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Pepperdine University
Graduate School of Education and Psychology

CHALLENGES OF NEUROPSYCHOLOGICAL TESTING WITH ASIAN
AMERICAN ADULTS: A CRITICAL REVIEW OF THE LITERATURE

A clinical dissertation submitted in partial satisfaction
of the requirements for the degree of
Doctor of Psychology

by

Heejin Kim

June, 2011

Stephanie Woo, Ph.D.-Dissertation Chairperson

This clinical dissertation, written by

Heejin Kim

under the guidance of a Faculty Committee and approved by its members, has been submitted to and accepted by the Graduate Faculty in partial fulfillment of the requirements for the degree of

DOCTOR OF PSYCHOLOGY

Doctoral Committee:

Stephanie Woo, Ph.D., Chairperson

Susan Himmelstein, Ph.D.

Sepida Sazgar, Psy.D.

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TABLE OF CONTENTS

	Page
DEDICATION.....	vi
ACKNOWLEDGEMENTS.....	vii
VITA.....	ix
ABSTRACT.....	xvi
Chapter I. Introductory Literature Review.....	1
Asian Americans.....	4
History of Asian Immigration to the United States	6
1800s to the World War I.....	6
World War I through World War II.....	7
Post World War II.....	8
Consequences of Immigration	10
Acculturation.....	13
Impact of Asian Culture on Psychopathology/Differential Diagnosis	15
Impact of Cultural Values on the Testing Experience	22
Psychometric Issues with Ethnic Minorities.....	23
Neuropsychological Testing with Asian Americans.....	25
Specific Objectives for Review and Analysis.....	34
Definition of Terms.....	34
Chapter II. Review and Analysis Procedures	36
Introduction.....	36
Review Procedures.....	36
Identification of Relevant Literature.....	36
Collection of Relevant Literature.....	37
Analysis Procedures.....	37
Basic Analysis Techniques	37
Challenges of Neuropsychological Assessment with Asian Americans.....	37
Recommendations for Culturally Competent Assessment Procedures.....	38
Chapter III. Review and Analysis of Literature.....	39
Effect of Cultural Values and Immigration on Help-Seeking Behavior.....	39
Prevalence of Help-Seeking among Asian Americans	39
Factors that Affect Help-Seeking among Asian Americans	41
Asian Cultural Values	42
Intergenerational Transmission of Cultural Values	45
Socioeconomic Status	46
Individualistic Foundations of Psychology.....	48

	Page
Consequences of Immigration that Affect Help Seeking Behavior.....	52
Effects of Bilingualism on Neuropsychological Assessment	55
Definitions of Bilingualism.....	55
Effect of Second Language Acquisition on Cognitive Development and Processing.....	56
Monolingual vs. Bilingual Brain	62
Indications of Potential Bilingual Advantage	66
Current Research in Neuropsychological Assessment of Asian Americans	67
Ethical Practice	67
African American Normative Data.....	69
Hispanic Normative Data.....	71
Normative Data.....	75
Advantages in the use of Normative Data	76
Disadvantages in the use of Normative Data.....	78
Potential Drawbacks of Ethnicity Specific Normative Data.....	79
Neuropsychological Research.....	82
Possibilities for Ethnic Group Differences	84
Chapter IV. Recommendations.....	89
Neuropsychological Test Selection.....	94
Administration	97
Normative Data.....	102
REFERENCES	107

DEDICATION

To my family (Mom, Dad, Yoon, Ki) and Andrew.

ACKNOWLEDGEMENTS

I have been blessed to have Dr. Stephanie Woo, Dr. Susan Himmelstein, and Dr. Sepida Sazgar as my committee members. You have all been endlessly supportive, patient, and encouraging through this process.

Dr. Sazgar: Thank you for sharing your amazing resources and providing great information surrounding multicultural issues. It was wonderful to have dialogues with you surrounding the challenges of testing ethnic minorities. Also, your words of encouragement had a huge impact on my motivation!

Dr. Himmelstein: I consistently sought out the classes that you taught from the Masters level PSY 601 Assessment of Intelligence course to our final neuropsychology course in the Doctoral program. I have always relied on your comprehensive teaching style and patience in learning cognitive testing. You were consistently compassionate and understanding with your students, and that made our journey through graduate school that much easier. You helped me to discover my love for cognitive and neuropsychological testing, and I will forever be indebted to you for that.

Dr. Woo: I can still recall the moment in your Behavioral Assessment and Interventions class when I mustered up the courage to ask you to be my dissertation chair. It took hours of cognitive reframing from one Nikki Rubin to finally convince me to ask you at the end of class. It was one of the greatest decisions that I made, and I am forever grateful for your kindness, encouragement, and humor through this process. I appreciate every last comment, edit, and word of advice, and I could not have made it to this point without you!

I have to express my gratitude to my loving, supportive parents, grandparents, and siblings. They believed that I could accomplish everything when I lacked the confidence. Thank you to my mom and dad for all of your sacrifices; I will forever attempt to match your work ethic, intelligence, and sense of humor. Yoon, you set the gold standard in our family; I'm still hoping to be as smart and brave as you someday. Ki, your humor and easy-going personality helps me to keep things in perspective, and I know you will far surpass me in successes.

A great thank you to Andrew who witnessed every facet of my personality during this entire process and continued to stay by my side. I cannot express how much your love, patience, and parents' support have meant to me.

Emily, Michelle, Nina, and Crystal, you're each lovely, quirky, and hilarious in your own way, but you all share the trait of unfailing kindness. Thank you for all of your phone calls, emails, and texts, which kept me in the loop. I value our friendship and can't wait to see what the next decade will bring.

I could not have made it through the doctoral program without Nikki, Whitney, Kerri, and Anna. I was very lucky to have met some of the smartest, funniest, kindest girls through this experience and there are just too many memories to take away from our time together.

VITA
Heejin Kim

EDUCATIONAL HISTORY

DOCTORAL STUDENT OF CLINICAL PSYCHOLOGY (degree expected May 2011)
Pepperdine University – An APA Accredited Psy.D. Program
Dissertation: Challenges Of Neuropsychological Testing With Asian Americans
(Chairperson: Stephanie Woo, Ph.D.)

MASTER OF ARTS IN CLINICAL PSYCHOLOGY
Pepperdine University, West Los Angeles
Graduated: April 2007

BACHELOR OF SCIENCE IN HUMAN DEVELOPMENT AND FAMILY SCIENCES
The University of Texas at Austin
Graduated: December 2003

CLINICAL HISTORY

NEW YORK UNIVERSITY-RUSK INSTITUTE OF REHABILITATION (NYU-RIRM)

New York, NY

September 2010 – August 2011

Inpatient Rotation:

Supervisors: Joseph Marcantuono, Ph.D., Robert Gordon, Ph.D.

- Conduct intake interviews with patients requiring acute inpatient rehabilitation. Patient population includes spinal cord injury, traumatic brain injury, stroke, musculoskeletal disorders, cardiac and pulmonary conditions, cancer, orthopedic impairment
- Administer, score, interpret, write neuropsychological reports and provide feedback.
- Provide ongoing supportive individual psychotherapy to patients.
- Participate in family meetings for discharged patients.
- Participate in multi-disciplinary patient evaluation conference and present patient's progress to medical team.

Outpatient Rotation:

- Conduct intake interview with outpatients with acquired or congenital brain injury (e.g., epilepsy, multiple sclerosis, Parkinson's disease, traumatic brain injury, etc.)
- Administer, score, interpret, and write full-length neuropsychological reports.
- Conduct supportive and psychoeducational groups for patients undergoing medical rehabilitation.
- Provide cognitive remediation in individual and group settings.

Training:

- Participate in individual and group supervision with clinical supervisor and interns.
- Attend didactics, trainings, and seminars surrounding neuroanatomy, brain-behavior relationships, cognitive remediation, neurological conditions, etc

HARBOR-UCLA NEUROPSYCHOLOGY PROGRAM

Torrance, CA

September 2009 - August 2010

Supervisor: Matthew Wright, Ph.D.

- Conducted intake interviews with outpatients with chronic psychiatric disorders, history of substance abuse, learning disabilities, head trauma, multiple cerebrovascular risk factors.
- Administered, scored, interpreted, and wrote one full-length neuropsychological assessment report bi-weekly.
- Participated in weekly group supervision with clinical supervisor and other externs. Responsibilities included formulating differential diagnoses for weekly cases, attending lectures, researching relevant literature related to clinical cases.
- Attended weekly didactic seminars relevant to neuropsychology.

PEPPERDINE PSYCHOLOGICAL AND EDUCATIONAL CLINIC

West Los Angeles, CA

September 2009 – July 2010

Supervisor: Aaron Aviera, Ph.D.

Consultation: Robyn Walser, Ph.D. (ACT)

- Developed and co-led a group for clients from an Acceptance and Commitment Therapy (ACT) approach.
- Attended weekly supervision sessions with clinical supervisor

UNIVERSITY OF CALIFORNIA-LOS ANGELES NEUROPSYCHIATRIC INSTITUTE (UCLA-NPI)

Los Angeles, CA

August 2008 – July 2009

Supervisor: Po Lu, Psy.D.

- Conducted intake interviews for an adult population suffering traumatic brain injury, seizure disorder, dementia, learning disability, adhd, pervasive developmental disorders, language disorders, brain tumors, and other medical/forensic issues.
- Administered, scored, interpreted, and wrote one full-length neuropsychological assessment report per week.
- Observed and supervised new externs in neuropsychological administration, scoring, interpreting, and report writing.
- Participated in weekly group supervision with clinical training supervisor and other externs. Responsibilities included case presentations, cognitive assessment presentations, and clinical diagnosis presentations.
- Participated in bi-weekly group supervision with clinical supervisor to discuss clinical diagnoses and case presentations.
- Attended weekly didactic seminars and supervision sessions.
- Observed WADA testing.

PEPPERDINE PSYCHOLOGICAL AND EDUCATIONAL CLINIC

West Los Angeles, CA

Supervisor: Carolyn Keatinge, Ph.D

- Administered psychoeducational and personality battery, wrote comprehensive report, and conducted a summary conference to assess an adult for educational, cognitive, and personality problems.

