Comparison of White, African American, Hispanic, and Asian Children on the Naglieri Nonverbal Ability Test

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This study examined differences between 3 matched samples of White (n = 2,306) and African American (n = 2,306), White (n = 1,176) and Hispanic (n = 1,176), and White (n = 466) and Asian (n = 466) children on the Naglieri Nonverbal Ability Test (NNAT; J. A. Naglieri, 1997a). The groups were selected from 22,620 children included in the NNAT standardization sample and matched on geographic region, socioeconomic status, ethnicity, and type of school setting (public or private). There was only a small difference between the NNAT scores for the White and African American samples (d ratio = .25) and minimal differences between the White and Hispanic (d ratio = .17) and between the White and Asian (d ratio = .02) groups. The NNAT was moderately correlated with achievement for the total sample and correlated similarly with achievement for the White and ethnic minority groups. The median correlation of NNAT with reading was .52 and NNAT with math was .63 across the samples. Results suggest that the NNAT scores have use for fair assessment of White and minority children.

Accurate assessment of intelligence for people from diverse cultural and linguistic backgrounds has been a topic of great debate and interest for some time (Sattler, 1988). To effectively evaluate diverse populations, researchers have widely used tests that comprise nonverbal, geometric designs arranged in a progressive matrix because they are considered culturally reduced in their content (Jensen, 1980; Naglieri & Prewett, 1990; Sattler, 1988). For example, although bilingual children may do poorly on verbal tests because they lack English language skills, researchers have found that the nonverbal measures are less influenced by limited English language skills and, therefore, are more appropriate because they can lead to a reduced mean score difference between groups (Hayes, 1999; Naglieri & Yazzie, 1983). It has also been found that scores from verbal tests of intelligence can be adversely influenced when children have poor achievement skills (e.g., limited vocabulary, general information, and arithmetic knowledge; Kaufman, 1994; Naglieri, 1999). For these reasons, nonverbal tests of intelligence are considered appropriate for a wide variety of people, especially those with limited English language skills and a history of academic failure (Bracken & McCallum, 1998; Zurcher, 1998).

The oldest and most widely used nonverbal ability test is the Raven Progressive Matrix (Raven, 1947), which has been studied in many countries and with a variety of individuals (Jensen, 1980). Its use in the United States, however, has been criticized because of poor standardization procedures, rough item difficulty gradients, inadequate numbers of items, and the need for better documentation of the sample used to generate normative tables, as well

as psychometric issues such as internal and test–retest reliability (Jensen, 1980; Naglieri, 1985a, 1985b; Naglieri & Prewett, 1990; Nicholson, 1989). In response to these needs, other progressive matrix tests have become available. This includes the Test of Nonverbal Intelligence (Brown, Sherbenou, & Johnsen, 1990), the Matrix Analogies Test—Short Form (MAT–SF; Naglieri, 1985b) and Expanded Form (MAT–EF; Naglieri, 1985a), the Naglieri Nonverbal Ability Test (NNAT; Naglieri, 1997a), and the General Ability Measure for Adults (Naglieri & Bardos, 1997). These more recently developed tests offer advantages such as good U.S. standardization samples and psychometric properties, but they do not have the large research base of the Raven. The purpose of this study was to enlarge the research base on the differences across racial and ethnic groups using the recently published NNAT.

The NNAT uses the same progressive matrix format as the Raven, but there are some important differences between the tests. First, the NNAT—like its forerunners, the MAT–SF and MAT–EF (Naglieri, 1985a, 1985b)—was constructed with items that are least influenced by color-impaired vision (only the colors white, black, blue, and yellow were used). Second, the NNAT is well standardized on a sample of more than 68,000 kindergarten through 12th-grade students. Third, the psychometric properties of the test are amply documented (Naglieri, 1997b). There is an emerging research base on the NNAT and its earlier versions, the MAT–EF and MAT–SF, for diverse populations of children.

