Handbook of Multicultural Mental Health

ASSESSMENT AND TREATMENT OF DIVERSE POPULATIONS

Edited by

Israel Cuéllar

Department of Psychology and Anthropology
University of Texas—Pan American
Edinburg, Texas

Freddy A. Paniagua

Department of Psychiatry and Behavioral Sciences
University of Texas Medical Branch
Galveston, Texas

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CHAPTER 20

Neuropsychological Assessment of Ethnic Minorities: Clinical Issues

ANTONIO E. PUENTE
Department of Psychology
University of North Carolina at Wilmington
Wilmington, North Carolina

MIGUEL PEREZ-GARCIA
Department of Psychology
Universidad de Granada
Granada, Spain

The psychology of individual differences underscores the importance of understanding the unique qualities of the person. Of particular importance is the issue of understanding the role of culture in the assessment of psychological abilities and disabilities. Indeed, the third article ever published in English on psychological assessment (Willey & Herskovits, 1927) was entitled "Psychology and Culture." In that article the influence of culture on human behavior as measured by psychological testing is debated. Over the last quarter of a century, it has become widespread knowledge that ethnic minorities represent a unique challenge to psychological assessment. Whether the issue is that of bias (e.g., Jensen, 1980) or cultural equivalence (e.g., Helms, 1992), most scientists and professionals have come to understand the unique challenges that must be faced to develop a comprehensive understanding of all individuals. Indeed, that is the purpose of this volume.

Although the preceding argument has become commonplace, its application to all areas of psychological assessment has not been realized (Betancourt & Lopez, 1993). This is clearly the case in one of the fastest and most important

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areas of psychological assessment, the evaluation of the behavioral, cognitive, and emotional sequalae of injury to the brain. Over the last 20 years, clinical neuropsychology has grown to become an important area of professional psychology (Puente, 1992; Puente & Marcotte, in press). Despite its unprecedented growth and impact, both in psychology and in medicine (most notably in neurology), the field has not considered the important variable of culture in its unique approach to the measurement of humans. Whether this ignorance is due to a willful disregard of ethnic minorities and cultural variables or simply historical inertia is rarely speculated (Puente & Perez-Garcia, in press) and not the topic of this chapter.

The purpose of this chapter is to attempt to alleviate this gross misunderstanding. Initially, we will outline the objectives and development of what is now being called cross-cultural neuropsychology. Traditionally, cross-cultural psychology has dealt with the comparisons of persons across distinct cultures (e.g., North Americans Europeans). In this case, we will expand the approach to subsume the contrast and comparisons of individuals from a majority group to those of a minority group. In fact, we define ethnicity much in the same way one would define culture. After outlining the objectives and development of the discipline, we will turn our attention to the application of these principles to neuropsychological evaluation. Issues such as illiteracy and adaptation will be considered. In addition, specific strategies for interviewing, testing, and interpreting results will be presented. Finally, suggestions for future training and research in the area will be considered.

It is important to note that although we look forward to presenting a new model as a solution to a long-standing problem in neuropsychology and the understanding of ethnic minorities, we realize the unique nature of our assumptions, model, and implications. To that end, we trust that the reader will consider this chapter as an introduction to a complex issue in neuropsychology and the psychological assessment of nonmajority group members. Further, we invite the reader to critique, revise, and expand this important and new area in neuropsychology and the assessment of the ethnic minority.

I. OBJECTIVES AND DEVELOPMENT OF A CULTURALLY SENSITIVE CLINICAL NEUROPSYCHOLOGY

The application of clinical neuropsychology to people of diverse cultural heritage is a relatively newfound scientific and professional enterprise. This development was due, among other factors, to both the growth of professional neuropsychology along with increasing societal concerns, both here and abroad, of the

importance of understanding individuals in a broader cultural context (Puente & McCaffrey, 1992). The application of psychometric instruments standardized on White individuals from the majority culture resulted in larger than expected false-positives both in terms of psychopathological and neuropsychological variables. As a consequence, the lack of the universality of the instrument prevented not only the use of those instruments with individuals of varied cultural backgrounds but the limitations of theories of human function, especially brain, that were similarly universal in nature (Ardila, 1995; Greenfield, 1997).

