studies report that girls outscore boys in academic self-concept (Li, 1988), but others report the opposite pattern (Kelly & Jordan, 1990). Still other studies reveal gender differences only at certain ages (Chan, 1988) or focus only on average-ability students (Marsh, Byrne, and Shavelson, 1988). Further, some studies that separately analyze data from males and females do not make direct comparisons between the genders (Kelly & Colangelo, 1984; Whalen & Csikszentmihalyi, 1989) and, therefore, are difficult to interpret with regard to gender differences. Because of the inconsistencies in the literature, and because the majority of studies suggest that gender differences are not present, it appears that the most logical conclusion to draw is that there are no large gender differences in general, academic, or social self-concept among gifted individuals.

Approaches to social self-perception. Some authors have noted behavioral differences between the genders. For example, it has been noted that gifted girls may be particularly prone to conform to the expectations and behaviors of others during adolescence (Clark, 1979), perhaps hiding their abilities in order to be socially accepted. Coleman (1985) suggests that gifted women may maintain high self-concepts through the pursuit of "acceptable" successes (e.g., marrying before pursuing excellence in other areas or focusing achievement upon traditionally feminine occupations). Similar strategies on an adolescent level may include
concentrating on dating before school and focusing upon "feminine" rather than "masculine" activities. Thus, it has been proposed that, because the social climate in which females develop is different than that in which males develop, there may be gender differences in the approaches commonly taken toward giftedness.

Conclusions

Evidence exists that gifted students perceive themselves to be at least at risk socially, and may view themselves as unpopular. Nevertheless, it also appears that highly able students are at least equal to their average-ability peers in general, academic, and social self-concept. These findings are reported even among adolescents, although social pressures may be particularly strong during the adolescent years. From these research results, a question arises: How do gifted adolescents maintain high self-concepts despite feeling socially handicapped during a time when social approval is very important to them?

Because some of the difficulties that gifted students may face in terms of their social lives are different from those experienced by the majority of adolescents, gifted students are likely to utilize social coping strategies that are somewhat unique. This study was designed to investigate such strategies. Self-perceptions of popularity, self-concept, and social coping mechanisms were examined in a sample of gifted students. When appropriate, comparisons were made with a group of average-ability students. In addition, consideration was given to possible gender differences in the approaches to giftedness that were reported by gifted adolescents.
METHOD

Subjects

Gifted group. The subjects comprising the gifted group in this study are junior high school students who attended CY-TAG in either 1989 or 1990. CY-TAG is an academic summer program for intellectually gifted students that is conducted through the Office of Precollegiate Programs for the Talented and Gifted (OPPTAG) at Iowa State University. CY-TAG students reside on the University campus for three weeks, during which time they are enrolled in an accelerated class in an area of their choice. Qualification for the program is determined through the use of the Scholastic Aptitude Test (SAT; Donlon, 1984) or the ACT (American College Testing Program, 1988, 1989), both of which are tests designed for high school seniors. This "out-of-level" testing removes the ceiling effect from the tests usually used with junior high school students, thereby allowing more specific assessment of giftedness. The school grade and test score requirements for CY-TAG students, as well as the classes offered, varied between 1989 and 1990, as detailed below and summarized in Table 1.

In 1989, there were two three-week sessions of CY-TAG, during which eight different classes were offered: a) Computer Science, b) Precalculus Mathematics, c) Probability and Statistics, d) Latin, e) Expository Writing, f) Personal Writing, g) Chemistry, and h) Earth Science. Additionally, mentorship opportunities were made available for students with research interests in specific areas.

The SAT and ACT tests were used to identify seventh-, eighth-, and ninth-grade students for the program; qualifying scores varied based upon the class to which a student applied. A minimum score, by age 13, of 500 on the mathematics
Table 1. CY-TAG course offerings and qualifying scores

<table>
<thead>
<tr>
<th>Year</th>
<th>Grade range</th>
<th>Courses offered</th>
<th>Qualifying scores(^a)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1989</td>
<td>7 - 9</td>
<td>Computer Science</td>
<td>(\geq 500) SAT-M</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Precalculus Math</td>
<td>(\geq 21) ACT Composite</td>
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<tr>
<td></td>
<td></td>
<td>Prob./Stat.</td>
<td>(\geq 21) ACT Math</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Latin</td>
<td>(\geq 430) SAT-V</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Expository Writing</td>
<td>(\geq 21) ACT Composite</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Personal Writing</td>
<td>(\geq 21) ACT English Usage</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Chemistry</td>
<td>(\geq 930) SAT-M + SAT-V</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Earth Science</td>
<td>(\geq 500) SAT-M</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(\geq 430) SAT-V</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(\geq 21) ACT Composite</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(\geq 21) ACT Natural Sciences</td>
</tr>
<tr>
<td>1990</td>
<td>7 - 10</td>
<td>Latin</td>
<td>(\geq 430) SAT-V</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Exploratory Writing</td>
<td>(\geq 20) ACT English</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(\geq 20) ACT Reading</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Precalculus Math</td>
<td>(\geq 500) SAT-M</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Computer Science</td>
<td>(\geq 20) ACT Math</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(\geq 20) ACT Science</td>
</tr>
<tr>
<td></td>
<td></td>
<td>20th Century Physics</td>
<td>(\geq 930) SAT-M + SAT-V</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Field Biology</td>
<td>(\geq 20) ACT Composite</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Mentorships</td>
<td>(\geq 20) ACT Science</td>
</tr>
</tbody>
</table>

\(^a\) Scores listed are seventh-grade scores. Older students’ scores were age-adjusted.
section of the SAT (SAT-M) or 21 on either the ACT Composite or ACT Mathematics subtest was required for the Computer Science, Precalculus Mathematics, and Probability and Statistics courses; a minimum score, by age 13, of 430 on the verbal section of the SAT (SAT-V) or 21 on the ACT Composite or ACT English Usage subtest was required for the Latin, Expository Writing, and Personal Writing courses. To qualify for the remaining courses (Chemistry, Earth Science, and the mentorships), students were required to meet one of five test score requirements by age 13:

- 930 on the SAT-M and SAT-V combined
- 500 on the SAT-M
- 430 on the SAT-V
- 21 on the ACT Composite
- 21 on the ACT Natural Sciences subtest.

In all cases, the scores stipulated are for seventh-graders; qualifying scores were grade-adjusted for more advanced individuals. All students involved in CY-TAG met at least one of these criteria.

During the summer of 1989, a total of 114 students (66 males and 48 females) attended CY-TAG. The number of students in each class, broken down by gender, is presented in Table 2. Ninety-one of these students (52 males and 39 females) completed at least three of the five measures that were collected during CY-TAG and were used in this study (as described in the Instrumentation section). These 91 students were surveyed further.

In 1990, there were again two three-week CY-TAG sessions. The courses offered were: a) Latin, b) Precalculus Mathematics, c) Twentieth Century Physics,
Table 2. Numbers of students in CY-TAG 1989 classes

<table>
<thead>
<tr>
<th>Class</th>
<th>Number of students</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Male</td>
</tr>
<tr>
<td>Latin</td>
<td>5</td>
</tr>
<tr>
<td>Expository Writing</td>
<td>4</td>
</tr>
<tr>
<td>Math (Session 1)</td>
<td>11</td>
</tr>
<tr>
<td>Earth Science</td>
<td>3</td>
</tr>
<tr>
<td>Chemistry</td>
<td>12</td>
</tr>
<tr>
<td>Probability/Stats</td>
<td>5</td>
</tr>
<tr>
<td>Personal Writing</td>
<td>2</td>
</tr>
<tr>
<td>Math (Session 2)</td>
<td>18</td>
</tr>
<tr>
<td>Computer Science</td>
<td>7</td>
</tr>
<tr>
<td>Mentorships</td>
<td></td>
</tr>
<tr>
<td>Psychology</td>
<td>0</td>
</tr>
<tr>
<td>Zoology</td>
<td>2</td>
</tr>
<tr>
<td>Veterinary Medicine</td>
<td>2</td>
</tr>
</tbody>
</table>

a Total number of students in table is greater than that cited in text because several students attended both Session 1 and Session 2 of CY-TAG.
d) Computer Science, e) Exploratory Writing, and f) Field Biology. Mentorship opportunities also were available for students with specific research interests. Participants were students who had just completed grade seven, eight, or nine. Sixth-grade students who met the seventh-grade score requirements were considered, as well.

The qualifying SAT and ACT scores for CY-TAG 1990 were similar to those used in 1989, and were again grade-adjusted for students above the seventh grade. A minimum score of 500 on the SAT-M or 20 on the ACT Mathematics or ACT Science subtest, by age 13, was required for the Computer Science and Precalculus Mathematics courses; a minimum score of 430 on the SAT-V or 20 on the ACT English or ACT Reading subtest, by age 13, was required for the Exploratory Writing and Latin courses. The qualifying scores for the mentorships and the Physics and Field Biology classes were 930 on the SAT-M and SAT-V combined or 20 on either the ACT Composite or the ACT Science subtest.

A total of 200 students (113 males and 87 females) attended CY-TAG 1990. The number of students in each class, broken down by gender, is presented in Table 3. Thirty-five students (14 males and 21 females) participated in CY-TAG in both 1989 and 1990. For the purposes of this study, these students are considered to be part of the 1989 CY-TAG group. Therefore, 165 students (99 males and 66 females) comprise the 1990 CY-TAG group. Of these 165 students, 147 (85 males and 62 females) completed at least three of the five measures that were collected during CY-TAG and used in this study (as described in the Instrumentation section). These 147 students were surveyed further; thus, the total number of gifted students surveyed for this study was 238 (137 males and 101 females).
Table 3. Numbers of students in CY-TAG 1990 classes

<table>
<thead>
<tr>
<th>Class</th>
<th>Number of students</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Male</td>
<td>Female</td>
<td>Total</td>
<td></td>
</tr>
<tr>
<td>Latin</td>
<td>5</td>
<td>15</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>Math (Session 1)</td>
<td>34</td>
<td>12</td>
<td>46</td>
<td></td>
</tr>
<tr>
<td>Physics</td>
<td>14</td>
<td>8</td>
<td>22</td>
<td></td>
</tr>
<tr>
<td>Computer Science</td>
<td>14</td>
<td>3</td>
<td>17</td>
<td></td>
</tr>
<tr>
<td>Field Biology</td>
<td>11</td>
<td>12</td>
<td>23</td>
<td></td>
</tr>
<tr>
<td>Math (Session 2)</td>
<td>29</td>
<td>13</td>
<td>42</td>
<td></td>
</tr>
<tr>
<td>Exploratory Writing</td>
<td>7</td>
<td>23</td>
<td>30</td>
<td></td>
</tr>
<tr>
<td>Mentorships</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Agriculture</td>
<td>0</td>
<td>3</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Art</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Computer Science</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Engineering</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Family/Consumer Science</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Journalism</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Spanish</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Veterinary Medicine</td>
<td>2</td>
<td>2</td>
<td>4</td>
<td></td>
</tr>
</tbody>
</table>

\* Total number of students in table is greater than that cited in text because several students attended both Session 1 and Session 2 of CY-TAG.
"Average-ability" group. Several of the assumptions of this study involve comparisons between gifted and average-ability adolescents. Therefore, a comparison group of adolescents was recruited through an advertisement in the local newspaper of a university town. This group was comprised of 58 individuals (31 males and 27 females) who ranged in age from 12 to 14 and were paid for their participation in this research. None of these adolescents had ever been enrolled in any special academic program for gifted students. The group's mean score on the Iowa Test of Basic Skills (ITBS) was in approximately the 81st percentile based on national norms (N = 38) and the 65th percentile based on Iowa norms (N = 36). On the basis of these figures, one may view the comparison-group students as being above average in ability. It is most appropriate, however, to compare students to Iowa norms, as the majority of subjects for this study were from Iowa. Therefore, the comparison-group students can be viewed as having ability levels that are close to average. Regardless of the specific norm group used for comparison, it is clear that the comparison-group students were of a lower ability level than were the CY-TAG students, who not only reached the ceiling of the ITBS, but also performed extremely well on an out-of-level test (i.e., the SAT or the ACT). For the purposes of simplicity, the comparison group will be referred to as the "average-ability group".