Naglieri (1985a) summarized the results of two studies conducted using the MAT–SF and MAT–EF standardization sample data that examined the performance of ethnic minority children. Samples of White (n = 336) and African American (n = 336) children matched on school, gender, and age in years performed similarly (effect size = 0.17) on the MAT–SF. Additionally, matched samples of White (n = 55) and African American (n = 55) children earned standard scores (M = 100, SD = 15) of 90.6 and 90.0, respectively, on the MAT–EF. Cross-cultural studies have also demonstrated that the MAT correlated significantly with the Wechsler Intelligence Scale for Children—Revised (Wechsler,

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1974) Performance IQ Scale ($r = .43$, $p < .001$) and the Raven Progressive Matrix ($r = .64$, $p < .001$) for a sample of 114 Native American students (Naglieri, 1985a). U.S. and Canadian children earned similar mean scores in two studies by Naglieri and Bardos (1988), who tested 407 Canadian children aged 5–17 years, and Saklofske, Yackulic, Murray, and Naglieri (1992), who assessed a sample of 660 Canadian children aged 6–11 years. Proctor, Kranzler, Rosenbloom, Martinez, and Guevar-Aguire (2000) studied a sample of 104 Ecuadorian children. They found that the MAT–EF correlated significantly with the Raven Progressive Matrix ($r = .62$) and that the Ecuadorian sample earned scores about 1 SD below those of the U.S. normative sample. Additionally, they found that the MAT–EF internal reliability was .95 for this sample of children living in South America. In contrast, Tamoaka, Saklofske, and Ide (1993) found that Japanese children aged 6–12 years ($N = 451$) earned mean MAT–SF scores that were higher than those of the U.S. sample. These initial studies were conducted on the first editions of progressive matrix tests by Naglieri (1985a, 1985b). The purpose of the present study was to examine the differences between matched samples of White with African American, Hispanic, and Asian American children on the second edition of the test—the NNAT (Naglieri, 1997a).

Method

Participants

Three samples of students were selected from the 22,620 children who were included in the NNAT standardization sample during the Fall 1995 data collection phase. This portion of the 68,000 children used to standardize the NNAT was selected because this group was also administered measures of reading and math. The standardization sample of the NNAT was stratified by state. Within each state, the samples were chosen to be representative of the national school population according to socioeconomic status, urbanicity, and ethnicity on the basis of data provided by the National Center for Educational Statistics (1993–1994; Naglieri, 1997b). Districts were invited to participate in the standardization program, and about 25% of them were ultimately involved. The 22,620 students were selected to be fairly representative of the national school population according to socioeconomic status, urbanicity and ethnicity. The data provided in Table 1 show that the sample closely matched the demographic characteristics of the U.S. population on geographic region, socioeconomic status, ethnicity, and type of school setting (public or private). A small percentage of the students was limited in their English language proficiency. The largest number of children with limited English proficiency was found in the Hispanic sample (9%, $n = 103$), followed by the Asian sample (4%, $n = 18$); the remaining groups had less than 1% with limited

Table 1

Demographic Characteristics of the NNAT Samples and the U.S. Population

Variable	United States %	Total sample: Fall 1995		Sample 1: White & African American		Sample 2: White & Hispanic		Sample 3: White & Asian	
		n	%	n	%	n	%	n	%
Total n		22,490		4,612		2,352		932	
Gender									
Male	51	11,287	50	2,376	52	1,230	52	420	45
Female	49	11,196	50	2,236	49	1,122	48	512	55
Region									
Northeast	20	4,308	19	1,206	26	362	15	218	23
Midwest	24	5,745	26	940	20	274	12	76	8
Southeast	24	4,804	21	596	13	212	9	190	20
West	32	7,633	34	1,870	41	1,504	64	448	48
SES status									
Low	20	4,191	21	1,044	23	384	16	182	20
Low–middle	21	4,589	23	1,144	25	998	42	154	17
Middle	21	2,999	15	458	10	116	5	12	1
High–middle	18	4,099	20	884	19	216	9	274	29
High	20	4,421	22	1,082	24	638	27	310	33
Urbanicity									
Urban	27	1,523	8	298	7	382	16	70	8
Suburban	48	798	48	2,520	55	1,008	43	710	76
Rural	25	8,978	44	1,794	39	962	41	152	16
Ethnicity									
African American	16	2,865	14	2,306	50	0	0	0	0
Hispanic	13	2,002	10	0	0	1,176	50	0	0
White	67	14,180	71	2,306	50	1,176	50	466	50
Asian	4	609	3	0	0	0	0	466	50
American Indian	1	269	1	0	0	0	0	0	0
School level									
Elementary		9,484	42	1,876	41	1,352	58	396	43
Middle		8,719	39	1,986	43	678	29	364	39
High		4,287	19	750	16	322	14	172	19