PEPPERDINE PSYCHOLOGICAL AND EDUCATIONAL CLINIC

- West Los Angeles, CA
- September 2007 – July 2010
- Supervisors: Aaron Aviera, Ph.D. (2007-2010)
- Dity Brunn, Psy.D. (2008-2009)
- Consultation: Robyn Walser, Ph.D. (2008-2010)
- Conducted intake interviews with clients presenting with various symptoms and concerns.
- Administered and interpreted clinical measures assessing current level of functioning as well as follow-up measures used to gauge symptom reduction.
- Provided ongoing individual therapy to help adolescents and adults develop better coping skills and gain insight into their current concerns.
- Participated in weekly case conference with other therapists, peer supervisors, and clinic supervisors, to develop treatments plans and discuss legal and ethical issues.
- Attended twice weekly supervision sessions.
- Responsible for carrying clinic emergency pager and trained in crisis intervention protocol.

PROFESSIONAL EXPERIENCE

SUBSTANCE ABUSE COUNSELOR

ASIAN AMERICAN DRUG ABUSE PROGRAM – RESIDENTIAL UNIT

Los Angeles, CA

October 2005 – March 2007

This facility is an inpatient program designed to treat substance addiction. Patients range from ages 18 and up and were from a variety of different backgrounds.

- Maintained caseload of 8-10 clients and duties included but were not limited to: conducting intake interviews, client treatment planning, conducting individual sessions, working in conjunction with social workers, psychiatrists, courts, and judges to effectively help client, crisis intervention
- Supervised and monitored residents 40 hours per week.
- Facilitated a minimum of three groups per week.
- Co-led Family Sessions with Marriage and Family Therapist.
- Participated in weekly Case Conference
- Managed crisis calls from the community, particularly from Korean speakers
- Participated in outreach work to the Asian community.

SUPERVISORY EXPERIENCE

TESTING PEER SUPERVISOR

PEPPERDINE PSYCHOLOGICAL AND EDUCATIONAL CLINIC

West Los Angeles, CA

September 2009 – June 2010

Supervisor: Carolyn Keatinge, Ph.D.

- Provided weekly peer supervision to second-year and third-year doctoral students working on their testing comprehensive exam.
- Examined students' scoring, interpretation, and report writing for comprehensive assessment battery.
- Supervised students in assessment administration.

TEACHING EXPERIENCE

TEACHING ASSISTANT

PEPPERDINE UNIVERSITY, PSYCHOLOGY DEPARTMENT

Doctoral Level Cognitive Assessment Course

West Los Angeles, CA

Professors: Carolyn Keatinge, Ph.D. and Susan Himmelstein, Ph.D.

September 2009 – December 2009

- Administered WAIS-III test to students and served as test subject.
- Provide feedback regarding administration strengths and weaknesses.
- Examine students' scoring and interpretation on WAIS-IV, Bender-Gestalt, Trails, Rey-Osterrith, WRAT-4

TEACHING ASSISTANT

PEPPERDINE UNIVERSITY, PSYCHOLOGY DEPARTMENT

Doctoral Level Personality Assessment Course

West Los Angeles, CA

Professors: Carolyn Keatinge, Ph.D. and Susan Himmelstein, Ph.D.

January 2010 – April 2010

- Administered Rorschach Inkblot Test to students and serve as test subject.
- Provided feedback regarding administration strengths and weaknesses.
- Examined students' scoring and interpretation on MMPI-2, MCMI, TAT, HTP, RISB, Rorschach

TEACHING ASSISTANT

PEPPERDINE UNIVERSITY, PSYCHOLOGY DEPARTMENT

Master's Level Cognitive Assessment Course

West Los Angeles, CA

Professor: Linda Nelson, Ph.D

September 2007- August 2008

- Administered WAIS-III and WISC-IV tests to students and served as test subject for students.
- Scored all of the WAIS-III and WISC-IV tests that were administered by the students

GUEST LECTURER

ASIAN AMERICAN DRUG ABUSE PROGRAM

July, 2008 “Stages of Change”

- Presented to counselors, support staff, and residents of an 18-month inpatient substance abuse rehabilitation program the transtheoretical model of change based on the relevance of the topic for this population.
- Presentation included psycho-education about the stages of change, administration of the stages of change questionnaire, and interpretation of the results in relation to the residents’ treatment stage of rehabilitation.

TEACHING ASSISTANT

THE UNIVERSITY OF TEXAS AT AUSTIN CHILD AND FAMILY LABORATORY

Austin, TX

September 2003 – December 2003

- Worked weekly in the four-year-old classroom.
- Implemented developmentally appropriate activities.
- Provided appropriate guidance for the child’s physical, cognitive, social and emotional development.
- Prepared regular anecdotes on the children’s communication and its affects on their behaviors.

RESEARCH EXPERIENCE

RESEARCH ASSISTANT

HARBOR-UCLA NEUROPSYCHOLOGY PROGRAM

Torrance, CA

September 2009 – July 2010

Supervisor: Matthew Wright, Ph.D.

- Edited paper for abstract submission
- Performed statistical analyses for various research studies
- Researched, reviewed, and archived articles relating to activity memory

RESEARCH ASSISTANT

UNIVERSITY OF CALIFORNIA-LOS ANGELES, ALZHEIMER’S DISEASE RESEARCH CENTER

Los Angeles, CA

October 2008 – July 2010

Supervisors: Po Lu, Psy.D. and Ellen Woo, Ph.D.

- Conducted intake interviews with research patients to assess changes in cognitive or daily functioning.
- Administered, scored, interpreted, and wrote report of full-length neuropsychological assessment per week.
- Updated and maintained data for national Alzheimer’s coordinating center

RESEARCH ASSISTANT
THE UNIVERSITY OF TEXAS AT AUSTIN
 May 2003-August 2003

Relationship Project: A study that observed the characteristics that led to marriage in dating couples.

Supervisor: Cathy Surra, Ph.D.

- Utilized the UT TRAC information to further study couples.
- Gained knowledge about the mutuality of interests/attraction that leads to relationships.
- Researched to identify correlations between parent divorce and conflict in their offspring's relationships.
- Studied statistical information in order to measure the degree of correlations.
- Learned statistical information programs.
- Wrote a research paper stating the findings of the research completed during assistantship.

RESEARCH ASSISTANT
THE UNIVERSITY OF TEXAS AT AUSTIN
 Austin, TX

January 2003-May 2003

Parents and Children/Stepchildren Project: A study that explored mothers' interaction styles with their biological child and their stepchild.

Supervisor: Edward Anderson Ph.D.

- Coded video interviews of families based on interactions and emotional state.
- Analyzed family interviews
- Evaluated individual's tone of voice and facial expressions to determine emotion.

POSTERS AND PRESENTATIONS

Kim, H., & Lu, P. (2009). Alzheimer's Disease Clinical Case Presentation. Poster Presented at the Universal Gerontology & Alzheimer's disease Awareness Conference, Westwood, CA.

Wright, M. J., Schmitter-Edgecombe, M., Woo, E., Kim, H., & Mikael, M. (2009). Verbal memory impairment in severe closed-head injury: The role of encoding and consolidation. American Neuropsychiatric Association annual conference, Tampa, Florida, 2010.

COMMUNITY OUTREACH

September 2006, Los Angeles Korean Festival

- Provided information and education to Korean families and parents about the cycle of addiction, drug abuse, and various forms of drugs.
- Furnished information about the Asian American Drug Abuse Program.

PROFESSIONAL AFFILIATIONS

American Psychological Association, Student Affiliate
Association for Contextual Behavioral Science, Student Affiliate
Association for Contextual Behavioral Science-New York City Chapter (Founding Member)
International Neuropsychological Society

HONORS AND AWARDS

Psi Chi National Honor Society in Psychology
Pepperdine Colleagues Grant Scholarship (2007-2010)
Pepperdine Diversity Scholarship (2007-2010)
University honors, University of Texas at Austin

LANGUAGE SKILLS

Fluent in Korean (includes conversational, reading, writing).

ABSTRACT

The present study is a critical analysis of literature surrounding the challenges faced during neuropsychological testing with Asian American adults. This dissertation will provide a comprehensive overview and critically analyze what is known with regards to neuropsychological assessment of Asian individuals, challenges that psychologists face in conducting culturally competent neuropsychological assessment of this population, and recommendations for conducting such assessments. Current literature reveals how confounds such as culture, acculturation, language, and the inappropriate use of tests and normative data can impact scores and subsequent treatment recommendations. Given these confounds, recommendations will be made regarding the neuropsychological test selection, test administration, and normative data to discuss ways that testing with Asian Americans can be improved.

Chapter I

Introductory Literature Review

The field of clinical neuropsychology has experienced tremendous growth, which is reflected in the number of publications in this field and the rapid expansion of neuropsychological test development. A PsycINFO search of the keyword *neuropsychology* yielded 18, 441 hits prior to 1990, and a search post-1990 resulted in 90,504 hits as of February 7, 2010; this is a difference of over 70,000 citations. Compared to the amount of literature that is being produced within this field, the exploration of cross-cultural factors in neuropsychological assessment is noticeably limited. Specifically, there is a significant dearth of research related to the neuropsychological assessment of Asian Americans, which is one of the most rapidly growing ethnic-minority groups in the United States (Wong & Fujii, 2004). The 2000 United States Census revealed that the total Asian population experienced a 48% to 72% increase between 1990 and 2000, whereas the total U.S. population increased by only 13% (U.S. Bureau of the Census, 2000). Thus, as the Asian American population grows, it becomes increasingly important for psychologists to attend to issues related to the psychological assessment of members of this group, including issues related to neuropsychological assessment. *Clinical neuropsychology* is a specialty of psychology that applies principles of assessment and intervention based upon the scientific study of human behavior as it relates to normal and abnormal functioning of the central nervous system (American Psychological Association, 2003). Neuropsychology is dedicated to enhancing the understanding of brain-behavior relationships and the application of such knowledge to human problems (American Psychological Association, 2003).

Impairments to the central nervous system have a global impact on an individual, and this includes possible compromises in biological, psychological, and social functioning. Consequently, the early exploration of cognitive concerns can result in interventions that alleviate or delay impairing symptomatology.

