

Chapter 12

PRELIMINARY NORMATIVE DATA FROM A BRIEF NEUROPSYCHOLOGICAL TEST BATTERY IN A SAMPLE OF NATIVE AMERICAN ELDERLY

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Abstract

The present chapter summarizes our attempt at collecting preliminary normative data from Native American elderly adults on a brief neuropsychological test battery. To this end we tested approximately 51 enrolled members of a tribe in North-Central North Dakota (M age = 69 years) and 30 non-Native American elderly adults (M age = 72 years). The brief neuropsychological test battery was taken from Hill and Storandt (1989). In general, the Native American elderly performed as well as the non-Native American elderly. Results are discussed in relationship to the development and standardization of neuropsychological tests and test batteries for Native Americans.

Introduction

In the current neuropsychological literature there seems to be much more aging and dementia research directed toward minority cultures with larger populations, rather than the Native American cultures (Adebimpe, 1981; Ardila, 1995; Baker, 1988; Chee & Kane, 1993). This relative absence of research may in part be attributed to the fact that the Native American population is significantly lower in actual numbers than the other minority cultures (Norton & Manson, 1996). This relative lack of research may also be because Native Americans may distrust Non-Native researchers, particularly Caucasian researchers, because of poorly recognized differences between cultures. Caucasian people are often seen as greedy by Native Americans, thus Native Americans may be suspicious of researchers' motives (Arean & Gallagher-Thompson, 1996; Schneider, 1994; Welsh, Ballard, Nash, Raiford, & Harrell, 1994).

The omission of Native Americans is critical, however, because as a group, Native Americans are an extremely diverse population, with over 200 federally recognized tribes (and many not recognized). Likewise, there are over 2 million Native American and Alaska Natives currently, according to the most recent (1990) Census (Norton & Manson, 1996; Stenger, 1994). Despite these numbers, there has been relatively little in the way of careful, empirical research reports (especially dealing with neuropsychological issues) with Native American elderly adults (although see Cooley, Ostendorf, & Bickerton, 1979; Kramer, 1991, 1992; Lowe, Tranel, Wallace, & Welty, 1994; Manson, 1989; Novak, 1974; Strong, 1984). Furthermore, Indian Health Services (IHS) provides a disproportionate amount of health care services to Native elders, although this group only makes up approximately 5.8% of the total IHS population (Stenger, 1994). Thus, there appears to be a need for an increase in such research activities.

Why examine the Native American?

The Native American minority group has been called the fastest-growing culture in the United States (McDonald et al., 1992). This observation, coupled with the scarcity of the information available about Native Americans in general on a wide array of topics, would thus dictate the need for investigation into all aspects of the Native American culture, as well as on topics that relate most particularly to neuropsychological assessment and neuropsychology test battery development.

This area of study may be of importance due to the rising life expectancies of this particular minority group over the last few decades (Schneider, 1994). This greater life expectancy may be attributed to improved medical care on the reservation. Thus, with the advent of modern medicine as well as the comforts of modern technology, native people are presumably living longer than they did before the advent of modern technology. This may then open the door for research in areas concerning the Native American aged, or

Native elders. It offers many possibilities to do research on aging that before may not have been possible, or practical due to longevity issues.

One other issue relates to the relationship of Alzheimer's disease (AD) and Native American elderly. The greatest predictor of AD is advancing age and there is now some preliminary evidence that in some tribes AD is relatively rare (Hendrie et al., 1993) and virtually non-existent due to genetic influence (Rosenberg, Richter, Risser et al. (1996). Thus, any new information regarding neuropsychological assessment and normative data collection/neuropsychological test battery test construction is critical, as these would have an impact on dementia screening and dementia prevalence issues.

Problems to overcome when studying Native Americans

The biggest hurdle that faces the prospective researcher is one that may be unique to that of the Native American people of this country (see also Norton & Manson, 1996). When dealing with issues in "Indian Country", there are several considerations that one must keep in mind. These include, but are not limited to, political and cultural issues. Tribal governments have limited sovereignty, meaning that they are free to establish their own policies, rules and regulations that are implemented within the boundaries of reservation and tribal lands (Schneider, 1994). Other things to be aware of are: in some Native cultures it is considered disrespectful to look someone in the eyes. It is also customary when asking for something, whether it be information or whatever, to offer a gift of some kind (usually tobacco), to the person that one asks. There are also geographic issues, there can be differences within reservations regarding dialects, and even customs.

