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Multiple intelligences and self-esteem in three high school populations

William T. Fagan

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MULTIPLE INTELLIGENCES AND SELF-ESTEEM
IN THREE HIGH SCHOOL POPULATIONS

A Thesis
Presented to the
Faculty of
California State University,
San Bernardino

In Partial Fulfillment
of the Requirements for the Degree
Master of Science
in
Clinical Psychology

By
William T. Fagan
June 1995
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ABSTRACT

The literature on traditional intelligence tests and school suggests a correlation between what is evaluated on these tests and what is taught in school. Both seem to require strong verbal and symbolic communication skills for success. Studies have also linked improved self-esteem to higher academic achievement (Robinson, Kehle, and Jenson, 1986). Although Gardner (1983) and others have written of a more comprehensive view of intelligence called multiple intelligences, virtually no studies have been conducted to explore the connection between these seven identified intelligences, school success, and self-esteem. The present study was undertaken to fill this void by examining the intelligences and self-esteem levels of 100 high school students, 29 in honors and advance placement classes, 39 in regular education classes, and 32 in alternative settings for students who have been unsuccessful in regular education programs. Students completed a seven-item demographic questionnaire, the Teele Inventory for Multiple Intelligences (Teele, 1992) and Rosenberg's Self-Esteem Scale (Rosenberg, 1965). No significant differences in self-esteem were found between the three groups, although self-esteem scores aligned in the expected direction. Significant differences were noted between the three groups in their third and fourth most dominant intelligences. Suggestions for improving future research in this area and implications for education were discussed.
ACKNOWLEDGMENTS

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Finally, to my family, thanks for understanding. This is a gift both from you and to you. And to my wife Terry, my computer analyst, partner, and friend, I cannot adequately express my gratitude. May we always follow the Yellow Brick Road together.
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INTRODUCTION

It has long been stated that intelligence is that which intelligence tests measure (Pelligrino, 1992). The history of intelligence testing, however, suggests that a rather limited set of skills is actually being assessed: Primarily verbal and symbolic communication. These are the same skills which are emphasized in traditional classrooms throughout America.

Howard Gardner (1983) has described a more expansive view of intelligence, called multiple intelligences, suggesting that verbal and symbolic communication skills are only two of seven equally important human abilities. It is suggested that intelligence tests have failed to give expression to the full range of human potential and school has failed to teach to this potential.

A History of Intelligence Tests

The English biologist Sir Francis Galton was primarily responsible for launching the testing movement in the late 1800's (Anastasi, 1988). Galton believed that all intelligent behavior was related to innate sensory ability and therefore developed psychophysical methods to measure sensorimotor reaction time and sensory discrimination (Pellegrino, 1992). However, his attempts to empirically validate the relation between sensory ability and intelligence proved largely unsuccessful.

Binet criticized Galton's narrow approach to measuring intelligence and argued that appropriate intelligence testing must include assessment of more complex mental processes, such as memory, attention, imagery, and comprehension (Binet & Henri, 1896). He was
commissioned in 1904, along with Simon, by the French Minister of Public Instruction to develop a procedure to select children who were not able to benefit from regular public school instruction for placement in special programs for the retarded (Binet & Henri, 1896). This test represented the first attempt to quantify the concept of intelligence. In 1908 and again in 1911, Binet and Simon published revised versions of their intelligence test. The revised tests distinguished intellectual abilities according to age norms, thus introducing the concept of mental age (Pellegrino, 1992).

H. H. Goddard was the first to popularize the Binet scale in America during the early 1900's. Unlike Binet, he regarded the scores as a measure of a single, innate entity (Gould, 1981). Lewis Terman introduced a revised version of Binet's intelligence test in 1916 which he labeled the Stanford-Binet (Terman, 1916). The test, which was extended to ninety items, introduced the intelligence quotient: The ratio between mental age and chronological age.

A major change in intelligence testing involved the development of intelligence tests that could be administered simultaneously to large groups rather than to one person at a time (Pellegrino, 1992). In 1917, in response to the entry of the United States into World War I, the Army Alpha and Beta tests were developed to assess the abilities of recruits. The former was designed for general routine testing; the latter was a non-language scale employed with illiterates and foreign-born recruits who were unable to take a test in English (Anastasi, 1988). Some 1.75 million recruits were given this test during the war.
Both individual and group intelligence tests have been revised and used extensively since the 1920's. However, the question then and now is: What precisely do these tests measure? That is, what is intelligence?

What is Intelligence?

For more than one hundred years psychologists have worked with varying degrees of success to define and measure the concept known as intelligence. However, there is still much disagreement over the definition of 'intelligence' (Sternberg & Detterman, 1986) and exactly what things could be labeled 'intelligent' (Schull, 1990).

Some researchers believe the term is so vague that it has limited scientific value in the study of mental abilities (Howe, 1988, 1989; Mackintosh, 1987). Howard (1993) argues that intelligence actually labels three major concepts, each with several variants. The first concept is basically Spearman's g (Jensen, 1987). Spearman (1904) argued that intelligence is composed of a general factor that is found in intellectual functioning and specific factors associated with the performance of specific tasks.

Howard's second concept of intelligence is a characteristic of behavior. An example of this concept comes from Estes (1982) who has described intelligence as "adaptive behavior of the individual."

Howard's third concept defines intelligence as a set of abilities. Theorists who propose this approach include Jensen (1987) who labeled intelligence as "the sum total of all mental abilities and the entire repertoire of a person's knowledge and skills." Simon & Kaplan (1989) also define intelligence as "a diverse set of abilities."
Howard concludes that researchers need to be clear when discussing intelligence and specify exactly which of the three concepts they are addressing. Additionally, the second concept is difficult to measure due to its subjective nature. It cannot always be clear which behaviors are adaptive and therefore, intelligent. In addition, behaviors which may be adaptive in one time or one place, may not be adaptive at another time or in a different place.

Mayr (1982) categorized intelligence theorists into two camps, lumpers and splitters. Lumpers, including Spearman, Binet, and Simon, define intelligence as a general capacity for acquiring knowledge and solving problems. Belief in this general underlying sense of intelligence has been used to justify the use of a single number to report intelligence (IQ) for assessment purposes.

American psychologists largely comprise Mayr's second category, the splitters, who contend that intelligence includes specific mental abilities that work relatively independently from one another. Thurstone (1924, 1938) identified several primary mental abilities which he suggested represent discreet intellectual abilities and for which he developed distinct tests. Among them were verbal comprehension, word fluency, numerical ability, spatial relations, memory, reasoning, and perceptual speed. Based on Thurstone's work, many tests of mental abilities have been developed and widely administered.

Another splitter, Cattell (1963, 1971) argued in favor of two major factors of intelligence, fluid and crystallized, as well as three minor ones. Fluid intelligence correlated with basic biological capacity and was measured as perceptual ability while crystallized intelligence was defined as the types of abilities required for most school activities as
measured by standard achievement tests. Guilford (1980) disagreed with Cattell, suggesting 120 distinct intellectual abilities while Harvard professor Howard Gardner has argued in favor of at least seven "relatively autonomous human intellectual competences" (1983, p.8).