However, Asian Americans may remain unaware of available resources to evaluate cognitive problems or experience difficulty in obtaining assistance due to language barriers. Additionally, Asian Americans seeking neuropsychological assessment may be tested with measures not adapted for use with their ethnic group and their performance may be compared to normative data samples consisting of primarily Caucasian subjects. Studies reveal that the application of psychometric instruments standardized on Caucasian individuals from the majority culture can result in larger than expected false-positives findings with ethnic minorities both in terms of psychopathological and neuropsychological variables (Puente & Perez-Garcia, 2000). This could potentially lead to the inappropriate diagnosis and treatment of Asian Americans.

The proposed dissertation will be a critical analysis of the literature that will specifically address what is currently known with regards to cognitive assessment of Asian individuals, challenges that psychologists face in conducting culturally competent neuropsychological assessment of this population, and recommendations for conducting such assessments. What follows is a concise review of selected literature in this area that is intended to provide a framework for understanding why such a critical analysis is worthwhile to conduct and to introduce readers to some of the salient issues and

controversies in the area of psychological assessment of Asian populations that will be the focus of a more in-depth review and analysis in the proposed dissertation.

In order to fully appreciate the challenges that are present in the neuropsychological assessment of Asian Americans, many factors will be considered in the following review of the literature. This includes more obvious issues of test bias and lack of appropriate normative data, as well as other factors like race-related trauma that may have a more subtle presentation, yet still have a significant impact on cognitive test results. These factors all play a role in affecting the neuropsychological assessment process to varying degrees, and the rest of this chapter will further explore these topics. However, first, there will be a discussion of the diversity of the Asian American population and an exploration of how this heterogeneous group has been subsumed under one umbrella for so long. Next, an exploration of Asian immigration into the United States will evaluate how race-related trauma may shape individual world-views and how it continues to affect the subsequent generations of Asian Americans. The importance of assessing acculturation will be explored, as it informs test battery selection based on information about the individual's fluency or literacy. Additionally, an individual's level of acculturation informs testing procedures and the treatment planning process. The exploration of Asian culture will also reveal the ways in which the expression of psychological distress may differ from Caucasian populations and the manner in which the stigma of mental illness can affect help-seeking behavior. For examiners, the probability of misdiagnosis increases if they are not aware of these factors, and if they do not account for patient psychopathology during testing. The investigation of cultural values will demonstrate the ways in which concepts such as *face* and *shame* can affect the

patient's presentation, working alliance with the examiner, and rapport. The test batteries that are utilized with ethnic minorities possess fundamental issues such as test bias and lack normative sample data with which to compare test results. Diagnoses are routinely made based on the comparison of an individual's scores to age- and education-equivalent "normative" populations. However, the lack of normative data with the Asian American population brings into question whether results are valid. Finally, a look at the lack of procedures related to culturally competent assessment will reveal how neuropsychological testing has been performed so far, and what changes need to be made in order to improve assessment practices.

Asian Americans

The rising number of Asians in the US represents a population that can no longer remain unnoticed. The Asian American population continues to double every 10 years in the United States, which consequently raises questions about the significance of previous research findings with current Asian populations (Okazaki, 1998). Oftentimes, research was performed with a small number of participants or only included one ethnicity; yet, the results were generalized to all *Asian Americans*. The growing number of Asian Americans in this country demands for a more appropriate recognition of the ethnicity as opposed to subsuming all Asians under the "other" category. The diversity of this group is highlighted by the fact that the term *Asian* includes 24 countries of origin and ethnic groups with distinct languages, specific values and traditions, and unique histories of immigration (Fujii, 2010). The heterogeneity within this ethnicity complicates the assessment of cross-cultural factors during testing. However, the continued influx of Asian immigrants into this country reveals the necessity of continued research with this

demographic. Records of legal immigration into the U.S. reveal that an Asian country (i.e., Philippines) appeared as one of the top five countries of immigration between the years of 1961-1980 (Llorente, Taussig, Satz, & Perez, 2000). Furthermore, between the years of 1981-1990, Philippines, China, Korea, and Vietnam were four of the top five countries of immigration into the United States, behind Mexico (Llorente et al., 2000). This indicates that many Asians in the U.S. are foreign born, and their immigration and cultural experience are therefore highly relevant in any psychological assessment.

During this moment of continual transition, the greatest concern stems from the question of the salience of previous clinical studies on the Asian American population. Espiritu (1993) discovered that the majority of research on Asian Americans was performed in the 1970's due to increased political awareness and empowerment for women and ethnic minorities. Similarly, Uba (1994) speculated that much of the general clinical research conducted during that time was ultimately discontinued due to fears of possibly exacerbating existing negative stereotypes of Asians. The greatest prevailing stereotype of Asian Americans is the perception that they are the *model minority* that experiences few social or psychological problems in their adjustment in the United States (Wing, 2007). This image is often magnified by the overrepresentation in the press and media of Asian American students among winners in national competitions, acceptance rates to prestigious universities, and graduation rates from high school and universities (Dandy & Nettelbeck, 2002). This proves to be problematic in many aspects because less research and attention may be paid to a population that does not appear to have difficulties and this, in turn, may cause more misunderstandings to accumulate for this minority group. Within the realm of neuropsychology, the spotlight on Asian Americans'

school or occupational achievement could influence a neuropsychologist's conceptualization of an Asian patient's presenting problems in such a way that the examiner minimizes the legitimate cognitive concerns of their patient. The homogenization of such a diverse group perpetuates stereotypes and affects the manner in which a neuropsychologist conceptualizes each patient. To help the reader better understand the diversity of the histories and experiences of different Asian groups in the United States, a brief history of Asian immigration to this country follows.

History of Asian Immigration to the United States

The history of Asian immigration into the United States reveals not only the chronology of immigration by different ethnicities, but also differentiates the experience of each group. The immigration history of Asian Americans was strongly dependent on American government legislature, with laws restricting entry based on ethnicity, gender, or employment needs. Examiners who are unaware of unfortunate moments in American history (e.g., Japanese internment camps in the U.S. during World War II) may neglect to take into account the psychological impact of their experiences, and make critical errors in differential diagnosis.

1800s to World War I. The Chinese were the first Asians to immigrate to the United States around the middle of the 19th century; this first group included mostly men due to the severe restrictions placed by the 1882 Exclusion Act on the number of Chinese women allowed in the U.S. and discrimination in housing, employment, and the imposition of special taxes (Uba, 1994). Japanese immigrants arrived in 1868 to work on plantations in Hawaii and farms on the mainland of the U.S. in an effort to avoid military draft in their native country (Uba, 1994). The U.S. government did not immediately

exclude the Japanese from immigration after the Japanese military showed dominance in China and Russia (Uba, 1994). Also, many Koreans immigrated between 1903 and 1905 to avoid Japan's rule over their country (Uba, 1994). In 1906, Executive Order #589 and the 1907 Gentleman's Agreement restricted the immigration of Japanese to the United States (Uba, 1994). Uba (1994) noted that Japanese Americans are the most acculturated of the Asian American groups; this stemmed from the quick marriage and establishment of families after many feared that a ban on Japanese immigration would be imminent.

World War I through World War II. Filipinos, mostly male, began to immigrate to Hawaii in large numbers in 1909 and to the mainland around 1920 to work as agricultural laborers as many U.S. men were deployed to fight in World War I (Uba, 1994). The U.S. Immigration Act of 1924 limited the number of immigrants to 150,000 a year and completely restricted immigration from Asian countries (Ngai, 1999). World War II stretched between 1939-1945, and the second wave of Chinese immigrants entered the United States when the government repealed the Exclusion Act to encourage Chinese scientists and professionals to enter the country (Uba, 1994). Despite the alliance of the U.S. and China during World War II, anti-Japanese sentiment remained from the early part of the twentieth century (Ng, 2001). Under the guise of military necessity, Japanese Americans were evacuated and sent to internment camps in remote areas such as Manzanar and Tule Lake in California, Poston and Gila River in Arizona; Minidoka in Idaho, Topaz in Utah, Heart Mountain in Wyoming, Amache in Colorado, and Jerome and Rohwer in Arkansas (Ng, 2001; Tateishi, 1999). In 1942, over 120,000 Japanese American citizens (*Nisei*, or second generation) and Japanese immigrants (*Issei*, or first generation) were forced to leave their homes and sell all possessions for

outlandishly low sums by soldiers bearing rifles (Loo, 1993; Tateishi, 1999). They were first placed under detention in temporary assembly centers for 6 months, then moved to permanent relocation centers which were enclosed in barbed-wire fences and surrounded by guard towers and search lights (Tateishi, 1999). Japanese Americans remained interned for 2 to 3 years until 1944, when the War Department realized they could no longer justify the necessity for the camps (Tateishi, 1999). The Japanese Americans left a traumatic experience only to return home to rejection and verbal abuse from their community (Loo, 1993). The sentiment of Americans towards the Japanese pressured this group to quickly assimilate following World War II; subsequently, Japanese Americans have been in the United States the longest as families (Uba, 1994).

Post World War II. The War Brides Act of 1945 enabled spouses and adopted children of U.S. military personnel to enter the U.S. after World War II and this resulted in a small influx of Korean and Filipino immigration (Shin & Shin, 1999). This quota was extended at the end of the Korean War (1950 – 1950) and this marked another surge of Korean immigration (Shin & Shin, 1999). Rates of Asian immigration into the United States correspond heavily to the laws enacted throughout history to monitor immigration based on specific ethnicity. The 1965 Immigration Act lifted quotas of immigration based on race, and subsequently resulted in increased immigration into the United States (Uba, 1994). The year of 1975 was marked with considerable Southeast Asian immigration, following the end of the Vietnam War (Uba, 1994).

The United States reportedly denied that its pullout from Vietnam was imminent and Vietnamese refugees had only a few days to prepare for departure (Uba, 1994). The first group of Vietnamese refugees had ties to America, were members of the South

Vietnamese military, or was targeted for death by the communist North Vietnamese (Uba, 1994). The Chinese-Vietnamese were the second group, and they left Vietnam due to discrimination from the government, which included confiscation of assets, forced closure of businesses, and reduction of food rations (Uba, 1994). Both groups left primarily by boat and endured attacks from pirates, inhumane conditions (i.e., lack of food, standing for the duration of the trip due to cramped quarters), and some were forced to eat the remains of people due to hunger (Uba, 1994).

