

Using the WISC-III with Navajo Children: A Need for Local Norms

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A local normative sample of Navajo children's performance on the Wechsler Intelligence Scale for Children — Third Edition (WISC-III) was completed for this study. A brief review of past research in this area and some of the fallacies of performance testing is followed by the results of this study. There were 185 children of Navajo descent who were attending one of two schools on the western edge of the reservation that were administered the WISC-III according to standardized procedures. A brief discussion of the utilization of the WISC with Navajo children is presented along with implications of performance testing. Results provided a procedure to convert WISC-III scores, enabling a direct comparison of Navajo children to their Navajo counterparts. Adjusted scores for the verbal scales are presented.

Introduction

With increasing diversity within our society today, concerns regarding fair and appropriate psychological and educational assessment practices are understandable and necessary. The need for fair and nondiscriminatory assessment practices are addressed within professional testing standards as well as federal legislation such as the Individuals with Disabilities Education Act (IDEA). As indicated by Ortiz (2002), nondiscriminatory assessment is best viewed as a decision-making process that involves a variety of approaches in an attempt to collect information and data as fairly as possible to make equitable decisions about a child's performance. Ortiz postulated a framework of "best practices" in nondiscriminatory assessment in an effort to systematically reduce bias in the process of making valid inferences and decisions. Practices such as assessing and evaluating an individual's learning ecology, language proficiency, opportunity to learn, and educationally relevant cultural and linguistic factors provide an avenue to address extrinsic factors that may be impacting observed learning difficulties. If necessary, further assessment can be conducted and should consider the need for a language assessment, efforts to reduce bias in traditional testing practices, use of authentic procedures, and evaluation within the context of the child's unique experiences and background to inform appropriate intervention. This framework presents a comprehensive approach to the

assessment of individuals from diverse backgrounds and holds promise for educators and assessment professionals.

One component of the above framework addresses reducing the bias associated with the use of traditional assessment practices and instruments. One approach for reducing bias is to modify the testing situation through the use of interpreters, nonstandardized administration procedures, extension/elimination of time requirements, and alternate response modes (Lopez, 1997; Ortiz, 2002). While such approaches may reduce bias, results are often difficult to interpret because of questionable validity due to the extensive modifications and deviations from standardized procedures. A second approach, specific to measures of cognitive ability, involves the use of nonverbal measures that provide a language-free measure of functioning (Lopez, 1997). McCallum, Bracken, and Wasserman (2001) described nonverbal assessment as an administration that involves no spoken language on the part of the examiner or examinee. Instruments such as the Universal Nonverbal Intelligence Test (UNIT; Bracken & McCallum, 1998), the Test of Nonverbal Intelligence (TONI-III; Brown, Sherbenou, & Johnson, 1997), and the Comprehensive Test of Nonverbal Intelligence (CTONI; Hammill, Pearson, & Wiederholt, 1996) are administered nonverbally and offer alternatives to traditional cognitive measures. A third approach involves administering traditional instruments and interpreting results using locally developed norms in an effort to reduce bias in decision making. This article focuses upon the use of the Wechsler Scales of Intelligence with Navajo children and presents data pertaining to the development of local norms for the Wechsler Intelligence Scale for Children — Third Edition (WISC-III; Wechsler, 1991). This information is presented in a broader context, which recognizes the need for additional assessment approaches, responsible interpretation, and informed decision-making.

There are a number of issues associated with the assessment of children from ethno-culturally and linguistically distinct populations using intellectual measures such as the Wechsler scales. The WISC-III has a verbal scale, which primarily assesses verbal comprehension and English-language skills, and a performance scale that assesses visual processing and perceptual organization. These issues include nonrepresentativeness of minority populations in the normative sample (Tanner-Halverson, Burden, & Sabers, 1993), test bias (Jordan, French, Tempest, 1997; Lopez, 1997; Mishra, 1982; Weiss, Prifitera, & Roid, 1993; Tempest, 1998), and ethno-cultural factors (Helms, 1997; Phinney, 1996). In addition to such issues, studies have indicated that children who learn English as a second language or who learn two languages simultaneously frequently obtain performance scale scores that are significantly higher than verbal scale scores (Kaufman, 1994). Historically, Navajo children have obtained performance scale scores that exceed verbal scale scores by approximately 30 points on the WISC-R (Kaufman & Kaufman, 1983; Naglieri, 1982; Teeter, Moore & Peterson, 1982; Tempest & Skipper, 1988). More recently verbal performance differences have been investigated using the WISC-III. Tanner-Halverson et al. (1993) reported a mean performance greater than a verbal pattern of 7.4 points with an