Note. U.S. percentages are from the National Center for Education Statistics, U.S. Department of Education, 1993–1999. Because percentages were rounded, they may not sum to 100. NNAT data copyright 1997 by The Psychological Corporation (see Naglieri, 1997b). Reprinted with permission. Elementary school includes kindergarten through Grade 4, middle school includes Grades 5–8, and high school includes Grades 9–12. NNAT = Naglieri Nonverbal Ability Test; SES = socioeconomic status.

English proficiency. The total sample was largely composed of children from suburban and rural settings, with urban children somewhat underrepresented. The data provided in Table 1 also show the characteristics of the total fall sample compared with the demographics of the U.S. national school population, as well as the characteristics of the three subsamples.

To examine the performance of similar samples of White and ethnic minority groups, we matched children from kindergarten through Grade 12 on the basis of region of the United States (Northeast, Midwest, Southeast, and West), urbanicity (urban, suburban, and rural), gender, socioeconomic status (SES), and school level. Each subsample was composed of equal numbers of the majority ethnic group (Whites) and a minority ethnic group: Sample 1, African Americans; Sample 2, Hispanics; and Sample 3, Asians. The similarity of the groups is demonstrated in Table 2, which shows demographics for each of the three pairs of samples. The three matched groups were nearly identical with regard to their respective demographic characteristics, as expected. Each group differed from the U.S. population on the relative percentages of children from the middle SES level and the percentages of children from urban settings.

Data Analyses

Basic descriptive statistics were computed for the separate matched groups by grade level and for all grades combined. Standard scores ($M =$

100, $SD = 15$) were used in all analyses, and the differences between the three matched groups were described using d ratios (Becker, 1991). The d ratio expresses the difference between the means in units of standard deviation based on the standard deviations of the samples. Group means for the NNAT and the Stanford Achievement Test (9th ed.; SAT-9; 1995) Reading and Math achievement scales were also compared using an analysis of variance. Pearson correlations were computed and compared across White and ethnic minority groups using a z test for the difference between independent correlations (Guilford & Fructer, 1978). Six z tests were computed (two for the comparison of White with minority group correlations in both reading and math for each of the three samples). An experimentwise error rate of .01 was used.

Instruments

NNAT. The NNAT (Naglieri, 1997a) is designed to be a brief, culture-fair, nonverbal measure of ability that does not require the child to read, write, or speak (Naglieri, 1997b). The test is designed as a nonverbal measure of general ability comprising progressive matrix items that use shapes and geometric designs interrelated through spatial or logical organization. The NNAT measures general ability, or "g," in contrast to tests such as the Cognitive Assessment System (Naglieri & Das, 1997), which is designed to measure four different types of cognitive abilities. All of the

Table 2
Similarity of the White/African, American, White/Hispanic, and White/Asian Matched Samples on Demographic Variables