The people of Laos fled their country due to the campaign of repression by Pathet Lao that included killing, torturing, and imprisonment of opponents to the regime (Uba, 1994). Two minority Laotian groups, the Hmong and the Mien, were promised help by the U.S. government, if they assisted the U.S. Central Intelligence Agency in fighting the communists (Uba, 1994). Unfortunately, the U.S. abandoned the minority groups, and Pathet Lao began a campaign of Hmong and Mien extermination (Uba, 1994). The Khmer Rouge, led by Pol Pot, took power in Cambodia in 1975, and subsequently sent nearly 2 million residents of the capital city to labor camps and collective farms in an effort to rid the country of bourgeois, Western influences (Uba, 1994). Cambodians destroyed their symbols of education, such as books and glasses, and they stopped using French and the proper Khmer grammar (Uba, 1994). Families were separated to prevent the undermining of loyalty to the Khmer Rouge, and neighbors spied on each other in order to save their lives (Uba, 1994). Anonymous national police, which consisted of young boys with rifles, tore children from limb to limb, buried people alive, and beat people on the head; this was especially traumatic because Cambodian women believed the soul resided in the head, and in their culture, younger individuals are not to touch

elders (Uba, 1994). The final wave of Asian immigrants experienced unremitting trauma before they arrived in the United States.

Consequences of Immigration

Knowledge of the detailed history of Asian American immigration into the United States is necessary to comprehend the struggle, discrimination, and hardships that were endured in order to gain residency in this country. Although second generation and third generation Asian Americans may not have personally experienced immigration and its related stressors, intergenerational communication plays a role in relaying details of hardships endured by parents or grandparents. In other cases, the lack of communication about immigration related hardships may have a similarly profound effect upon the children of immigrants. For example, World War II profoundly influenced Japanese Americans and subsequent generations; the experiences that many Japanese Americans endured during that period have been conceptualized as a form of race related trauma, including cumulative overt and covert forms of racial discrimination (Loo, 1993). Some of the offspring of the *Nisei* generation (i.e., the *Sansei* generation) have reported that their parents maintained silence about their internment camp experiences, which inhibited communication within the family and created a sense of secrecy (Nagata, 1991). Others have been “racially socialized” by their parents and taught how to live in an environment that may judge based on ethnicity (Nagata & Cheng, 2003). Despite the *Sansei*’s lack of actual wartime experiences, their worldview has been affected by their parent’s experiences. For a neuropsychologist, it is imperative to gather information surrounding an Asian American’s experience with immigration trauma, or the immigration experience of a patient’s parents. Patients may have experienced racial discrimination or learned of

the potential for discrimination from their parent's experiences, which can affect their rapport with a Caucasian neuropsychologist. Asian patients may convey feelings of depression or post-traumatic stress in the form of somatic symptoms due to cultural stigmas related to mental illness. However, a clinician can utilize background information, such as immigration history, to ascertain possible issues with mental health.

Similarly, the process of immigration in the present day may still be extremely stressful as individuals or families uproot themselves from familiar, comfortable surroundings to an entirely new culture and language where social support may initially be lacking. Asians may encounter a new obstacle due to the lack of social supports. Specifically, individuals from collectivistic cultures may rely on their extended family members for support, and the absence of or changes in the level of this support following immigration may amplify difficult transitions. Apart from the natural stressors associated with transition, immigrants deal with the frustration, shame, or fear of the lack of fluency with the host language (Foster, 1998). Non-bilingual individuals lack the basic ability to communicate with others, which makes a range of activities, from employment to navigating through and utilizing community resources, difficult. Foster (2001) noted that a downward shift in socioeconomic status is the norm across both the social and educational spectrums for immigrants. Many immigrants may discover that the years spent attaining a higher-level academic or professional degree were seemingly useless once they arrived in the United States. Some may be forced to economically rebuild at a later phase in their life. The combination of a lack of economic resources and lack of fluency can result in decreased access to or knowledge of medical or psychological resources.

Shifts in family dynamics may also be a consequence of immigration. Women may find work more quickly due to their willingness to accept menial and low paying jobs, and subsequently become the primary wage earner for the family (Foster, 2001). Early entry into the job market could speed the rate of acculturation for women and create power differentials at home. Children may quickly adjust to their new culture through intense integration at school. Eventually, children of immigrants might become the translator for the family and take on the task of dealing with adult responsibilities. The blurring of lines between adult and child within a family could challenge typical collectivistic roles and responsibilities.

Furthermore, this stressful transition may be intensified if the immigration was involuntary. A 1993 census revealed that there are upwards of 20 million refugees in the world today, who flee their home countries due to war or the possibility of starvation (United Nations High Commission of Refugees, 1993). Unfortunately, traumatic experiences may not end once the refugee reaches their new country. Foster (2001) indicated that immigrants are known to be at significant risk for poor living conditions, economic exploitation, and possibly racist treatment from their host locations. Potential for psychological distress occurs at several stages of the involuntary immigration process. Desjarlais, Eisenberg, Good, and Kleinman (1995) identify four migration stages at which there is significant potential for traumatic experiences that could lead to psychological distress: premigration trauma, traumatic events experienced during transit to the new country, continuing traumatic experiences during the process of resettlement, and substandard living conditions in the new country. With regards to premigration trauma, the severity of psychopathology may have a dose-response relationship with the

amount and severity of torture or abuse endured in the native country (Mollica, Poole, & Tor, 1998). The assessment of immigration trauma should be a standard part of the clinical interview during the neuropsychological evaluation. Untreated post-traumatic stress disorder or fear of other ethnicities based on personal history can affect an individual's behavior in the room and subsequent test performance.

Acculturation

The history of Asian immigration reveals the diversity of experiences that each ethnicity faced as they came to the United States. While a general trend of immigration may be observed for each ethnicity, great diversity exists among each group. Variables such as year of immigration, education, family, social support, etc., determine the rate and extent of acculturation into a new culture. Acculturation can be defined as a process represented by all the changes that occur as a result of individuals from two distinct cultures coming into continuous first-hand contact with one another, but particularly those changes of the original cultural patterns of either or both groups (Sam & Berry, 2006). Bronfenbrenner's (1989) ecological perspective of culture proposes that culture is a multilevel phenomena that operates at various levels simultaneously (i.e., macrosystem, exosystem, mesosystem, microsystem). Specifically, new cultures affect laws, values, culture (macrosystem), social settings (exosystem), social and group behavior, rituals, customs, foods (mesolevel), and cognition, emotion, and behavior (microlevel; Cuellar, 2000). Within this perspective, acculturation occurs as individuals learn about the different systems of their new environment.

Immigrants will acquire characteristics of mainstream America at different rates and will acculturate with respect to different qualitative aspects of the new culture

(Cuellar, 2000). Beery and Kim (1988) posited four main modes of acculturation:

- *Assimilation*: this is a mode of acculturation that results in the immigrant acquiring behaviors and values of the host culture and either not acquiring, not relinquishing, not practicing, or not valuing their traditional culture.
- *Integration*: the immigrant or minority member integrates both traditional culture with acquired characteristics of the host culture. The individual retains traditional culture and integrates it with the host culture in a way that ethnic identity is maintained while endorsing mainstream values.
- *Separation*: The traditional culture is adhered to and not relinquished and traditional identity is maintained as well, along with a reluctance to accept, change, adapt, or even identify with the host culture in which the individual resides or works.
- *Marginalization*: The immigrant does not maintain allegiance to traditional beliefs, values, and behaviors, while not adopting the values of the host culture. These individuals are truly marginalized as they do not have a good or strong sense of identity with either their traditional culture or with mainstream culture.

Each mode of acculturation possesses specific possibilities for mental health issues or neuropsychological testing implications (i.e., relevance of use of specific neuropsychological tests) for immigrants; therefore, it is pertinent to assess individuals with respect to their level of acculturation (Cuellar, 2000). Also, second or third generation Asian Americans may be acculturating to two cultures simultaneously, and consequently may face cultural conflicts (Cuellar, 2000). While this information may be difficult to gather during the interview process due to fluency issues or the examinee's lack of insight into their level of acculturation, this information is integral to test selection, conceptualization of the presenting problem(s), and treatment recommendations. For example, an Asian patient in the *separation* mode of assimilation would not receive a treatment recommendation of group cognitive rehabilitation well.

Patients may feel shameful about their cognitive disorder diagnosis, which could decrease their chances of receiving treatment in a group format. Neuropsychologists should remain mindful in all aspects of work with Asian patients, and consider how acculturation could impact their treatment.

Impact of Asian Culture on Psychopathology/Differential Diagnosis

Several factors contribute to the underrepresentation of psychopathology within the Asian American population. Uba (1994) indicated that rates of psychopathology typically come from three sources: subjective reports of psychological distress, rates at which mental health services are sought, and clinical diagnoses of psychopathology. However, this set of criteria for determining rate is not applicable to the Asian American population due to several factors. Different cultures possess varying criteria for what determines troubling behavior and have different ideas about which problems are psychologically based (Uba, 1994). In the Asian American population, low rates of psychiatric disorders may be related to the tendency to manifest psychic distress as physical ailments (Chang, 2002). Studies have found that the tendency toward somatization is probably the strongest example of psychological symptom expression in the Asian American population (Leong & Lau, 2001). Also, data suggest that Asian Americans are less likely than the general population to use mental health services, so prevalence rates of psychopathology based solely on clinical diagnoses will be inaccurate (Sue, Sue, Sue, & Takeuchi, 1995).

Asians can face increased risk for misdiagnoses due to culturally biased criteria for expressions of psychopathology (Chang, 2002). Leong and Lau (2001) indicate that ethnic minorities may define and express problems differently because of cultural

behavior patterns and communication styles. Misdiagnoses may also occur due to therapist bias and inaccurate evaluation of Asian American patients. Overpathologizing occurs when a clinician incorrectly judges variations of belief, behavior, or experience in a patient's culture as psychopathological because of the clinician's narrow frame of reference (Leong & Lau, 2001). Conversely, a clinician's lack of experience with diverse cultural groups may result in the justification of all symptoms as cultural as opposed to pathological, thus resulting in underdiagnosis (Leong & Lau, 2001). For example, a clinician with superficial multicultural training may attribute a patient's paranoia as an adaptive reaction to oppression, when the patient actually warrants a diagnosis of paranoia (Sandhu, 1999). Clinicians or examiners who do not possess cultural sensitivity may also avoid discussion of important areas, possess a lack of awareness of historical influence on patient presentations, and have difficulty assessing patient strengths and weaknesses (Roysircar, 2005). Examiners cannot afford to neglect the importance of ethnicity and culture given the amount of diversity in America.