average performance scale score of 92 for Tohono O'Odham Indians. The Tohono O'Odham reservation is located southwest of Tucson, Arizona. Participants in the study were from the local school district and lived in Sells, Arizona, or in surrounding communities. Their primary language was English, although many were considered limited-English proficient. Tempest (1998) reported an 18.3 performance greater than a verbal difference with an average performance score of 100.4 for Navajo students.

The above issues and research have influenced some researchers' and practitioners' views on how test results from the Wechsler scales should be interpreted and reported. Naglieri (1982) suggested that the WISC-R Verbal IQ is more a measure of English language proficiency rather than verbal intelligence for Native American children. Naglieri postulated that the best estimate of intellectual capacity is the Performance Scale IQ of the WISC-R, thus there was no need to report or consider the verbal scale results. In addition, Kaufman (1994) recommended that those who use the WISC-III with American Indian/Alaska Native children emphasize the Performance Scale Score as opposed to the Full Scale Score in estimating intellectual functioning as well as making diagnostic decisions. This recommendation is based upon previous research with the Wechsler Scales, which indicates that the Full Scale Score would be negatively impacted by relatively lower verbal scores often obtained by Navajo children. On the other hand, McCallum et al. (2001) cautioned the use of the Wechsler Performance Scale to assess overall cognitive functioning because the subtests on the scale required lengthy verbal directions from the examiner; thus, characterizing it as a language-reduced instrument.

Other researchers, however, have argued that the use of the Performance IQ measure as an estimate of a child's intellectual ability results in the loss of valuable information about that student's verbal strengths or weaknesses (Tanner-Halverson, et al., 1993). As such, researchers (e.g., Geisinger, 1994; MacAvoy, Orr, & Sidles, 1993; Tanner-Halverson et al., 1993) suggested that it may be better to establish local norms with which similar children can be compared against one another. Local norms address the issue of normative representation by allowing a comparison of a child with both the local and national normative data. In addition, local comparisons reduce bias and acculturation issues associated with English laden content inherent in tests of ability and achievement.

The derivation of local norms is also important because minority children constitute only a small percentage (4%) of the standardization sample of the WISC-III (Wechsler, 1991). In addition, there are unique characteristics that distinguish different ethnic/cultural groups from one another that can never be fully captured in a large standardized sample (Helms, 1997; Lopez, 1997). Current estimates indicate that there are approximately 123,113 individuals of Navajo descent living on the Navajo Reservation. Approximately 49% of the members of the Navajo tribe are below the age of 21 (Arizona Department of Economic Security, 1997). Geographically the largest Indian reservation in the United States, the Navajo Nation, encompasses parts of New Mexico, Utah, Arizona, and

Colorado, covering an area roughly equivalent to the state of West Virginia. Many Navajo children begin school as primarily Navajo speakers, consequently some schools offer Navajo immersion programs during the primary school years. Although the prevalence of individuals who only speak Navajo is declining, the issue of second language acquisition is common on the Navajo reservation.

As discussed above, researchers (e.g., Geisinger, 1994; MacAvoy et al., 1993; Tanner-Halverson et al., 1993) have argued that the derivation of local norms reduces the impact of the language usage interpretation, thus allowing the use of both verbal and performance measures of the WISC-III in the assessment of intellectual ability. However, there are no known published data that allow comparisons of Navajo children's WISC-III performance with other similarly aged children from the same local area. Such data would be informative for practitioners who work with children of Navajo descent. Similarly, there are no known studies that have compared the WISC-III performance of Navajo children on the Navajo reservation with the WISC-III standardization sample. Such information would (a) provide practitioners with a broader scope of assessment information from which to make informed decisions and recommendations about a particular child and (b) add additional normative information about WISC-III performance with a minority population. The limitations of local norms should also be highlighted here. The professionals who utilize local norms should be very familiar with the represented group and not generalize to groups who may share some, but not all, characteristics. In addition, utilization of local normative data to make educational decisions should not be used in exclusion.