	United States %	Sample 1				Sample 2				Sample 3			
		White		African American		White		Hispanic		White		Asian	
Variable		n	%	n	%	n	%	n	%	n	%	n	%
Total n		2,306		2,306		1,176		1,176		466		466	
Gender													
Male	51	1,188	52	1,188	52	615	52	615	52	210	45	210	45
Female	49	1,118	49	1,118	49	561	48	561	48	256	55	256	55
Region													
Northeast	20	603	26	603	26	181	15	181	15	109	23	109	23
Midwest	24	470	20	470	20	137	12	137	12	38	8	38	8
Southeast	24	298	13	298	13	106	9	106	9	95	20	95	20
West	32	935	41	935	41	752	64	752	64	224	48	224	48
SES status													
Low	20	522	23	522	23	192	16	192	16	91	20	91	20
Low–middle	21	572	25	572	25	499	42	499	42	77	17	77	17
Middle	21	229	10	229	10	58	5	58	5	6	1	6	1
High–middle	18	442	19	442	19	108	9	108	9	137	29	137	29
High	20	541	24	541	24	319	27	319	27	155	33	155	33
Urbanicity													
Urban	27	149	7	149	7	191	16	191	16	35	8	35	8
Suburban	48	1,260	55	1,260	55	504	43	504	43	355	76	355	76
Rural	25	897	39	897	39	481	41	481	41	76	16	76	16
Ethnicity													
African American	16	2,306	50	2,306	50	0	0	0	0	0	0	0	0
Hispanic	13	0	0	0	0	1,176	50	1,176	50	0	0	0	0
White	67	2,306	50	2,306	50	1,176	50	1,176	50	466	50	466	50
Asian American	4	0	0	0	0	0	0	0	0	466	50	466	50
Indian	1	0	0	0	0	0	0	0	0	0	0	0	0
School level													
Elementary		938	41	938	41	676	57	676	58	198	43	198	43
Middle		993	43	993	43	339	29	339	29	182	39	182	39
High		375	16	375	16	161	14	161	14	86	19	86	19

Note. U.S. percentages are from the National Center for Education Statistics, United States Department of Education, 1993–1994. Because percentages were rounded, they may not sum to 100. NNAT data copyright 1997 by The Psychological Corporation (see Naglieri, 1997b). Used with permission. Elementary school level includes kindergarten through Grade 4, middle school includes Grades 5–8, and high school includes Grades 9–12. NNAT = Naglieri Nonverbal Ability Test; SES = socioeconomic status.

NNAT items have the same basic requirement: The child must examine the relationships among the parts of the matrix and determine which response is the correct one on the basis of only the information provided in the matrix. The NNAT items are organized into seven levels, each containing 38 dichotomously scored items. Each level contains a carefully selected set of items that are most appropriate for children at the grade or grades for which that level is intended. Every level contains items that are shared with adjacent higher and lower levels as well as unique items. Shared items were used to develop a continuous scaled score across the entire standardization sample. The seven levels and corresponding grades for which they are appropriate are as follows: Level A, kindergarten; Level B, Grade 1; Level C, Grade 2; Level D, Grades 3–4; Level E, Grades 5–6; Level F, Grades 7–9; Level G, 10–12.

The child's NNAT raw score is converted to a Nonverbal Ability Index standard score, which is set at a mean of 100 with a standard deviation of 15 through an intermediate Rasch value called a scaled score. Level D of the NNAT was used as the base level to which all other levels were equated. The appropriate equating constant was then added to the spring standardization Rasch item difficulties of each level to produce a continuous Rasch ability scale across all levels of the test. For more information, see Naglieri (1997b).

The NNAT was standardized on a nationally representative sample of 89,600 children from kindergarten through Grade 12. The sample included 22,600 children tested in Fall 1995 and 67,000 children tested in Spring 1996. The present study involved the children who were included in the Fall 1995 sample when the SAT-9 was also administered to the same children. The final complete sample used to create the NNAT norms closely matched the U.S. population on the basis of geographic region, SES, urbanicity, ethnicity, and school setting (private and parochial; see Naglieri, 1997b). The Kuder–Richardson 20 (KR-20) internal reliability coefficients for the NNAT by grade found in Naglieri (1997b) ranged from .83 to .93. The median internal reliability across all levels is .87.