Other elements in the assessment and diagnostic process that can lead to bias with diverse individuals are the use of the DSM-IV-TR as a foundation for diagnosis and biopsychosocial factors of the patient. The reliance on the cost conscious medical model in the United States may lead to a preoccupation with diagnosis and symptom checklists in favor of more comprehensive testing and assessment (Sanchez & Turner, 2003). Narrowed focus on a diagnosis based on the DSM could perpetuate false assumptions due to its lack of an inclusive delineation of multicultural variability (Roysircar, 2005). This leaves the DSM vulnerable to aiding in misdiagnosis, misprognosis, and mistreatment of

minority patients, when their symptoms and test results are based on Euro-American social norms (Roysircar, 2005).

With regards to biopsychosocial factors, culturally diverse patients may encompass multiple socially constructed identities and retain cultural and sociopolitical experiences that could present a challenge in assessment (Roysircar, 2005). A history of physical complaints that include multi-systemic symptoms may be due to a diagnosis of somatization disorder. Yet, if these symptoms were considered in the context of an individual who was raised in Asia, the diagnosis may not be warranted, due to cultural differences in the way individuals describe symptoms. This demonstrates the importance of cross-cultural sensitivity because biopsychosocial factors of the patient can influence assessment results and produce an inaccurate diagnosis. An accurate psychological diagnosis is integral in determining the etiology of cognitive dysfunctions during the neuropsychological testing process. For example, individuals with anxiety may experience difficulty on timed tests due to worries of making mistakes or individuals with depression may not attend to stimuli to the best of their abilities. Asian individuals may not receive a necessary diagnosis of depression due to cultural expressions of mental illness (i.e., psychosomatization), and his or her low scores on tasks of attention and concentration may be incorrectly attributed to cognitive dysfunction.

Linguistic issues can also impact the diagnostic process. For example, Del Castillo (1970) found that Hispanic patients revealed psychotic symptoms in interviews held in their native language, but the symptoms were absent when they were interviewed in English. Del Castillo hypothesized that the intellectual effort of utilizing a foreign language causes the patient to concentrate carefully and remain in better contact with

reality. However, it is plausible that a non-native Asian American can present as disorganized, withdrawn, or disturbed due to their inability to communicate freely in their native language (Leong & Lau, 2001). This poses a problem for a clinician who is attempting to diagnostically differentiate the etiology of a patient's problems. The patient may be unable to detail his or her psychological and medical history due to lack of English fluency. One of the symptoms of dementia can present as paranoid ideation, and it may be difficult to determine if an Asian patient's disorganization or disturbed presentation is due to a psychological or neurodegenerative process.

A study in 2007 revealed that that prevalence of serious psychological distress in the Asian American population was 6.4%, but none of these individuals sought services (Substance Abuse and Mental Health Services Administration, 2008). Asian Americans have been found to underutilize mental health services and when services are sought, individuals often have more severe symptoms and are more severely disturbed than non-Asians (Sue & Sue, 1987). Leong and Lau (2001) isolated four specific barriers to help-seeking in the Asian American population: cognitive, affective, value orientation, and physical. Cultures inform the conceptions that develop regarding mental health and mental illness. Cognitions include traditional notions about the nature, causes, and cures of mental illness and determine the definition of well-being (Leong & Lau, 2001). Essentially, an individual needs to possess an understanding of illness and health in order to differentiate between the two states and seek help accordingly. Findings from a study with recent Chinese immigrants revealed that dementia symptoms may be interpreted as signs of mental illness, which is viewed as shameful (Elliot, Di Minno, Lam, & Tu,

1996). The embarrassment associated with mental illness in the family would prevent or delay them from seeking cognitive assessment for their family member.

A prevalent cognitive barrier within the Asian American community lies in the widely held concept of mind-body holism, in which there is no clear distinction between psychological and physical ailments (Leong & Lau, 2001). If Asian Americans believe that all symptoms are tied to organic causes, then the natural course of action would lead to seeking help from a medical doctor, particularly if the individual has cognitive complaints. The underutilization of mental health services by Asian Americans is further compounded by the fact that Asian Americans may think that it is detrimental to dwell on gloomy or disturbing thoughts (Leong & Lau, 2001). This population may view mental illness as a problem solved through willpower and avoidance of disturbing thoughts (Leong & Lau, 2001). Cross-cultural research reveals that therapists have to make an effort to bridge the gap between cultures in terms of mental health treatment (Kim, Atkinson, & Umemoto, 2001). This can be accomplished through establishing credibility through age, expertise, education, and through demonstrated skill (Kim, et al., 2001).

Asian Americans may cognitively understand the nature of mental illness, but the emotions associated with mental health issues may prevent help seeking behavior (Leong & Lau, 2001). Stigmatization remains pronounced in the Asian American culture with respect to mental illness, and research suggests that the concern of shame impedes the search for assistance (Uba, 1994). Narikiyo and Kameoka (1992) found that Japanese Americans tend to first look towards family for help to avoid having their name viewed poorly by others or to publicly admit problems.

Leong and Lau (2001) explain that the third barrier to help seeking is the inherent conflict between Western individualistic norms and Asian collectivistic values.

Traditional psychotherapy emphasizes open verbal communication, exploration of intrapsychic conflicts, and places heavy importance on the individual (Leong & Lau, 2001). Leong and Lau assert that these processes encourage the patients to put their own goals and needs above that of their collective support systems. This could potentially exacerbate an Asian American patient's emotional condition because the patient may worry additionally about bringing shame to his or her family. In terms of cognitive assessment, Asian Americans may be less likely to seek treatment for learning disabilities because of the stigma attached to mental deficiency or cultural values that emphasize effort over abilities (Uba, 1994). Another barrier is the physical inaccessibility or lack of awareness of available services (Leong & Lau, 2001). Often, families will have trouble finding the time to seek services, lack the finances to leave their children in child care, require transportation, etc, and these practical issues may prevent their participation in mental health services (Leong & Lau, 2001).

Cultural issues may also play a tremendous role in terms of the stigma attached to mental health issues. The conceptualization of mental illness in Asian cultures differs drastically from Western, individualistic thinking, and mental illness in a family member may be viewed as a failure of the family system itself (Sue & Sue, 1987). Ying and Hu (1994) found that increased acculturation appears to influence positive attitudes toward seeking psychological services and higher levels of actual help-seeking behavior. Fortunately, ethnic specific services were established in recognition of the need to offer mental health services for diverse populations (Leong & Lau, 2001). Ethnic-specific

services consist of bicultural and bilingual staff, culturally relevant treatment practices, and culturally familiar services (Leong & Lau, 2001). Outcome studies reveal that therapist-patient ethnic match significantly predicts increased service for all groups, with the exception of Southeast Asians (Ying & Hu, 1994). Regrettably, research about the importance of psychologist-patient ethnic match in psychological assessment or neuropsychology is less well developed. However, there is no question that cross-cultural dynamics can negatively affect an assessment and impair a psychologist's ability to diagnose and conceptualize a patient (Uomoto & Wong, 2000).

If psychopathology is not accurately diagnosed and evaluated, it can significantly complicate the differential diagnosis process. Research has revealed that psychopathology can present as cognitive impairments, which influences the ability to collect accurate measures of cognitive functioning. For example, a study comparing neuropsychological tests of patients with unipolar depression with age and IQ matched controls revealed that depressed patients showed at least some impairment, with deficits seen across cognitive domains (Elliot, Sahakian, McKay, & Herrod, 1996). An additional finding showed detrimental effects of failure on subsequent performance, and depressed patients were far more likely than controls to fail a subsequent item after solving a previous item incorrectly (Elliot, Sahakian, et al., 1996). This demonstrates the way in which an accurate evaluation of cognitive difficulties can be compromised if psychopathology has not been assessed correctly. The role of examiners includes ensuring that they have assessed a patient based on best effort. However, the impact of psychopathology on motivation exhibits the importance of factoring in all aspects when determining a diagnosis.

Impact of Cultural Values on the Testing Experience

A complete case conceptualization is often the first necessary step to reconstruct what and how patients are experiencing their problems within the context of their particular cultural environment (Zane & Yeh, 2002). Zane and Yeh (2002) indicated the need for a conceptual framework that comprehensively accounts for the bicultural experience of individuals and describes the salient cognitive, affective, and behavioral aspects of a person's functioning. An important construct in the East Asian culture is the concept of *filial piety* and *face* (Ho, 1976). Ho (1976) defines face as:

Respectability and/or deference which a person can claim for himself from others, by virtue of the relative position he occupies in his social network and the degree to which he is judged to have functioned adequately in that position as well as acceptably in his general conduct; the face extended to a person by others is a function of the degree of congruence between judgments in his total condition in life, including his actions as well as those of other people closely associated with him, and the social expectations that others have placed on him. (p. 882).

This cultural concept is an essential part of a case conceptualization involving an Asian patient because it will determine the presentation, rapport, and working alliance between clinician and patient. With specific relevance to cognitive assessment, a desire to avoid loss of face may lead Asian Americans to avoid guessing answers, elaborating upon responses, or providing self-assured statements (Zane & Yeh, 2002). Zane and Yeh caution that in Asian cultures, a response of "I don't know" may not indicate that an individual does not know an answer, but rather, it may reflect modesty or an uncertainty about the response. The concept of face may also contribute to high premature termination rates and short treatment stays in mental health systems (Zane & Yeh, 2002).

Another important construct in East Asian culture lies in the concept of *shame*. Societies like Japan have been described as a shame culture in which experiences of

shame are actively promoted (Okano, 1994). The belief remains that one's values should not be exposed openly but remain implied or suggested (Okano, 1994). This idea implies the notion that what is hidden is powerful (Okano, 1994). This construct may play a tremendous role in a testing setting with an assessor. Okano (1994) notes that typical Japanese examples of culturally promoted shows of shame include: not staring at others, especially elders or superiors, not engaging in verbal assertion or making one's opinion clear; and not showing off competence and competitiveness to others. An examiner who remains unaware of these cultural issues may note that an examinee did not make eye contact or was verbally reticent and question emotional or psychopathological issues. Additionally, during cognitive assessments, queries are often utilized to give patients an opportunity to demonstrate their true capabilities. An Asian patient may not utilize this chance in order to avoid appearances of showing off, which would result in scores that do not demonstrate the patient's true abilities.