For example, on the reservation that participated in the present experiment, there is some variation in one of the Native languages spoken there (Michif) depending on where the particular person lives on the 6 mile x 12 mile reservation. Many Native Americans also may have an inherent distrust of people conducting research. This distrust may stem from past experience in dealing with the "white world". These experiences may include, but are not limited to, broken treaties, promises, and experiences with prejudice.

There are also problems with issues related to acculturation. Acculturation (Padilla, 1980) can be viewed as a point on a continuum (see also Serpell & Boykin, 1994). At one point is total immersion in the dominant culture (totally acculturated), at the other point is the total immersion in the traditional culture (totally unacculturated). Native People may be at any point along this continuum.

On the reservation that participated in the present experiment, for instance, there are two distinct cultures. The predominant culture is the "Michif" (a Native American version of the French word "Metis", which means mixed blood) culture who are of mixed Native American and French ancestry. These people have a distinct language that is made up of French and Cree languages. They have also adopted various aspects of both the French and Native American cultural traditions. The other group of people are the

more traditionally Chippewa. This group practices more traditionally Native American ways, and speaks the Chippewa language. Both groups have varying levels of acculturation with respect to the dominant culture. Both groups speak English as either a first or second language. In both cases there may be a limited English vocabulary in contrast to the majority population. Thus words that may be common in the majority culture may not be used in this culture. If you asked someone from this reservation, what the word "diminutive" meant they would probably not know what it meant, but would assuredly know the meaning of small. Also, certain things that Native Americans believe in may be misconstrued as abnormal in the majority culture. For example in many native cultures it may be ordinary for one to say that a spirit spoke with them. There is a belief in many Native cultures (including the more traditionally Chippewa of the reservation that participated in the present study) that all things have spirits, and that if one would, for example, chop down a tree, one would talk to the spirit thanking that tree for the warmth it gave or for the shelter it provides. This would indeed be considered by the majority culture to be aberrant behavior. There are others of the Reservation that are devout Christians, and their beliefs parallel that of the majority cultures.

Families may also be located in a particular area of a reservation. Thus if one restricts her research to a particular area of the reservation one will probably get many of the same family members, rather than a more representative sample of the whole tribe. In the Turtle Mountain Reservation there are three areas of more traditional tribal members all located in different sections of the reservation. One group is located in an area north of Dunseith, another in an area by where Greatwalker school used to be (this area is around the North Western boundaries of the reservation) and the third group is located in the North East area of the reservation. These three areas are all located by where the Traditional Chippewa of the reservation, hold or used to hold Sun dances.

Other considerations that one must keep in mind are that there are different ways of approaching the elders of the tribe. If the Elder is a more traditional Native American then one should offer him a gift of tobacco, for example, then and only then respectfully ask for his participation. More non-traditional members and the more traditional Michif may be approached in a more direct manner, but should always be treated with the respect due to them because of their age. One important thing to keep in mind when utilizing standardized tests on minority populations is that minorities tend to score lower on these tests than do their "Euro-American" counterparts (Ferraro & Bercier, 1996).

Depending on how "traditional" the subject is, one problem that may arise is one of language: words that are used in particular tests may not have any utility or purpose in a Native American community, (McDonald et al., 1992). Thus when interpreting any results involving Native Americans one needs to remain aware of these differences and adjust the interpretation accordingly.

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Thus far we have seen that the Native American culture is one of the least-studied minority cultures in the United States, especially from a cognitive and neuropsychological perspective. This may be because of cultural differences that have seemed to place white researchers in an adversarial role in the eyes of many Native Americans. This is somewhat ironic, as there are several published reports in the literature dealing with a variety of other cultures and minority groups as they relate to neuropsychological test performance. These include, but are not limited to Hispanics (Ponton & Ardila, 1999), rural populations (Blazer et al., 1985), African Americans (Fillenbaum, Huber, & Taussig, 1997), and Japanese (Sugishita, Otomo, Kabe, & Yunoki, 1992). Growing native populations, however, along with higher life spans, may be ample justification for more studies. Furthermore, it is imperative that this neglected cultural group be included, especially as there is ample evidence that culture and cognitive performance are not only related to each other but influence each other (Helms, 1992; Lee, 1994; Perez-Arce, 1999). This added emphasis may, in turn, result in information that may help their culture deal with age-related problems such as memory impairment and dementia.