Instrumentation

Six measurement instruments were used in this study, five of which were administered to students at the beginning of their CY-TAG session. One of these five instruments, the Adjective Check List (Gough & Heilbrun, 1983), was used to identify students who demonstrate unusually low levels of affiliative needs. Three of the instruments, each designed specifically for use with CY-TAG students, assessed
the students' perceptions of themselves in relation to other students in order to replicate the common finding that self-ratings of popularity are lower among intellectually gifted students than among average students. These measures are the Background Questionnaire for CY-TAG Students, the Rating Scale of Student Characteristics, and the Social Comparison Scale. The fifth instrument was the Self-Description Questionnaire II (Marsh, 1990; see also Marsh, Parker, & Barnes, 1985), which was used to measure general, academic, and social self-concepts for the purpose of verifying the assumption that the gifted students in the sample have strong self-concepts in these areas. This instrument was not available for administration to CY-TAG students in 1989. The sixth instrument was designed specifically for this study and explores gifted students' views of their own giftedness as it relates to social activities. This measure was mailed to the students in June 1991. One dollar was enclosed with the questionnaire in an attempt to increase response rates.

**Adjective Check List.** The Adjective Check List (ACL; Gough & Heilbrun, 1983) is a standardized measure of various personal attributes (Appendix A). It consists of 300 adjectives, from which an individual marks those that he or she considers to be self-descriptive. The resulting pattern of responses is scored on 37 different scales. In this study, however, only the Affiliation scale was used. According to the ACL manual (Gough & Heilbrun, 1983), this scale is intended to measure one's psychological need to "seek and maintain numerous personal friendships" (p. 10). Thus, the scale may be said to measure the need for popularity. The Affiliation scale has been reported to have internal consistency coefficients of .89 for males and .87 for females; test-retest reliability over a six-month period has been cited as .60 for males and .66 for females (Gough & Heilbrun, 1983).
Background Questionnaire for CY-TAG Students. The Background Questionnaire for CY-TAG Students (BQ) includes items that address a range of topics, including educational experiences, attitudes, interests, and self-perceptions. Only one of the items from the BQ was used in this study. This item asks "How popular are you in school?"; students respond by ranking themselves on a scale from one ("Not at all") to five ("Very popular").

Rating Scale of Student Characteristics. The Rating Scale of Student Characteristics (RSSC; Appendix B) is comprised of several identical scales, each containing 22 descriptors (e.g., "Attractive", "Makes friends easily", Self-confident"). On the first scale, gifted students are asked to rate "the typical student in your school" on each of the descriptors; on the second scale, they are asked to rate "gifted students"; on the third scale, they are asked to rate themselves. In 1989, the instrument also contained a fourth scale, which assessed students' perceptions of CY-TAG students as a group. For each descriptor, a response is given on a scale from one ("Strongly agree") to seven ("Strongly disagree"), in which a rating of four is marked "Neither agree nor disagree/Neutral".

Social Comparison Scale. The Social Comparison Scale (SCS; Appendix C) is a four-part instrument that assesses students' perceptions of themselves relative to other students. The item format requires students to indicate their answers by placing a slash mark at an appropriate point along a horizontal line that represents a continuum of possible responses. The score for each item is comprised of the distance, in millimeters, between the left edge of the line and the student's slash mark.
Self-Description Questionnaire II. The Self-Description Questionnaire II (SDQ-II; Appendix D; Marsh, 1990; see also Marsh, Parker, & Barnes, 1985) is a standardized measure of adolescents' (seventh- through twelfth-graders') self-concepts in eleven domains: a) General Self, b) Mathematics, c) Verbal, d) General School, e) Physical Abilities, f) Physical Appearance, g) Same-Sex Relations, h) Opposite-Sex Relations, i) Relations with Parents, j) Honesty, and k) Emotional Stability. The General Self scale is not an additive composite of the other ten scales; it is comprised of unique items. The SDQ-II contains 102 items, to each of which a response is made on a scale from one to six. On this scale, the following system applies:

1 = False
2 = Mostly False
3 = More False than True
4 = More True than False
5 = Mostly True
6 = True

Half of the items in each of the 11 SDQ-II scales are negatively worded.

The SDQ-II is based upon the hierarchical model of self-concept advocated by Shavelson and his colleagues (e.g., Marsh & Shavelson, 1985; Shavelson, Hubner, & Stanton, 1976). Marsh, Parker, and Barnes (1985) demonstrate support for the existence of the eleven scales through factor analysis and for the relative independence of the various scales through correlational analyses. Coefficients of stability that range from .72 to .88, with a median of .79, are reported in the test manual (Marsh, 1990). These figures do not come from a study that was designed specifically to assess test-retest reliability for the SDQ-II, however. Rather, they were produced in
the context of an investigation of changes in the self-concept scores of 137 eighth-grade Catholic-school girls over a seven-week period, during which they participated in a physical fitness training program (see Marsh & Peart, 1988). Internal consistency coefficients were computed for the norm group of 5,494 students and are reported in the manual. These coefficients range from .83 to .91 for the eleven SDQ-II scales, with a median alpha of .86 (Marsh, 1990). For each of the scales used in this study, the specific alpha coefficients and the number of items per scale are detailed in Table 4.

**Social Coping Questionnaire for Gifted Students.** The Social Coping Questionnaire for Gifted Students (SCQ; Appendix E) was designed specifically for this study. It consists of 35 items that address beliefs and activities relating to various social aspects of giftedness. Students are asked to indicate how true each item is for them on a scale from one ("strongly false") to seven ("strongly true"). The items are intended to reflect the social coping strategies that are suggested in the literature, including hiding giftedness, denying the importance of popularity, becoming highly involved in extracurricular activities, denying the negative social effects of giftedness, and denying being gifted.

**Procedure**

**Constructing variables for further analyses.** Differences between students’ self-perceptions and approaches to giftedness often were investigated according to the students’ ability level or ability area. For all analyses using ability level as a variable, the contrasting groups were comprised of students whose composite SAT or ACT scores represent the top 25% of the subject group and those whose scores represent
Table 4. Internal reliability coefficients and number of items in each SDQ-II scale

<table>
<thead>
<tr>
<th>Scale</th>
<th>Coefficient alpha</th>
<th>Number of items</th>
</tr>
</thead>
<tbody>
<tr>
<td>General self</td>
<td>.88</td>
<td>10</td>
</tr>
<tr>
<td>General school</td>
<td>.87</td>
<td>10</td>
</tr>
<tr>
<td>Math</td>
<td>.90</td>
<td>10</td>
</tr>
<tr>
<td>Verbal</td>
<td>.86</td>
<td>10</td>
</tr>
<tr>
<td>Opposite-sex relations</td>
<td>.90</td>
<td>8</td>
</tr>
<tr>
<td>Same-sex relations</td>
<td>.86</td>
<td>10</td>
</tr>
<tr>
<td>Parent relations</td>
<td>.87</td>
<td>8</td>
</tr>
</tbody>
</table>
the bottom 25% of the subject group. For the analyses using ability area as a variable, age-adjusted SAT scores were standardized. Students whose standardized SAT-M scores were at least one standard deviation higher than their standardized SAT-V scores were used as a "high-math" group; students whose standardized SAT-V scores were at least one standard deviation higher than their standardized SAT-M scores were used as a "high-verbal" group.

Verifying a need to be popular. One assumption that underlies this study is that adolescents feel a need to be popular. This assumption appears to be supported by the literature on adolescence (e.g., Dunphy, 1983; Erikson, 1965). Nevertheless, it is possible that some adolescents do not have a need for popularity. This possibility may complicate the interpretation of students' responses to the SCQ. Several of the items on this instrument might be viewed as having different meanings for students with different affiliative needs. For example, one item states that "I don't worry about whether or not I am popular". If this item were endorsed by a student who is high in affiliative needs, (the "typical" adolescent, as portrayed in the literature), it might be viewed as a defensive, denying statement. If, however, this same approach were endorsed by an adolescent who does not have strong affiliative needs, it might be viewed as a simple statement of truth. Thus, in order to increase the interpretability of the results, students with low affiliation needs were removed from the SCQ analyses. For the purposes of this study, low affiliation needs were defined as scores that are more than one standard deviation below the norm on the Affiliation scale of the ACL (Gough & Heilbrun, 1983).
Verifying self-perceived lack of popularity. A second assumption of this study is that gifted adolescents view themselves as being less popular than do average-ability students. Information from the BQ, the SCS and the RSSC were used to verify this assumption for the sample to be used in this study.

One item from the BQ was used to assess students' perception of their popularity, as noted above. The mean of the responses to this item was used as the BQ popularity score.

Part Ib of the SCS is comprised of five items, in which students are asked to compare themselves with "the typical student" in various areas (e.g., "academically, in science and math", "Socially"). One of the items in this section specifically asks students to compare themselves with others with regard to popularity. It appeared likely that other items would be related to this construct, as well. In order to determine which, if any, of the remaining four items related to students' assessment of their popularity, correlations between each of these four items and the popularity item were computed. Two correlations attained statistical significance. Both of these statistically significant correlations represented large effect sizes, as specified by Cohen (1988) for behavioral science research. The items involved in these two correlations asked students to compare themselves to others "Socially" \( r = .77; p < .01 \) and "Athletically" \( r = .56; p < .01 \). Thus, the mean score across these three SCS items (popularity, socially, athletically) was used as an SCS popularity score. The internal consistency coefficient (Cronbach's alpha) for this three-item scale, as computed using all 1989 and 1990 CY-TAG students, was .81.

On the RSSC, several items, in addition to the popularity item itself, could be expected to relate to popularity. Rather than selecting items to be studied a priori,
two principal components analyses, using varimax rotation, were run on the 22 RSSC items. The first analysis was conducted with students' ratings of "the typical student"; the second analysis was conducted with students' ratings of themselves. In both analyses, one factor was produced that appeared to reflect popularity (see Table 5). In the first analysis, this factor was the third of five and yielded an Eigenvalue of 1.88; in the second analysis, it was the first of four factors and yielded an Eigenvalue of 5.39. The popularity factor that was produced by analyzing students' ratings of themselves was comprised of considerably more items than was the factor that was produced using students' ratings of the typical student. Nevertheless, all of the items in the typical student factor were also contained in the self factor (i.e., there was complete overlap).

Because this study focuses upon the difference between students' ratings of themselves and their ratings of typical students, only the items that were contained in both components were used to obtain an RSSC popularity score. These items are: (a) good at sports, (b) nerd (negative loading), (c) socially skilled, (d) popular, and (e) makes friends easily. Two RSSC popularity scores were comprised of the mean rating across these five variables. The first scale reflected perceived popularity of the self and was used, in addition to the BQ and SCS measures, to access information about adolescents' self-perceptions. The second scale indicates how students view "the typical student"; the score that each student obtained on the second RSSC scale was compared with the RSSC self-perception score. Internal consistency (Cronbach's alpha) coefficients were computed for both of these RSSC popularity scales using all 1989 and 1990 CY-TAG students. The alpha coefficient for the self-rating scale was .61; the alpha coefficient for the rating of the typical student was .47.
Table 5. Descriptors comprising RSSC popularity components based on students’ ratings of the typical student and themselves

<table>
<thead>
<tr>
<th>Rating group</th>
<th>Descriptors</th>
</tr>
</thead>
</table>
| Typical student | Good at sports  
                 | Nerd (negative loading)  
                 | Socially skilled  
                 | Popular  
                 | Makes friends easily |
| Self           | Popular  
                 | Makes friends easily  
                 | Socially awkward (negative loading)  
                 | Attractive  
                 | Socially skilled  
                 | Nerd (negative loading)  
                 | Good at sports  
                 | Self-confident  
                 | Dislikes a lot of people |
Information from the BQ, SCS, and RSSC was analyzed separately, as indicated above. In addition, all three sets of data were analyzed separately by gender, ability level (as reflected by Talent Search SAT or ACT composite scores), and ability area (as reflected by Talent Search scores in mathematical vs. verbal areas).

Verifying positive self-concepts. The third assumption of this study is that gifted students have positive general, academic, and social self-concepts. The SDQ-II (Marsh, 1990; see also Marsh, Parker, & Barnes, 1985) was used to replicate these findings among the students in this sample. The responses to the negatively-worded items were recoded so that a score of six always indicated the most highly positive response.

The theoretical model upon which the SDQ-II is based (e.g., Marsh & Shavelson, 1985; Shavelson, Hubner, & Stanton, 1976) posits three domain-specific self-concepts that are subordinate to social self-concept (see Figure 1). Research that has been conducted with the three forms of the Self-Description Questionnaire (SDQ-I for preadolescents; SDQ-II for adolescents; SDQ-III for university-age students) indicates that the hierarchical structure of self-concept may become weaker as children grow older; by adolescence, "the size of the correlations [among domain-specific self-concepts] argues against any strong hierarchical ordering of the SDQ-II dimensions" (Marsh, Parker, & Barnes, 1985; Marsh & Shavelson, 1985).