The development of culturally sensitive clinical neuropsychology was a direct function of increasing interests in cultural concerns in the assessment and treatment of psychological problems (Brislin, 1980; Phinney, 1996). Indeed, over the last 10 years an ever increasing concern for these issues has been noted in the general psychological literature as well as within the American Psychological Association (APA) (Fowers & Richardson, 1996; Hall, 1997). From these concerns, cross-cultural psychology has begun to describe the differences in performances and treatment of individuals from different cultures. The rationale for this has been that differences from the majority culture have been compared to a constant—the majority culture—as if other forms of behaving were of interest, at best, or pathological, at worst. Greenfield, among others, have suggested that appropriate comparison, therefore, can only be realized if both cultures are at least generally understood before any form of comparison can be made.

Assessment of diverse groups within clinical neuropsychology will be, as suggested earlier, defined as cross-cultural neuropsychology. In other words, we are expanding the traditional concepts of cross-cultural psychology to address the issues of how one group, a minority group, compares and contrasts to that of a larger group. The rationale for this expanded concept is that we believe that understanding ethnic minorities in the United States should subscribe to the same principles as understanding a minority group in any other national or international setting. For example, the basic principles of neuropsychological comparisons between White, European-Americans to Hispanics in the United States should reflect similar approaches when Portuguese-speaking, city-dwelling Brazilians are compared to indigenous people living in the Amazon.

By expanding the scope accordingly, our comprehension of brain–behavior relationships will be similarly expanded. We are, after all, in search of a "neuropsychological *g*," much like Cattell was envisioning for a general intelligence. Thus, we should be able to factor the role of culture and minority status in understanding brain function. We do not want to confound adaptation with brain dysfunction as the two are, at least theoretically, different. Of course, the argument could be proposed that, after all, the reason for a difference is academic and that brain dysfunction and adaptation are different words for the same thing—an inability to process information in a goal-directed fashion.

If this approach is considered, then a literature clearly has been developing over the last 5 or so years. Examples include Ardila (1993a, 1993b) and Pontius (1993), an excellent example of this work. Pontius (1993) attempted to compare a variety of neuropsychological tests with indigenous people of New Guinea. In this study, he compared indigenous individuals living in traditional rural settings with those living in less traditional (i.e., Western) urban settings. In this and related studies, the conclusions are that the environment played a crucial role at least in visual processing.

An interesting and potentially useful source of comparisons can be found in recent work with AIDS patients across different cultures. This work, completed under the auspices of the World Health Organization, has been realized in five different countries located in Europe, North America, South America, Asia, and Africa (Maj, 1993; Maj et al., 1991, 1993). One of the findings is that the original versions of some of these tests, such as the Rey Auditory Verbal Learning Test, are affected significantly. For example, the standard deviation of across-national differences sometimes masked the differences noted between AIDS and non-AIDS patients (Maj et al., 1993, 1994a, 1994b).

A. Cultural Adaptation and Educational Attainment

Without doubt, one of the most salient lines of research has been the exploration of the role of cultural adaptation and educational attainment on neuropsychological functioning. The changing demographics of American society alone beg the importance of attending to the role of adaptation alone. However, review of the demographics show an interesting pattern. Whereas during the early 20th century immigrants emigrated primarily from Europe, during the later part of this century, immigrants come from either Asia or the Americas. There is evidence to suggest that sometime during the next century, ethnic minorities will actually become the majority in the United States (Hall, 1997). Hence, understanding the minority group culture in light of changing demographics is clearly becoming more evident. There is ample evidence, however, that at present ethnic minorities do more poorly on most neuropsychological tests. Although most of this evidence appears anecdotal and clinical in nature, there is a growing body of data on intelligence (Helms, 1992; Greenfield, 1997; Puente & Perez-Garcia, in press; Puente & Salazar, 1998). More careful analysis of these findings indicate that cultural adaptation might be the salient variable that explains group differences (Berry, 1990; Magana et al., 1996).

In addition to cultural adaptation, there is growing evidence that educational attainment may help in explaining a significant aspect of cultural differences. Examples of this line of research include Roselli (1993), Roselli and Ardila (1991,

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1993), Roselli, Ardila, and Rosas (1990), Ardila, Roselli, and Puente (1994) and Ostrovski-Solis, Ardila, Rosselli, Lopez-Arango, and Uriel-Mendoza (1998). In general, these studies suggest that low educational attainment produces low performance on neuropsychological tests. In the Ardila et al.'s (1994) book, norms are published for a variety of tests using both age, education, and status of brain function (i.e., brain-damaged vs. non-brain-damaged). As with many other types of psychological test results across a sample, a bell curve emerges. However, the results are particularly important when brain-damaged versus non-brain-damaged patients are compared. What is particularly unusual is that non-brain-damaged illiterates appear highly similar to brain-damaged but literate patients. That is, education, either directly or otherwise, appears to be a prophylactic for brain injury. Conversely, illiteracy appears much like brain damage.