In addition to the question of reliability and validity of standardized test results with Asian Americans, test scores must be interpreted in the context of cultural constructs and ethnic factors. Native language, years of education abroad and in the United States, occupation, and languages spoken in the home are all examples of the factors that must be considered in neuropsychological assessments with this population. Ethnocultural and linguistic factors present potential limitations to accuracy of neuropsychological test results and test score interpretation.

Psychometric Issues with Ethnic Minorities

While ethnocultural and linguistic factors present obvious limitations to accuracy in assessment, additional factors can contribute to invalid test results. Bias in tests can

present in three major ways: the content or construction of the test items, incidental features such as formatting, mode of test administration, examiner characteristics, and the inappropriate use of tests (Padilla & Medina, 1996). Test translation has not provided an acceptable solution to the issue of inappropriate testing due to the following reasons:

1. Test directions utilize psychological terms and are difficult to translate (Bracken & Barona, 1991).
2. Practitioner produced translations rarely utilize back-and-forth translation (Ardila, 2005).
3. Psychological constructs may not be universal across cultures (Ardila, 2005).
4. Cultures vary with regards to what is deemed important to assess in achievement tests (Berry, Poortinga, Segall, & Dasen, 1992).
5. Test taking behavior and orientation towards test directions and procedures can differ between cultures (Ardila, 2005).
6. Standardization for translation may not exist across languages and cultures (Ardila, 2005).

Admittedly, the heterogeneity of Asian Americans poses a tremendous barrier in test standardization efforts due to the amount of sampling that would be necessary to include each ethnicity and the amount of funding and effort it would require to collect the necessary data (Okazaki & Sue, 1995). This may be the primary reason that Asian Americans are notably missing or represented in low numbers in normative data and clinical populations (Okazaki & Sue, 2000). Even in large-scale standardization studies for popular instruments such as the WAIS-III, Asian Americans were not oversampled like the African American and Hispanic populations, due to possible difficulties in locating large populations of Asian Americans who may also be geographically scattered and possess lower levels of English fluency (Okazaki & Sue, 2000). However, the exclusion of Asian Americans in test standardization and norming procedures may affect

the cross-cultural and psychometric equivalence data for standardized assessment instruments (Okazaki & Sue, 2000).

Neuropsychological Testing with Asian Americans

A GoogleScholar search of neuropsychological studies with Asian Americans result in almost 10,000 hits, but the research predominantly examines how to administer neuropsychological tests to diverse populations or reiterates the need for further research with the Asian population. The number of quantitative cognitive assessment studies with Asian Americans is noticeably minimal. The majority of available studies only include around ten percent Asian American subjects in their study, and some studies only utilize one Asian subject. However, several studies have taken steps to focus research on the Asian population and consider the role that culture plays on cognitive development and functioning.

Wang (2009) examined episodic remembering with the Asian population based on the results of several cross-cultural studies that demonstrated that Asians have less accessibility to episodic memory than Euro-Americans. Episodic memory, also called declarative memory, refers to memories of one's own experiences (Meyers, 2000). Wang (2009) found that cultural differences in episodic recall may not be a consequence of memory retention, but culture-specific perceptual processing and encoding. Further research in the differing performances of ethnic groups in neuropsychological processing tasks could produce a new set of ethnic normative data to base test scores against. Green, Crinion, and Price (2006) discovered that both functional and structural brain changes are associated with the acquisition of other languages. This finding is important for future treatment because these differences in language acquisition and expression may also

indicate variances in the recovery pattern of bilingual speakers. This could clarify potential disparities in which cognitive rehabilitation occurs within specific ethnic groups with brain injury. The growth observed in the field of neuropsychology has only magnified the need for cross-cultural normative data. Lu and Bigler (2002) have taken steps to answer this need by providing normative data for neurologically normal, Chinese-speaking adults in the United States.

These studies represent a sample of the ongoing research that is occurring with this ethnic population. A review of existing cognitive studies with Asian Americans is necessary to gain a comprehensive understanding of the challenges that are present during neuropsychological testing. Continued research is necessary in order to discover both similarities and differences in cognitive functioning that could potentially impact the way in which neuropsychological testing is administered to not only Asian Americans, but differing subgroups within this population (i.e., completed education in Asia, unacculturated Asians, refugees, etc.). The current state of neuropsychology in the U.S. does not afford much flexibility in testing due to the lack of cross-cultural research. The existing approach is to provide the most competent service based on the examiner's knowledge of the patient's background and culture.

Unfortunately, there is very little empirical evidence that indicates what constitutes culturally competent assessment practices with Asian Americans (Okazaki, 1998). More generally, culturally sensitive assessment should include continuing and open-ended adaptations that are specifically designed to integrate the process of assessment with cultural characteristics of the group (Padilla & Medina, 1996). Most existing research studies how an individual's cultural background may influence his or

her performance on standardized assessments, but no further research has given systematic information to guide culturally competent administration of psychological testing in general, or neuropsychological testing in particular (Okazaki, 1998). A significant source of cultural bias in testing with the Asian American population lies in the fact that there is a lack of concrete explanatory or descriptive instructional guides that clinicians can utilize to construct a meaningful or valid assessment (Zane & Yeh, 2002). It appears that clinicians tend to utilize experience with past Asian American patients or previous education on cultural sensitivity to address bicultural patients; yet, clinicians cannot articulate reasons for selecting particular strategies or implementing certain procedures (Zane & Yeh, 2002).

General best practice guidelines for testing prefer the use of culturally similar examiners who speak the native tongue of the patient (Puente & Perez-Garcia, 2000). Division 40 of the American Psychological Association (i.e., clinical neuropsychology) has a disproportionately smaller number of ethnic minority members, fellows and officers when compared to other divisions (Puente & Perez-Garcia, 2000). It may be difficult for an ethnic minority individual to receive neuropsychological testing based on best practice guidelines due to the sheer lack of practicing ethnic minority neuropsychologists. The lack of diversity within psychologists, and more so within practicing clinical neuropsychologists, puts ethnic minority patients seeking neuropsychological assessment at a distinct disadvantage.

The ideal testing situation for a non-native Asian American patient is testing by a trained bicultural, bilingual test administrator in the patient's native language with translated versions of the tests that possess established psychometric properties (Okazaki

& Sue, 2000). Various versions of the Wechsler Adult Intelligence Scale (WAIS) has been translated and standardized in several Asian nations such as Japan, China, Korea, and India (Hindi), although it is not clear whether these versions are readily available in the United States (Okazaki & Sue, 2000). However, even utilizing Asian standardized normative data may not always be appropriate because the immigrants in the United States may not be representative of those who remain in their native country with regards to education, socioeconomic status, cultural values, subjective experiences, etc (Sue et al., 1995).

Also, instruments developed in the United States often are normed on a majority group population or developed on Eurocentric approaches (Padilla & Medina, 1996). This highlights the limbo that Asian Americans are trapped in, especially if they are not fully fluent in the English language. Given current testing standards, examiners may also face the dilemma of using translated tests, if they are available, or giving the Asian American patient a Eurocentric testing battery. At this point, the WAIS does not have any published data on the reliability or validity of Wechsler tests with the Asian American population and translated tests may not be updated as regularly as the original American version (Okazaki & Sue, 2000). This results in potentially invalid and unreliable results in which patient's performance may be compared to Eurocentric population or an outdated normative data (Okazaki & Sue, 2000).

Another issue stems from the presumption that non-verbal tests are culture-free due to the lack of a language component (Iverson, 2000). However, several studies have found contradicting evidence. For example, Jacobs et al. (1997) administered a battery of neuropsychological tests to large samples of age, education, and gender matched English-

speaking and Spanish-speaking elderly adults. The tests were carefully translated into Spanish, yet the Spanish-speaking adults performed more poorly on several measures, especially the nonverbal measures (Jacobs et al., 1997). Non-verbal tests also possess cultural bias; for example, pictorial representations are often unsuitable due to marked differences in the perception of pictures by individuals of different cultures (Miller, 1973). Also, poorer performances on non-verbal measures may be indicative of the fact that individuals have not been exposed to certain tasks in their culture. So-called “universal skills” such as copying figures and drawing a map are absent in certain cultures (Ardila & Moreno, 2001). Another study revealed that within a sample of 190 elderly Chinese participants, fewer than 60% of the uneducated participants were able to perform tasks such as the WAIS Digit Symbol, Trails A, or draw a clock (Salmon, Jin, Zhang, Grant, & Yu, 1995). These findings exhibit the need for continued research on the use of non-verbal tests with English as second language patients, with specific focus on its validity and reliability with ethnic minorities.

The litany of issues surrounding neuropsychological assessment with Asian Americans elucidates the need for the rapid development of solutions. As previously mentioned, an existing alternative for testing with this population lies in test adaptation or translation. However, researchers cannot begin the process of adapting instruments without knowledge of the appropriateness of a measure in the culture of interest. In terms of utilizing test instruments in cross-cultural research, several factors must be considered to avoid bias and yield valid results. Flaherty et al. (1988) describes three priorities of test selection: a) instruments already proven to be cross-culturally equivalent (rare), b) instruments that have been extensively tested and found to be psychometrically sound in

one culture but have not been tested in other cultures, c) instruments that have high face validity but require further psychometric testing in the country of origin followed by cross-cultural validation (p. 258). However, if appropriate tests do not exist for a culture in terms of the measurement of a particular concept, then the researcher needs to construct a new instrument. Flaherty et al. indicates that this involves both psychometric testing and an evaluation of the cultural equivalence of a new instrument. Keane, Kaloupek, and Weathers (1996) define equivalence as the extent to which an assessment instrument fulfills its promise across different cultures and subcultures within a society (p. 186).

Flaherty et al. (1988) proposes five major dimensions of cross-cultural equivalence:

1. *Content equivalence*: the content of each item of the instrument is relevant to the phenomena of each culture being studied.
2. *Semantic equivalence*: the meaning of each item is the same in each culture after translation into the language and idiom (written or oral) of each culture.
3. *Technical equivalence*: the method of assessment (e.g., pencil and paper, interview) or method of data collection is comparable in each culture with respect to the data that it yields.
4. *Criterion equivalence*: the interpretation of the measurement of the variable remains the same when compared with the normative data for each culture studied.
5. *Conceptual equivalence*: the instrument is measuring the same theoretical construct in each culture (p. 258).