Because the hierarchical organization of self-concept is questionable for adolescents, it may be unsound to assess social and academic self-concepts by averaging the types of self-concept that are, theoretically, subordinate to them. Therefore, the Same-Sex Relations, Opposite-Sex Relations, and Relations with
Figure 1. Structure of self-concept (Shavelson, Hubner, & Stanton, 1976)
Parents scales were considered separately in the assessment of social self-concept. Similarly, the Mathematics and Verbal scales were considered separately in the assessment of academic self-concept. The General School scale was considered as a third means of measuring academic self-concept. It was used in addition to the Mathematics and Verbal scales because research has indicated that these two scales, by themselves, are not equivalent to the more general construct represented by the General School scale.

T-scores were computed for the General Self, General School, Mathematics, Verbal, Same-Sex Relations, Opposite-Sex Relations, and Relations with Parents scales, as per the SDQ-II manual (Marsh, 1990). These scores were compared to their respective norms. Also, scores were analyzed separately by gender, ability level, and ability area.

*Exploring coping strategies.* The main focus of this study is learning about the ways in which gifted adolescents approach issues that pertain to their social lives. The purpose of this study is to gain some insight into the means by which gifted adolescents are able to preserve strong social self-concepts despite a self-perceived lack of popularity. A factor analysis was conducted with the SCQ in order to determine whether the relationships among students’ responses verify the existence of distinct approaches to giftedness, such as those that are suggested in the literature (i.e., hiding giftedness, denying the importance of popularity, becoming highly involved in extracurricular activities, denying the negative social effects of giftedness, and denying giftedness).

A general ranking of the approaches presented in the SCQ was generated based upon the frequency with which students reported using them. In order to examine
differences among diverse groups, this ranking also was broken down by gender, ability level, and ability area. Of course, all students in this sample are highly gifted; the division of students by ability can only provide for an examination of the possibility that there are coping differences between very highly and extremely highly able students.

Response Rates

Response rates for all six instruments used in the study are listed in Table 6. The SCQ was collected specifically for this study. Of the 238 SCQ surveys that were mailed, 213 (90%) were completed and returned. Three of the respondents, however, indicated that they were enrolled in schools for which exceptional academic ability was required for admission. These subjects were not included in the SCQ analyses, as the survey was designed for students in a more typical school setting. Further, 49 of the subjects were eliminated from analyses utilizing the SCQ due to ACL scores that were missing or more than one standard deviation below the norm. Thus, 161 (76%) of the completed SCQ surveys were used in this study. This number reflects 69% of the 1989 students and 80% of the 1990 students who responded to the SCQ mailing.

In analyzing the data, both statistical significance and effect size were considered. Because the findings in the area of giftedness as it relates to popularity and self-concept among adolescents may be useful for counseling, however, only relationships that approximated at least a medium effect size were viewed as important.

Correlation coefficients (r), in themselves, are effect sizes. According to Cohen (1988), effect sizes for correlations are classified as small at the $r = .10$ level,
<table>
<thead>
<tr>
<th>Instrument</th>
<th>Response rates (percentages)</th>
<th>1989</th>
<th>1990</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>BQ</td>
<td></td>
<td>82</td>
<td>96</td>
<td>91</td>
</tr>
<tr>
<td>RSSC</td>
<td></td>
<td>99</td>
<td>90</td>
<td>93</td>
</tr>
<tr>
<td>SCS</td>
<td></td>
<td>99</td>
<td>72</td>
<td>82</td>
</tr>
<tr>
<td>SDQ</td>
<td></td>
<td></td>
<td>96</td>
<td></td>
</tr>
<tr>
<td>ACL</td>
<td></td>
<td>100</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>SCQ</td>
<td></td>
<td>90</td>
<td>89</td>
<td>90</td>
</tr>
</tbody>
</table>

BQ Background Questionnaire
RSSC Rating Scale of Student Characteristics
SCS Social Comparison Scale
SDQ Self-Description Questionnaire II (not administered in 1989)
ACL Adjective Check List
SCQ Social Coping Questionnaire (includes only usable surveys)
medium at the $r = .30$ level, and large at the $r = .50$ level. For differences between means, effect sizes ($d$) can be calculated by dividing the difference between the means by the standard deviation of the control group (or, if no control group exists, by the mean of the two standard deviations). Cohen classifies effect sizes as small when $d = .20$, medium when $d = .50$, and large when $d = .80$. 
RESULTS

Verifying a Self-Perceived Lack of Popularity

Three surveys were used to generate measures of self-perceived popularity: the Background Questionnaire (BQ), the Social Comparison Scale (SCS), and the Rating Scale of Student Characteristics (RSSC). One scale from each survey assessed students' ratings of their own popularity; one scale from the RSSC assessed students' ratings of the popularity of "the typical student". A summary of the findings from each of the four scales is provided in Table 7.

The individual item from the BQ, which simply asked respondents how popular they believed themselves to be, revealed no differences between the gifted students and the average-ability comparison group. Both groups of subjects obtained an average BQ popularity score corresponding to a place on the scale between "Neither popular or unpopular" and "Somewhat popular". Among members of the gifted group, mean scores on this item did not differ according to gender, ability level, or ability area.

The three-item SCS popularity score, consisting of students' ratings of themselves as compared to "the typical student" socially, athletically, and in terms of popularity, favored the average-ability students over the gifted group ( X = 8.87 for the average-ability group, X = 6.99 for the gifted group; t(203) = 4.69, p < .001). This difference reflects an effect size at the very top of the medium range (d = 0.79). No differences between mean scores were found by gender, ability level, or ability area for members of the gifted group.

Similarly, the five-item RSSC popularity score reflected higher levels of perceived self-popularity among average-ability students (X = 5.60) than among
Table 7. Scores on the various measures of self-perceived popularity

<table>
<thead>
<tr>
<th>Measure</th>
<th>Scores [mean (SD)]</th>
<th>Gifted</th>
<th>Average-ability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Background Questionnaire&lt;sup&gt;a&lt;/sup&gt;</td>
<td>3.63 (0.99)</td>
<td>3.71 (0.59)</td>
<td></td>
</tr>
<tr>
<td>Social Comparison Scale&lt;sup&gt;b&lt;/sup&gt;</td>
<td>6.99 (2.64)</td>
<td>8.87 (2.39)</td>
<td></td>
</tr>
<tr>
<td>Rating Scale of Student Chars. &lt;sup&gt;c&lt;/sup&gt;</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Self</td>
<td>4.74 (1.20)</td>
<td>5.60 (0.88)</td>
<td></td>
</tr>
<tr>
<td>Typical student</td>
<td>4.95 (0.87)</td>
<td>5.08 (0.93)</td>
<td></td>
</tr>
</tbody>
</table>

<sup>a</sup> Scale from 1 to 5

<sup>b</sup> Scale from 1 to 13.5

<sup>c</sup> Scale from 1 to 7

*<sup>p</sup> < .005

**<sup>p</sup> < .001
gifted adolescents ($\bar{X} = 4.74$) ($t(125) = 5.67, p < .001$). This difference reflects a large effect size ($d = 0.98$). When students' perceptions of their own popularity were compared with their perceptions of the popularity of the typical student, different results were obtained for the two groups. Among the gifted students, there was no difference between self-perceptions and perceptions of others. Among the average-ability students, however, a difference in scores was found that favored self ($\bar{X} = 5.60$) over the typical student ($\bar{X} = 5.09$) ($t(53) = 3.23, p < .005$) and represented a medium effect size ($d = 0.56$). That is, whereas gifted students considered themselves to be about as popular as the typical student, average-ability students viewed themselves as being more popular than the typical student. Gifted and average students were approximately equal in their ratings of the popularity of the typical student, however.

The scores obtained on these RSSC scales were further investigated by comparing mean scores according to the gender, ability level, and ability area of the members of the gifted group. The only significant difference that was found suggested that students in the top 25% of the group in overall ability had lower self-popularity ratings ($\bar{X} = 4.32$) than did the students in the bottom 25% of the group ($\bar{X} = 5.13$) ($t(64) = 3.27, p < .005$). This difference represents a large effect size ($d = 0.81$). Students in the bottom quartile, however, remained significantly lower in their self-rated popularity ($\bar{X} = 4.99$) than were the average-ability students ($\bar{X} = 5.60$) ($t(91) = 3.19, p < .005; d = 0.69$).

**Verifying Positive Self-Concepts**

Before presenting the results of the comparisons using the SDQ, a cautionary note is required. Inspection of the gifted students' self-concept scores revealed that
the ceiling on the SDQ is too low for accurate measurement among members of this sample. The gifted group's mean score was less than two standard deviations below the ceiling for every type of self-concept measured. Further, for each of the variables, at least one individual scored at the very highest possible level. Therefore, it is very likely that the self-concept scores of the gifted group as a whole should have been higher than the scores that were obtained.

For the SDQ scales assessing self-concepts in the areas of general self, general school, mathematics, verbal, and same-sex relations, gifted students as a group scored significantly higher than the norms ($p < .001$ in each case; see Table 8). Further, the effect sizes ($d$) associated with the majority of these comparisons were large (see Table 9). In the areas of opposite-sex relations and parent relations, there were no significant differences between the gifted sample and the test norms. Similar results were found for males and females when they were considered separately and also are summarized in Tables 8 and 9.

For members of the gifted group, mean scores on each of the self-concept scales were compared according to gender, ability level, and ability area. The results of these analyses yielded several statistically significant correlations that also represented at least a medium effect size: a) girls expressed higher levels of verbal self-concept than did boys ($\bar{X} = 61.5$ for females, $\bar{X} = 56.0$ for males; $t(108) = 4.09, p < .001; d = 0.76$), b) very highly mathematically gifted students showed higher levels of math self-concept than did very highly verbally gifted students ($\bar{X} = 65.5$ for math gifted, $\bar{X} = 61.4$ for verbally gifted; $t(27) = 2.09, p \leq .05, d = 0.78$), and c) very highly verbally gifted individuals expressed higher
Table 8. Mean scores for the gifted sample on individual SDQ scales

<table>
<thead>
<tr>
<th>Scale</th>
<th>Mean (SD)</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total group</td>
<td>Males</td>
<td>Females</td>
</tr>
<tr>
<td>General Self</td>
<td>55.0 (6.5)*</td>
<td>53.4 (7.3)*</td>
<td>56.9 (5.1)*</td>
</tr>
<tr>
<td>General School</td>
<td>63.0 (4.4)*</td>
<td>61.5 (4.6)*</td>
<td>63.7 (3.7)*</td>
</tr>
<tr>
<td>Mathematics</td>
<td>62.3 (6.5)*</td>
<td>62.6 (4.9)*</td>
<td>61.6 (8.2)*</td>
</tr>
<tr>
<td>Verbal</td>
<td>58.2 (8.1)*</td>
<td>56.7 (8.5)*</td>
<td>61.1 (5.8)*</td>
</tr>
<tr>
<td>Same-Sex Relations</td>
<td>53.9 (11.0)*</td>
<td>53.8 (11.4)*</td>
<td>55.2 (9.8)*</td>
</tr>
<tr>
<td>Opposite-Sex Relations</td>
<td>48.9 (11.3)</td>
<td>47.0 (11.7)</td>
<td>50.8 (10.8)</td>
</tr>
<tr>
<td>Parent Relations</td>
<td>50.0 (8.8)</td>
<td>48.9 (9.3)</td>
<td>51.4 (8.5)</td>
</tr>
</tbody>
</table>

*The norm for each scale is a score of 50.0.

*p < .001
Table 9. Effect sizes ($d$) for the statistically significant differences between the gifted sample and the norms for the SDQ

<table>
<thead>
<tr>
<th>Scale</th>
<th>Total $d$</th>
<th>Males $d$</th>
<th>Females $d$</th>
</tr>
</thead>
<tbody>
<tr>
<td>General Self</td>
<td>0.50</td>
<td>0.34</td>
<td>0.69</td>
</tr>
<tr>
<td>General School</td>
<td>1.30</td>
<td>1.15</td>
<td>1.37</td>
</tr>
<tr>
<td>Mathematics</td>
<td>1.23</td>
<td>1.26</td>
<td>1.16</td>
</tr>
<tr>
<td>Verbal</td>
<td>0.82</td>
<td>0.67</td>
<td>1.11</td>
</tr>
<tr>
<td>Same-Sex Relations</td>
<td>0.39</td>
<td>0.38</td>
<td>0.52</td>
</tr>
</tbody>
</table>
levels of verbal self-concept than did very highly mathematically gifted individuals ($X = 62.5$ for verbally gifted, $X = 51.6$ for math gifted; $t(27) = 3.14, p \leq .005, d = 1.23$).