B. Ecological Validity

Besides cultural adaptation and educational attainment, another important issue is that of biopsychosocial context—now referred to as ecological validity. The question of validity moves us away from what variables affect brain function to how they affect brain dysfunction. In other words, we now begin to focus not on questions as to whether ethnic minorities are slower on neuropsychological tests nor if education mediates brain function. Ardila (1995) has stated that "cultures dictate what is and what is not situationally relevant. What is relevant and worth learning for an Eskimo does not necessarily coincide with what is relevant and worth learning for an inhabitant of New York, Mogadishu, Manus, or Bogota" (p. 144). Hence, the mechanism is to potentiate the development of whatever cognitive and related abilities are necessary to be successful within a given culture. Ardila (1995) believes that there are common or universal abilities and that these abilities are molded by the specific cultural context around the person. This point is elaborated upon towards the end of this chapter.

As a consequence, it is the purpose of this chapter to address more specifically cultural issues in clinical neuropsychology. We will address later how these factors play a role in the expression of neuropsychological pathology in disorders such as AIDS and Alzheimer's dementia. In addition, specific and pragmatic considerations for the evaluation of the culturally dissimilar will be considered.

II. NEUROPSYCHOLOGICAL EVALUATION OF THE CULTURALLY DISSIMILAR PERSON

Because the theoretical aspects of several studies on cultural issues were briefly reviewed in the preceding section, we now turn to the more pragmatic aspects

of the evaluation itself. Specifically, what are the variables that affect correct assessment of the culturally dissimilar person and how can they be understood and controlled.

A. Role of Cultural Adaptation and Educational Attainment

The role of acculturation in neuropsychological functioning has been realized with a variety of diverse populations, including individuals with schizophrenia (Chen, Lam, Chen, & Nguyen, 1996; Karno & Jenkins, 1993), AIDS patients (Maj et al., 1993, 1994a, 1994b), and dementia (Jacobs et al., 1997; Loewenstein, Rubert, Arguelles, & Duara, 1995; Mahurin, Espino, & Hollifield, 1992). Of these, dementias have probably received the most attention and, thus, might reveal the most critical aspects of culture and educational attainment in individuals of a minority status.

The effects of culture on neuropsychological function has basically focused on Hispanics. This ethnic group is expected to reflect anywhere between 33 and 38% of the population of the United States growth projected to occur between 1990 and the year 2020 (Campbell, 1994). In fact, between 1979 and 1980, Hispanics over the age of 65 grew by over 75% (Cuellar, 1990). Initial studies tended to focus on the use of screening measures for this population (Glosser et al., 1993; Loewenstein, Arguelles, Barker, & Duara, 1993; Mahurin et al., 1992; Taussig, Henderson, & Mack, 1992). A common finding across studies is that Hispanic elderly perform at a lower level on most screening measures. Further, this effect is more pronounced when the individual is either nonacculturated or of low educational attainment. Further, these authors suggest that possibly the use of nonverbal tests might be of greater value, and they intuitively have less cultural weight attached to them. In addition, others have recommended that analysis of neuropsychological dysfunction be based on more functional tests, such as observation of actual behavior in a home setting (Loewenstein, Ardila, Roselli, Hayden & Eisdorfer, 1992; Loewenstein et al., 1995).

In some studies, acculturation has been controlled statistically. However, other problems arise. For example, sample selections have not allowed for adequate generalization. One illustration of this is the use of Hispanics as a unified or cohesive ethnic group when Hispanics reflect a heterogeneous population. Indeed in attempting to establish proverbs for a Spanish translation of the WISC, a panel of experts from different countries of Latin America, consensus could not be reached over a proverb that was universal to all different Hispanic groups. To compensate for these problems, Jacobs et al. (1997) de-

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signed a study that controlled most of these confounds. Of the 14 measures used, Hispanic elderly scored poorer on 5 of the 14 measures. Surprisingly, most of these measures were nonverbal (i.e., Identities and Oddities, Benton Visual Retention Test matching (BVRT), and recognition. After obtaining these findings, the authors then grouped individuals according to three different acculturation groups. Acculturation was measured according to ease or fluidity of the English language. The three groups include adapted Hispanics (those that spoke good or very good English), a second group that was not acculturated (spoke little or no English), and a group that were native English speakers. The three groups were equal in terms of age and educational attainment. The results indicated that no differences were found between either the acculturated Hispanics or the English speakers. However, differences were noted between the non-acculturated Hispanics and the English speakers. Based on these findings, Jacobs's team is now exploring whether elderly Hispanics have different processing capabilities on geometric figures since that is the foundation of the BVRT.