SAT-9. The SAT-9 was administered concurrently with the NNAT during the Fall 1995 data collection. This test is a widely used measure that includes scores for Total Reading, Vocabulary (including Word Reading), and Reading Comprehension (including Sentence Reading). These reading tests include both multiple-choice and open-ended assessment formats. Reading Comprehension, administered to all grades except kindergarten, progresses from simple sentences with orally presented questions, to simple paragraphs, then to more complex paragraphs. This includes understanding of directly stated details or relationships, as well as implicit information and relationships that demand integration of what is provided in text. Vocabulary includes simple through complex identification of words, as well as antonyms and synonyms. Each of these scores was converted to a standard score ($M = 100$, $SD = 15$). We obtained these standard scores by converting each child's national percentile scores to a standard score using a normal cumulative distribution function (e.g., a Z score). The standard score means, standard deviations, and Pearson correlations were calculated for the NNAT and the SAT-9 reading measures by grade and for the total sample.

Results

Means, standard deviations, and *d* ratios are presented in Table 3 separately for the three matched samples by school level (elementary, middle, high) and for the total sample of children from kindergarten through Grade 12. The matched samples generally performed similarly. The *d* ratios ranged from 0.02 to 0.41, which are all considered small according to Cohen's (1988) suggestion to interpret *d* ratios less than 0.5 as small. These small differences were statistically significant for the White and African American groups, $F(1, 4610) = 71.6, p < .01$; and for the White–Hispanic groups, $F(1, 2350) = 17.8, p < .01$; but not for the White–Asian groups, $F(1, 1930) = 0.1, p > .05$. Despite the statistical significance for White–African American and for White–Hispanic subsamples, the differences between these total means were small. The *d* ratios (0.25 for White–African American groups; 0.17 for White–Hispanic groups; and 0.02 for White–Asian groups) indicate that there were only minor differences (at the maximum one quarter of a standard deviation) between these

Table 3
NNAT Means, Standard Deviations, and d Ratios Between White/African American, White/Hispanic, and White/Asian Matched Samples

Variable	Sample 1			Sample 2			Sample 3		
	White	African American	*d*	White	Hispanic	*d*	White	Asian	*d*
Elementary									
M	99.9	97.5	.13	100.5	98.7	.10	102.3	103.2	.05
SD	18.0	18.0		17.9	16.2		17.3	19.2	
n	938	938		676	676		198	198	
Middle									
M	99.8	94.2	.38	101.6	95.8	.41	104.2	103.3	.06
SD	14.3	15.6		14.2	14.3		14.4	15.5	
n	993	993		339	339		182	182	
High									
M	96.6	91.6	.27	105.1	104.1	.06	105.0	107.0	.13
SD	17.7	19.3		17.9	15.3		14.4	15.8	
n	375	375		161	161		86	86	
Total									
M	99.3	95.1	.25	101.4	98.6	.17	103.6	103.9	.02
SD	16.5	17.4		17.0	15.7		15.7	17.2	
N	2,306	2,306		1,176	1,176		466	466	

Note. NNAT data copyright 1997 by The Psychological Corporation (see Naglieri, 1997b). Used with permission. Elementary school level includes kindergarten through Grade 4, middle school includes Grades 5–8, and high school includes Grades 9–12. NNAT = Naglieri Nonverbal Ability Test.

matched samples. Similarly small d ratios were found between the groups on the SAT-9 Reading and Math achievement scores ($Mdn = 0.22$) reported in Table 4. Not surprisingly, the largest d ratio (0.43) was found for the White and Hispanic comparison groups on the Stanford Reading subscale. All of the d ratios except the maximum of 0.62 fell below 0.5, indicating that the differences for the samples of kindergarten through 12th-grade students were all small. These data generally show that the African American sample mean was only about 4 standard score points below the White sample, the Hispanic group earned a mean only 3 points below the White group, and there was less than 1 point difference between the Asian and White groups.