**Approaches to Giftedness**

The 187 usable SCQs were factor analyzed in order to determine whether discrete constructs were represented in the survey. The results of this factor analysis yielded five psychologically meaningful factors: denial of giftedness, popularity/conformity, peer acceptance, fear of failure, and activity level (see Appendix F). Each SCQ item was standardized and weighted by its factor loading in order to obtain a score for each subject on each of these factors.

Because the SCQ scales were formed using standardized items, the mean for each scale was zero. Therefore, descriptive statistics were computed on approximations of the scales, which were obtained, in each case, by using only the items that loaded strongly on a scale, then averaging the raw responses to those items. These descriptive statistics provided information about both the internal consistencies of the scales and the average response given by members of the gifted group to the items in each area.

The internal consistency coefficients of the SCQ factors ranged from 0.59 to 0.78. Because all of these values are close to or greater than 0.60, the scales can be considered reliable for research purposes. Table 10 summarizes the alpha coefficients for the five scales.

The responses to the items that assessed denial of giftedness clustered at the high end of the distribution, indicating some uncertainty in this area. The trend also is observable by the mean score of 5.03 ($s = 0.84$) on a scale from 1 to 7, in which
Table 10. Cronbach’s alpha for the SCQ factors

<table>
<thead>
<tr>
<th>Factor</th>
<th>Alpha</th>
</tr>
</thead>
<tbody>
<tr>
<td>Denial of giftedness</td>
<td>0.78</td>
</tr>
<tr>
<td>Popularity/conformity</td>
<td>0.64</td>
</tr>
<tr>
<td>Peer acceptance</td>
<td>0.72</td>
</tr>
<tr>
<td>Fear of failure</td>
<td>0.64</td>
</tr>
<tr>
<td>Activity level</td>
<td>0.59</td>
</tr>
</tbody>
</table>
higher scores reflect greater denial of giftedness. Responses to the items from the "popularity/conformity" scale approximated a normal distribution and centered upon the mid-range of the response continuum, suggesting that the average individual in the gifted group considered popularity and social conformity to be moderately important ($\bar{X} = 4.32$, $s = 0.93$). There was less agreement with regard to self-reported peer acceptance; the distribution of responses was somewhat jagged, with a slight skew to the right, indicating that some students believe that giftedness functions as a social handicap ($\bar{X} = 3.20$, $s = 1.21$). The distribution of responses to the items from the "fear of failure" scale approximated normality, indicating a moderate concern with failure ($\bar{X} = 3.80$, $s = 1.07$). Responses to the items focusing upon activity level were skewed to the right, suggesting that the majority of the students in the sample were not concerned with maintaining a busy schedule ($\bar{X} = 2.65$, $s = 1.10$). The average raw-score responses are summarized in Table 11.

Mean scores on each of the standardized-score scales were compared by gender, ability level, and ability area to determine whether there were significant differences, representing at least a medium effect size, for any of these groups. The results indicated that: a) students in the top quartile of ability were more likely to deny their giftedness than were students in the bottom quartile ($\bar{X} = 1.28$ for top quartile, $\bar{X} = -0.84$ for bottom quartile; $t(64) = 2.56$, $p < .05$, $d = 0.63$), b) students whose major strength is in verbal ability reported lower peer acceptance than did mathematically gifted students ($\bar{X} = -1.78$ for verbally gifted, $\bar{X} = -0.26$ for mathematically gifted; $t(31) = 2.12$, $p < .05$, $d = 0.80$), and c) mathematically gifted individuals reported more extensive involvement in structured activities than
Table 11. Raw-score responses to the SCQ

<table>
<thead>
<tr>
<th>Factor</th>
<th>Mean (SD)</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total group (SD)</td>
<td>Males (SD)</td>
<td>Females (SD)</td>
</tr>
<tr>
<td>Denial of giftedness</td>
<td>5.03 (0.84)</td>
<td>5.12 (0.83)</td>
<td>4.93 (0.84)</td>
</tr>
<tr>
<td>Popularity/conformity</td>
<td>4.32 (0.93)</td>
<td>4.22 (0.99)</td>
<td>4.45 (0.84)</td>
</tr>
<tr>
<td>Peer acceptance</td>
<td>3.20 (1.21)</td>
<td>3.24 (1.19)</td>
<td>3.15 (1.24)</td>
</tr>
<tr>
<td>Fear of failure</td>
<td>3.80 (1.07)</td>
<td>3.95 (1.04)</td>
<td>3.60 (1.08)</td>
</tr>
<tr>
<td>Activity level</td>
<td>2.65 (1.10)</td>
<td>2.81 (1.15)</td>
<td>2.46 (1.01)</td>
</tr>
</tbody>
</table>
did verbally gifted individuals ($\bar{X} = -0.13$ for mathematically gifted, $\bar{X} = -1.08$ for verbally gifted; $t(31) = 2.02, p \leq .05, d = 0.73$).

In order to determine whether any of the identified approaches to giftedness related to the various areas of self-concept or to self-ratings of popularity, correlations were computed between each of the SCQ scales, each of the SDQ self-concept areas, and the popularity score from the SCS, which, of the three measures of self-perceived popularity used in this study, was the one with the highest level of internal consistency (Cronbach's alpha = 0.81). The results of these correlations are summarized in Table 12. The correlations also were considered for males (see Table 13) and females (see Table 14) separately.

For the gifted group as a whole, all of the statistically significant, medium effect size correlations involved peer acceptance and activity level. Generally, it appears that self-reported peer acceptance was inversely related to social self-concept and self-perceived popularity. Also, activity level was inversely related to general self-concept, opposite-sex relations, and the SCS popularity score. When the genders were considered separately, however, different patterns emerged.

The males followed almost exactly the same pattern as the group as a whole, although the magnitude of the correlations tended to be greater when only males were included in the analyses. Among females, the only relationships that were in common with those of the mixed-gender gifted group were those indicating that social self-concept is negatively related to self-reported peer acceptance; none of the relationships with activity level were either statistically significant or of a medium effect size, and peer acceptance did not relate at all to the SCS popularity score. Relationships involving denial of giftedness and popularity/conformity were found for
Table 12. Correlations between scales from the SCQ, SDQ, and SCS, as determined for the total subject group $^a$

<table>
<thead>
<tr>
<th></th>
<th>Denial of giftedness</th>
<th>Popularity/conformity</th>
<th>Peer acceptance</th>
<th>Fear of failure</th>
<th>Activity level</th>
</tr>
</thead>
<tbody>
<tr>
<td>General self</td>
<td>.22*</td>
<td>.10</td>
<td>-.11</td>
<td>.09</td>
<td>-.29**</td>
</tr>
<tr>
<td>General school</td>
<td>.16</td>
<td>-.04</td>
<td>.15</td>
<td>-.13</td>
<td>-.09</td>
</tr>
<tr>
<td>Math</td>
<td>.05</td>
<td>-.04</td>
<td>.18</td>
<td>-.03</td>
<td>.20*</td>
</tr>
<tr>
<td>Verbal</td>
<td>.11</td>
<td>.03</td>
<td>.06</td>
<td>.03</td>
<td>-.08</td>
</tr>
<tr>
<td>Same-sex relations</td>
<td>.18</td>
<td>-.08</td>
<td>-.32**</td>
<td>-.02</td>
<td>-.24*</td>
</tr>
<tr>
<td>Opposite-sex relations</td>
<td>.03</td>
<td>-.11</td>
<td>-.45***</td>
<td>.04</td>
<td>-.34***</td>
</tr>
<tr>
<td>Parent relations</td>
<td>.13</td>
<td>.01</td>
<td>-.01</td>
<td>.04</td>
<td>-.07</td>
</tr>
<tr>
<td>SCS popularity</td>
<td>.12</td>
<td>-.08</td>
<td>-.27**</td>
<td>-.02</td>
<td>-.32***</td>
</tr>
</tbody>
</table>

$^a$ Degrees of freedom range from 97 to 139.

* $p \leq .05$

** $p \leq .01$

*** $p \leq .001$
Table 13. Correlations between scales from the SCQ, SDQ, and SCS, as determined for males only \(^a\)

<table>
<thead>
<tr>
<th>Scale</th>
<th>Denial of giftedness</th>
<th>Popularity/conformity</th>
<th>Peer acceptance</th>
<th>Fear of failure</th>
<th>Activity level</th>
</tr>
</thead>
<tbody>
<tr>
<td>General self</td>
<td>.17</td>
<td>-.04</td>
<td>-.19</td>
<td>.07</td>
<td>-.34*</td>
</tr>
<tr>
<td>General school</td>
<td>.17</td>
<td>-.07</td>
<td>.16</td>
<td>-.09</td>
<td>-.15</td>
</tr>
<tr>
<td>Math</td>
<td>.16</td>
<td>.12</td>
<td>.18</td>
<td>.09</td>
<td>.14</td>
</tr>
<tr>
<td>Verbal</td>
<td>.16</td>
<td>-.11</td>
<td>.15</td>
<td>.07</td>
<td>.01</td>
</tr>
<tr>
<td>Same-sex relations</td>
<td>.13</td>
<td>-.20</td>
<td>-.28*</td>
<td>-.09</td>
<td>-.18</td>
</tr>
<tr>
<td>Opposite-sex relations</td>
<td>-.01</td>
<td>-.22</td>
<td>-.57***</td>
<td>-.04</td>
<td>-.39**</td>
</tr>
<tr>
<td>Parent relations</td>
<td>.18</td>
<td>-.21</td>
<td>-.07</td>
<td>-.07</td>
<td>-.03</td>
</tr>
<tr>
<td>SCS popularity</td>
<td>.07</td>
<td>.07</td>
<td>-.49***</td>
<td>.05</td>
<td>-.44***</td>
</tr>
</tbody>
</table>

\(^a\) Degrees of freedom range from 51 to 69.

\(\ast p \leq .05\)

\(\ast\ast p \leq .01\)

\(\ast\ast\ast p \leq .001\)
Table 14. Correlations between scales from the SCQ, SDQ, and SCS, as determined for females only

<table>
<thead>
<tr>
<th></th>
<th>Denial of giftedness</th>
<th>Popularity/conformity</th>
<th>Peer acceptance</th>
<th>Fear of failure</th>
<th>Activity level</th>
</tr>
</thead>
<tbody>
<tr>
<td>General self</td>
<td>.32*</td>
<td>.31*</td>
<td>.05</td>
<td>.18</td>
<td>-.13</td>
</tr>
<tr>
<td>General school</td>
<td>.15</td>
<td>-.05</td>
<td>.18</td>
<td>-.19</td>
<td>.05</td>
</tr>
<tr>
<td>Math</td>
<td>-.01</td>
<td>-.09</td>
<td>.16</td>
<td>-.14</td>
<td>.20</td>
</tr>
<tr>
<td>Verbal</td>
<td>.06</td>
<td>.09</td>
<td>.02</td>
<td>.01</td>
<td>-.05</td>
</tr>
<tr>
<td>Same-sex relations</td>
<td>.30*</td>
<td>-.05</td>
<td>-.33*</td>
<td>.16</td>
<td>-.19</td>
</tr>
<tr>
<td>Opposite-sex relations</td>
<td>.07</td>
<td>-.06</td>
<td>-.31*</td>
<td>.15</td>
<td>-.21</td>
</tr>
<tr>
<td>Parent relations</td>
<td>.08</td>
<td>.22</td>
<td>.08</td>
<td>.20</td>
<td>-.07</td>
</tr>
<tr>
<td>SCS popularity</td>
<td>.07</td>
<td>-.32**</td>
<td>.03</td>
<td>-.07</td>
<td>-.13</td>
</tr>
</tbody>
</table>

a Degrees of freedom range from 45 to 61.

* \( p \leq .05 \)

** \( p \leq .01 \)

*** \( p \leq .001 \)
the females that were not found for anyone else, however. These correlations indicated positive relationships between denial of giftedness and both general self-concept and same-sex relations and between popularity/conformity and both general self-concept and the SCS popularity score.