A third category, somewhere between lumpers and splitters, is posited by Mayr to include researchers who suggest a hierarchical organization of intelligence from one or two general factors to several specific skills. Among these is Burt (1949) and Vernon (1961) both of whom subdivided the general factor of intelligence into narrower factors. Vernon's major group factors included verbal-educational and practical-mechanical abilities.

Two other theories of intelligence deserve mention. Perhaps the best known, that of Jean Piaget, suggests that the how of cognition is much more important and more revealing about mental ability than the information possessed (Cowan, 1978). Piaget proposed four major stages of cognitive development which were age-related (Rathus, 1989). Many studies have identified a positive though moderate correlation between Piagetian and psychometric scales of intelligence in infant, preschool, and school-age populations (Sattler, 1988).

Similar to the stages of Piaget, the information-processing approach to understanding intelligence is a detailed analysis of cognition which attempts to discover how individuals acquire information and solve problems (Weinberg, 1989). Like Piaget, cognitive psychologists propose universal mechanisms of information processing (Brown & Campione, 1982). An example of this approach is the triarchic theory of Robert Sternberg (1985): (a) intelligence can only be understood within a sociocultural context;
(b) intelligence is purposeful and goal-oriented, involving two basic skills: the ability to
deal with novel tasks and the ability to learn from experience; intelligence depends on
acquiring the skills to process information.

Clearly, disagreements over the definition of intelligence have not been resolved, nor
can we expect them to be any time soon. Intelligence means different things to different
people and has since psychologists began studying the concept. Illustrative of this fact are
the results of a 1986 symposium. Two questions were posed to those in attendance:
Psychometricians, cognitive psychologists, developmental psychologists, as well as
individuals associated with the fields of artificial intelligence and learning disabilities.

(1) What did they conceive intelligence to be and by what means could it best be measured
by group tests? (2) What were the most crucial next steps in research? (Sternberg &
Detterman, 1986). The only point of consensus reached was that a unidimensional,
unifactor view of intelligence was no longer tenable.

Although this position agrees with Gardner's theory of multiple intelligences to be
discussed later, it may be in conflict with a more generally held notion of IQ as it has been
perceived by the public and institutionalized through mass testing in elementary and
secondary schools.

IQ Goes to School

When one sets out to examine a concept such as intelligence, it is incumbent that
both its explicit as well as its contextual meaning developed over time be reviewed. Thus,
despite the previous discussion which provides multiple definitions and interpretations of
intelligence, and leads one to believe that professionals have expanded their understanding
of this concept, we must still review current ideas and attitudes held by society which may well be remnants of old theory. Most of these ideas have been acquired from school, a place familiar to virtually everyone in America, a place where administration can be heavily influenced by average citizens who take on the role of school board members.

As stated earlier, intelligence testing had its inception in schools when Binet was commissioned in 1904 by the French Minister of Public Instruction to develop a procedure for identification of children who were not able to benefit from regular public school classroom environments for placement in special education programs (Binet & Henri, 1896). Following the development of this test, Binet insisted upon three fundamental principles for those who were to use his tests in the future.

1. The scores are a practical device; they do not buttress any theory of intellect. They do not define anything innate or permanent. We may not designate what they measure as intelligence or any other reified entity.

2. The scale is a rough, empirical guide for identifying mildly retarded and learning-disabled children who need special help. It is not a device for ranking normal children.

3. Whatever the cause of difficulty in children identified for help, emphasis shall be placed upon improvement through special training. Low scores shall not be used to mark children as innately incapable (Gould, 1981, p. 55).

Unfortunately, many psychologists who followed Binet did not heed these principles. According to Gould (1981, p. 157):
American psychologists perverted Binet's intention and invented the hereditarian theory of IQ. They reified Binet's scores, and took them as measures of an entity called intelligence. They assumed that intelligence was largely inherited, and developed a series of specious arguments confusing cultural differences with innate properties. They believed that inherited IQ scores marked people and groups for an inevitable situation in life.

Among these psychologists was Goddard, who popularized Binet's scale in America, Terman, who developed the Stanford-Binet scale, and Yerkes, who persuaded the government to use group intelligence testing during World War I. Nor were these attitudes confined to the early developmental stages of IQ. Among modern psychologists who believe that intelligence is largely fixed and largely (if not mostly) inherited are Arthur Jensen (1969) and Richard Herrnstein (1994).

However, not only have psychologists such as Kamin (1974) and Gould (1981) refuted the arguments for inherited and fixed intelligence, a review of the literature on the correlation between schooling and intelligence suggests the possibility that IQ may be something quite different from Spearman's g, and certainly, not a fixed quantity.

If IQ were fixed, nothing could be done to transform it. Research has shown that this is not the case. In a study of Black and interracial children adopted as infants by upper-middle-class families where the children learned middle-class, White culture (including vocabulary and cognitive skills consistent with IQ tests), the adopted children performed well above average on IQ tests and better than Black and interracial children with similar
genetic backgrounds not raised in a White culture (Scarr & Weinberg, 1976). In addition, the California Guidance Study (Honzik, MacFarlane, and Allen, 1948) reported individual IQ changes of as much as 50 points over time. Even over the period of 6 to 18 years of age, a period of time when retest correlations are typically high, 59% of the children in this study changed by 15 or more IQ points, while 30% changed by 20 or more points and 9% changed by 30 points or more.

Of course, neither is IQ completely malleable. It has been estimated that intelligence is about 50% heritable (Plomin, 1986). This means that traditional IQ is subject to environmental influences of between 20 and 25 points (Zigler & Seitz, 1982). One institution with the greatest potential for influencing IQ is the home of formal education, the school.

In a major review, Ceci (1991) examined eight different kinds of correlational studies showing a link between IQ and schooling. Based on these studies, Ceci concluded that school attendance, "accounts for not only a substantial portion of the variance in children's IQs but also apparently some, though not all, of the cognitive processes that underpin successful performance on IQ tests." Thus, more time in school leads to higher IQ scores.

Ceci identified four possible reasons for schools' positive influence on IQ. First, schools directly teach the answers to some questions asked on IQ tests. Second, much of what is done in school improves students' cognitive functioning which is rewarded with higher scores on these tests. Third, school teaches certain skills, e.g., attending, memory, formal language, that correlate with IQ performance. Finally, school may hasten the
development of hierarchical organization (Nelson, 1977) important to intelligence test performance.