Ostrovski-Solis et al. (1998) have chosen not to control but to manipulate educational attainment in neuropsychological test situations. She and her colleagues have found that educational level and acculturation has a negatively accelerated curve that eventually stabilizes or plateaus. Some neuropsychological tests, such as comprehension of language or verbal fluidity, are affected by as little as one to 2 years of formal education. Various hypotheses have been proposed by Ostrovski-Solis and colleagues, including the limited number of occasions that illiterate individuals come in contact with tests, the lack of familiarity with test protocol and performance (e.g., time), and, most likely, that education affects cerebral organization.

An excellent example of this type of study is found with the previously described WHO studies on AIDS patients (Maj et al., 1993, 1994a, 1994b). One of the more interesting results is found when comparing asymptotic HIV-1 zero-positive and HIV-1-zero-negative controls in Kinshaha and Sao Paolo. These two groups, as compared to the other locations, perform worse, regardless of HIV status of their counterparts. In another instance, Maj et al. (1994b) reported that in Kinshasa and Nairobi, decreased functioning on neuropsychological tests was only evident in individuals with a very limited (versus high levels) of education. Maj et al. (1994b) have hypothesized that high levels of education augment a "cerebral reserve" potentiating cerebral circuits and synaptic connections. In addition, low educational attainment appears highly correlated with the prevalence of other medical problems including, but not limited to, infectious diseases and malnutrition as well as with morbidity. In other words, illiteracy, again, appears to equate, in one fashion or another, with brain dysfunction.

B. Controlling Cultural and Educational Variables in Neuropsychological Evaluations

According to Ardila (1995) and Greenfield (1997), tests are not cultural or educationally isolated. Some tests, more than others, have attempted to be less affected by education and culture (Jensen, 1980; Greenfield, 1997). However, it must be understood that even before the actual testing, these variables begin to affect our understanding of the patient. As a consequence we begin by addressing the review of records, then the interview, and finally the actual testing.

1. Records

Every neuropsychological evaluation begins with a review of existing records. These records might include school, prison, service, and vocational ones. By design, individuals with limited educational background and different cultural heritage pose significant difficulties for a number of reasons, including existence of such records, obtaining them, appreciating the American equivalence, and so on. For example, recently the senior author was asked to complete an evaluation of an Arabic woman. Because premorbid intelligence is an important factor to be addressed and because educational attainment is often considered a good measure of premorbid intelligence, review of school records is a must. However, in some Arabic cultures, especially the more traditional ones, formal education for women is not considered appropriate for middle and upper classes. However, it is important to note that formal education in some Arabic countries does not equate with intellectual abilities. In fact, in some cases, education is considered for those not intelligent enough to be able to marry early and adequately.

When records are available, it is important to realize that things are not equivalent simply because face validity appears evident. For example, a college education in non-North American countries usually equals to a Master's degree in the United States. Hence, some understanding of the culture of origin and the educational system is in order. Otherwise, mistakes will be made in estimating premorbid functioning.

2. Interview

For starters, let us begin by addressing the issue of interpreters. In order of preference, we propose, that all things being equal (and they are not often the case), that the evaluation be done by a culturally similar individual (Spanish patient and Spanish evaluator) in the native tongue of the patient. Next best

would be a translator. However, unusual care must be taken in that two common errors are often made. One is that the translator, though qualified, could be literal and miss the cognitive equivalence of the intended question. A second issue is that it is often easier to use available family members. Such individuals are apt to provide their own interpretation as they are not entirely objective. Finally, one could conceivably argue that it would be better to attempt a neuropsychological evaluation without any understanding of the culture or language of the person rather than not do an evaluation at all. In this case, extreme caution should be taken and any final report should address explicitly these concerns. What it comes down to is the clinician weighing Type 1 versus Type II errors. Is it better to have some flawed data than none?