To summarize, for the total gifted group, peer acceptance and activity level were inversely related to popularity and to various types of social self-concept. Gender-separate analyses revealed that relationships suggesting lower self-evaluations among individuals who were highly involved in activities were generated by the males only, whereas those suggesting more positive self-evaluations among students who deny their giftedness and focus on popularity and conformity were generated only by females.
DISCUSSION

A considerable amount of literature suggests that gifted adolescents tend to consider themselves as less popular than do average-ability students. Nevertheless, research also has indicated that gifted adolescents score at least as well as do average-ability adolescents in the area of social self-concept. Given the importance of popularity during adolescence, this pair of findings is surprising. Thus, one may ask what approaches to giftedness are used by highly able adolescents that allow them to maintain their social self-concepts. This study was designed to address these issues.

The first step in the study was to replicate, in this sample of gifted adolescents, the findings regarding self-rated popularity and self-concept that are documented elsewhere. This replication was necessary in order to ascertain the validity of the assumptions (i.e., low self-ratings of popularity and positive self-concepts, especially in social areas) upon which the rest of the study is based. Next, the results of the SCQ were studied in order to learn about the views that the students in the gifted sample take of themselves and their abilities and the methods they use to manage their social lives.

The results of these procedures revealed findings similar to those in previous studies of self-perceived popularity and self-concept. Various approaches to giftedness were identified through a factor analysis of the SCQ, and several correlations between the resulting factors and self-concept ratings were obtained.

Perceptions of Popularity

The results from both of the popularity scales that consisted of more than one item demonstrated that self-ratings of popularity were lower for gifted individuals than for average-ability individuals. This finding is consistent with those of many
previous studies (e.g., Coleman & Cross, 1988; Kerr, Colangelo, & Gaeth, 1988; Tidwell, 1980), including some that identified gifted subjects through use of the SAT (e.g., Brody & Benbow, 1986; Dauber & Benbow, 1990), which indicate that gifted students often doubt themselves in the social realm.

In addition to considering self-perceived popularity in a broad way, however, students in this study also were asked separately and specifically about their views of themselves and of others (i.e., "the typical student"). The responses in these areas showed approximate equality between average-ability and gifted individuals in the assessment of the popularity of the typical student, but advantages for the average-ability individuals in self-assessment. Thus, the difference in perception between gifted and average-ability adolescents appears truly to be a difference in self-perception, not the perception of popularity in general.

Although a student of average ability actually is more "typical", at least in one important school-related area, than is a highly gifted student, the average-ability students in this sample rated themselves as more popular than "the typical student", whereas the gifted students estimated their own popularity to be at about the same level as that of a typical student. This finding suggests that the average-ability students "overrated" themselves in terms of school popularity, whereas the gifted students were more realistic. Alternately, the responses of both subject groups may have been influenced by social desirability. Given that popularity is generally a desirable characteristic, the students may have inflated their self-ratings slightly in order to create a positive impression. If so, it is likely that the average-ability students' "real" assessments were in the range of the typical student, whereas the gifted students' assessments fell below that point. In either case, it is noteworthy that
a difference in self-rated popularity between gifted and average-ability students, favoring those of average ability levels, was found in this study.

The further investigation into the gifted students' self-ratings indicated that differences are obtained even within the gifted group. Specifically, gifted individuals who were in the lowest quartile in terms of ability rated themselves as being more popular than did the students who were in the highest quartile of ability. Both groups of gifted students, however, had self-rated popularity scores that were significantly lower than those of the average-ability students. Thus, it appears that students at all the levels of giftedness included in this study are, to some extent, at a disadvantage in terms of self-perceived popularity.

_Self-Concept Levels_

The majority of the self-concept scales that were investigated yielded significantly higher scores for the gifted group than for the norm group. Further, the gifted students' scores may have been underestimated due to the low ceiling on the SDQ-II. In the areas of opposite-sex relations and parent relations, however, the mean score of the gifted sample was not significantly different from the norm. Also, the significant difference in same-sex relations represented only a small effect size.

Some might focus upon the fact that these exceptions are all in the social self-concept category and interpret the data as indicative of difficulty in that area among gifted adolescents. In studies not utilizing a comparison group or a norm group, this interpretation would appear to be well-founded. It is important to note, however, that the social self-concept scores obtained by the gifted students in this sample were equal to those of the norm group. Thus, it may be inaccurate to say that gifted adolescents suffer from depressed self-concept in social areas. Rather, as much of the literature
suggests, gifted students appear to have self-concepts that are at least equal to those of average-ability students. In this study, this conclusion was supported for both males and females. To summarize, the gifted subjects demonstrated self-concepts that were at least equal to the norms in all areas.

Although the social self-concept scores earned by members of the gifted group are strong in an overall way, the fact remains that they are low relative to the academic self-concept scores earned by the same individuals. This difference may relate to Marsh’s internal/external (I/E) frame of reference model (see Marsh, 1988, 1992), which states that two processes are involved in the formation of self-concept. One process (external) involves a comparison between self and others in a given area; the other process (internal) involves comparisons among one’s own abilities in different areas. Perhaps, in making internal comparisons between their academic and social skills, gifted students notice a greater discrepancy than do average students and, as a result, form relatively low self-concepts in social areas.

When mean self-concept scores were compared by gender, ability level, and ability area, some differences emerged. Two of these differences are not surprising: individuals who were mathematically gifted had stronger math self-concept scores than did those who were verbally gifted, and verbally gifted students had higher verbal self-concept scores than did mathematically gifted individuals. These findings may indicate simply that gifted students are aware of the areas in which they are particularly strong and develop self-concepts that are congruent with this understanding.

Marsh (1992) notes that this pattern of self-concept and ability findings is common. He states that the internal component of his I/E model of self-concept can
explain these patterns: "Because of the internal, ipsative component of this model...particularly high skill levels in any one subject result in lower self-concepts in other subject areas" (p. 36). That is, when compared with notably strong abilities in one area, abilities in other areas may appear to be weak.

One might suspect that students' awareness of their own abilities comes from differential outcomes of their previous efforts. Although this view seems logical, it may not be accurate because it rests upon the assumption that the students have experienced greater success in the area reflected by their strongest SAT score than in other areas. In reality, however, many of the CY-TAG students had experienced success in several different areas. Also, because the self-concept measure used in this study was administered at the beginning of CY-TAG, successful CY-TAG experiences (which would be consistent with SAT scores due to the use of those scores for admittance to CY-TAG classes) could not have affected the scores. Thus, it appears that differential success experiences may be of minimal explanatory power in the consideration of self-concept differences between highly mathematically and highly verbally gifted individuals.

Students' ability to experience success in several areas and still distinguish among those areas in terms of self-concept is consistent with the I/E model, as well: "academic self-concepts in different subjects are predicted to be substantially less correlated than the corresponding skill areas" (Marsh, 1992, p. 36). Perhaps students who achieve highly in several areas are aware that some achievements are more easily obtained than others.

In addition, one gender difference in self-concept was obtained: girls scored significantly higher than did boys on the verbal self-concept scale. Several additional
observations are informative in discussing this difference. First, it is important to note that the boys did not score higher than the girls in math self-concept. Second, it is useful to consider the SAT score differences between the girls and the boys: a) the boys scored significantly higher on the SAT-M than did the girls (using standardized scores, $X = 0.32$ for boys, $X = -0.37$ for girls; $t(149) = 4.50, p < .001; d = 0.73$), b) there were no gender differences in SAT-V scores, and c) the difference between SAT-M and SAT-V favored math to a greater extent for boys than for girls (using standardized scores, $X = 0.38$ for boys, $X = -0.44$ for girls; $t(149) = 4.37, p < .001; d = 0.71$). Thus, boys did not obtain higher math self-concept scores than did girls even though they demonstrated higher ability levels in mathematical areas both in an overall way and relative to their demonstrated verbal ability. In contrast, girls did earn higher verbal self-concept scores despite the fact that their verbal ability, according to the SAT, was no higher than that of the boys. Perhaps social stereotypes of mathematical and scientific areas as "male" and verbal and artistic areas as "female" exert more influence upon the self-concepts of gifted girls than do their actual ability profiles.

Further, differences in self-concepts may relate to the choices that individuals make regarding higher education and careers. It is well known that males greatly outnumber females in mathematical and scientific fields (e.g., Dick & Rallis, 1991; Maple & Stage, 1991). Although this difference might be explained by positing a lack of confidence in mathematical ability among females, the data obtained here are not compatible with this interpretation; there were no gender differences in mathematical self-concept. Further, there was no difference between girls' mathematical and verbal self-concepts and no indication that the girls were less
willing to take risks than were the boys (i.e., the "fear of failure" factor from the SCQ showed no gender differences).

Rather than looking for patterns within the girls' self-concepts, it seems appropriate to consider the pattern in the boys' self-concept scores. Among boys, math self-concept was higher than was verbal self-concept. This difference appears to be an accurate reflection of the boys' strengths, as measured by the SAT. Perhaps the differences in abilities and self-evaluations, compounded by social expectations that men should perform well in mathematical and scientific areas, lead gifted boys to perceive more limited career choices than gifted girls. One consequence of such a perception might be that the girls eventually pursue various career paths, whereas the boys maintain a focus on the areas in which they feel most comfortable. This explanation fits with the findings obtained for adults regarding gender distributions in various areas of employment.

Although there were some minor differences in self-concept by ability area and by gender, the results of the investigations into gifted adolescents' self-concepts yielded no cause for concern. The general and academic self-concepts of the gifted students were shown to exceed the norms and may have been even higher if the SDQ had provided for more accurate scoring at the upper extreme. Gifted students' self-concepts in the social area, although low relative to those in the general and academic areas, were equal to those of the norm group.

Approaches to Giftedness

The findings regarding perceived popularity and self-concept among gifted individuals are not new; they have been previously documented, as presented above. In contrast, the results relating to the SCQ are exploratory in nature; the instrument
itself is new. Therefore, the findings in this area require replication (see Lykken, 1968). Nevertheless, information about the students in the gifted sample can be gained through a consideration of the pattern of their responses to several of the scales derived from the SCQ factors.

It may be surprising that the average response to the items assessing denial of giftedness was rather high. Students who are identified as highly gifted may deny their abilities in order to avoid the pressure to achieve that may follow from such recognition, because they fear that their identification was in error, or due to pressures to conform to other students. Whether or not these gifted students deny their abilities, however, they do not appear to fear failure or disappointment; their responses to items that deal with attitude toward failure suggest only a moderate level of concern. This moderate concern may actually be productive, motivating an individual to strive for positive achievements. Similarly, the moderate average score on the items assessing the extent to which the students focus upon popularity and conformity suggests that these students may be oriented toward popularity enough to encourage their social development, but not enough to bring about a maladaptive fear of rejection. The scores in this area appear to indicate that, generally, the gifted students are well-rounded individuals, geared toward social interaction as well as academic pursuits.

The correlations between the SCQ factors and both self-rated popularity and the various areas of self-concept shed further light on the functioning of students with different approaches to their abilities. Because the analyses are correlational, causality cannot be determined. Nevertheless, this method of study provides some
initial insights into the relationships between self-concept and the personal "style" of gifted adolescents and suggests some topics for future research.

With regard to gender, ability level, and ability area, three of the comparisons using the SCQ factors achieved both statistical significance and a medium effect size. First, of the gifted subjects, the most highly able individuals were those most likely to deny being gifted. Several explanations for this relationship are available. Students who received very high SAT or ACT scores by the age of 13 may have had more difficulty believing them to be accurate than did students who received moderately high scores. A related possibility is that the most highly able students may feel more pressure to perform well academically than do the less highly gifted students and may be uncertain of their ability to measure up to others' standards. Seen in this light, denial of giftedness may be an attempt to avoid being the focus of others' high expectations. It also is possible that adolescents deny their abilities in order to conform to other students. In this case, it might be reasonable to expect that the most able students would exhibit the most denial. Regardless of the explanation used, it appears that very highly gifted students may require particular encouragement and support in accepting their abilities.

A second finding was that students with predominant verbal abilities reported lower levels of peer acceptance than did those with predominant mathematical abilities. The integration of two hypotheses regarding giftedness can help to clarify this finding. First, several authors (e.g., Buescher, 1985; Coleman, 1985; Coleman & Cross, 1988; Delisle, 1984; Guskin, et al., 1986; Janos, Fung, & Robinson, 1985) have suggested that "differentness" may be a complicating factor in the social lives of gifted students. Second, it has been suggested that students who have
exceptional verbal abilities may be more "visibly gifted" than are mathematically talented students (Dauber & Benbow, 1990). As a result of this visibility, verbally gifted individuals may feel more different from other students than do their mathematically-gifted peers, therefore perceiving lower levels of peer acceptance.

