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

Jack A. Naglieri and Margaret E. Ronning
Ohio State University

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, 1988; 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, & Johnson, 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, 1999).