Hypothesis for the present study

We were concerned with how the elderly of the Turtle Mountain tribe compare on a brief neuropsychological test battery, in relation to the majority culture. This is important because of the rising age of the Native American elderly population. Similarly, this study represents one of the first (as far as the authors can tell) to begin construction on a short neuropsychological test battery.

It is important to keep in mind that the present study intends to gather preliminary normative neuropsychological test data from Native American elderly adults using a brief neuropsychological testing battery. The tests to be used have been shown to delineate a characteristic pattern of cognitive deficit in patients with very mild dementia of the Alzheimer type versus normal aging. However, the tests used in the present experiment do not specifically test for competencies such as problem-solving, judgment, abstraction, and spatial orientation. Likewise, these four tests do not tap directly into functions related to visual construction, motor functions, and attentional capacities. Thus, the present study does not allow for making differential dementia diagnoses. Perhaps inclusion of the Mini-Mental Status Examination in future studies would satisfy some of these shortcomings. However, use of these four tests in a preliminary neuropsychology test battery, and the results obtained by Hill and Storandt (1989) regarding the sensitivity of these tests in differentiating very mild senile dementia of the Alzheimer type from normal aging, are a first step in the right direction.

Additionally, no such normative data exist for elderly Native Americans on the tests that comprise this test battery. Thus, making any clear diagnoses or attempting to detect dementia in this sample of Native American elders

would be premature and unjustified. The present study, by examining two ethnic groups and various age groups, will result in a way of validating these various neuropsychological tests.

Methods

Subjects

Subjects in this study included 51 enrolled members of a North-Central North Dakota tribe and 30 non-tribal members. Subjects were divided by culture (native, non-native) and age (60-69, 70-79, 80-89). The non-native control group consisted of Euro-American male and female aged, randomly selected from areas from surrounding communities adjacent to the Reservation in question. Matching of subjects was attempted on sex and age. The Native American sample was not stratified by acculturation level.

Materials

A four-battery series of psychometric tests was employed. Hill and Storandt (1989) found three of these particular tests to be of significant value in assessing for very mild and questionable forms of Senile Dementia of the Alzheimer type from normal healthy aging. They include: 1) The Boston Naming Test, 15-item version. This shortened version was found to be useful in screening for Alzheimer's disease (Mack et al., 1992); 2) The Logical Memory Test (immediate and delayed); 3) The Wechsler Adult Intelligence Scale - Revised (WAIS-R) Vocabulary Subscale (Wechsler, 1981) and 4) the WAIS-R Digit Symbol Subscale.

Apparatus

The apparatus used for administering these protocols consisted of a stop watch to measure the protocols that are timed, and one cassette player used to play prerecorded stories.

Procedure

Prospective participants were solicited on a door-to-door basis by the second author. A representative sample from both the Michif and the more traditional people was sought. Subjects were solicited from all areas of the reservation to satisfy any differences that may be due to geographic location, although this factor was not systematically varied. These include two cultures living within the reservation, and both live in various part of the reservation.

The second author and one or two research assistants (who also lived on the reservation) were responsible for administering all tests and gathering all data. An effort was made to reduce any experimenter bias by having all instructions presented in a standardized format (typed out and spoken). The second author was aware of the hypotheses in question (as this project

represented his Master of Arts Thesis project) but the research assistants were unaware of the hypotheses being tested. At the conclusion of the study, all research assistants were told of the various hypotheses under investigation.

Design

The design is a 2 (Group: Native American, Non-Native American) \times 3 (Age: 60-69, 70-79, 80-89) between-subjects design. This design resulted in 29, 12, and 10 Native American subjects across the three age ranges, respectively, and 11, 10, and 9 non-Native Americans across the three age ranges, respectively. Although an attempt was made to examine gender differences, some of the resulting cells contained five or less individuals and analyses with gender are not reported.

Results and Discussion

Table 1 lists mean, standard deviation and range scores for all demographic and neuropsychological variables as a function of Group and Age. Next, several 2 (Group) \times 3 (Age) ANOVAs were performed across many of the variables presented in Table 1. For these analyses, the Group main effect had 1 and 75 degrees of freedom, and the main effect for Age and the Group \times Age interaction had 2 and 75 degrees of freedom. All p values are at $p < .05$ or less, unless otherwise stated. These ANOVA results can be grouped into two categories, Demographic Information and Neuropsychological Test Battery Performance.