As Velasquez et al. (1997) have suggested, however, a lack of understanding of language and culture will invariably produce errors in the interview process. These errors could include specific terms or concepts, cognitive equivalence issues, and subtle meanings only deciphered with a fluid understanding of the language and culture. If at all possible, the major cultural issue should be understood. Among other variables, Greenfield (1997) has suggested that the following variables should be considered in an interview.

1. *The value and significance of specific cultural concepts.* For example, educational systems in Spanish cultures may reflect more social ability than formal education.
2. *Modes of knowledge.* Mode of knowledge is the collective form of knowing. It is common for a head of a family to speak on behalf of the rest of the family. Hence, better information might be ascertained not from the patient but from the head of the family.
3. *Modes of communication.* It is important to note the role and strategies of communicating. Sometimes apparently important and straightforward questions can be construed as an invasion of privacy, eventually affecting the success of the later testing.

In addition to these considerations, the following information should be obtained, as it may help in appreciating the role of acculturation and education in neuropsychological functioning.

1. *Prior testing history.* Considering that individuals with either cultural or educational differences are often not exposed to standardized testing, it would be valuable to determine prior knowledge with these modes of understanding.
2. *Level of education.* Clearly, educational attainment affects neuropsychological functioning. It is imperative that the level and type of education be obtained and understood. However, as Loewenstein, Arguelles, Arguelles, & Linn-Fuentes (1994) have argued, care must be taken not to translate equally the number of years of schooling.

3. *Acculturation.* Though sometimes understood in general counseling and some testing situations, this is rarely appreciated by neuropsychologists. Whereas one might be able to use acculturation measures (see Magana et al., 1996), number of years in U.S. culture, knowledge of English, employment records, and language spoken at home are some of the variables that could be easily obtained in an interview.

The aforementioned information provides the clinician with a working hypothesis of neuropsychological impairment. This hypothesis helps the clinician identify the types of tests that are necessary and most appropriate. For example, if a person does not speak English (e.g., Vietnamese), the use of some portions of the Halstead-Reitan Neuropsychological Battery (e.g., Speech-sounds Perception Test) would be totally inappropriate, because some items are nothing more than tests for phonetic understanding.

3. Neuropsychological Testing

The lengthiest portion of any neuropsychological evaluation is the testing. Indeed, it is common clinical knowledge that neuropsychological evaluations take twice as long as standard clinical ones, in large part because of the extensive set of labor-intensive tests. In this section we address the different concerns as well as tests that could be used with culturally dissimilar patients. We begin with specific suggestions for the selection of appropriate neuropsychological tests:

1. Address the variables that need to be measured, then select the tests that measure that variable. Sometimes the abilities that need to be measured do not have a cultural equivalence (Helms, 1992). For example, time is often an important variable in determining intelligence in North American cultures. If intelligence is the issue, time might not be that valuable a measure in certain ethnic groups.

2. Select measures that have been adequately translated. By this we mean that the cognitive equivalence and not the literal one is being measured. This should include an understanding of the underlying factors that the test measures and a point-to-point correspondence with the translation. For example, the recall of digits is an integral part of several tests of attention, memory, and intelligence. However, if the issue is memory, then the number "eight" is a monosyllabic memory, whereas "*ocho*" (Spanish for eight) is two syllables. This becomes even more complex when going between American and Asian cultures and languages.

3. Use tests that have appropriate norms. For example, a recent study by Camara, Nathan, and Puente (in press) revealed that the most common test used by neuropsychologists is the MMPI. The MMPI has been translated into various languages but no formal norms are available in most instances for groups other than the mainstream United States population.

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4. Use tests that have specific instructions and protocols. It is our contention that greater errors are made when the degrees of freedom are larger in circumstances where culture and language become intervening variables.

5. Select tests that reflect the language ability and culture of the patient. Tests such as the Mini-Mental Status Exam (MMSE) is relatively easy and brief. However, even with such a test, education can have significant effects. Bertolucci, Brucki, Campacci, and Juliano (1994) have reported that in illiterate patients, a cutoff of 13 should be used to detect pathology. Of particular concern is the use of intellectual tests, especially in educational settings. Since the likelihood of a false-positive is greater with ethnic minorities, care must be taken not to make educational placement decisions in specific programs (e.g., brain-injury programs) using these tests alone (Puente & Salazar, 1998). Another example comes from the work of Loewenstein and Rubert (1992), who discovered that differences between elderly Hispanic and white European-American individuals on dementia screening was due to performance on tests involving fluency with the letters F, A, and S. These letters occur with greater frequency in the English than in the Spanish language.