The third finding, that mathematically gifted individuals are more involved in structured activities than are verbally gifted individuals, suggests that the mathematically gifted students may develop some of their peer relationships through extracurricular activities. The correlational nature of the analyses cannot confirm this directional interpretation; it is equally possible that mathematically talented students feel more free to involve themselves in extracurricular activities because they are more sure of acceptance from others.

Before the correlations with self-concept are discussed, a cautionary note is necessary. It is incorrect to view large numbers of gifted students as "low" in any of the areas of self-concept to be discussed, as the scores of the gifted students were suppressed by the low ceiling on the SDQ, yet were still consistently at or above the levels presented in the norms for the instrument. All of the relationships between self-concept and other variables in this study are meaningful only in the context of the gifted group. Given this caveat, the correlations among the areas of self-concept, self-perceived popularity, and approaches to giftedness can be considered.

The two factors that yielded statistically significant correlations of medium effect size (no large effect sizes were represented) with either self-concept scores or self-rated popularity were peer acceptance and activity level. With regard to peer acceptance, the correlations indicated that the lower the perceived peer acceptance, the higher the scores in the areas of same-sex relations, opposite-sex relations, and
self-rated popularity. These results are counterintuitive and difficult to explain; they should be replicated before they are accepted. Nevertheless, some hypotheses regarding the findings can be advanced for consideration.

Perhaps the findings partially relate to students' definitions of "popularity". Individuals who feel that their abilities may have a negative effect on their acceptance by other students may focus their attention on a small group of friends. If they are successful in relating to this small group, they might view themselves as popular with regard to the people who are important to them (relatively high popularity, positive social self-esteem), while still acknowledging the difficulties they have with students in general (relatively low peer acceptance).

An alternative explanation of the self-concept scores is suggested when one notes that the majority of the items in the peer acceptance factor deal specifically with the effects of giftedness on peer acceptance. Gifted individuals who report difficulties with peer acceptance may believe that they are socially skilled, but that their giftedness places them at an unavoidable disadvantage in the social arena. If gifted individuals do not blame themselves for peers' reactions to them, their self-concepts would not be expected to suffer. This possibility is consistent with Tidwell's (1980) hypothesis that gifted individuals can derive satisfaction from their own skills and do not require positive feedback from others. Also, it may be the most socially skilled and aware individuals who best realize the difficulties that giftedness can cause in terms of peer acceptance.

Involvement in activities exhibited inverse correlations with general self-concept, opposite-sex relations, and self-rated popularity. Given that two of these relationships involve variables that focus upon social life, they may indicate that
students who are somewhat unsure of their social skills (especially in terms of opposite-sex relations) are more likely to become involved in organized activities than are socially confident individuals. The structured nature of both academic and extracurricular activities may simplify for such persons the establishment of social relationships with members of the opposite sex. Despite any simplification of social interaction, however, these students may remain aware of their social difficulties in less structured situations, thereby maintaining relatively low social self-concepts. Conversely, it is possible that students who believe themselves to be popular and to have good relationships with the opposite sex, an issue that becomes quite important for most individuals during adolescence, may be comfortable relying upon themselves to organize social interactions. It is, of course, impossible to state with certainty that any causal interpretation is accurate. Also, quasi-experimental research cannot predict the self-concept levels of individuals who are not permitted to organize their own social interactions.

When the relationships between the SCQ factors and both self-concept and self-perceived popularity were considered separately by gender, additional information was revealed. The inverse correlations involving activity level and self-concept were found to derive from boys only; no significant relationships were found among girls. Also, positive correlations were found only among girls between: a) denial of giftedness and general self-concept, b) denial of giftedness and self-concept in the area of same-sex relations, and c) popularity/conformity and general self-concept. Apparently, girls are more comfortable focusing upon their social lives than upon their abilities. Because there were no overall gender differences in the SCQ factors assessing popularity and conformity or denial of giftedness, it appears that
gifted girls and boys are equally likely to focus upon their abilities; this focus may be more difficult for girls, however. Thus, the personal meaning of ability may be an especially relevant counseling issue for gifted females.

Conclusions

Some basic conclusions that have appeared in the literature regarding giftedness, popularity, and self-concept were replicated in this study. Specifically, gifted students reported lower self-ratings of popularity than did the average-ability students, but higher general and academic self-concepts (despite the low ceiling on the SDQ). With regard to the popularity findings, the design of this study revealed that the differences between gifted and average-ability adolescents are probably based upon differences in views of the self, not views of others.

Analysis of the SCQ yielded some preliminary information regarding the approaches that gifted students may take to their abilities and highlighted some potential counseling issues. Five factors were derived from the SCQ: a) denial of giftedness, b) popularity/conformity, c) peer acceptance, d) fear of failure, and e) activity level. Subsequent analyses using these factors suggested that specifiable groups of individuals within the gifted group may encounter unique issues with regard to their abilities.

First, it appears that very highly gifted adolescents, as opposed to moderately gifted individuals, may have particular difficulty in accepting and owning their abilities. The denial of abilities among members of this group may relate to conformity to others and may have implications for underachievement. Perhaps highly able students who see counselors might benefit from exploring issues...
surrounding the validity of identification of giftedness and the meaning of high ability in one's life.

Second, verbally gifted students may be at greater risk than are mathematically gifted students for peer difficulties, or at least for the perception of such difficulties. It might be advisable to assess the extent to which such students seek out social relationships with others. One approach to the development of a social network might be involvement in extracurricular activities that are consistent with a given student's interests. This approach is suggested by the theoretical work of various authors and by the empirical findings in this study. Theoretically, "differentness" can be problematic for gifted students (e.g., Buescher, 1985; Coleman, 1985; Coleman & Cross, 1988; Delisle, 1984; Guskin, et al., 1986), perhaps especially for verbally-gifted students (Dauber & Benbow, 1990). Groups tend to emphasize the similarities among their members; thus, participation in structured group activities may lessen the extent to which verbally-gifted adolescents feel different. The finding that mathematically-gifted students, who have higher perceptions of acceptance by peers, report more involvement in extracurricular activities than do the verbally-gifted individuals may indicate the potential usefulness of such activities for gifted students, as well.

In addition, some gender differences were uncovered in this research. Perhaps most importantly, gifted girls may be less comfortable with their abilities than are gifted boys. The above points about denial of giftedness among high-ability adolescents may apply to gifted girls, as well.

One encouraging result also appeared in the analyses of the SCQ. Gifted students who feel slighted by their peers appear to be able to cope with these feelings.
Somehow, they seem to maintain positive self-concepts in social areas and positive ratings of their own popularity. It was suggested that such individuals may approach their relationships with others by focusing upon a relatively small group of friends, within which they can consider themselves popular and develop strong social self-concepts. Research that specifically explores this possibility is needed.

These results are preliminary and replication is necessary (see Lykken, 1968), especially for some of the unexpected findings. Studies using different identification procedures for gifted subjects would be helpful, as would the use of subjects from a broader geographical area. Should the findings presented here be replicated, research based upon them could begin to develop a more complete picture of gifted students' social functioning.
REFERENCES


APPENDIX A:
ADJECTIVE CHECK LIST
Below is a list of adjectives. Please read them quickly and circle each one you would consider to be self-descriptive. Do not worry about duplications, contradictions, and so forth. Work quickly and do not spend too much time on anyone adjective. Try to be frank, and circle those adjectives which describe you as you really are, not as you would like to be.

1. absent-minded
2. active
3. adaptable
4. adventurous
5. affected
6. affectionate
7. aggressive
8. alert
9. aloof
10. ambitious
11. anxious
12. apathetic
13. appreciative
14. argumentative
15. arrogant
16. artistic
17. assertive
18. attractive
19. autocratic
20. awkward
21. bitter
22. blustery
23. boastful
24. bossy
25. calm
26. capable
27. careless
28. cautious
29. changeable
30. charming
31. cheerful
32. civilized
33. clear-thinking
34. clever
35. coarse
36. cold
37. commonplace
38. complaining
39. complicated
40. conceived
41. confident
42. confused
43. conscientious
44. conservative
45. considerate
46. contented
47. conventional
48. cool
49. cooperative
50. courageous
51. cowardly
52. cruel
53. curious
54. cynical
55. daring
56. deceitful
57. defensive
58. deliberate
59. demanding
60. dependable
61. dependent
62. despondent
63. determined
64. dignified
65. discreet
66. disorderly
67. dissatisfied
68. distractible
69. distrustful
70. dominant
71. dreamy
72. dull
73. easy going
74. effeminate
75. efficient
76. egotistical
77. emotional
78. energetic
79. enterprising
80. enthusiastic
81. evasive
82. excitable
83. fair-minded
84. fault-finding
85. fearful
86. feminine
87. fickle
88. flirtatious
89. foolish
90. forceful
91. foresighted
92. forgetful
93. forgiving
94. formal
95. frank
96. friendly
97. frivolous
98. fussy
99. generous
100. gentle
101. gloomy
102. good-looking
103. good-natured
104. greedy
105. handsome
106. hard-headed
107. hard-hearted
108. hasty
109. headstrong
110. healthy
111. helpful
112. high-strung
113. honest
114. hostile
115. humorous
116. hurried
117. idealistic
118. imaginative
119. immature
120. impatient
121. impulsive
122. independent
123. indifferent
124. individualistic
125. industrious
126. infantile
127. informal
128. ingenious
129. inhibited
130. initiative
131. insightful
132. intelligent
133. interests narrow
134. interests wide
135. intolerant
136. inventive
137. irresponsible
138. irritable
139. jolly
140. kind
141. lazy
142. leisurely
143. logical
144. loud
145. loyal
146. mannerly
147. masculine
148. mature
149. meek
150. methodical
151. mild
152. mischievous
153. moderate
154. modest
155. moody
156. nagging
157. natural
158. nervous
159. noisy
160. obliging
161. obnoxious
162. opinionated
163. opportunistic
164. optimistic
165. organized
166. original
167. outgoing
168. outspoken
169. painstaking
170. patient
171. peaceable
172. peculiar
173. persevering
174. persistent
175. pessimistic
176. planful
177. pleasant
178. pleasure-seeking
179. poised
180. polished
181. practical
182. praising
183. precise
184. prejudiced
185. preoccupied
186. progressive
187. prudent
188. quarrelsome
189. queer
190. quick
191. quiet
192. quitting
193. rational
194. rattlebrained
195. realistic
196. reasonable
197. rebellious
198. reckless
199. reflective
200. relaxed
201. reliable
202. resentful
203. reserved
204. resourceful
205. responsible
206. restless
207. retiring
208. rigid
209. robust
210. rude
211. sarcastic
212. self-centered
213. self-confident
214. self-controlled
215. self-denying
216. self-pitying
217. self-punishing
218. self-seeking
219. selfish
220. sensitive
221. sentimental
222. serious
223. severe
224. sexy
225. shallow
226. sharp-witted
227. shiftless
228. show-off
229. shrewd
230. shy
231. silent
232. simple
233. sincere
234. slipshod
235. slow
236. sly
237. smug
238. snobbish
239. sociable
240. soft-hearted
241. sophisticated
242. spendthrift
243. spineless
244. spontaneous
245. spunky
246. stable
247. steady
248. stern
249. stingy
250. stolid
251. strong
252. stubborn
253. submissive
254. suggestible
255. sulky
256. superstitious
257. suspicious
258. sympathetic
259. tactful
260. tactless
261. talkative
262. temperamental
263. tense
264. thankless
265. thorough
266. thoughtful
267. thrifty
268. timid
269. tolerant
270. touchy
271. tough
272. trusting
273. unaffected
274. unambitious
275. unassuming
276. unconventional
277. undeniable
278. understanding
279. unemotional
280. unexcitable
281. unfriendly
282. uninhibited
283. unintelligent
284. unkind
285. unrealistic
286. unscrupulous
287. unselfish
288. unstable
289. vindictive
290. versatile
291. warm
292. wary
293. weak
294. whimsy
295. wholesome
296. wise
297. withdrawn
298. witty
299. worrying
300. zany
APPENDIX B:
RATING SCALE OF STUDENT CHARACTERISTICS
RATING SCALE OF STUDENT CHARACTERISTICS

We would like you to rate three types of individuals, the typical students in your school, gifted students, and yourself on the characteristics listed below. We want you to report the extent to which you agree or disagree that the characteristics describe (1) typical students in your school, (2) gifted students, and (3) yourself. Place your answers on the enclosed answer sheet. Use this scale and choose the response that best reflects your feelings. Thank You!