A study completed by Tempest (1998) provided information regarding the performance of Navajo children on the WISC-III. Tempest does not, however, provide a method to convert scores from the WISC-III normative sample for conversion. This study provided information about a specific population of Navajo children and provided a method of normalizing that sample for comparison to the original standardization sample of the WISC-III. A description of the specific method follows.

Method

Participants

Participants in this study were 175 Navajo children ranging in age from 6 to 12 years ($M = 8.99$; $SD = 1.94$) from two schools (designated herein as A and B) located 50 miles north of Flagstaff, Arizona, in the southwestern region of the Navajo Nation. The distance between schools is about 20 miles by road. School A is a public elementary school with a total of 229 students (preschool to eighth grade) with 99% of their enrolled students being of Navajo descent. School B is a grant school that provides instruction to 93 students (preschool to 6th grade) with 100% of their children being of Navajo descent. Fifty percent of the students attending School A and 66% of the students at School B participated in this study. Eligible participants were children between the ages of 6 and 12 years of age. Also, children eligible for special education services were tested, but not included

in the statistical analysis of this sample. Ninety-five percent of all eligible students were included in the sample of School B. Participation at School A was based on completing target cell sizes. This procedure was determined before the study began because the demographic characteristics of the two schools were essentially identical and School B was the first school to participate. English is used as the primary instructional language at both sites, although the majority of teachers at School B were bilingual and used supplemental instruction in Navajo when appropriate.

Permission to conduct this study was obtained from the respective administrations from both schools and the Institutional Review Board of Northern Arizona University. Permission from the parents for their children to participate in this study was obtained via a signed consent form. Parents were informed that their child would receive a packet of school supplies for their participation.

Of the total participant sample ($N = 175$) returning signed permission forms, 114 were from School A and 61 were from School B. The distribution of participants by age and gender for each school is shown in Table 1. Fifty-two percent ($n = 91$) were male and 48% ($n = 83$) were female. Seventy-seven percent ($n = 135$) of the children were reported by their parents to speak English most often at home. A total of 16.5% ($n = 29$) parents reported Navajo as the language spoken most often at home, and 6.8% ($n = 12$) reported both English and Navajo were spoken equally at home. The mean number of years ($n = 12$) in school for both parents was in the same range.

Procedure

The WISC-III was administered to children at both schools between November of 1995 and March of 1996 by trained graduate students or by the principal investigator. The principal investigator, Mary McLellan, is a nationally certified school psychologist, a state certified school psychologist, and a licensed

Table 1
Description of Subject Population by School and Gender

Age	School A		School B		School A and B
	Male	Female	Male	Female	Males and Females
6	2	2	14	5	23
7	10	9	2	6	27
8	3	8	6	3	20
9	12	9	5	5	31
10	11	12	3	1	27
11	9	10	4	3	26
12	7	10	3	1	21
Totals	$n = 54$	$n = 69$	$n = 37$	$n = 24$	
	$n = 114$		$n = 61$		$n = 175$

psychologist in the State of Arizona. She has 12 years experience with psychoeducational assessment and teaches psychological assessment classes at Northern Arizona University. Standardized procedures were followed for each test administration (Wechsler, 1991). Two experienced examiners scored completed WISC-III protocols and the principal investigator reconciled any discrepancies between scores.

The initial testing began at School B ($n = 61$) with 95% of the eligible children participating. Students eligible for special education services participated in the testing process so they would not be excluded from getting a participation gift, but their data were not included in the analyses. This resulted in the attainment of unequal sample sizes across the age levels (6 to 12 years). Thus, the children at School A ($n = 114$) were selected, in part, to equalize the sample sizes (Table 1) across age levels.