Content equivalence taps into multitude of manners in which different cultures can define or experience distinct constructs. Keane et al. (1996) suggest the use of focus groups consisting of professionals familiar with the culture, language, and mores of the society of interest to generate a comprehensive list of topics that encompass a culture's

definition of a construct. Items from the list of topics can serve as a foundation for the development of an assessment instrument.

Semantic equivalence involves the translation of an instrument from the parent language and then back-translation to see if the original meaning is retained (Keane et al., 1996). Optimally, several translators would work together to discuss the concept of interest and examine the intricacies of a topic within a cultural context. Keane et al. (1996) indicate that grammar, denotative meanings, and connotative meanings should be similar or equivalent in the final product. Additionally, in completing a translation, using a word that is generic in nature and one that is broadly reflective of the culture of interest would appear to be the most useful (Arnold, Cuellar, & Guzman, 1998). The rationale behind this translation approach is that the less complex the verbal performance requests, the greater the likelihood that it will be meaningful to a larger number of potential patients in the target population (Arnold & Matus, 2000).

Technical equivalence refers to the use of comparable metric methods in measuring a construct (Keane et al., 1996). Lack of technical equivalence can result in method bias, and this can be discovered through repeated administrations of a translated test or when variations in performances across administrations are observed for individuals who initially hold similar scores (Arnold & Matus, 2000). Method bias can be observed through the use of triangulation, which is a procedure that emphasizes the use of multiple measures to identify a particular construct (Van de Vijver & Leung, 1997). Researchers may not be aware of the fact that types of measurements that are salient to a Western culture may not translate to an Asian culture. For example, Likert scales or true/false methods may not hold any relevance to a non-Western individual and

validity may be lost at the onset of assessment (Keane et al., 1996). Problems exist when cultural factors such as deference for figures of authority prevent examinees from expressing their lack of familiarity with a measurement. Test taking behaviors have been hypothesized to be culturally learned (Arnold & Matus, 2000).

Criterion equivalence or normative data equivalence retains importance due to the fact that normative data determine the differentiation between normal or abnormal results in assessment (Keane et al., 1996). However, normative standards must also be determined within a cultural framework and often standards vary markedly between societies. Assessment tools designed in a Western culture will evaluate individuals from a Eurocentric lens and may be fundamentally inappropriate for use with persons from different cultures. Keane et al. (1996) state that making comparisons between non-Western individuals' performance on instruments developed with Western normative data is problematic because it gives precedence to the Western way of experiencing life and it does not inform the examiner of the status of individuals relative to their cultural peers. Cuellar (1998) suggested that if there is similarity between the performances of a normative data group on a particular test and the performance of a culturally distinct target group on a translated version of the same test, and if the normative data distributions are not significantly different, then the original normative data may be useful if translated with caution. However, care must be taken in this case to ensure that the translated test discriminates at a level of specificity and sensitivity (Arnold & Matus, 2000). Care must be taken to ensure the clinical utility of a test with target populations, and to make certain that individuals are properly assessed without being overpathologized.

Conceptual equivalence determines whether different cultures possess equivalent meanings of a concept (Keane et al., 1996). Marsella (1987) numerated a series of steps that could increase the conceptual equivalence of measurement tools across cultures: (a) eliciting the domain of the concept, (b) categorizing the items through an acceptable means of ranking, (c) examining and rating the meaning of items that have been generated through word association, and (d) identifying the behavioral referents of the concept being studied.

The next step in cross-cultural research should include the design of an instrument that can be used in different cultures and yield quantitative and replicable findings (Ardila, 2005). Instrument development involves a rigorous process of research and restandardization with the culture of interest. Unfortunately, the glaring lack of research in the area of neuropsychological or cognitive testing with this population does not promote optimism for future restandardization or normative data sampling. Neuropsychological testing continues with this population, with stipulations that test results should be interpreted with caution. However, in order to gain comprehensive knowledge about specific cultures, initial action must be taken to begin groundwork for further research.

Goals of cross-cultural testing includes assessing the commonality of a psychological concept, as well as possibly explaining the differences or similarities of functional abilities from differing cultures (Butcher, Lim, Nezami, 1998). Ultimately, psychometric equivalence is the degree with which test instruments measure the same variables at the same level across cultural groups (Helms, 1992).

Specific Objectives for Review and Analysis

The objective of this present literature analysis is to critically analyze the specific challenges that exist in neuropsychological assessments with Asian Americans and evaluate former and current attempts to alleviate this issue. The questions that will be examined include: (a) What are some historical challenges that have been documented in neuropsychological assessment with the Asian American population? (i.e., help-seeking behavior, cultural values [deference, face, shame, etc.], consequences of immigration experience, levels of acculturation, diversity in the definition of bilingualism, effect of second language acquisition on cognitive development and processing, lack of normative data, translated tests, use of translators) (b) What recommendations can be made to improve culturally competent assessment with the Asian American population?

Definition of Terms

Asian American: Given the heterogeneity of Asian ethnicities and limited research with this cultural group, the term Asian Americans will include Korean, Japanese, Chinese, Vietnamese, and Filipino individuals.

Adult: Adulthood will range from the end of the adolescence (i.e., age 18; Gemelli, 2008) to the beginning of geriatric age (i.e., 65; Hybels, Blazer, & Hays, 2009).

Culture: Shared learned meanings and behaviors that are transmitted from within a social activity context for purposes of promoting individual/societal adjustment, growth, and development (Marsella & Yamada, 2000).

Ethnicity: Reflects group composition in which membership is based on common descent, physical characteristics, and heritage (Ardila, Rosselli, & Puente, 1994).

Neuropsychology: Neuropsychology demarcates three populations for treatment, and these include children, adult, and older adult. Adult neurological problems may stem from cerebrovascular accidents, neoplasm (i.e., tumor), infectious and inflammatory diseases, degenerative diseases, head trauma, demyelinating disease, or dementing diseases (American Psychological Association, 2003). Adult psychiatric populations may be referred for the differential diagnosis of somatoform disorders of a pseudoneurologic nature, depression as a component of dementia, psychosis as a pseudodementing disorder and as a differential diagnostic entity to be distinguished from behavioral disturbance in select neurological populations (e.g., partial complex seizure disorder, frontotemporal dementia, etc.; American Psychological Association, 2003).

Chapter II

Review and Analysis Procedures

Introduction

This chapter presents aspects of the research methodology, which includes review procedures such as identification and collection of relevant literature, and analysis procedures such as detailing past challenges in the neuropsychological assessment of Asian Americans and making recommendations for culturally competent assessment procedures based on the outcome of previous procedures.

Review Procedures

Identification of relevant literature. Given the paucity of research on the neuropsychological testing of Asian Americans in the United States, the literature review for the purposes of this dissertation did not exclude any documents on the basis of their dates of publication. Additionally, neuropsychological research with other ethnic minorities was investigated in order to glean information that may help facilitate culturally competent assessment and also provide a basis for recommendations with Asian Americans. The primary research tools that were employed for the review of literature search will include the PsycINFO and PsycArticles electronic database; Academic Search Elite; Google Scholar; WorldCat; JSTOR; Project MUSE; Scopus; Research Library; and various University library catalogue holdings (e.g. Pepperdine University, UCLA, etc). Many sources were utilized in order to maximize the collection of relevant literature, and this review utilized quantitative and qualitative articles, comprehensive reviews of literature, commentaries, and books.

The following key words were used in the search tools during the literature review process in order to locate the greatest number of sources on this topic: *alphabetic language, Asian, Asian American, Asian language, Asian underrepresentation, assessment, bilingualism, cognition, cognitive assessment, cultural bias, dementia, disability, education in Asia, English language learners, English as a second language, idiographic language, immigrant, intelligence, interpreter, language of testing, learning disability, learning in Asia, model minority, neuropsychology, neuropsychological assessment, passive learning, psychological assessment, psychopathology, rapport, refugee, reliability, special education, stereotype, symbolic language, test development, third-party factor, translation, translators, trauma, traumatic brain injury, validity.*

Collection of Relevant Literature. Relevant literature was gathered in a variety of ways: books were borrowed from libraries and bought online, articles from databases were downloaded or printed.

Analysis Procedures

Basic analysis techniques. Each available source of literature was read thoroughly and placed in electronic folders that corresponded to a superordinate category. An outline was utilized to detail each category, and main ideas from different pieces of literature were written to develop ideas. Once this was completed, each piece of literature was reread in each folder, which helped to synthesize and formulate a critique of the literature in the following sections.

Challenges of Neuropsychological Assessment with Asian Americans

In this section, the author analyzed literature in order to investigate identified challenges that have been documented during cognitive and neuropsychological

assessments with the Asian American population. The literature was organized according to the following subheadings:

1. Effect of cultural values and immigration on help-seeking behavior. In this section, the impact of Asian cultural values, including their intergenerational transmission to subsequent generations on cognitive testing was reviewed. Additionally, the effects of trauma during immigration were examined to explore its effect on decreased help-seeking behavior.
2. Effect of bilingualism on neuropsychological assessment. In this section, the effect of culture and bilingualism on brain development was examined.
3. Current research on neuropsychological assessment with Asian American populations. The available neuropsychological research with Asian American populations was reviewed and analyzed to highlight contributions to this ethnic population.

Recommendations for Culturally Competent Assessment Procedures

Recommendations for culturally competent assessment procedures with Asian Americans were made based on current procedures, relevant findings from literature, and procedures utilized with other ethnic minorities in the United States.

Chapter III

Review and Analysis of Literature

This chapter will provide a comprehensive review of the literature that was previously outlined and critically analyze specific challenges that exist with the

neuropsychological assessment of Asian Americans. First, the impact of Asian cultural values, including their intergenerational transmission to subsequent generations, on cognitive testing will be reviewed. Next, the chapter will examine the effect of trauma during immigration, and how the unique immigration experience of each ethnicity can present to mental health professionals. This section will examine how racial biases that emerged during Asian immigration into the United States and Asian cultural values culminated to decrease the help-seeking behavior of this population. Next, this chapter will evaluate the effect of acculturation and bilingualism on brain development and discuss how differences could impact cognitive assessment or treatment planning. Finally, an extensive review of available cognitive studies with Asian American subjects will be provided and contributions to cognitive research with this ethnic population will be highlighted.