6. Be careful not to assume that nonverbal tests mean nonculturally biased tests. As Mahurin et al. (1992) have found, some nonverbal tests yield differences in different cultural groups. If possible, use nonverbal tests that appear to be culture-free. Cuevas and Osterich (1990) reported that the original booklet version of the Category test appears to have cultural equivalence, especially for men.

7. If available, use ecologically valid, tests of function, especially of activities of daily living. One example of this is the Direct Assessment of Continual Status by Loewenstein et al. (1989). Of course, one must be also concerned about the lack of reliability that such tests often provide.

4. Interpretation of Neuropsychological Test Results

Once the testing is complete, then comes the most difficult part of an evaluation—the integration of record, clinical, and testing information. This task is difficult in and of itself without adding cultural and educational confounds. Considering that it is almost impossible to find a perfect evaluation situation (i.e., similar culture and language between tester and patient, adequate tests, and norms, etc.), it is imperative to be extremely careful with the integration of a variety of data to address the presence and impact of a brain injury. We offer several suggestions in attempting this difficult task;

1. Interpret the results in a biopsychosocial context. Whenever possible, understand the biological, psychological, and social context of the patient, including, but not limited to, language and culture.

2. Appreciate what the criterion variable is. This is a difficult issue. If the question is whether a patient is brain-injured, extremely careful attention must

be paid to all the issues addressed in this chapter. If the question is whether the patient has the capacity to adapt to the culture where the patient is residing, then it might be reasonable not to accommodate accordingly. In other words, the question might be more of acculturation than brain function. Of course, it could very well be that both questions bear being asked, and the evaluation strategies might actually be mutually exclusive. Here is where clinical acumen, including understanding of the referral question, would be valuable.

3. Use a variety of sources of information. Traditionally, neuropsychologists rely heavily on test results, interview, and, typically, existing records. Such sources of information, while valuable, may be insufficient. The clinician might consider alternative strategies, including collateral interviews, thorough histories, assessment of social abilities, and so on. Although immigrants often score poorer on standardized neuropsychological tests, sometimes they are successful in adapting to the immeasurable demands placed on them by a foreign culture and language.

4. Avoid stereotypical interpretations. Although it is imperative to guide interpretation with existing literature, as Velasquez et al. (1997) has underscored, most of that literature does not exist for culturally dissimilar patients. Although intuition would suggest something to be true (e.g., whenever possible, use nonverbal tests), existing studies sometimes provide differing conclusions. An interesting example comes from the study by Karno and Jenkins (1993) that reports that schizophrenia has a better prognosis in less developed countries than in more developed ones.

5. If follow-up with the patient is possible, explain the results in a manner that could be understood by the patient and their family. Avoidance of technical and medical terms and explaining the results in practical, day-to-day, colloquial language will increase an understanding of the situation. One must realize that these individuals may not only have educational and cultural differences, but these are superimposed on neuropsychological deficits. The combination makes for a unique and challenging task of information dissemination.

III. FUTURE PERSPECTIVES IN THE ASSESSMENT OF CULTURALLY DISSIMILAR PATIENTS

In the first section we presented the more theoretical aspects of the neuropsychological assessment of culturally and educationally dissimilar patients. In the second section, our intent was to focus more on the pragmatic aspects of the assessment. In this third, and final section, we address the issues of future directions for both theory and practice. Relative to theoretical issues, we purport to address the potential areas for research as well as to what this research

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might mean in the development of comprehensive theories of human brain function and dysfunction. In the second portion, we address specific directions we believe practitioners in the field will eventually have to take into consideration.

