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ABSTRACT

Gifted underachievers (n=108) were compared to gifted high achievers (n=96). All children had Wechsler Intelligence Scale for Children - Revised (WISC-R) IQ scores of 130 or greater, but underachievers were performing at or below the 50th percentile in at least one major area of achievement, whereas high achievers were at the 96th percentile or greater in three areas of achievement: language, math, and reading. Results of analysis of variance of achievement level X WISC-R subtests revealed significant differences in scores on four verbal subtests: Information, Similarities, Vocabulary, and Comprehension. High achievers had significantly higher verbal, but not performance, IQ scores than underachievers. However, comparison of the verbal IQ-performance IQ discrepancy distributions for the two groups revealed no significant differences, negating the idea that a large verbal/performance IQ discrepancy can be used as an indicator of risk for low achievement in gifted children. Analysis of gender, ethnicity, and risk revealed a greater concentration of non-Caucasian males with at least two risk factors in the underachieving group. Present findings are consistent with earlier findings concerning the importance and discriminating power of the Information subtest in distinguishing high versus underachievers. The findings indicate that gifted underachievers are not as motivated or interested in acquiring traditional factual information as high achievers. (Contains 242 references.) (DB)

CHAPTER 6

Understanding Gifted Underachievers in an Ethnically Diverse Population

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Abstract

A well defined sample of gifted underachievers was compared to a sample of gifted high-achievers. All children had full scale WISC-R IQ scores of 130 or greater. Underachievers were performing at or below the 50th percentile in at least one major area of achievement, whereas high-achievers were at the 96th percentile or greater in three areas of achievement: language, math, and reading. Of 6,067 children who had obtained full scale IQ scores of 130 or greater over a nine year period in an ethnically diverse population, 108 met criteria for gifted underachievement, and 96 met criteria for high achievement. Results of a 2 (achievement level) by 9 (WISC-R subtest) mixed repeated measures ANOVA revealed significant ($p < .01$) differences in scores on four verbal subtests: Information, Similarities, Vocabulary, and Comprehension. High-achievers had significantly ($p < .001$) higher Verbal, but not Performance, IQ scores than underachievers. However, comparison of the VIQ-PIQ discrepancy distributions for the children in the two groups revealed no significant differences. This finding negates the idea that a large VIQ-PIQ discrepancy can be used as an indicator of risk for low achievement in gifted children, since large VIQ-PIQ discrepancies were as likely to be seen in high-achievers as in low. Analysis of gender, ethnicity, and risk revealed a greater concentration of nonCaucasian males with at least two risk factors in the underachieving group. Present findings are consistent with, and confirm those of others concerning the importance and discriminating power of the Information subtest in distinguishing high versus underachievers. The findings indicate that gifted underachievers are not as motivated or interested in acquiring traditional factual information as high-achievers. Creative teaching strategies are recommended to maximize the talents of underachievers.

Traditionally, gifted underachievers are defined as those children who cannot or will not perform at a level of academic achievement commensurate with their intellectual potential (Emerick, 1989; Fine, 1967; Gowan, 1955). Underachievement manifests itself as a discrepancy between a child's performance in the classroom and his or her intellectual ability (Rimm, 1988); a discrepancy between what is expected and what is actually accomplished (Newell, & d'Lberville, 1989).

As Gowan (1955) noted some time ago, gifted underachievers represent one of the greatest social wastes in our culture. Gifted underachievers are children of exceptional ability who achieve at average or even below average levels. Unfortunately, gifted underachievers tend to be overlooked because such children perform at relatively good levels (Wolfe, 1991). Thus, while gifted children may be as susceptible to factors that cause underachievement as are children of normal intelligence, their underachievement is less likely to be recognized because of their giftedness (Supplee, 1989).

According to various estimates, between 10% and 20% of high school dropouts are judged to have very superior ability (Lajoie & Shore, 1981; Nyquist, 1973; Whitmore, 1980). Ten to fifteen percent of the academically gifted are believed to achieve at a rate far below their potential (Gallagher, 1985; Ford, 1992). Consequently, an increasing number of researchers have called for more study of these gifted children who fail to fulfill their high potential and yet are so easily missed, or dismissed as lazy, manipulative or irresponsible (Emerick, 1989; Ford, 1992; Gallagher, 1985; Wolfle, 1991).