This relationship between time in school and IQ should not be surprising given both the nature of school and the nature of the tests. There can be little doubt that school stresses the development of language, logical and mathematical skills (Samples, 1992; Gardner, 1993). Modern IQ tests examine these same abilities. The Stanford-Binet Fourth Edition (Anastasi, 1988) consists of 15 tests representing four major cognitive areas including verbal reasoning, abstract visual reasoning, quantitative reasoning, and short-term memory. Indeed, the entire examination begins with a vocabulary test based on the test-takers chronological age. These results lead to the entry level for all remaining portions of the test. Another widely used intelligence test, the WISC-R, consists of a verbal and performance scale which also stresses the kinds of skills taught in school. A higher correlation between schooling and verbal IQ than non-verbal IQ has consistently been found as well (Madaus et al., 1980).

**Academic Failure, Delinquency, IQ and Self-Esteem**

The link between IQ and schooling continues as we review studies of academic failure and delinquency. The association between poor academic achievement in school as measured by grades, test scores, and grade retention, and dropping out of school has been well established (Borus & Carpenter, 1984; Wehlage & Rutter, 1986). Other studies have suggested that delinquency may be the learning disabled student's reaction to academic school failure (Dunivant, 1982; Kolmetz, 1982).
Although it has been established that delinquents score lower on intelligence tests than nondelinquents (Glueck & Glueck, 1934, 1950; Wilson & Herrnstein, 1985), the direction of the effect has been difficult to establish and subject to dispute. A recent study (Lynam, Moffitt, et al., 1993) set out to determine this direction. Using data on 13-year-old boys involved in a high risk longitudinal study, they concluded that the likely relationship was from low IQ to delinquency (however, the effect was present for Black youth and not for White youth). In a unique study of this same issue (Lipsitt, Buka, et al., 1990) 3,164 members of the Brown University cohort were tested at three age levels. At eight months, there were no differences in mental or motor development scores between subsequently identified delinquents and nonoffenders. However, the age four Stanford-Binet scores and the age seven WISC scores were significantly lower among the delinquent sample.

Similarly, a number of studies have shown strong positive correlations between academic achievement and self-esteem (Brookover & Passalacqua, 1981; Skaalvik & Lauvdal, 1984). In a study of 148 above average, average, and below average achieving high school sophomores in an urban high school (Haynes, Hamilton-Lee & Comer, 1988) students in the below average group differed significantly from their higher achieving peers in levels of self-esteem. A cross-cultural study (Watkins & Astilla, 1980) found a positive association between academic self-esteem and academic performance in high school girls in the central Philippines. Finally, a meta-analysis of 128 studies (Hansford & Hattie, 1982) confirmed these correlations, also showing an increase in the relationships from preschool to secondary school.
The studies previously reviewed suggest that intelligence tests tend to measure the same aptitudes emphasized in school, mostly verbal, mathematical and logical. Children obtaining low IQ scores are not necessarily less intelligent, but rather may lack the verbal and abstract reasoning skills so important for academic success. Thus, the link between IQ and schooling. The relationship between low IQ and delinquency continues the potential spiral of failure. Students with low IQ tend to perform poorly in school and have lower levels of self-esteem which may lead to dropping out and/or delinquency. School, with its emphasis on verbal and abstract reasoning skills may be responding to the IQ test. Perhaps what is needed is a more comprehensive model of both.

Multiple Intelligences

Even the most ardent believers in IQ now suggest that intelligence tests should not be used to label individuals (Hobbs, 1975). Nor should they be used in isolation, but rather, in conjunction with other measures, observations in natural environments and multiple social contexts (Christenson, Abery, & Weinberg, 1986).

In accordance with this perspective, psychologist Howard Gardner has developed a theory of multiple intelligences which responds to many of the limitations of standard intelligence tests and that also has strong educational implications. He argues for the existence of seven "relatively autonomous human intellectual competences or human intelligences" (1983, p.8).

According to Gardner, "An intelligence is the ability to solve problems, or to create products, that are valued within one or more cultural settings" (1983, p.x). Although he does not insist that his list of intelligences is exhaustive, he has created the following criteria
for an intelligence. First, an intelligence can be destroyed or isolated by brain damage. Second, an intelligence can be observed in unique ways in idiot savants, prodigies, and other exceptional individuals. Third, an intelligence must display one or more basic information-processing operations or mechanisms, which can deal with specific kinds of input. Another criterion for an intelligence is that it has an identifiable developmental history. A fifth criterion is that an intelligence possesses an evolutionary history. Experimental psychology involving tasks that interfere (or fail to interfere) with each other, tasks that transfer (or do not transfer) across different contexts, and identification of memory, attention, or perception that may be peculiar to one kind of input is a sixth criterion for an intelligence. A seventh criterion involves correlations with traditional psychometric measures of intelligence. Finally, an intelligence must have a symbolic system of communication.

Based on these criteria, Gardner has identified the following seven intelligences.

Linguistic intelligence involves ease in producing language, as well as sensitivity to the nuances and rhythm of words. A journalist or attorney is likely to have this kind of intelligence as a strength. Logical-mathematical intelligence is the ability to reason deductively as well as recognize and manipulate abstract patterns and relationships. Scientists and actuaries, among others, would display logical-mathematical intelligence. Spatial intelligence includes the ability to create visual-spatial representations of the world and transfer these representations mentally or concretely. A creative athlete like Michael Jordan demonstrates spatial intelligence in action. Musical intelligence suggests sensitivity to pitch, timbre, and rhythm of sounds and one’s response to these elements. Those who
are strong in this intelligence often become performing musicians or song writers. Bodily-kinesthetic intelligence, which dancers tend to possess, involves the use of the whole body to solve problems, create products, and convey ideas or emotions. Surgeons, while typically valued for their academic knowledge, must also possess this type of intelligence to skillfully wield a scalpel. Interpersonal intelligence refers to the ability to work effectively with others. A chief negotiator would likely have a heightened level of interpersonal intelligence. Finally, intrapersonal intelligence is an ability to understand one's own emotions, goals, and intentions. Someone who is self-employed might well possess a high level of intrapersonal intelligence.

Perhaps a less scholarly but more easily understood presentation of multiple intelligences has been offered by Armstrong (1993, pp. 7-8). Imagine for a moment that you're living in prehistoric times. You've been awakened in the middle of the night by the thundering noise of a herd of mastodons moving toward your encampment. Now, let's say for the sake of argument that you're able to bring any individual from the 20th century into your primitive setting to help you out of this jam. Who's it going to be? Will it be Albert Einstein? Nope, too puny. How about James Joyce? Sorry, too nearsighted. What about Franklin Delano Roosevelt? Not in a wheelchair. The most brilliant men of the 20th century would be of little use to you in your hour of need. In fact, many of them would be at risk for early extinction in such an environment. On the other hand, if I suggested you summon someone
like Michael Jordan or Arnold Schwarzenegger, I'd be closer to bailing you out of your predicament. The truth is that intelligence in that environment had more to do with quick reflexes, acute spatial orientation, speed, strength, and agility than with $E=MC^2$, *Finnegan's Wake*, or the New Deal.