Demographic Information

For Education, there was no main effect of Group ($F = .76$) a marginal main effect of Age ($F = 2.86$, $p = .063$) and a significant interaction ($F = 4.68$, $p < .02$). This interaction revealed that whereas the 60-69 and 70-79 year old Non-Natives had significantly ($p < .05$) more education than their Native counterparts, the reverse was true for 80-89 year-old Natives, who possessed significantly ($p < .01$) more education than their non-Native counterparts.

For Self-Rated Health, no main or interaction effects were present ($F < 3.00$, $p > .06$).

For Number of Medications Currently Taken, no main or interaction effects were present ($F < 2.00$, $p > .16$).

For Geriatric Depression Scale-Short Form scores, there was a main effect for Group ($F = 6.84$, $p < .02$), as well as for Age ($F = 6.79$, $p = .002$). There was no interaction between these variables ($F = 1.37$, $p = .26$). The Native Group reported less overall probable depression ($M = 4.36$) than the non-Native group ($M = 6.21$). Also, as both groups age, there was an increase in self-reported probable depression ($M = 4.32$, 4.34, 7.21, respectively).

For WAIS-R performance, there was no main effect of Group ($F = .86$) but there was a main effect for Age ($F = 4.10$, $p = .02$). This main effect

Table 1. Mean and standard deviation performance as a function of Group (Native, Non-Native) and Age (60-69, 70-79, 80-89).

		Native			Non-Native		
		60-69	70-79	80-89	60-69	70-79	80-89
Age	M	62.00	74.17	84.90	62.91	73.40	83.44
	SD	5.67	2.91	2.84	4.50	2.80	2.92
Educ.	M	10.55	9.17	10.60	12.36	12.40	7.67
	SD	3.49	5.27	1.90	2.46	3.37	.87
Health	M	2.59	2.58	2.80	2.64	2.60	3.67
	SD	1.15	.79	.79	.81	1.07	.71
Meds.	M	1.31	1.61	1.40	.54	1.80	1.22
	SD	1.85	1.56	1.26	.52	1.40	.97
GDS-SF	M	2.72	4.08	6.30	5.91	4.60	8.11
	SD	2.84	2.23	2.16	3.36	3.75	3.14
WAIS-R	M	40.69	41.92	32.70	37.36	42.40	25.33
	SD	14.39	19.92	11.60	14.94	20.26	4.85
BNT	M	13.38	12.67	13.40	12.91	13.30	13.00
	SD	1.61	3.39	1.84	2.26	1.49	1.32
LogM-I	M	8.69	10.25	4.30	7.55	10.50	4.56
	SD	4.94	6.74	2.50	4.84	6.50	1.67
LogM-D	M	8.00	10.25	5.50	9.54	8.80	6.56
	SD	4.35	6.74	3.57	5.05	4.29	3.24
Digit	M	21.41	18.50	20.80	18.73	24.70	16.56
	SD	11.83	10.53	9.33	15.89	10.04	8.19

Notes: GDS-SF indicates Geriatric Depression Scale-Short Form; WAIS-R indicates Wechsler Adult Intelligence Scale-Revised; BNT indicates Boston Naming Test (15-item version); LogM indicates Logical Memory; I indicates Immediate; D indicates Delayed; Digit indicates Digit Symbol.

indicated that vocabulary ability increased across the 60-69 and 70-79 year-olds ($M = 39.03, 42.16$, respectively) then decreased in the 80-89 year-olds ($M = 29.02$). No interaction resulted ($F = .34$).

Neuropsychological Test Battery Performance

Boston Naming Test performance resulted in no main effects for either Group ($F = .03$) or Age ($F = .06$). There was also no interaction ($F = .53$).

Logical Memory (Immediate) performance resulted in no main effect for Group ($F = .03$), but a significant main effect of Age ($F = 8.06, p < .01$), in which performance increased, then decreased as age increased ($M = 8.12, 10.38, 4.43$, respectively). There was no interaction ($F = .19$).

Logical Memory (Delayed) performance mirrored Immediate performance with no main effect for Group ($F = .12$) and a significant main effect of Age ($F = 3.13, p = .05$). With advancing age, there was evidenced of an increase, then a decrease, in performance ($M = 8.77, 9.53, 6.03$, respectively). There was no interaction ($F = .19$).