Because they usually perform at satisfactory levels, gifted underachievers are difficult to identify, and consequently have proved resistant to systematic scientific inquiry. Much of the available research has been devoted to the problem of identification (Ford & Harris, 1990; Mather & Udall, 1985). Some studies have looked at the role of the family (VanTassel-Baska, 1989) or socioemotional consequences (Cornell, Callahan, & Lloyd, 1991). Still other reports have used case studies to examine gifted underachieving children (Hannel, 1990).

A major line of investigation has been concerned with test patterns in order to better understand and operationalize underlying correlates of underachievement in gifted children. The basis for the search for test patterns can be found, in part, in evidence that suggests that gifted children process information in a qualitatively different manner from average children on tests such as the WISC-R (Brown & Yakimowski, 1987). Moreover, in a study of WISC test patterns of bright and gifted underachievers, Bush and Mattson (1973) found that normal achievers and underachievers differed on three subtests: Information, Arithmetic, and Digit Span. In a related study, Moffitt and Silva (1987) examined children from an unselected birth cohort who had WISC-R Verbal and Performance IQ discrepancies that placed them beyond the 90th percentile. Underachieving children in this sample were found to have depressed a Verbal IQ relative to the Performance IQ.

In the present study, we continued the exploration of the test patterns of gifted underachievers. A well-defined sample of gifted underachievers was compared to a well-defined sample of gifted high-achievers, to explicate differences in patterns of subtest scores as well as verbal-performance discrepancies.

Method

Subjects:

The subjects were drawn from children who were referred for an evaluation of giftedness in the San Diego School District between 1984 and 1993. The San Diego City School District consists of over 123,000 children who attend more than 130 elementary, middle, and high schools across a wide geographic and ethnically diverse area. Children may be referred for a giftedness evaluation by teachers, parents, or central nomination from the District office. Each child referred is examined by a school psychologist who conducts a case study analysis including a consideration of IQ, achievement, aptitude, and risk factors. For each child evaluated, the psychologist determines whether the child has one or more of five

risk factors as follows: cultural/language, economic, emotional, environmental, and health. Children who score two standard deviations above the mean on a standardized IQ test are automatically certified as gifted. Children may also be certified as gifted based on a combination of high achievement, high IQ and risk factors.

Procedure:

Between 1984 and 1991 the vast majority of children evaluated for giftedness (more than 95%) were administered the Wechsler Intelligence Scale for Children-Revised (WISC-R). A total of 9,315 children had been given the WISC-R during this time period. From these 9,315 children, we identified all who had a Full Scale IQ of 130 or greater (i.e., two standard deviations above the mean or greater). A total of 6,067 children met this criterion. From this group of high IQ children, a group of underachievers was obtained by selecting all children who scored at the mean (i.e., 50th percentile) or lower on the Total Reading, Language, or Math scores of the Comprehensive Test of Basic Skills (CTBS). Such children would therefore have at least a two standard deviation discrepancy between IQ and achievement. A total of 108 children representing an ethnically diverse sample met this criterion. To obtain a high-achieving group, all children who had all three achievement scores in the 96th percentile or higher were selected. A total of 96 children met this criterion. For the underachievers, 11 were Latino, 73 Caucasian, 10 African-American, 7 Asian, and 7 Other (Native-American. Indochinese, Filipino, or Pacific Islander). For the high-achieving sample, 2 were Latino, 78 Caucasian, 4 African-American, 2 Asian, and 10 Other. Chi Square analysis was conducted to determine if there were significantly more nonCaucasians represented in the underachieving group. Compared to an expected 50-50 split, results revealed that there were significantly more nonCaucasians in the underachieving group $\chi^2(1, N = 108) = 5.45$, ($p < .02$). There were no significant differences in numbers of Caucasians in the two groups ($p > .05$). In terms of risk factors, 56 high-achievers had none, 23 had one, and 17 had two. In the underachieving group 61 had no risk factors, 23 had one risk factor, and 24 had two risk factors. There were no statistically significant differences between the two groups in the number of children in each risk category. In the high-achieving group, 49 were female, 47 male. In the underachieving group, 40 were female and 68 were male. Males were overrepresented in the underachieving group, $\chi^2(1, N = 108) = 7.26$, $p < .007$.