We've grown accustomed in the 20th century to associating high intelligence with the bookworm, the egghead, and the academic. Yet by definition, intelligence is the ability to respond successfully to new situations and the capacity to learn from one's past experiences. If your car breaks down on the highway, who's the most intelligent person for the job? Is it someone with a Ph.D. from a major university or a car mechanic with a junior high school education? If you become lost in a large city, who's likely to be of greatest help to you? An absentminded professor or a little boy with a great sense of direction? Intelligence depends on the context, the tasks, and the demands that life presents to us and not on an IQ score, a college degree, or a prestigious reputation.

Gardner, a developmental psychologist, originally wrote for the psychological community, describing what he believed to be a more expansive and inclusive view of human intelligence. However, his greatest response has come from the educational community. Just as school became highly logical-mathematical and linguistic as a reaction to traditional IQ tests, some educators have created multiple intelligence (M.I.) schools in
response to Gardner's theory. These schools seek to identify the students' intellectual strengths as well as to educate and train all seven of the intelligences.

Formal studies of multiple intelligences are almost nonexistent. Several descriptive articles have been written, however, reporting the progress of experimental M.I. schools. Thomas R. Hoerr (1992) supervised the implementation of the multiple intelligence model at The New City School in St. Louis, Missouri, during the 1990-1991 school year. Teachers there have begun using all seven of the intelligences in designing classroom instruction. In addition, they are researching alternative forms of assessment consistent with an M.I. perspective.

A similar multiple intelligences project was undertaken at the Cascade Elementary School in Marysville, Washington (Campbell, 1992). A four-step instructional model was designed which included the main lesson, centers based on multiple intelligences, sharing and reviewing time, and individual student projects. A 1989-1990 research project based on this model showed positive results: Students' learning improved; many students indicated they enjoyed school for the first time; many new skills emerged and students developed responsibility and self-confidence.

Positive results have also been reported at the Clara Barton School in Minneapolis, Minnesota (Ellison, 1992) where goal-setting conferences were changed in 1991 to reflect Gardner's theory of multiple intelligences. By upgrading children's abilities to "intelligences," both children and parents seem to value their talents more. In addition, the goal-setting form has been used as a valuable assessment tool.
In a recent study of teachers' judgments, expectancies, and decisions (Guskin, Peng, & Simon, 1992) it was determined that teachers would pay more attention to student ability and talents than they do gender, social class, or racial information provided they are given a sufficient range of data about individual students such as those suggested by M.I. theory.

It appears, then, that the theory of multiple intelligences leads to classroom environments that are more stimulating, visions of students that are more positive, and opportunities for success that are more extensive. Perhaps one researcher's story best illustrates how this theory in practice may provide new hope where failure has reigned under the old model of intelligence.

I once asked a class of sixth graders in the Bedford-Stuyvesant borough of New York to "move in such a way as to demonstrate what freedom means." After some hesitation, a tall student stood and walked heavily forward to the front of the room. I heard the audible reaction of the other students and saw the look of dismay on the teacher's face. The student stopped, stood straight, and announced that he was about to demonstrate Freedom! He began to take a long stride across the room. Halfway through the stride he came to a shattering stop. A look of panic crossed his face, and, for all purposes, his right foot was riveted to the floor. His body lurched forward, then backward, but his right foot stayed locked to the floor. He jerked and lunged, but the foot wouldn't budge. He tried to pry the foot loose with a nearby chair--he commandeered a broomstick, which also failed to move the foot.
We were all transfixed by the performance. Then his entire body relaxed. He smiled widely at us all, bent over, and deftly slipped his right foot out of its shoe and walked away with a lilt leaving the "anchored" shoe behind. The class broke into applause, the teacher relaxed, and the student took several bows and returned to his seat. I asked if he could tell us what his movements told us about what freedom means. He said, "Sometimes you have to give up something that matters to you so that you can have it." [freedom] . . . His teacher later confided in me that this student was the problem student of the school and that he virtually held the class hostage for his whims. The teacher also said this was the first assignment he had voluntarily engaged in since school had started (Samples, 1992, p. 65).

The Present Study

The present research was conducted in order to explore the relationship between success in school, Gardner's theory of multiple intelligences, and self-esteem. Three main questions guided the research. First, do those students who have experienced greater academic success in school have a higher level of self-esteem than students who have been less successful? Second, do students who have experienced greater academic success in school have different dominant intelligences than students who have been less successful? Specifically, do successful students display linguistic and logical-mathematical intelligences more often than less successful students? Finally, is there a relationship between student demographics and self-esteem or dominant intelligences? In this study, achievement was
operationally defined by class grouping (advance placement or honors, regular, and alternative education).
METHOD

Subjects

One hundred (48 male and 52 female) high school students served as participants. Twenty-nine (12 male and 17 female) were enrolled in one or more advance placement or honors courses designed for students who have demonstrated extraordinary academic success and ability. Thirty-nine (16 male and 13 female) were enrolled in a regular high school course of study. Another 32 (20 male and 12 female) were enrolled in an alternative educational program. These students had either been expelled from the regular comprehensive high school due to academic failure or behavior problems, or had chosen to attend an alternative school for any number of academic or personal reasons. Other sample demographics are detailed in Table 1.

Materials

Students completed a brief questionnaire providing demographic data including age, gender, language spoken in the home, GPA, race/ethnicity, grade level, involvement in extra-curricular activities, and education level of their parents (see Appendix A).

Next, they completed two self-rating scales. The first instrument, Rosenberg's Self-Esteem Scale (Rosenberg, 1965) is a 10-item questionnaire designed as a self-rating of personal self-esteem (see Appendix B). As defined by Rosenberg, the individual with high self-esteem expresses the feeling that he is a person of worth who respects himself for who he is without standing in awe of himself or expecting others to stand in awe of him. Low self-esteem conversely, implies self-rejection and lack of respect for the self he observes.
Table 1
Sample Demographics

N=100

<table>
<thead>
<tr>
<th>Age</th>
<th>Gender</th>
<th>Home Language</th>
<th>Ethnicity</th>
</tr>
</thead>
<tbody>
<tr>
<td>14</td>
<td>5% Male</td>
<td>48% English</td>
<td>86% African-American</td>
</tr>
<tr>
<td>15</td>
<td>18% Female</td>
<td>52% Spanish</td>
<td>14% Asian</td>
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</tr>
<tr>
<td>17</td>
<td>39% Hispanic</td>
<td>25% Hispanic</td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>21% Other</td>
<td>8% Other</td>
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<tr>
<th>Grade Level</th>
<th>Mother's Education</th>
<th>Father's Education</th>
</tr>
</thead>
<tbody>
<tr>
<td>9th</td>
<td>3% Some High School</td>
<td>21% 15%</td>
</tr>
<tr>
<td>10th</td>
<td>25% High School Diploma</td>
<td>42% 41%</td>
</tr>
<tr>
<td>11th</td>
<td>27% Some College</td>
<td>14% 13%</td>
</tr>
<tr>
<td>12th</td>
<td>45% College Degree</td>
<td>15% 15%</td>
</tr>
<tr>
<td></td>
<td>Graduate Level</td>
<td>8% 16%</td>
</tr>
</tbody>
</table>

Extra Curricular Activities

<table>
<thead>
<tr>
<th>Activity</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Band</td>
<td>12%</td>
</tr>
<tr>
<td>Theater</td>
<td>8%</td>
</tr>
<tr>
<td>Sports</td>
<td>42%</td>
</tr>
<tr>
<td>Art</td>
<td>22%</td>
</tr>
<tr>
<td>Job</td>
<td>30%</td>
</tr>
<tr>
<td>Other</td>
<td>47%</td>
</tr>
</tbody>
</table>
This is a Guttman scale which is internally reliable, unidimensional, and displays face validity. In addition, Rosenberg's Self-Esteem scale has been found to correlate with other measures related to self-esteem.