Data Analysis

The data conversion procedure reported by Tanner-Halverson et al. (1993) for establishing local norms was adopted for this study. The procedure entailed several steps that are discussed below. For each participant, scaled score equivalents for each WISC-III subtest raw score were obtained using Table 1.A from the WISC-III Manual (Wechsler, 1991). These scaled score equivalents were then converted to percentile scores to create a normal distribution for this sample. Based upon the derived normal distribution, points ranging from 1 to 19 were assigned to the obtained scaled score equivalents. The 19-point scale was utilized to be consistent with the procedure utilized in the WISC-III standardization. For example, a scaled score of 7 obtained from standard administration and scoring procedure will correspond to the 50th percentile within the Navajo sample and yield an adjusted scaled score of 10. These points, from 1 to 19, represent the Navajo sample distribution and provide adjusted scaled scores (see Table 3). Such a distribution of adjusted scaled scores was obtained for all subtests comprising the WISC-III verbal and performance scales. The resulting table allows a direct conversion from WISC-III standard scores to Navajo standard scores based upon local norms for the Navajo sample included in this study. These Navajo adjusted scale scores could then be used to find their scaled score WISC-III equivalents. To illustrate this procedure an example is provided. A student is given the WISC-III according to standardized directions. Scaled scores are obtained from the WISC-III manual. The examiner then uses those scaled scores and goes to Table 3. A scaled score of 10 on information from the WISC-III manual converts to a Navajo score of 13.

Results

Although there were small differences between schools on the verbal and performance IQ measures, individual school and age norms were not developed. This was because the combined sample size across age groups was small, and IQ point differences between the age groups for the verbal and performance

subscales were not substantial. In addition, demographically, the samples were essentially identical, with many students having attended both schools during their educational careers.

Verbal, performance, and full scale IQ means (based upon WISC-III Manual scoring procedures) across age levels (6 to 12-years) for all 175 Navajo children are shown in Table 2. Maximum mean differences of 8.17 and 5.41 IQ points were found between age groups for the verbal and performance scale, respectively. A maximum mean difference of 7.33 IQ points was found across age levels for the full scale. A maximum mean difference of 24.4 IQ points (for 6-year olds) was found between the verbal and performance IQ measures (range: 16.52 to 24.4).

Table 2
Navajo WISC-III Age Group Means and Standard Deviations

Age	n	Verbal		Performance		Full Scale		PIQ-VIQ
		M	SD	M	SD	M	SD	
6	23	79.61	12.75	103.70	14.82	90.09	13.60	24.09
7	27	83.56	11.08	106.37	13.27	93.59	11.44	22.81
8	20	83.05	11.30	107.45	12.89	93.55	11.35	24.40
9	31	87.16	12.51	106.74	14.45	95.84	12.85	19.58
10	27	87.22	11.70	103.74	14.62	94.37	12.96	16.52
11	26	87.88	10.09	109.11	13.18	97.42	10.96	21.23
12	21	80.48	11.18	104.52	14.17	90.71	11.89	24.04
Total	17	84.46	11.78	105.99	13.85	93.87	12.24	21.53

The verbal scale did present a challenge to the children in this sample, with the mean scaled score across most ages (range = 79.61 to 87.88) falling approximately one standard deviation below the mean ($M = 84.46$). Thus, the conversions that are provided in Table 3 reflect an upward adjustment for the WISC-III verbal subtests to address the resultant difference in verbal standard scores between the WISC-III standardization sample and the Navajo sample in this study.

An overall mean performance scaled score of 105.99 for the total sample was within a range of 103.70 to 109.11. Performance scaled scores, converted in a similar manner, produced a distribution similar to the Wechsler standardization sample. Given the similarity between the adjusted norms and the standardization norms, the performance subtest scores would not require adjustment.

Table 3 shows the distribution of Navajo adjusted scaled scores for all subtests comprising the WISC-III verbal scale. These tables can be used to convert scaled scores that are obtained using the standardization sample norms to scaled scores based upon a Navajo norm group. Individuals would enter the body of the table with the Wechsler norms scaled score and read across either to the far left or right to obtain the Navajo adjusted score. For example, a vocabulary subtest scaled score of 5 using the norms in the WISC-III manual would convert to a Navajo scaled score of 8.