The similarity of the performance of these matched samples was also apparent when the correlations of NNAT with reading and math achievement provided in Table 5 were examined. The minority groups typically had NNAT reading and math correlations that were at least as high as those found for the White samples. The differences between the White and minority group correlations

were nonsignificant for the three samples, with the single exception of the White and African American comparisons in reading (.48 vs. .62). These two correlations were significantly different ($z = 6.8$, $p < .01$), suggesting that the NNAT was a better predictor of reading for the African American than the White children. Overall, the correlations for the kindergarten–12th grade White–African American, White–Hispanic, and White–Asian samples varied from a low of .46 to a high of .68 ($Mdn = .68$), indicating a moderate relationship between the NNAT and achievement in reading and math for the various groups. The median correlation between NNAT and reading was .52 and math .63 across the three matched samples.

Discussion

The results of the present investigation suggest that carefully matched groups of White and ethnic minority children showed small differences on the NNAT. Mean scores between similar

Table 4

Reading and Math Means, Standard Deviations, and d Ratios for White/African American, White/Hispanic, and White/Asian Matched Samples

Variable	Sample 1			Sample 2			Sample 3		
	White	African American	d	White	Hispanic	d	White	Asian	d
Reading									
Elementary									
M	101.7	98.7	.22	101.5	97.5	.32	102.5	100.6	.15
SD	13.0	14.5		14.1	11.2	'	13.2	12.5	
n	915	898		658	656		195	198	
Middle									
M	101.4	97.2	.28	103.7	94.3	.62	105.7	99.8	.41
SD	15.0	15.2		15.1	15.3		13.8	14.9	
n	979	981		333	325		182	178	
High									
M	97.4	96.4	.06	107.8	100.9	.45	106.8	109.2	.16
SD	15.3	16.1		16.7	13.7		15.5	13.5	
n	370	375		158	161		84	86	
Total									
M	100.9	97.7	.22	103.0	97.0	.43	104.6	101.9	.19
SD	14.3	15.1		14.9	13.0		14.0	14.1	
n	2,264	2,254		1,149	1,142		461	462	
Math									
Elementary									
M	101.0	98.5	.19	101.1	99.0	.15	102.3	105.9	.28
SD	13.4	13.3		13.6	13.4		12.6	13.3	
n	924	912		669	670		194	195	
Middle									
M	100.7	96.7	.29	103.0	95.7	.49	105.9	102.5	.21
SD	14.1	13.5		14.6	15.5		14.1	17.6	
n	978	981		334	321		180	182	
High									
M	98.5	95.1	.23	107.0	100.9	.46	105.7	109.4	.27
SD	13.1	17.1		14.3	12.0		13.7	14.1	
n	366	366		156	161		82	82	
Total									
M	100.5	97.2	.24	102.4	98.4	.29	104.3	105.2	.06
SD	13.7	14.1		14.1	13.9		13.5	15.4	
n	2,268	2,259		1,159	1,152		456	459	

Note. The numbers of students in each comparison varies slightly due to partial missing data. Naglieri Nonverbal Ability Test data copyright 1997 by The Psychological Corporation (see Naglieri, 1997b). Used with permission.

Table 5

Pearson Correlations Between NNAT and SAT-9 Reading and Math Standard Scores for White/African American, White/Hispanic, and White/Asian Samples

Sample	Reading		Math	
Sample 1	White	African American	White	African American
Elementary	.48	.58	.59	.63
Middle	.47	.59	.63	.57
High	.53	.75	.55	.75
Total	.48	.62	.59	.63
n	2,264	2,254	2,268	2,259
Sample 2	White	Hispanic	White	Hispanic
Elementary	.52	.44	.62	.66
Middle	.54	.52	.65	.65
High	.68	.40	.65	.36
Total	.55	.46	.63	.62
n	1,149	1,142	1,159	1,152
Sample 3	White	Asian	White	Asian
Elementary	.40	.56	.53	.67
Middle	.51	.60	.66	.70
High	.65	.47	.71	.75
Total	.49	.55	.60	.68
n	461	462	456	459

Note. Numbers of participants in matched groups vary slightly due to missing data. Elementary school level includes kindergarten through Grade 4, middle school includes Grades 5–8, and high school includes Grades 9–12. NNAT = Naglieri Nonverbal Ability Test; SAT-9 = Stanford Achievement Test (9th ed.)

groups of White and African American children were small, minimal differences were found for White and Hispanic children, and essentially no differences were found for White and Asian children. The similarity of the mean scores and predictions to achievement suggest that the NNAT scores earned by these matched samples may have use for a wide variety of children. This provides considerable support for the validity of the NNAT when used with African American, Hispanic, and Asian children, but more important, this suggests that these groups can be fairly assessed.