Digit Symbol performance resulted in no main effects for Group ($F = .01$) or Age ($F = .33$) and no interaction ($F = 1.32$).

Correlational Analyses

In addition to the ANOVA results reported above, correlation coefficients were also calculated. Tables 2, 3, and 4 present correlational results for the various demographic and neuropsychological variables for all subjects (Table 2), non-Native Americans (Table 3) and Native Americans (Table 4).

The present experiment was an attempt to begin the process of attaining preliminary normative data on a brief neuropsychological test battery in Native American elderly adults. To this end, a neuropsychological test battery, patterned after Hill and Storandt (1989) was given to 51 Native American elderly adults and 30 non-Native American elderly adults. For the most

Table 2. Correlation table for all subjects.

	1	2	3	4	5	6	7	8	9	10	11
1 Year	—										
2 Age	.91**	—									
3 Educ.	-.20	-.19	—								
4 Hlth	.22*	.20	-.20	—							
5 Meds	.09	.17	-.10	.25**	—						
6 GDS-SF	.41**	.39**	-.32**	.40**	.10	—					
7 WAISR	-.23**	-.19	.67**	.10	.10	-.47**	—				
8 BNT	-.02	-.04	.32**	.05	-.02	-.26**	.51**	—			
9 LMI	-.25**	-.22*	.55**	-.26**	.02	-.56**	.62**	.18	—		
10 LMD	-.16	.16	.35**	-.25**	.08	-.31**	.55**	.36**	.62**	—	
11 Dig	-.06	-.14	.41**	-.08	-.11	-.38**	.36**	.31**	.43**	.24**	—

Notes: Hlth indicates Self-Rated Health; GDS-SF indicates Geriatric Depression Scale-Short Form; WAISR indicates Wechsler Adult Intelligence Scale-Revised; BNT indicates Boston Naming Test; LMI indicates Logical Memory-Immediate; LMD indicates Logical Memory Delayed; Dig indicates Digit Symbol; *significant correlations at $p < .05$; **significant correlations at $p < .01$ (significance varies across tables due to N differences).

Table 3. Correlation table for non-Natives only.

	1	2	3	4	5	6	7	8	9	10	11
1 Year	—										
2 Age	.93**	—									
3 Educ.	-.58**	-.52**	—								
4 Hlth	.42*	.42*	-.53**	—							
5 Meds	.27	.31	.10	.16	—						
6 GDS-SF	.23	.15	.70**	.42*	-.38*	—					
7 WIAISR	-.29	-.26	.80**	-.23	.43*	-.70**	—				
8 BNT	.03	.03	.18	-.02	.12	-.30	.38*	—			
9 LMI	-.21	-.17	.80**	-.42	.37*	-.77**	.85**	.26	—		
10 LMD	-.28	-.27	.38*	-.31	.17	.46*	.49**	.48**	.47**	—	
11 Dig	-.06	-.07	.50**	-.59**	.55	.34	.57**	.21	.24	.27	—

Notes: See Table 2.

Table 4. Correlation table for Native Americans only.

	1	2	3	4	5	6	7	8	9	10	11
1 Year	—										
2 Age	.89**	—									
3 Educ.	-.04	-.07	—								
4 Hlth	.07	.07	-.06	—							
5 Meds	.04	.15	-.16	.31*	—						
6 GDS-SF	.48**	.51**	-.18	.35*	.41**	—					
7 WAISR	-.17	-.13	.64**	.00	-.05	-.28*	—				
8 BNT	-.03	-.06	.39**	.08	-.06	-.25	.58**	—			
9 LMI	-.27	-.25	.43**	-.16	-.13	-.43**	.47**	.15	—		
10 LMD	-.12	-.12	.33*	-.24	-.16	-.28*	.61**	.31*	.71**	—	
11 Dig	-.05	-.18	.37**	-.15	-.30**	-.23	.24	.30*	.34*	.25	—

Notes: See Table 2.

part, the Native elderly and the non-Native elderly performed very similarly. That is, in only one instance (for GDS-SF performance) was there significant main effect for Group and in only one instance (for Education level) was there an interaction involving Group. For all intents and purposes, and across all remaining neuropsychological tests used in the present study, the Native elderly performed as well as the non-Native elderly. While this pattern of results is encouraging, there are several caveats that must be made regarding the present study and the results obtained.