The second instrument was the Teele Inventory for Multiple Intelligences (TIMI), (Teele, 1992). This is a 28-item forced choice test (see Appendix C) designed to identify students' dominant intelligences based on the seven intelligences described by Gardner. Although this inventory has some level of face validity, data regarding its other psychometric qualities is not yet available.

**Procedure**

Permission was requested and received from the principal of a comprehensive high school, a continuation high school and an alternative high school to conduct the study using students in their programs as subjects. Instructors in these schools were then approached for the purpose of arranging specific times to test students. Teachers sent home with students a letter of informed consent (see Appendix D) which they were told must be signed by a parent or guardian and returned to school in order for them to participate in the study. Subjects were told that their voluntary participation would remain anonymous and no names or other identifying information would be collected. In addition, the informed consent forms would be kept separate from their questionnaires.

Of the 130 letters of informed consent handed out, 100 were returned. On the day of their participation in the study, students were greeted warmly and thanked for their cooperation. After receiving the survey forms, they independently answered the demographic questions and then went on to complete the 10-question self-esteem scale.
After all students had finished these two items, the Teele Inventory was introduced. Students were instructed to choose one of the two pictures for each pair of the 28 items which was most like themselves. Pictures were displayed on an overhead projector in front of the room and students were given sufficient time to make their selections. A comfortable, relaxed atmosphere was created.

Upon completion of the TIMI, students were shown how to score the inventory. They were instructed to double-check their scores and record their dominant intelligences in descending order.

Sessions ended with a brief description of each of the seven intelligences. Students were encouraged to ask questions and take notes. Many students did so and responded to the information enthusiastically. Most indicated that the results appeared to accurately reflect their dominant intelligences.

A debriefing statement (see Appendix E) was read aloud to the students and distributed for their perusal.

**Analyses**

The following analyses were performed. An analysis of variance was conducted on self-esteem controlled for all demographic variables. A Chi-Square test for independence was performed for all TIMI variables stratified by group membership. For those demographic variables having greater than two strata, the residuals were analyzed using the Tukey Multiple Comparisons test. All comparisons were made between groups since GPA was not available for within group comparisons.
RESULTS

Students' level of self-esteem did not differ significantly by academic achievement group. Table 2 does show that advance placement students reported the highest level of self-esteem, while alternative students reported the lowest. Students placed in a regular high school program were in the middle as expected.

Table 3 shows that two groups differed significantly in response to self-esteem scale item #2: "All in all, I am inclined to feel I am a failure." The advance placement students indicated a significantly higher level of self-esteem on this item than did the alternative students. No other significant item differences were noted.

The level of self-esteem did differ according to gender, but not significantly. Table 4 indicates that males reported a higher level of overall self-esteem than did females.

Finally, students' level of self-esteem differed significantly by gender on question #10: "At times I think I am no good at all." Male responses to this item reflected a higher level of self-esteem than female responses as shown in Table 5.

Students' dominant intelligences did not differ significantly by group at the first and second highest levels reported. Table 6 indicates that all three groups reported interpersonal intelligence as their most dominant (spatial intelligence was equally prevalent in the alternative group). Bodily-kinesthetic intelligence was also reported as the most dominant by the second highest percentage of students in each group. Table 7 indicates that interpersonal intelligence was reported as the second most dominant by all three groups (bodily-kinesthetic intelligence was equally prevalent at this level in the regular high school group).
Students' dominant intelligence did differ significantly at the third and fourth highest levels reported. Table 8 indicates that alternative students differed significantly from advance placement and regular students in the percentage that reported linguistic intelligence or bodily-kinesthetic intelligence as their third most dominant. Students in the regular category exceeded the advance placement students on both measures.

Table 9 outlines significant differences at the fourth highest level of dominant intelligences. Alternative students differed significantly from advance placement and regular students in the percentage that reported logical-mathematical intelligence as their fourth most dominant. Advance placement students differed significantly from both other groups in the percentage that reported interpersonal intelligence, spatial intelligence, and intrapersonal intelligence as their fourth most dominant.

All other demographic data were reviewed, but did not elicit significant differences.
Table 2

Analysis of Variance of Responses to Self-Esteem by Academic Group

N = 100

<table>
<thead>
<tr>
<th>Group</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alternative Student</td>
<td>20.625</td>
</tr>
<tr>
<td>Regular High School Students</td>
<td>19.333</td>
</tr>
<tr>
<td>Advance Placement Students</td>
<td>19.207</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Source</th>
<th>Sum of Sq</th>
<th>DF</th>
<th>Mean Sq</th>
<th>F-Stat.</th>
<th>Probability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between</td>
<td>39.665</td>
<td>2</td>
<td>19.832</td>
<td>0.747</td>
<td>0.477</td>
</tr>
<tr>
<td>Within</td>
<td>2576.925</td>
<td>97</td>
<td>26.566</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Tukey HSD Multiple Comparisons

<table>
<thead>
<tr>
<th>Comparisons</th>
<th>Probability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alternative - Regular</td>
<td>0.547</td>
</tr>
<tr>
<td>Alternative - Advance Placement</td>
<td>0.533</td>
</tr>
<tr>
<td>Regular - Advance Placement</td>
<td>0.995</td>
</tr>
</tbody>
</table>

Note. The higher the mean self-esteem scores, the lower the self-esteem.
Table 3

Analysis of Variance of Responses to Self-Esteem by Academic Group.