The fair assessment of African American and Hispanic children in particular is, of course, an important goal in evaluation of ability. Intelligence tests that show sizable mean score differences can lead to greater numbers of minority children in classes for those with mental retardation (MacMillan, Gresham, & Siperstein, 1993) and fewer minority children in classes for the gifted (Ford-Harris, 1998). The greater the mean score difference, the more effect there is on decisions about which children fall below or above specified criteria for identification. This makes selection of the instrument an important factor when fair evaluation is needed. The present findings suggest that the NNAT is an option that should be carefully considered. The present findings also imply that practitioners can use the approach studied here with the expectation that the obtained scores will predict achievement similarly for the various groups and be minimally influenced by the race or ethnicity of the child.

The results from this study are also similar to findings by Carver (1990) and Naglieri (1996) that the relationship between reading and intelligence is moderate. The NNAT and reading correlations

for the total samples of matched groups (*Mdn* = .52) are consistent with those reported by Carver (1990) and Naglieri (1996) (*r*s = .50 and .57, respectively). These data substantiate the view that reading is correlated with intelligence when measured by nonverbal progressive matrix tests. These data also support previous research (Naglieri, 1985a) that has shown progressive matrix test scores correlate somewhat higher with measures of math than reading. Finally, these data show that the NNAT correlations with achievement are comparable to those reported in the Wechsler Individual Achievement Test manual (Wechsler, 1992).

The importance of this study and those that preceded it lies in the fact that nonverbal tests can be used to evaluate minority children's ability fairly and can be effective predictors of academic performance. The essential difference between the items on the NNAT and other group ability tests is that the latter typically include verbal, quantitative, and nonverbal tests. Some researchers have argued that the inclusion of verbal tests limits the use of any ability test because it demands English language skills and knowledge directly taught in school (Naglieri, 1999; Naglieri & Prewett, 1990). The NNAT has the advantage of content that does not involve English language or reading skills. It is important to note that this study showed that a nonverbal test—in this case, the NNAT—yielded small differences between White and African American children and negligible differences between White and Hispanic and between White and Asian children; in addition, the test correlated well with achievement despite the exclusion of verbal content. This supports Naglieri and Ronning's (in press) suggestion that a nonverbal measure of general ability can be as effective for prediction of achievement as a general measure of ability that contains both verbal and nonverbal content.

Perhaps the most important finding of this study is that when the NNAT was used, the differences between White and minority groups was much lower than expected. For example, the difference between White and African American children on the NNAT (an effect size of .25 or about 3.8 standard scores) is considerably less than the difference of 11 points on the Wechsler Intelligence Scale for Children (3rd ed.; Wechsler, 1991) reported by Prifitera and Saklofske (1998) for matched samples of White (*n* = 252) and African American (*n* = 252) children. The differences found here are also considerably less than the 1-*SD* difference typically expected for Whites and African Americans and the 0.5-*SD* difference typically expected for Whites and Hispanics (Suzuki & Valencia, 1997). These results suggest that the larger differences between groups, although reasonably attributed to a number of complex variables (Suzuki & Valencia, 1997), may also be influenced by the nature of the instrument used to assess the differences. It appears that when large samples of children matched on important demographic characteristics were assessed with a nonverbal test of general ability (NNAT), the groups did not differ substantially. Practitioners can expect good prediction to achievement and minimal racial and ethnic group differences for similar groups of children. Researchers should examine these differences more closely with other populations such as those with limited English language skills or children who reside in other countries.

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