Table 3
Verbal Score Adjustments for Navajo Children Ages 6 – 12

Navajo Scaled Score	In-formation	Simi-larities	Arith-metic	Vocab-ulary	Compre-hension	Digit Span	Navajo Scaled Score
19	-	-	-	-	-	-	19
18	-	-	-	-	-	-	18
17	13	14	14	12	14	14	17
16	13	14	13	12	13	13	16
15	12	13	12	11	12	12	15
14	11	12	11	10	11	12	14
13	10	11	10	9	10	11	13
12	9	10	10	8	9	10	12
11	8	9	9	7	8	9	11
10	7	8	8	7	7	8	10
9	6	7	7	6	5	7	9
8	6	5	7	5	5	7	8
7	5	3	6	4	4	6	7
6	4	2	4	3	2	5	6
5	4	1	4	2	1	4	5
4	2	1	3	1	1	4	4
3	1	1	2	1	1	3	3
2	1	1	2	1	1	2	2
1	1	1	2	1	1	2	1

Discussion

This study compared the WISC-III performance of Navajo children with the WISC-III standardization sample and also develops local normative information. It was presented that developing local norms would reduce the acculturation and bias issues associated with English laden content inherent in the WISC-III. Simply developing local norms, however, raises other issues that have not been discussed in the literature, such as how local normative information is used in making psychoeducational decisions about school-aged children. Further, utilization of instruments such as the WISC-III should occur within a broader assessment context that also addresses a student’s learning environment, language proficiency, opportunities to learn, and the use of authentic assessment procedures.

The results of this study showed that there were some differences in how Navajo children performed on the WISC-III as compared to the WISC-R (McCullough, Walker, & Diessner, 1985). The difference between performance and verbal scores appears to have decreased substantially. This article presents a procedure for conversion of WISC-III scores to scores that can provide direct comparison between the standardization sample of the WISC-III and the Navajo sample obtained in this study.

Limitations

The results of this study suggest that the children in this sample perform differently on the WISC-II than the normative sample. The representativeness of the sample should be closely scrutinized. This sample is highly representative of School A and School B and may be a good representation of how other Navajo children perform, but further research in other regions of the reservation would need to be completed to make this determination.

In conclusion, this study suggests that the verbal–performance discrepancy on the WISC-III for Navajo children is less dramatic than that evidenced using the WISC-R. While local norms can be established, diagnostic and eligibility determination remains an issue. One benefit of using locally based norms is that decisions can then be based on a more global measure of ability, which includes verbal skills that strongly correlate with academic achievement. However, research is still needed to clarify the implications of using adjusted scores for educational purposes.

Future research should address unanswered questions. Specifically, the issues include:

1. To what extent should the local norms drive one's assessment decisions?
2. Is the fact critical that the ability scores are adjusted, but not the achievement scores?
3. Are the individual circumstances of the child important? For example does the child plan to live within the locally normed group throughout his/her educational career?
4. Does the adjustment of the individual subtest score impact on clinical interpretation of that child's functioning?
5. Does the adjustment impact on educational recommendations?

Dr. Mary J. McLellan received her Ph.D. in School Psychology from Syracuse University in 1982. She is currently an associate professor and coordinator of the school psychology program at Northern Arizona University. She is a licensed psychologist in Virginia and Arizona, a Nationally Certified School Psychologist, and a Certified School Psychologist in Arizona. Her primary interests are within the area of psychoeducational assessment and working with individuals with low incidence disabilities.

Dr. Leah Nellis received her Ph.D. in School Psychology from Ball State University in 1995 and is an Assistant Professor in the School Psychology Program at the University of Kentucky. She has practiced as a school psychologist in both Indiana and Arizona. Primary research interests include cultural and familial influences on development, assessment, and services for young children.

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Erratum: Volume 41, No. 3, 2002, in the article, “Learning Styles of American Indian/Alaska Native Students: A Review of the Literature and Implications for Practice,” by Cornel Pewewardy on page 23, lines 13-16.

In order to clarify reference sources, these lines of text are amended as such:

Indian/Alaska Native students’ learning styles. An understanding of the interaction between how teachers teach and Native student learning must be a critical component of research and informed practice in Indian education (Swisher & Tippeconnic, 1999).

On page 39 of the same article, lines 13-16 under “Purpose of the Research,” are amended as follows:

academic performances. Moreover, “the bulk of the learning styles research has been conducted with children rather than adults. Consequently, it is unclear how or whether the current findings apply to the field of adult Indian education” (Aragon, 2002, p. 3). These findings have been sustained in previous research (Charter, 1996; Conti & Fellenz, 1991). Each of these areas need further research before we can accept or reject the saliency of learning styles as a way of addressing the needs of American Indian/Alaska Native students.