Item #2

N = 100

<table>
<thead>
<tr>
<th>Group</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alternative Student</td>
<td>1.813</td>
</tr>
<tr>
<td>Regular High School Students</td>
<td>1.513</td>
</tr>
<tr>
<td>Advance Placement Students</td>
<td>1.448</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Source</th>
<th>Sum of Sq</th>
<th>DF</th>
<th>Mean Sq</th>
<th>F-Stat.</th>
<th>Probability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between</td>
<td>2.399</td>
<td>2</td>
<td>1.199</td>
<td>3.251</td>
<td>0.043</td>
</tr>
<tr>
<td>Within</td>
<td>35.791</td>
<td>97</td>
<td>0.369</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Tukey HSD Multiple Comparisons

<table>
<thead>
<tr>
<th>Comparisons</th>
<th>Probability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alternative - Regular</td>
<td>0.102</td>
</tr>
<tr>
<td>Alternative - Advance Placement</td>
<td>0.054</td>
</tr>
<tr>
<td>Regular - Advance Placement</td>
<td>0.902</td>
</tr>
</tbody>
</table>

Note. The higher the mean self-esteem scores, the lower the self-esteem.
### TABLE 4

Analysis of Variance of Responses to Self-Esteem by Gender

<table>
<thead>
<tr>
<th>Gender</th>
<th>Mean</th>
<th>Standard Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male (n = 48)</td>
<td>19.021</td>
<td>5.269</td>
</tr>
<tr>
<td>Female (n = 52)</td>
<td>20.346</td>
<td>4.986</td>
</tr>
</tbody>
</table>

\[ T = 1.292 \quad p = 0.19 \]

### TABLE 5

Analysis of Variance of Responses to Self-Esteem by Gender, Item #10

<table>
<thead>
<tr>
<th>Gender</th>
<th>Mean</th>
<th>Standard Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male (n = 48)</td>
<td>2.000</td>
<td>0.851</td>
</tr>
<tr>
<td>Female (n = 52)</td>
<td>2.423</td>
<td>0.871</td>
</tr>
</tbody>
</table>

\[ T = 2.454 \quad p = 0.016 \]
Table 6

Dominant Intelligence Percentages by Academic Group - Highest Reported

<table>
<thead>
<tr>
<th>Intelligence</th>
<th>Alternative</th>
<th>Advance Placement</th>
<th>Regular</th>
</tr>
</thead>
<tbody>
<tr>
<td>Linguistic</td>
<td>3.12</td>
<td>3.45</td>
<td>5.13</td>
</tr>
<tr>
<td>Logical-Mathematical</td>
<td>12.50</td>
<td>17.24</td>
<td>2.56</td>
</tr>
<tr>
<td>Intrapersonal</td>
<td>9.39</td>
<td>6.90</td>
<td>2.56</td>
</tr>
<tr>
<td>Spatial</td>
<td>21.88</td>
<td>13.79</td>
<td>10.26</td>
</tr>
<tr>
<td>Musical</td>
<td>12.50</td>
<td>13.79</td>
<td>10.26</td>
</tr>
<tr>
<td>Bodily-kinesthetic</td>
<td>18.75</td>
<td>17.24</td>
<td>20.51</td>
</tr>
<tr>
<td>Interpersonal</td>
<td>21.88</td>
<td>27.59</td>
<td>48.72</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Test Statistic</th>
<th>Value</th>
<th>DF</th>
<th>Probability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Likelihood Ratio Chi-Square</td>
<td>12.247</td>
<td>12</td>
<td>0.426</td>
</tr>
</tbody>
</table>
Table 7

Dominant Intelligence Percentages by Academic Group - 2nd Highest Reported

<table>
<thead>
<tr>
<th>Intelligence</th>
<th>Alternative</th>
<th>Advance Placement</th>
<th>Regular</th>
</tr>
</thead>
<tbody>
<tr>
<td>Linguistic</td>
<td>3.12</td>
<td>3.45</td>
<td>10.26</td>
</tr>
<tr>
<td>Logical-Mathematic</td>
<td>3.12</td>
<td>3.45</td>
<td>5.13</td>
</tr>
<tr>
<td>Intrapersonal</td>
<td>25.00</td>
<td>24.14</td>
<td>5.13</td>
</tr>
<tr>
<td>Spatial</td>
<td>21.88</td>
<td>20.69</td>
<td>12.82</td>
</tr>
<tr>
<td>Musical</td>
<td>3.12</td>
<td>6.90</td>
<td>15.38</td>
</tr>
<tr>
<td>Bodily-kinesthetic</td>
<td>6.25</td>
<td>17.25</td>
<td>25.64</td>
</tr>
<tr>
<td>Interpersonal</td>
<td>37.50</td>
<td>24.14</td>
<td>25.64</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Test Statistic</th>
<th>Value</th>
<th>DF</th>
<th>Probability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Likelihood Ratio Chi-Square</td>
<td>18.122</td>
<td>12</td>
<td>0.112</td>
</tr>
</tbody>
</table>
Table 8

**Dominant Intelligence Percentages by Academic Group - 3rd Highest Reported.**

<table>
<thead>
<tr>
<th>Intelligence</th>
<th>Alternative</th>
<th>Advance Placement</th>
<th>Regular</th>
</tr>
</thead>
<tbody>
<tr>
<td>Linguistic</td>
<td>0.00</td>
<td>13.79</td>
<td>23.08</td>
</tr>
<tr>
<td>Logical-Mathematic</td>
<td>18.75</td>
<td>10.34</td>
<td>15.38</td>
</tr>
<tr>
<td>Intrapersonal</td>
<td>18.75</td>
<td>13.79</td>
<td>15.38</td>
</tr>
<tr>
<td>Spatial</td>
<td>25.00</td>
<td>24.14</td>
<td>15.38</td>
</tr>
<tr>
<td>Musical</td>
<td>28.12</td>
<td>20.69</td>
<td>5.13</td>
</tr>
<tr>
<td>Bodily-kinesthetic</td>
<td>3.12</td>
<td>10.34</td>
<td>17.95</td>
</tr>
<tr>
<td>Interpersonal</td>
<td>6.25</td>
<td>6.90</td>
<td>7.69</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Test Statistic</th>
<th>Value</th>
<th>DF</th>
<th>Probability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Likelihood Ratio Chi-Square</td>
<td>23.454</td>
<td>12</td>
<td>0.024</td>
</tr>
<tr>
<td>Intelligence</td>
<td>Alternative</td>
<td>Advance Placement</td>
<td>Regular</td>
</tr>
<tr>
<td>----------------------</td>
<td>-------------</td>
<td>-------------------</td>
<td>---------</td>
</tr>
<tr>
<td>Linguistic</td>
<td>15.62</td>
<td>24.14</td>
<td>7.69</td>
</tr>
<tr>
<td>Logical-Mathematical</td>
<td>6.25</td>
<td>17.24</td>
<td>10.26</td>
</tr>
<tr>
<td>Intrapersonal</td>
<td>15.62</td>
<td>3.45</td>
<td>33.33</td>
</tr>
<tr>
<td>Spatial</td>
<td>18.75</td>
<td>6.90</td>
<td>23.08</td>
</tr>
<tr>
<td>Musical</td>
<td>9.38</td>
<td>17.24</td>
<td>7.69</td>
</tr>
<tr>
<td>Bodily-kinesthetic</td>
<td>25.00</td>
<td>17.24</td>
<td>15.38</td>
</tr>
<tr>
<td>Interpersonal</td>
<td>9.38</td>
<td>13.79</td>
<td>2.56</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Test Statistic</th>
<th>Value</th>
<th>DF</th>
<th>Probability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Likelihood Ratio Chi-Square</td>
<td>22.359</td>
<td>12</td>
<td>0.034</td>
</tr>
</tbody>
</table>
DISCUSSION

One purpose of the present research was to determine whether or not students who have experienced greater academic success in school also report higher levels of personal self-esteem than their lower-achieving counterparts. When the three groups in this study were compared, no significant effects were observed. These results are at variance with other studies which reported a positive correlation between academic achievement and self-esteem (Brookover & Passalacqua, 1981; Skaalvik & Lauvdal, 1984). However, while a meta-analysis of 128 studies confirmed this relationship, wide variations were reported based on the instruments used to measure academic achievement and self-esteem (Hansford & Hattie, 1982). This may account for the results of the present study, which were in the anticipated direction but not to the expected degree.