Scale for Responses:

7=Strongly Agree
6
5
4=Neither agree nor disagree/neutral
3
2
1=Strongly disagree

TYPICAL STUDENT IN YOUR SCHOOL

Please rate the typical student in your school using the above scale.

1. Attractive
2. Stuck-up
3. Makes friends easily
4. Dislikes a lot of people
5. Always tries to get attention
6. Self-confident
7. A smart aleck
8. A leader
9. Brags a lot
10. Popular
11. Immature

12. Likes challenges
13. Good at sports
14. Socially skilled
15. Nerd
16. Independent
17. Honest
18. Arrogant
19. Aggressive
20. Verbally skilled
21. Creative
22. Socially awkward
RATING SCALE OF STUDENT CHARACTERISTICS

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Scale for Responses:

7=Strongly Agree
6
5
4=Neither agree nor disagree/neutral
3
2
1=Strongly disagree

GIFTED STUDENTS

Please rate the typical student in your school using the above scale.

23. Attractive
24. Stuck-up
25. Makes friends easily
26. Dislikes a lot of people
27. Always tries to get attention
28. Self-confident
29. A smart aleck
30. A leader
31. Brags a lot
32. Popular
33. Immature
34. Likes challenges
35. Good at sports
36. Socially skilled
37. Nerd
38. Independent
39. Honest
40. Arrogant
41. Aggressive
42. Verbally skilled
43. Creative
44. Socially awkward
RATING SCALE OF STUDENT CHARACTERISTICS

We would like you to rate three types of individuals, the typical students in your school, gifted students, and yourself on the characteristics listed below. We want you to report the extent to which you agree or disagree that the characteristics describe (1) typical students in your school, (2) gifted students, and (3) yourself. Place your answers on the enclosed answer sheet. Use this scale and choose the response that best reflects your feelings. Thank You!

Scale for Responses:

7 = Strongly Agree
6
5
4 = Neither agree nor disagree/neutral
3
2
1 = Strongly disagree

YOURSELF

Please rate the typical student in your school using the above scale.

45. Attractive
46. Stuck-up
47. Makes friends easily
48. Dislikes a lot of people
49. Always tries to get attention
50. Self-confident
51. A smart aleck
52. A leader
53. Brags a lot
54. Popular
55. Immature

56. Likes challenges
57. Good at sports
58. Socially skilled
59. Nerd
60. Independent
61. Honest
62. Arrogant
63. Aggressive
64. Verbally skilled
65. Creative
66. Socially awkward
APPENDIX C:
SOCIAL COMPARISON SCALE
Self-concept Scale

In this part of the questionnaire we would like to get some information about how you see yourself relative to other students your age. Please read each question carefully and answer as honestly as you can. In most cases you should answer the question by placing a slash (/) on the line.

Part I

a) How similar do you think you are to each of the following:

(1) The typical student in your school:

Not at all                                      Extremely

(2) The typical gifted student:

Not at all                                      Extremely

(3) _______ of my friends are gifted students.

None                                      All

b) How do you compare with the typical student in these areas:

(4) academically, in science and math:

Much worse                                      Much better

(5) academically, in verbal and writing skills:

Much worse                                      Much better

(6) socially:

Much worse                                      Much better
(7) athletically:

| Much worse | Much better |

(8) popularity:

| Much worse | Much better |

c) How do you compare with the typical gifted student in these areas?

(9) academically, in science and math

| Much worse | Much better |

(10) academically, in verbal and writing skills:

| Much worse | Much better |

(11) socially:

| Much worse | Much better |

(12) athletically:

| Much worse | Much better |

(13) popularity:

| Much worse | Much better |

Part II

When students get test scores back or receive grades on a project or paper, they often like to find out how other people did on that test or project (we call that social comparison)...

(14) How often do you do that?

| never | sometimes | a lot |
(15) How often do other students in your class compare with you?


ever | a lot

(16) Suppose you just got a test score back, with whom would you be most interested in comparing your score?

Someone who ______ on the test.

| did poorly | got an average grade | got the highest grade

(17) Suppose you just received a grade on an essay that you had written, with whom would you be most interested in comparing your grade?

Someone who ______ on the test.

| did poorly | got an average grade | got the highest grade

(18) How well are you doing in school now compared with a year ago?

| much worse | much better

(19) How often do you compare how well you are doing now (in school) with how well you used to do?

| never | sometimes | a lot

(20) How well do you think you will do (in school) next year?

| much worse | about the same | much better

(21) When it comes to things like athletic ability, with whom do you usually compare?

Someone who is . . .

| very bad | average | very good
| at athletics | at athletics |
(22) How well do you think you will do in your class at Cy-Tag?

very poorly  average  very well

(23) How well do you think you will do at Cy-Tag compared to the other students there?

very poorly  average  very well

Part III

How important is each of the following dimensions to you?

(24) Doing well in school

Not at all  Extremely
Important

(25) Athletic ability

Not at all  Extremely
Important

(26) Being popular

Not at all  Extremely
Important

(27) Having friends

Not at all  Extremely
Important

(28) Having many friends

Not at all  Extremely
Important

(29) Having a boyfriend/girlfriend

Not at all  Extremely
Important
(30) Helping others

Not at all  |  Extremely
Important  |  Important

(31) Being attractive

Not at all  |  Extremely
Important  |  Important

Part IV

(32) How much do you have to work at school in order to do well?

Very little  |  Very much

For the next five questions, please indicate how much you agree with each of the statements:

(33) When I do well in school it is primarily because I work hard.

Not at all  |  Very much

(34) When I do well in school it is primarily because I have a lot of ability.

Not at all  |  Very much

(35) It's okay to take schoolwork (i.e., homework) home to work on.

Not at all  |  Very much

(36) How much do you like school?

Not at all  |  Very much

(37) If I had my choice, I would prefer to be in a class with

No gifted students  |  Some gifted, some not gifted students  |  All gifted students
APPENDIX D:

SELF-DESCRIPTION QUESTIONNAIRE II
SELF-DESCRIPTION QUESTIONNAIRE -- II

There are six possible answers for each question -- "True", "False", and four answers in between. There are six blanks next to each sentence, one for each of the answers. The answers are written at the top of each page. Choose your answer to a sentence and put a check in the blank under the answer you choose.

Before you start there is an example below.

1. In general, I am neat and tidy.  

If you want to change an answer you have marked you should cross out the check and put a new check in another blank on the same line. For all the sentences be sure that your check is on the same line as the sentence you are answering. You should have one answer and only one answer for each sentence. Do not leave out any sentences, even if you are not sure which blank to check.

1. MATHEMATICS IS ONE OF MY BEST SUBJECTS.
2. NOBODY THINKS THAT I'M GOOD LOOKING.
3. OVERALL, I HAVE A LOT TO BE PROUD OF.
4. I SOMETIMES TAKE THINGS THAT BELONG TO OTHER PEOPLE.
5. I ENJOY THINGS LIKE SPORTS, GYM, AND DANCE.
6. I'M HOPELESS IN ENGLISH CLASSES
7. I AM USUALLY RELAXED.
8. MY PARENTS ARE USUALLY UNHAPPY OR DISAPPOINTED WITH WHAT I DO.
9. PEOPLE COME TO ME FOR HELP IN MOST SCHOOL SUBJECTS.
<table>
<thead>
<tr>
<th></th>
<th>Question</th>
<th>False</th>
<th>Mostly False</th>
<th>More False Than Than True</th>
<th>More True Than False</th>
<th>Mostly True</th>
<th>True</th>
</tr>
</thead>
<tbody>
<tr>
<td>10.</td>
<td>IT IS DIFFICULT TO MAKE FRIENDS WITH MEMBERS OF MY OWN SEX.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11.</td>
<td>PEOPLE OF THE OPPOSITE SEX THAT I LIKE DON'T LIKE ME.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12.</td>
<td>I OFTEN NEED HELP IN MATHEMATICS.</td>
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<td>13.</td>
<td>I HAVE A NICE LOOKING FACE.</td>
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<td>14.</td>
<td>OVERALL, I AM NO GOOD.</td>
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<td>15.</td>
<td>I AM HONEST.</td>
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<td>16.</td>
<td>I AM LAZY WHEN IT COMES TO THINGS LIKE SPORTS AND HARD PHYSICAL EXERCISE.</td>
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<td>17.</td>
<td>I LOOK FORWARD TO ENGLISH CLASSES.</td>
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<td>18.</td>
<td>I WORRY MORE THAN I NEED TO.</td>
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<td>19.</td>
<td>I GET ALONG WELL WITH MY PARENTS.</td>
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<td>20.</td>
<td>I'M TOO STUPID AT SCHOOL TO GET INTO A GOOD UNIVERSITY.</td>
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<td>21.</td>
<td>I MAKE FRIENDS EASILY WITH BOYS.</td>
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<td>22.</td>
<td>I MAKE FRIENDS EASILY WITH GIRLS.</td>
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<td>23.</td>
<td>I LOOK FORWARD TO MATHEMATICS CLASSES.</td>
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<td>24.</td>
<td>MOST OF MY FRIENDS ARE BETTER LOOKING THAN I AM.</td>
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<td>25.</td>
<td>MOST THINGS I DO I DO WELL.</td>
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<td>26.</td>
<td>I SOMETIMES TELL LIES TO STAY OUT OF TROUBLE.</td>
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<td>27.</td>
<td>I'M GOOD AT THINGS LIKE SPORTS, GYM AND DANCE.</td>
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<td>28.</td>
<td>I DO BADLY ON TESTS THAT NEED A LOT OF READING ABILITY.</td>
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<td>29.</td>
<td>I DON'T GET UPSET VERY EASILY.</td>
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</table>
30. IT IS DIFFICULT FOR ME TO TALK TO MY PARENTS.  

31. IF I WORK REALLY HARD I COULD BE ONE OF THE BEST STUDENTS IN MY SCHOOL YEAR.  

32. NOT MANY PEOPLE OF MY OWN SEX LIKE ME.  

33. I'M NOT VERY POPULAR WITH MEMBERS OF THE OPPOSITE SEX.  

34. I HAVE TROUBLE UNDERSTANDING ANYTHING WITH MATHEMATICS IN IT.  

35. I AM GOOD LOOKING.  

36. NOTHING I DO EVER SEEMS TO TURN OUT RIGHT.  

37. I ALWAYS TELL THE TRUTH.  

38. I AM AWKWARD AT THINGS LIKE SPORTS, GYM AND DANCE.  

39. WORK IN ENGLISH CLASSES IS EASY FOR ME.  

40. I AM OFTEN DEPRESSED AND DOWN IN THE DUMPS.  

41. MY PARENTS TREAT ME FAIRLY.  

42. I GET BAD MARKS IN MOST SCHOOL SUBJECTS.  

43. I AM POPULAR WITH BOYS.  

44. I AM POPULAR WITH GIRLS.  

45. I ENJOY STUDYING FOR MATHEMATICS.  

46. I HATE THE WAY I LOOK.  

47. OVERALL, MOST THINGS I DO TURN OUT WELL.  

48. CHEATING ON A TEST IS OK IF I DO NOT GET CAUGHT.
49. I'M BETTER THAN MOST OF MY FRIENDS AT THINGS LIKE SPORTS, GYM AND DANCE.