Results

Table 1 shows the mean subtest performance for the nine subtests that were routinely given to the majority of the subjects. To evaluate differences in subtest performance between high and underachievers, the groups were compared in a 2 (Achievement Level) X 9 (Subtests) mixed repeated measures ANOVA. There were significant main effects for Achievement, $F(1, 131) = 17.16$, $p < .001$, and for Subtests, $F(8, 1048) = 35.14$, $p < .001$. Post-hoc multiple comparisons revealed that the high-achievers scored significantly higher ($p < .01$) on 4 subtests: Information, Similarities, Vocabulary, and Comprehension.

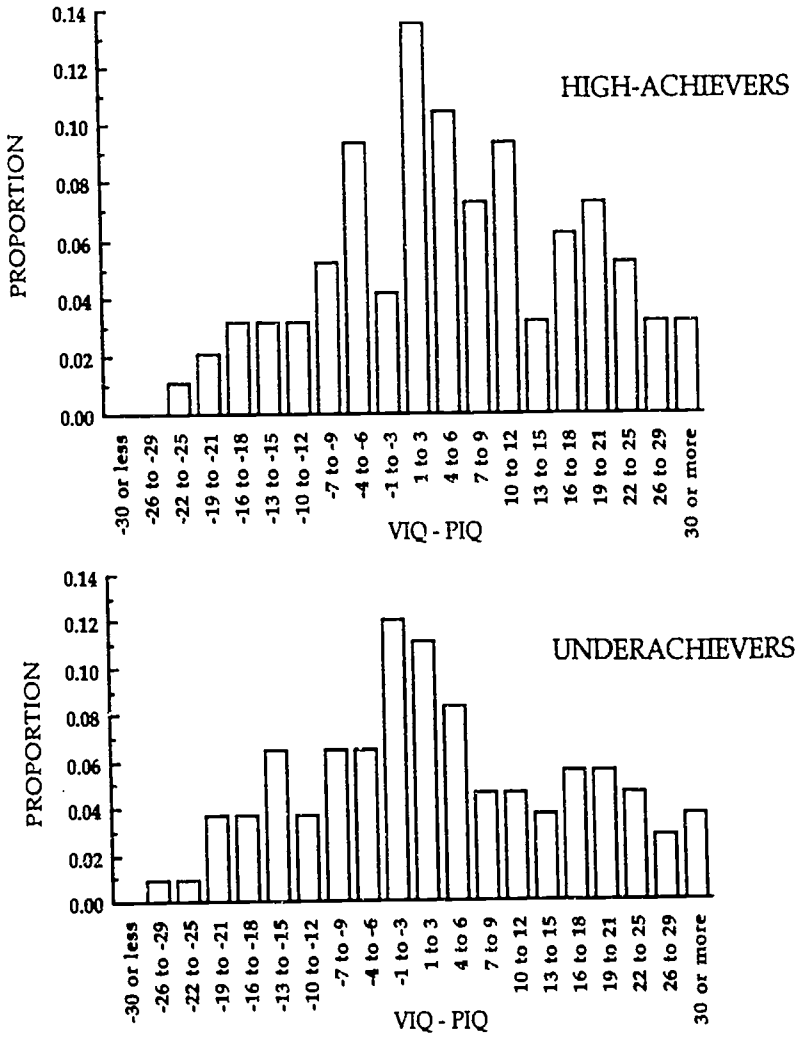
Table 1.
WISC-R Means and Standard Deviations for Subtest Performance by High and Underachievers.

WISC-R Subtest	High-achievers (*M*)	(*SD*)	Underachievers (*M*)	(*SD*)	Entire Sample (*M*)	(*SD*)
Information	14.78	(2.09)	13.88	(1.87)	14.30	(2.02)
Similarities	17.35	(1.99)	16.65	(1.97)	16.97	(2.01)
Arithmetic	14.73	(2.33)	14.40	(2.15)	14.55	(2.24)
Vocabulary	15.98	(2.08)	15.40	(2.08)	15.67	(2.09)
Comprehension	17.23	(1.76)	16.13	(1.97)	16.69	(1.94)
Picture Completion	13.76	(2.44)	13.90	(2.14)	13.83	(2.44)
Picture Arrangement	14.70	(2.47)	14.67	(2.51)	14.68	(2.49)
Block Design	15.39	(2.53)	14.82	(2.51)	15.09	(2.53)
Object Assembly	14.44	(2.86)	14.01	(2.73)	14.21	(2.79)