Previous studies have also used GPA to classify students into achievement groups (Haynes, Hamilton-Lee, Comer, 1988). The present study placed students into achievement groups based on their school status: Advance placement or honors students, general high school students, and students who had been excluded from the regular high school setting. Perhaps these designations were not sufficiently sensitive to student achievement. The advance placement/honors group might have included students who were not achieving at the level expected when they were placed in this category. The regular group might have included large numbers who were achieving at a high level when compared with other students in their group. Finally, most of the alternative students came from a successful model continuation high school which might mitigate against the lower
self-esteem which could be expected in students who have been excluded from the traditional comprehensive high school.

It is also possible that the Rosenberg Self-Esteem Scale (Rosenberg, 1965), a brief 10-item instrument, was not as sensitive as the other measures of self-esteem used in earlier studies. The Piers Harris Self-Concept Scale (Piers & Harris, 1984) for example, which has identified significant differences in self-esteem (Haynes, Hamilton-Lee, Comer, 1988) measures self-concept along six dimensions: (a) behavior, (b) intellectual and school status, (c) physical appearance and attributes, (d) anxiety, (e) popularity, and (f) happiness and satisfaction. This more extensive inventory might have identified a more enhanced effect for self-esteem than Rosenberg’s.

Another possible reason for the lack of significant results on self-esteem may be due to the nature of the advance placement and alternative groups. Students in both categories receive special attention because of their academic placement. Additionally, both groups have a recognizable and well-defined peer group for support. Thus, these two groups may indeed be more alike than different.

Finally, the Rosenberg Scale’s negative items may be more discriminating than its more positive ones. Item #2, “All in all, I am inclined to feel I am a failure” which did reach significance was one of the most negative questions. The other item which revealed significant differences by gender was also extremely negative, item #10, which read: “At times I think I am no good at all.”

Another goal of the present study was to determine whether or not students who have experienced greater academic success would identify different dominant intelligences
than those who have been less successful. More specifically, do more successful students report linguistic and logical-mathematical intelligences more often than less successful ones? Here, the overall results were mixed. While no significant differences were noted in the first and second most dominant intelligences, significant differences were reported for the third and fourth most dominant ones. There are several possible explanations for these results.

First, the instrument itself seemed ambiguous to many students. Numerous questions were asked during administration of the TIMI about the pictures and what precisely they were depicting (see Appendix C). In the case of group pictures, students often asked which bear they were supposed to be. During testing the administrator is cautioned not to help students make their selections but rather, carefully and objectively describe the picture for students as requested. Thus, many students may have made choices that were not necessarily most like themselves, especially those who were unsure but didn’t ask for help. In addition, since the TIMI is a visual inventory, students who were more linguistic may have had greater difficulty responding to it than students who were more spatially oriented.

Another reason that the results did not align as expected may be because the Teele Inventory for Multiple Intelligences is a research instrument which does not possess a high level of discriminate validity. Those students who have demonstrated academic success should be expected to report linguistic and logical-mathematical intelligences more frequently than their less-successful counterparts. However, the most frequently reported dominant intelligence was interpersonal regardless of academic group. It seems likely that
high school students, who are known to be extremely social beings, may have gravitated toward those pictures showing bears doing anything in groups rather than alone.

Another possibility is that the test was accurate. That is, more academically successful students may not possess linguistic and logical-mathematical intelligences at higher levels than their less successful peers. Although these students have been more successful, perhaps they and all students possess other intelligences as strengths and yet prefer activities that are non-language, non-mathematically oriented.

Future research should address these issues. First, a more extensive self-esteem scale might report self-esteem more thoroughly and accurately. Second, sorting students according to grade point average might be a more accurate way of grouping students into achievement groups. Third, the multiple intelligences instrument might be revised with an emphasis on clarity and reduction of ambiguity. In addition, a second, non-pictorial instrument could be used to corroborate the results of the first. Fourth, the study could be administered at the elementary school level, perhaps mitigating against the power of the peer group so dominant in the teenage population. In addition, these students might be followed into adulthood to determine the stability of their intelligences. Fifth, a larger sample size including a control group of students who had already dropped out of school might produce more definitive results. Finally, we might do well to create a test of intelligences that examines real-life, on-task behaviors rather than hypothetical preferences. Such a test, modeled after Feurstein’s dynamic assessment approach (Feuerstein, Rand, & Hoffman, 1979) would have a greater potential for identifying intelligences actually used by students.
Definitive results in the domain of multiple intelligences could have significant implications for future students and the place we call school. The identification of student strengths and weaknesses at an early age and the willingness of schools to teach through the dominant intelligences to support the weaker ones could help children reach vocational and avocational goals which are most appropriate to them. Students who are helped in this way, according to Gardner, "feel more engaged and competent, and therefore, more inclined to serve the society in a constructive way" (Gardner, 1993). What a wonderful vision for the future!
APPENDIX A

DEMOGRAPHICS

1. Age: __________  
2. Gender: M  F
3. Language spoken in the home: ____________________
4. Race/Ethnicity (check one):
   African/American ____  Asian ____  Caucasian ____  Hispanic ____
   Other: _________
5. Level of Education (circle one):  9th  10th  11th  12th
6. Highest level of education completed by:  Mother  Father
   Some high school
   High school diploma
   Two-year college degree
   Four-year college degree
   Graduate level education
7. Extra Curricular Activities (check all that apply)
   Band  ______
   Theater  ______
   Sports  ______
   Art  ______
   Job  ______
   Other (please specify): ____________________________
APPENDIX B

ROSENBERG'S SELF-ESTEEM SCALE

Circle the one answer that best describes your feelings about yourself.