The investigation of the existence of a neuropsychological "g" is at the foundation of what could be called cross-cultural or even cultural neuropsychology. The assumption is that, at birth, all humans possess roughly the same cognitive capacity at least across cultures. In other words, there are no major cognitive capacity differences across cultures, at least at birth. Evidence for this type of thinking has been found in studies on language. Furthermore, as cognitive, emotional, and personality capacity expands, it becomes more susceptible to environmental effects. In such a manner, the existing g becomes slowly molded to adapt to the specific tasks, cognitive or otherwise, that are demanded from the environmental cultural situation. As Ardila (1995) has suggested, we appear to have the same cognitive capacity to avoid danger, especially physical. However, a more neo-Darwinian or sociobiological perspective might provide a theoretical perspective on how a common neuropsychological g becomes culturally sensitive and globally fragmented. Thus, issues of what is good cognitively, such as faster is better, becomes incorrectly synonymous with a majority culture—as in the case of American culture where everything fast, from food to thinking, is desirable. Thus, an individual that does not understand and possess this important grain of knowledge is then considered as brain-impaired. Whereas some minority group members are certain to be brain-injured, if nothing else due to statistical probabilities, not all culturally dissimilar or educational disadvantaged individuals possess dysfunctional brains. It almost seems as in attempting to avoid Type I error in measurement, neuropsychologists are willing, maybe unknowingly, to make just as serious Type II errors. The end result is both mistaken identity and diagnosing in the short run and nongeneralized theories about brain function and dysfunction in the long run.

In addition, this approach to clinical neuropsychology can provide fruitful information to questions posed in related disciplines. For example, Neiser (1982) suggested that memory should be studied in a multidisciplinary perspective. Many of the cognitive studies of memory have been formulated for both developed and nondeveloped countries. Although not as of yet pursued, as these studies accrue comparisons between the cognitive underpinnings of memory across different cultures could be realized.

In terms of the application of cultural concerns to clinical neuropsychology, several issues should be considered. Few training programs contain courses on cross-cultural psychology, though a larger number purport to address ethnic-minority issues. In neuropsychology, one study (Echemendia, Harris, Congett, Diaz, & Puente, 1997) found that neuropsychologists are indeed concerned with these issues in an increasing fashion. However, the authors indicate that most neuropsychologists not only have limited training in dealing with these concerns, but similarly have not changed practice parameters to address these

concerns. This paradoxical situation, of concern but warranting no action, provides an avenue from which to pursue a minimizing of the reported gap.

The following are proposed as potential solutions to this problem:

1. Increase the number of ethnic minorities in neuropsychology. Puente and Marcotte (in press) have reported that in Division 40—clinical neuropsychology—of the American Psychological Association, ethnic minorities represent a disproportionately smaller number of members, fellows, and officers of the division relative to other divisions. This is particularly problematic in light of the relative small number of ethnic minorities within APA.

2. Increase the number of tests and norms currently available. Using Hispanics as an example, a plethora of tests are reported to be available here and there. Only a very small number have been scientifically translated and normed. Even then, what is available is at best but a small step. For example, Ardila, et al. (1994) contains norms of literate and illiterate individuals, but the aged are disproportionately represented.

3. Encourage publishing companies to support these efforts. The senior author was involved in a 10-year project involving the translation and standardization of the Weschler scales into Spanish. Due to economic and related concerns (including sampling problems in the trial phases), the project was placed on what appears a relatively permanent hold.

4. Support research that provides the foundation for the development of these tests. An analysis of convention and published papers in neuropsychology over the last 20 years (Puente & Perez-Garcia, in press) does not provide much hope for this to be resolved. Indeed, ethnic-minority concerns represent no more than about 1% of convention presentations and published reports in the neuropsychological literature.

5. Teach students, both undergraduate and graduate, about the importance of cultural and educational issues in understanding brain function and dysfunction. In most neuropsychological textbooks, education though not illiteracy—is given serious concern. Culture, in contrast, is rarely, if ever, mentioned.

6. Make practitioners aware that being "aware" is simply not enough. Increasing the understanding of these variables, as APA has done in its current rewrite of both the ethics as well as the testing standards would appear an excellent start. However, neuropsychologists have traditionally been isolated from APA and from the impact of culture on neuropsychological performance.

IV. CONCLUSION

The involvement of understanding the role of educationally and culturally dissimilar individuals is a relatively new enterprise within clinical neuropsychology.

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Although education has often been factored into the equation of neuropsychological knowledge, illiteracy has not. Furthermore, ethnic minorities and culturally dissimilar groups have not been well understood despite the unprecedented growth within the field. This chapter has presented both theoretical and pragmatic issues. Although clearly these efforts should be considered as a "work-in-progress," we hope that the eventual inclusion of these concerns will increase not only the understanding of all people with brain injury but will expand the horizons of our understanding of brain function and dysfunction as well.

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