Since all of the differences found were for Verbal subtests, high-achievers and underachievers were compared in a 2 (Achievement Level) X 2 (Verbal versus Performance IQ) ANOVA. PIQ scores for high-achievers ($M = 132.2$; $SD = 9.7$) and underachievers ($M = 130.6$; $SD = 9.1$) did not differ significantly. However, VIQ scores did differ significantly, $F(1, 202) = 13.5$, $p < .001$, with a mean of 137.8 ($SD = 8.5$) for the high-achievers and a mean of 133.4 ($SD = 7.8$) for the underachievers.

To investigate the possibility that high-achievers and underachievers differ in individual VIQ - PIQ discrepancy scores, VIQ - PIQ frequency distributions for the two groups were compared. No significant differences were found (Kolmogorov-Smirnov Z = 1.007, p = .263). As can be seen in Figure 1, relatively large VIQ - PIQ discrepancies were as likely to be seen in high-achievers as in low achievers.

Figure 1. Distribution of VIQ - PIQ differences at the extremes of achievement.



Performance was further analyzed through correlational analysis and stepwise multiple regression (see Table 2). Table 2 shows the intercorrelation matrix of the WISC-R subtests and CTBS (Language, Reading, and Math) scores. Stepwise multiple linear regression was performed, with the nine Wechsler subtest scores as predictors and level of achievement (i.e., whether the child was in the high versus underachievement group) as the criterion. Three subtests were significant in predicting achievement level. The first variable that entered into the equation was the Information subtest, with a multiple R of .29, $F_{(1, 131)} = 12.08$, $p < .001$. The Comprehension subtest added significant variance, $F_{(2, 30)} = 10.1$, $p < .001$, and increased the multiple R to .37. Finally, the Block Design subtest significantly, $F_{(3, 129)} = 8.5$; $p < .001$, increased the multiple R to .41.

Table 2.

Correlation Matrix for WISC-R Subtests and Achievement Scores

	INFO	COMP	ARITH	SIMS	VOCAB	PC	PA	BD	OA
INFO	1.00								
COMP	.22	1.00							
ARITH	.11	.07	1.00						
SIMS	.07	.18*	.09	1.00					
VOCAB	.40**	.24**	.11	.29**	1.00				
PC	-.01	-.11	.02	-.07	.07	1.00			
PA	-.08	-.11	.02	.11	.06	.12	1.00		
BD	.02	-.16	-.07	-.12	-.06	.06	.03	1.00	
OA	-.11	-.07	-.06	.08	.09	.18*	.36**	.31**	1.00
CODING	-.21*	-.05	.20*	-.06	-.03	.01	-.05	-.07	-.12
CTBSL	.26**	.29**	.05	.10	.15	-.10	-.04	.09	.10
CTBSR	.23**	.23**	.02	.10	.12	.02	.01	.11	.11
CTBSM	.05	.17	.07	.12	-.04	-.04	.01	.16	.03

	CODING	CTBSL	CTBSR	CTBSM
CODING	1.00			
CTBSL	.08	1.00		
CTBSR	.11	.71**	1.00	
CTBSM	.09	.52**	.40**	1.00

Note.: CTBSL = CTBS Total Language
CTBSR = CTBS Total Reading
CTBSM = CTBS Total Math

* $p < .05$
** $p < .01$

To aid in understanding the gender and ethnic differences between high-achievers and underachievers, the groups were further compared in terms of gender, risk, and ethnicity simultaneously. Chi Square analysis revealed significantly more male, nonCaucasians with 1 or more risk factors in the underachieving group: $\chi^2(1, N = 33) = 5.50$, $p < .019$.

Discussion

The present study compared intellectually gifted children who were achieving at least two standard deviations below expectation to a very high-achieving sample. In general, the high-achieving sample had slightly higher IQ scores. This superiority, however, was attributable only to Verbal subtests. The high-achievers had significantly higher scores on Information, Similarities, Vocabulary, and Comprehension. Although mean Verbal IQ was significantly higher for the high-achieving group, there were no differences for any of the Performance subtests or for the Performance IQ as a whole.