50. I'M NOT VERY GOOD AT READING.

51. OTHER PEOPLE GET MORE UPSET ABOUT THINGS THAN I DO.

52. I HAVE LOTS OF ARGUMENTS WITH MY PARENTS.

53. I LEARN THINGS QUICKLY IN MOST SCHOOL SUBJECTS.

54. I DO NOT GET ALONG VERY WELL WITH BOYS.

55. I DO NOT GET ALONG VERY WELL WITH GIRLS.

56. I DO BADLY IN TESTS OF MATHEMATICS.

57. OTHER PEOPLE THINK I AM GOOD LOOKING.

58. I DON'T HAVE MUCH TO BE PROUD OF.

59. HONESTY IS VERY IMPORTANT TO ME.

60. I TRY TO GET OUT OF SPORTS AND PHYSICAL EDUCATION CLASSES WHENEVER I CAN.

61. ENGLISH IS ONE OF MY BEST SUBJECTS.

62. I AM A NERVOUS PERSON.

63. MY PARENTS UNDERSTAND ME.

64. I AM STUPID AT MOST SCHOOL SUBJECTS.

65. I HAVE GOOD FRIENDS WHO ARE MEMBERS OF MY OWN SEX.

66. I HAVE LOTS OF FRIENDS OF THE OPPOSITE SEX.

67. I GET GOOD MARKS IN MATHEMATICS.
<table>
<thead>
<tr>
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<th>More True Than False</th>
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<td>69. I CAN DO THINGS AS WELL AS MOST PEOPLE.</td>
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<td>70. I SOMETIMES CHEAT.</td>
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<td>71. I CAN RUN A LONG WAY WITHOUT STOPPING.</td>
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<td>72. I HATE READING.</td>
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<td>73. I OFTEN FEEL CONFUSED AND MIXED UP.</td>
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<td>74. I DO NOT LIKE MY PARENTS VERY MUCH.</td>
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<td>75. I DO WELL IN TESTS IN MOST SCHOOL SUBJECTS.</td>
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<td>76. MOST BOYS TRY TO AVOID ME.</td>
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<td>77. MOST GIRLS TRY TO AVOID ME.</td>
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<td>78. I NEVER WANT TO TAKE ANOTHER MATHEMATICS COURSE.</td>
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<td>79. I HAVE A GOOD LOOKING BODY.</td>
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<td>80. I FEEL THAT MY LIFE IS NOT VERY USEFUL.</td>
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<td>81. WHEN I MAKE A PROMISE I KEEP IT.</td>
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<td>82. I HATE THINGS LIKE SPORTS, GYM AND DANCE.</td>
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<td>83. I GET GOOD MARKS IN ENGLISH.</td>
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<td>84. I GET UPSET EASILY.</td>
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<td>85. MY PARENTS REALLY LOVE ME A LOT.</td>
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<td>86. I HAVE TROUBLE WITH MOST SCHOOL SUBJECTS.</td>
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<td>87. I MAKE FRIENDS EASILY WITH MEMBERS OF MY OWN SEX.</td>
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<td>88. I GET A LOT OF ATTENTION FROM MEMBERS OF THE OPPOSITE SEX.</td>
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</table>
89. I HAVE ALWAYS DONE WELL IN MATHEMATICS.  False
90. IF I REALLY TRY I CAN DO ALMOST ANYTHING I WANT TO DO.  False
91. I OFTEN TELL LIES.  False
92. I HAVE TROUBLE EXPRESSING MYSELF WHEN I TRY TO WRITE SOMETHING.  False
93. I AM A CALM PERSON.  False
94. I'M GOOD AT MOST SCHOOL SUBJECTS.  False
95. I HAVE FEW FRIENDS OF THE SAME SEX AS MYSELF.  False
96. I HATE MATHEMATICS.  False
97. OVERALL, I'M A FAILURE.  False
98. PEOPLE CAN REALLY COUNT ON ME TO DO THE RIGHT THING.  False
99. I LEARN THINGS QUICKLY IN ENGLISH CLASSES.  False
100. I WORRY ABOUT A LOT OF THINGS.  False
101. MOST SCHOOL SUBJECTS ARE JUST TOO HARD FOR ME.  False
102. I ENJOY SPENDING TIME WITH FRIENDS OF THE SAME SEX.  False
APPENDIX E:
SOCIAL COPING QUESTIONNAIRE FOR GIFTED STUDENTS
Below is a list of statements about thoughts and actions. Please read each statement carefully and indicate whether it is true or false for you by placing a number (please do not use fractions or decimals) on the line preceding the statement. Use this guide to choose your response:

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<tr>
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<th>Strongly True</th>
<th>Moderately True</th>
<th>Somewhat True</th>
<th>Neither True</th>
<th>Somewhat False</th>
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1. I try to hide my giftedness from other students.
2. I don't worry about whether or not I am popular.
3. I would fit in better at school if I were not gifted.
4. The thought of failure scares me.
5. I try to avoid taking books home from school.
6. I find friends who have interests similar to mine by getting involved in extracurricular activities.
7. Most of the successes I experience are due to luck.
8. I am afraid of making mistakes.
9. Sometimes I do "silly things" on purpose.
10. I try to get involved in sports so that people don't think of me as a "geek".
11. Being popular is not important in the long run.
12. Other students do not like me any less because I am gifted.
13. People think that I am gifted, but they are mistaken.
14. I spend quite a bit of time on extracurricular activities.
15. I try to act very much like other students act.
16. It doesn't matter what other people think about me.
17. Because of all my activities, I don't have time to worry about my popularity.
18. I try not to tell people my test grades.
19. If I were not gifted, other kids in my school would not like me any more or less than they do now.
20. Too much success makes me anxious.
21. People who don't like me just because I am gifted are not worth worrying about.
22. I get embarrassed when I make a mistake.
23. I try to look very similar to other students.
24. I am not gifted; I am just lucky in school.
25. I don't tell people that I am gifted.
26. I prefer doing things alone over doing things with other kids.
27. Being gifted does not hurt my popularity.
28. As I get older and academic work gets more difficult, people will stop seeing me as gifted.
29. I avoid doing things that I may not do very well.
30. I don't like to give the appearance of being studious.
31. Sometimes I ask questions to which I already know the answers.
32. There are many people who are more gifted than I am.
33. I keep myself quite busy most of the time.
34. I try not to be too successful at the things I do.
35. I don't think that I am gifted.
APPENDIX F:

ITEMS AND FACTOR LOADINGS FOR THE SCQ FACTORS
People think that I am gifted, but they are mistaken.  
I don’t think that I am gifted.  
I am not gifted; I am just lucky in school.  
As I get older and academic work gets more difficult, people will stop seeing me as gifted.  
Most of the successes I experience are due to luck.  
I try to hide my giftedness from other students.  
I try not to be too successful at the things I do.  
There are many people who are more gifted than I am.  
Too much success makes me anxious.  
I don’t tell people that I am gifted.  
People who don’t like me just because I am gifted are not worth worrying about.  
I try not to tell people my test grades.  

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<td>I am not gifted; I am just lucky in school.</td>
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<td>As I get older and academic work gets more difficult, people will stop seeing me as gifted.</td>
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<td>Most of the successes I experience are due to luck.</td>
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<td>I try not to be too successful at the things I do.</td>
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<td>There are many people who are more gifted than I am.</td>
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<td>Too much success makes me anxious.</td>
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<td>I don’t tell people that I am gifted.</td>
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<td>People who don’t like me just because I am gifted are not worth worrying about.</td>
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<td>I try not to tell people my test grades.</td>
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<td>I don’t worry about whether or not I am popular.</td>
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<td>I try to act very much like other students act.</td>
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<td>It doesn’t matter what other people think about me.</td>
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<td>I try to look very similar to other students.</td>
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<td>Being popular is not important in the long run.</td>
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<td>Because of all my activities, I don’t have time to worry about my popularity.</td>
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<td>I try to get involved in sports so that people don’t think of me as a &quot;geek&quot;.</td>
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</tr>
<tr>
<td>Other students do not like me any less because I am gifted.</td>
<td>-.11</td>
<td>.04</td>
<td>.74</td>
<td>.05</td>
<td>.07</td>
</tr>
<tr>
<td>I would fit in better at school if I were not gifted.</td>
<td>.06</td>
<td>.07</td>
<td>-.62</td>
<td>.18</td>
<td>.05</td>
</tr>
<tr>
<td>If I were not gifted, other kids in my school would not like me any more or less than they do now.</td>
<td>-.01</td>
<td>-.12</td>
<td>.57</td>
<td>-.10</td>
<td>.09</td>
</tr>
<tr>
<td>I prefer doing things alone over doing things with other kids.</td>
<td>-.09</td>
<td>-.18</td>
<td>-.22</td>
<td>.10</td>
<td>-.09</td>
</tr>
</tbody>
</table>
I am afraid of making mistakes. & .02 & .08 & -.13 & .66 & .08 \\
I get embarrassed when I make a mistake. & .16 & .12 & -.08 & .60 & .02 \\
The thought of failure scares me. & .05 & .17 & .03 & .51 & .06 \\
Sometimes I do "silly things" on purpose. & .02 & -.01 & .01 & .36 & -.02 \\
Sometimes I ask questions to which I already know the answers. & .17 & .08 & -.18 & .35 & -.15 \\
I avoid doing things that I may not do very well. & .20 & .09 & .03 & .29 & -.09 \\

I spend quite a bit of time on extracurricular activities. & -0.07 & .11 & .15 & .14 & .71 \\
I find friends who have interests similar to mine by getting involved in extracurricular activities. & -.09 & .10 & .14 & -.02 & .57 \\
I keep myself quite busy most of the time. & .10 & -.11 & .04 & -.02 & .44 \\
I try to avoid taking books home from school. & .03 & .15 & -.00 & .18 & -.40 \\

^ Factor 1 = Denial of giftedness  
Factor 2 = Popularity/conformity  
Factor 3 = Peer acceptance  
Factor 4 = Fear of failure  
Factor 5 = Activity level
SUMMARY AND DISCUSSION

Often, the abilities of a gifted adolescent are obvious to adults in the individual’s environment; when a student is formally identified as gifted, this visibility increases. Therefore, it is not surprising that the intellectual abilities of gifted students receive a considerable amount of attention. Nevertheless, it is important to recognize that giftedness can be visible to other adolescents, as well as to adults, and the attention that agemates pay outstanding ability is not necessarily positive in nature. In effect, a gifted adolescent may live two lives during the school day: first, an academic life in which he or she may feel highly qualified to succeed; second, a social life in which there may be doubts and uncertainties. Professionals must consider both of these lives when programming and counseling with gifted students. The two empirical papers presented here examined, in turn, the intellectual and social aspects of the lives of highly able individuals.

The first paper investigated the long-term outcomes of a specific educational method: academic acceleration. A group of accelerated individuals and a group of ability- and gender-matched nonaccelerates were longitudinally followed up. Comparisons were made between the groups across a number of academic and psychosocial variables. No large differences were found. These results suggest that academic acceleration does not threaten those who choose to utilize it. The intellectual abilities of the students in the sample appeared to be equal to the tasks of learning at a faster-than-normal pace, retaining information so acquired, and applying that information to later learning tasks (e.g., in college). The psychosocial variables that were considered also indicated that no harm came to students who chose to
accelerate. In this paper, however, psychosocial variables were not the primary focus.

It was the second paper that concentrated upon the psychosocial aspects of the lives of gifted adolescents. First, levels of self-perceived popularity and self-concept were measured; the results indicated that the self-perceived popularity of gifted adolescents is lower than that of average-ability adolescents, but that self-concept scores are equal to or higher than norms. In order to explore these findings in greater depth, members of the gifted sample were asked about the attitudinal and behavioral approaches they take to their abilities. Several patterns were defined that may represent methods of coping with being gifted in an academic setting; these coping methods were then related back to the measures of self-perceived popularity and self-concept. Some of the results were surprising, such as the finding that self-reported peer acceptance was inversely related to various types of social self-concept. An unexpected finding pertaining to boys alone was that the degree of involvement in extracurricular activities was inversely related to various types of social self-concept. The results found among girls may have been less surprising, yet may be cause for concern: various types of self-concept were positively related to the denial of giftedness and a focus upon popularity and conformity. These findings suggest potential counseling and educational issues for gifted students.

At this point, the knowledge that is gained from both academic and psychosocial studies converges; psychosocial findings can inform educational decisions. For example, a key factor in the decision to accelerate a student is whether the student himself or herself desires acceleration. Students who do not desire special programming may have many reasons for this choice. The psychosocial findings
presented in Paper II suggest that some students may deny their giftedness or attempt to conform to other students, thereby downplaying their unique abilities. It seems likely that individuals who cope with their abilities in such ways might be less willing to attempt relatively high-profile educational interventions (e.g., acceleration). Teachers and counselors who are aware of these possible coping styles may wish to work with students who hesitate to accept intellectual challenges in order to discover the reasons for such hesitation and, perhaps, to assist the student in the decision-making process.

Individual differences must, of course, be considered. No specific educational intervention or pattern of coping styles will fit every student. Nevertheless, consciousness of potential psychosocial issues can help a counselor or educator to remain open to many possibilities. The more open a professional is to the experiences and perspectives of gifted adolescents, the more likely he or she is to be able to effectively assist members of this unique group of students.
ACKNOWLEDGEMENTS

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