1. I feel I'm a person of worth, at least on an equal plane with others.
   - strongly agree
   - agree
   - disagree
   - strongly disagree

2. All in all, I am inclined to feel I am a failure.
   - strongly agree
   - agree
   - disagree
   - strongly disagree

3. I feel that I have a number of good qualities.
   - strongly agree
   - agree
   - disagree
   - strongly disagree

4. I feel that I do not have much to be proud of.
   - strongly agree
   - agree
   - disagree
   - strongly disagree

5. I am able to do things as well as most other people.
   - strongly agree
   - agree
   - disagree
   - strongly disagree

6. I wish I could have more respect for myself.
   - strongly agree
   - agree
   - disagree
   - strongly disagree

7. I take a positive attitude toward myself.
   - strongly agree
   - agree
   - disagree
   - strongly disagree

8. I certainly feel useless at times.
   - strongly agree
   - agree
   - disagree
   - strongly disagree

9. On the whole, I am satisfied with myself.
   - strongly agree
   - agree
   - disagree
   - strongly disagree

10. At times I think I am no good at all.
    - strongly agree
    - agree
    - disagree
    - strongly disagree
APPENDIX C

The art work for this inventory was drawn by Deborah De Vries, freelance illustrator, P.O. Box 607, Nuevo, California 92567.
Teele Inventory for Multiple Intelligences (TIMI)

by Sue Teele

Published by
Sue Teele & Associates
P.O. Box 7302
Redlands, California 92373

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THE REPRODUCTION OR DUPLICATION OF THIS FORM IN ANY WAY IS A VIOLATION OF THE COPYRIGHT LAW
Teele Inventory for Multiple Intelligences (TIMI)
Once upon a time, there were three bears.

If line A crosses line B, then the answer is ...
Teele Inventory for Multiple Intelligences (TIMI)

13A

13B

14A

14B

Copyright © Sue Teele, 1992
I feel good about who I am and know my strengths.
Teele Inventory for Multiple Intelligences (TIMI)
THE TEELE INVENTORY OF MULTIPLE INTELLIGENCES

ANSWER SHEET

A  B
1.  
2.  
3.  
4.  
5.  
6.  
7.  
8.  
9.  
10.  
11.  
12.  
13.  
14.  
15.  
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TOTALS

DOMINANT INTELLIGENCES

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APPENDIX D

STATEMENT OF INFORMED CONSENT
DEPARTMENT OF PSYCHOLOGY
CALIFORNIA STATE UNIVERSITY, SAN BERNARDINO

The study in which you are about to participate is designed to investigate the relationship between academic achievement, self-esteem, and types of intelligence. This study is being conducted by William T. Fagan, a teacher in the Hesperia Unified School District, under the supervision of Dr. David Chavez, Professor of Psychology. This study has been approved by the Psychology Department, Human Subject Review Board, California State University, San Bernardino.

In this study, you will first complete an information page indicating such things as age, gender, and grade level. Next, you will complete a brief 10-item survey of personal self-esteem. Finally, you will complete an inventory which asks you to select a preferred activity from two that are shown. We will then score the inventory and discuss its meaning.

Please be assured that any information you provide will be held in strict confidence by the researchers. At no time will we ask for your name or any other identifying information. All data will be reported in group form only. At the conclusion of this study, you may receive a report of the results. This page with your signature will be kept separately from your answers to the surveys.

Please understand that your participation in this research is totally voluntary and you are free to withdraw at any time during this study without penalty, and to remove any data at any time during this study. Any questions about this study or your participation in the research should be directed to Dr. Chavez. He can be reached by calling (909) 880-5572. I acknowledge that I am at least 18 years of age. If I am not 18 years of age, my parent's signature at the bottom of this form indicates their consent for me to participate.

___________________________________________ Date
Participant's Signature

___________________________________________ Date
Parent's Signature

___________________________________________ Date
Researcher's Signature
APPENDIX E

DEBRIEFING STATEMENT

Thank you for participating in this study. The information you have provided will be extremely useful. As we discussed after you completed the surveys, Howard Gardner, a psychologist, believes that people are intelligent in more ways than have previously been recognized. Your responses suggest that you are indeed intelligent in many ways, some of which may be surprising to you. This is one of the reasons for the study — to let students know that they are intelligent in ways they may never have considered. Another reason is to inform teachers and administrators that because of these many intelligences, they should begin teaching and testing students in new ways. Finally, by exploring the relationship between academic achievement and self-esteem, we hope to confirm or disconfirm earlier studies that showed a correlation between these two constructs.

The results of this study will be available in June, 1995. If you indicated an interest in receiving these results, copies will be provided for your teacher to distribute. If you have any questions or concerns as a result of your participation in this study, please contact Dr. David Chavez at (909) 880-5572. If you know someone that may be taking part in this study at another time, please do not discuss the nature of the study with them until they have completed their participation. Thank you.
APPENDIX F

PROJECT DESCRIPTION

Prior to their involvement in this study, school administration will have given their consent for student participation (I am a teacher in the district and have already received approval from both high schools). In addition, informed consent forms will be distributed for parent signature (for those subjects under 18 years old) and for student signature (for those subjects 18 and older). Once these signed consent forms have been received, data will be collected.

Students will be asked to provide demographic information including age, gender, language spoken in the home, GPA, race/ethnicity, grade level, involvement in extra-curricular activities, and education level of their parents. Next, students will be asked to complete the Rosenberg Self-Esteem Scale (attached). They will then be asked to respond to the Teele Inventory of Multiple Intelligence, a 28-item forced choice instrument designed to measure Multiple Intelligences as described by Howard Gardner. We will score the instrument together and discuss the significance of the results. Finally, students will be given an opportunity to ask questions.

The purpose of this research is to determine whether or not self-esteem differs between students who have been very successful at the comprehensive high school students enrolled in regular classes, and those who attend high school at alternative settings. In addition, I am hoping to discover whether or not these same students differ in how they perceive themselves in relation to Gardner's seven intelligences.
APPENDIX G

CONFIDENTIALITY OF DATA

Students will not be asked to identify themselves in any way. Once the data has been recorded, the demographic collection form will be separated from the surveys. Results will be provided to teachers and will be made available to students interested in the outcome of this study.
APPENDIX H

RISKS AND BENEFITS

There are no identifiable risks to subjects who participate in this study. Subjects may become more aware of their own level of self-esteem, but the brief 10-item Rosenberg Self-Esteem Inventory, which has been widely used, is not invasive and should not be psychologically troubling.

Administration of the Teele Inventory for Multiple Intelligences may bring some psychological benefits to the respondents. Once subjects have identified their own intelligences and learn that according to Gardner's theory many of their skills and abilities (musical, spatial, etc.) are actually intelligences on an equal footing with reading, writing, and math computation, they may experience a rise in self-esteem.

Finally, society may benefit from this study through validation of Gardner's theory which may open the doors to further research, and lead to the establishment of schools which teach to all seven of the intelligences. Further, if indeed we have previously missed the full measure of a student's intelligence by using the more narrow IQ quantification, we may start the healing process for those who have been isolated, rejected, or offended by schools which did not meet their needs.
REFERENCES


Lorge, L. L. (1945). Schooling makes a difference. Teacher's College Record, 46, 483-492.