Differences in the pattern of individual VIQ - PIQ discrepancy scores were plotted in frequency distributions for each group. No differences were found between the two distributions. Indeed, VIQ - PIQ discrepancies on the order of 15 points or greater were found to be equally common in both high-achievers and underachievers. This finding underscores the fallacy of confusing statistical significance (i.e., the 15-point difference necessary to conclude with 95% certainty that an individual's VIQ and PIQ differ) with clinical significance (i.e., the mistaken conclusion that a 15-point VIQ-PIQ difference necessarily has prognostic significance and indicates risk for underachievement). Large VIQ-PIQ discrepancies are equally common in high- and low-achieving gifted children; only with the addition of a low achievement test score can a low-achiever be identified. In terms of predicting achievement level using WISC-R subtests, the primary correlates were Information and Comprehension, with Block Design adding a small, but significant, contribution to the variance.

Analysis of gender, ethnicity, and risk further revealed a greater concentration of nonCaucasian males with at least two risk factors in the underachieving group. These findings are consistent with previous studies, which indicate that of the intellectual underachievers, males outnumber females (Gallagher, 1985; Wolfle, 1991), and that many of these students are ethnic minorities (Ford, 1992). Thus, there is a need, as advocated by Gallagher (1985), to provide particular focus on underachieving minority males.

Our results confirm the findings of Bush and Mattson (1973) concerning the importance and discriminating power of the Information subtest in distinguishing high-achievers versus underachievers. Present findings show that the older results with the WISC generalize to the WISC-R. The findings pertaining to the Information subtest, taken at face value, seem to suggest that gifted underachievers simply do not have as much interest or motivation for acquiring factual information as do high-achievers. This suggests that gifted underachievers may require creative teaching strategies, such as making information more relevant and interesting or channeling their abilities into more creative pursuits.

Our findings are also consistent with those reported by Moffitt and Silva (1987). Gifted underachievers are characterized by certain depressed verbal skills; their Performance IQ's are comparable to that of the high-achievers. Thus, we can characterize the gifted underachiever as an individual who has not used his or her potential, or as Cattell (1963) would say, fluid intelligence, to acquire a traditional body of knowledge (i.e., crystallized intelligence). Again, the challenge for teachers is to find ways to motivate these underachievers to make full use of their potential.

Our findings pertaining to gifted underachievers are also relevant to a previous report of the direction of the difference between Verbal versus Performance IQ in 4,546 gifted African-American, Caucasian, Filipino, and Hispanic children (Saccuzzo, Johnson, & Russell, 1992). This study showed that for the typically gifted African-American, the Verbal IQ was actually higher than the Performance IQ. For Hispanics, the Verbal and Performance IQ's were roughly equivalent. Thus, the relevant dimension includes both direction and size; a very high Performance IQ relative to Verbal IQ for an African-American and perhaps an Hispanic should signal the possibility of a gifted underachiever because these individuals tend to have higher Verbal than Performance IQ's. For Filipinos, just the reverse is true since these individuals tend to have higher Performance than Verbal IQ (Saccuzzo et al., 1992). Therefore, while the WISC-R may be biased in terms of selection (Johnson, 1992), it (or its relative, the WISC-III) may still have utility in identifying gifted underachieving African-American and Hispanic/ Latino students.

Beyond modification of our educational strategies, researchers have pointed to three major approaches to gifted underachievers. The first focuses on motivational factors (e.g., Boyd, 1990). According to this model there is a need to add excitement or relevance to the learning process in order to help gifted underachievers fulfill their potential. A second approach emphasizes the importance of families as a source of encouragement and support for gifted underachievers (VanTassel-Baska, 1989). The third emphasizes the importance of personality variables, especially locus of control — one's perceived ability to influence or control the events of one's life (Laffoon, Jenkins-Friedman, & Tollefson, 1989; Waldron, Saphire, & Rosenbaum, 1987; Willings & Greenwood, 1990). Certainly any one, two, or all three of these factors play a role in gifted underachievement and need to be considered in addressing the problems of each individual and unique student.

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