While the results provide a valuable information resource about a Native American group where little such data has existed (Ferraro & Bercier, 1996), it should be stressed that there are many different Native American cultures or tribes. Our results cannot be assumed to be valid for any other Native American tribe except the one under investigation in the present study. Although there are similarities between tribes, they are different cultures, each distinct and each unique. Ardila (1999) makes this point quite nicely in his article on intelligence and neuropsychology. Specifically, he states that "cultural and linguistic diversity is an enormously, but frequently overlooked, moderating variable" (p. 132). One future direction would be to compare and contrast performance across different cultures, or tribes on various neuropsychological tests.

The elderly Native Americans that took part in the present experiment may have been the most appropriate sample of Native Americans for the present project. This is because many of these people, due to the influence of early French traders intermarrying with the Native Chippewa women, already show a significant amount of acculturation. This study included a majority of the population of "Michif" people, a culture that has the influence of both the Native, and French customs and spirituality. Also included in the sample were a smaller proportion of more "traditional" people. Thus, this unintentional confounding of cultures may have produced some of the obtained results. Valle (1994) discusses ways of differentiating such con-

finds when performing research as detailed in the present chapter, and these include socioeconomic status versus cultural variables, literacy levels and cultural factors, and race, racism, and the gene pool and the possibility of shared gene pools. His point is that if these factors are taken into account, it is possible to construct a culture-fair behavioral assessment and intervention model. His model relates specifically to dementing illnesses. However, given that one of the fastest-growing populations presently (in Native Americans as well as non-Native Americans) is adults over the age of 60, then this model becomes relevant for issues associated with the factors of age as well as neuropsychological assessment.

It may be possible that specific intervention strategies that have proven useful in the Non-native culture may have some use in the Native communities as well. One very interesting finding from the present study is that the Non-Native culture had a significant amount of more self-reported depression than the Native culture. One may speculate that in the Native cultures, the continued reliance on the elderly as wise and knowledgeable, and as useful and productive members of the community, may have a beneficial effect on degree of self-reported depression. Thus the Non-native community may learn from this and implement more programs that utilize the knowledge and wisdom that their elderly have acquired over the course of the years. This would perhaps have a twofold benefit. The communities would benefit from the knowledge of the elderly, and the elderly, finding more purpose to their existence, would possibly show a decrease in their level of depression. This is especially relevant, given the recent data to suggest that there may be some biases present in the belief systems of some Native Americans (Lightdale, Oken, Klein, Landrigan, & Welty, 1997) as well as the importance of education programs (based on information gathered from specific research projects) as ways of enhancing community healing processes (McShane, 1987).

Summary

The information found in the present study represents the first (to the author knowledge) attempt to collect preliminary normative data on tests that tap into neuropsychological performance. The development and standardization of neuropsychological tests suitable for Native American populations have long been overdue. These results represent one of the few studies aimed at achieving these goals. Of course, there are some caveats that need to be discussed. First, although the four tests used have been shown to delineate and classify very mild senile dementia of the Alzheimer type from normal aging, these tests do not specifically tap into problem-solving, abstraction, judgement, spatial orientation, multiple-trial memory tests, motor function, and attention. The inclusion of the Mini-Mental Status Examination could accommodate these requirements, and should be used in future studies. Fur-

thermore, additional tests as those described above would also assist in determining and classifying different forms of dementia, such as vascular dementia and subcortical dementia. Second, level of acculturation was not measured in the present study, but such information would be important regarding how acculturation affects neuropsychological test performance. Different levels of acculturation might lead to differing levels of performance. Third, since the individual in charge of data collection was an enrolled member of the tribe who participated, the issues of experimenter bias cannot be totally discarded. However, the research assistants were blind to the purposes and hypotheses of the present study, which may have reduced this possible experimenter bias. It must also be made clear that data collection was made much easier by the fact that one of the authors was from this particular tribe. As always, though, there are costs and benefits to any research project and the same is true in the case of the present study. Despite these caveats, the present study and the results obtained are clearly a step in the direction of developing and standardizing neuropsychological tests for Native American populations, especially older populations. Additionally, these results can be used in future validation studies to see whether or not specific neuropsychological tests are suitable for Native American populations. The present results are encouraging, although extensive additional work is needed in this very slim research area (Jackson et al., 1990; Moody, 1994).

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