Effect of Cultural Values and Immigration on Help-Seeking Behavior

Prevalence of help seeking among Asian Americans. In 2007, an epidemiological study conducted by the Substance Abuse and Mental Health Services Administration ([SAMHSA], 2008) estimated the prevalence of serious psychological distress in the Asian American population within a 12-month period at 6.4%, which was notably lower than rates for American Indian (13.7%), Native Hawaiian (11.9%), White (11.3%), Black (10.5%), and Hispanic/Latino (10.2%) populations. In addition to the lower rates of reported mental disorders in the Asian sample, a striking 0% of the Asians who endorsed a history of mental illness in the past year sought mental health services, as opposed to 50.9% of Whites, 29.6% of Hispanic/Latinos, and 26% of Black/African Americans individuals who did (SAMHSA, 2008). Asian Americans may be more likely

to visit a medical doctor for psychological or cognitive issues, and this places the doctor in a position of educating the patient about the necessity or benefits of mental health services. The need to improve physician's knowledge of mental illness has been well documented in the literature, and studies have shown that once patients are seen by physicians, the referral to psychological services are low (Hodges, Inch, & Silver, 2001). Currently, controversy surrounds how best to provide ongoing mental health training for primary care physicians, and this is an area that needs continued investigation.

While prevalence information does not currently exist for the number of Asian Americans seeking cognitive testing, it would be interesting to determine if the number is higher than those who seek mental health services due to the values placed on education. Asian parents may be more willing to seek cognitive testing for an issue that could potentially negatively impact their children's educational performance. However, the issues of shame and stigma surrounding mental illness may extend to cognitive issues in a society where so much value is placed on education. Chang and Hsu (2007) performed a qualitative study with Taiwanese families who have a child with a learning disability. Buddhism is prevalent in Taiwan, and the researchers found that members of the Buddhist community may utilize their belief in karma (i.e., the idea of cause and effect) to infer that the parents of children with learning disabilities have sinned in their past life, and subsequently stigmatize the family (Chang & Hsu, 2007). The stigma that surrounds learning disabilities may be relevant to Asian families who live in the United States. The expectations of stigma from the community can compete with a parent's desire to further investigate ways to help their child. Additionally, a parent's uncertainty about where to seek help or how evaluation or treatment may occur can further decrease their likelihood

of searching for help. In this case, medical doctors and psychologists should work more closely to ensure that Asian Americans are aware of psychological services and the benefits of the services offered. Research literature reveals that community outreach with the Asian community has resulted in positive effects. For example, Lam et al., (2003) found that media education increased breast and cervical screening, decreased smoking, and increased hepatitis B vaccinations among Vietnamese Americans. Media education consisted of broadcasting television ads on Vietnamese-language television channels for a pre-determined period of time (Lam et al., 2003). Also, Braun, Takamura, Forman, Sasaki, and Meininger (1995) recognized that native language videos and brochures increased the awareness of Alzheimer's disease and sources of help within the Asian American community. These are viable options for reaching Asian Americans who may not speak English fluently and for those who are hesitant about seeing a psychologist.

Factors that affect help seeking among Asian Americans. Cultural values dictate the way in which people view themselves with respect to their world, and determine how they experience their problems. The intake process should include an investigation of an individual's cultural values; culture specific values can include stigmas about mental health or conceptualizations of how mental health and cognitive issues may develop. Additionally, an exploration of the individual's past and current socioeconomic status is imperative, given the effects of life conditions (i.e., poverty, exposure to toxins, education) on cognitive development (Glymour & Manly, 2008). These factors can help an examiner begin to conceptualize the etiology of an Asian American's presenting problems and prevent the risk of misdiagnosis.

Asian cultural values. Assessment of cultural values is imperative in a cognitive assessment due to its global impact on an individual's functioning. Kim, Atkinson, and Yang (1999) attempted to empirically identify Asian cultural values through a three-stage research process consisting of a review of the literature on Asian cultural values, a nationwide survey of Asian American psychologists, and three focus-group discussions with Asian American participants. They identified 14 dimensions, with the caveat that the focus groups were primarily composed of Chinese and Korean-Americans, ethnicity information was not gathered from the psychologists, and the degrees of exposure to Asian values was unknown (Kim et al., 1999). In addition to the previously detailed domains of *filial piety, face, and shame*, Kim et al. identified *willpower, self-control and restraint, collectivism, conformity, deference to authority figures, self-effacement, educational and occupational achievement, importance of family, interpersonal harmony, placing other's needs ahead of one's own, and respect for elders and ancestors*. These cultural values have the potential to complicate the assessment process for Asian patients who ascribe strongly to them.

Willpower refers to the ability to resolve psychological problems on one's own and the value of *self-control and restraint* stems from the idea that it is better to hold your pain, suffering, and anger inside, as opposed to expressing them (Kim et al., 1999). *Willpower* and *self-control* rely heavily on one's ability to control the self and handle distress alone; therefore, asking for psychological help could be viewed as a sign of weakness for individuals who subscribe to these values. From this standpoint, the probability of an Asian American seeking psychological help is low, or they may only seek treatment as a last resort for a crisis situation. *Collectivism* describes a strong sense

of attachment to the group to which an individual belongs, and includes putting the welfare of the group before one's own (Kim et al., 1999). This value can be problematic to an Asian American in various ways, from feeling depressed due to a lack of other Asians in the community to neglecting one's own psychological or cognitive issues in order to focus on the family's wellbeing. *Conformity* involves following the norms of both society and family (Kim et al., 1999). An Asian American can become conflicted if their family norms clash with the norms of their individualistic society. A child of Asian immigrant parents may not seek mental health treatment if they are aware of the stigmas that their parents or family experience surrounding psychological help.

Deference to authority figures represents the respect that is given to those of authority, and this includes respecting those with a higher education, listening as opposed to talking, never referring to a person of position by their first name, and never questioning or evaluating an authority figure (Kim et al., 1999). This value in particular may affect the rapport between examiners and Asian American patients. Patient may not feel comfortable during assessments where the focus is solely on the patient's performance and Asian Americans may not refute misunderstandings or incorrect statements made by their psychologists. During cognitive assessments, the value of *self-effacement* may hinder the individual's ability to fully display their cognitive capabilities. *Self-effacement* dictates that one minimizes one's achievements, discourage individual attention to the self, and attribute accomplishments to the support received by others (Kim et al., 1999). This could stunt a psychologist's ability to gather all of the information necessary to provide the best care that is possible. The value of *educational and occupational achievement* has helped to create the "model minority" stereotype that

exists in Western culture. As Asians immigrate into the United States and face a decline in their socioeconomic status, they may feel that education is the primary avenue to success in the United States. The success derived from motivation, hard work, and perseverance is also viewed as a way to make one's parents proud of oneself; therefore, it may be difficult for an individual or the family to acknowledge the existence of a learning disability. Unfortunately, this can delay the decision to seek assessment, which could determine diagnosis and course of treatment for the individual.

The value of *family* is a consistent theme with respect to Asian Americans. Within a collectivistic society, individual family members feel a strong sense of obligation, honor, and duty to one's family, and members are expected to follow the role expectations set by the family as a whole (Kim et al., 1999). Personal achievement is viewed as family achievement, and conversely, personal failure is the failure of family system as a whole. Therefore, Asian American families may shield members with mental illness or cognitive disability as opposed to seeking help for the individual from mental health professionals. The family member dealing with psychological issues may remain silent in an effort to *maintain interpersonal harmony*. If the patriarch of the Asian family does not feel that a particular member has any problems, then an individual family member will likely not say anything that may cause the patriarch to lose face (Kim et al., 1999).

The value of *interpersonal harmony* compounded by the value of *placing other's needs ahead of one's own* may perpetuate stigmas of mental illness. For example, if the elder member of an Asian family begins to experience a decline in cognitive functioning and is in need of a cognitive or psychological evaluation, younger members may have

difficulty raising this issue with the elder member. Within the Asian culture, elders and ancestors are viewed with respect, and younger individuals avoid bringing displeasure to elders and they never confront, talk back, or go against the wishes of elders (Kim et al., 1999). Additionally, parents may ignore cognitive issues that they are experiencing (e.g., cognitive decline, memory issues subsequent to a traumatic brain injury) because they want to take care of their children's health issues or needs before their own.

Intergenerational transmission of cultural values.

Intergenerational transmission of cultural values, particularly within collectivistic cultures, ensures that subsequent generations of family members retain and embody concepts that bring honor to the family name. Therefore, psychologists should routinely determine to what extent cultural factors are relevant for each patient, regardless of the number of years a patient has lived in the United States. Wong and Fujii (2004) note this is important in establishing whether the patient should be referred elsewhere. The decision to refer should depend on the clinician's comfort level, knowledge base, competency, expertise with a particular culture, and the availability of better alternatives (Wong & Fujii, 2004). Additionally, level of acculturation is important to assess because of the positive relationship between acculturation and delinquency (Boutakidis, Guerra, & Soriano, 2006). First generation youth may have more commitment and a stronger identification to their culture of origin, whereas, second generation youth may have experiences of greater identity diffusion or confusion as they attempt to understand their parents' native culture and the mainstream culture in consolidating their own ethnic identity (Le & Stockdale, 2008). This information reveals the importance of never assuming that Asian American youth will possess the cultural values of their parents.

Acculturative dissonance reflects the general conflict that occurs when parent and youth cultural systems clash as a result of the differential acculturation experienced by the parent and youth (Rumbaut & Portes, 2002). Second generation Asian Americans may choose to completely alienate their Asian culture in an effort to assimilate to the mainstream culture. Conversely, highly acculturated Asian Americans were found to express more positive attitudes towards seeking psychological services and show higher levels of actual help-seeking behavior (Abe-Kim et al., 2007). Level of English fluency may not be a definitive indicator of an individual's level of acculturation. A child may possess their Asian parents' stigmas surrounding mental illness or cognitive disability and potentially minimize or hide any issues that they may be having. Also, during cognitive testing, an Asian American child may not correct the examiner of any misunderstanding in keeping with the collective value of deference to authority figures. Examiners should recognize this fact to garner the most accurate results during testing with both Asian American adults and children.

Socioeconomic status. During an intake process, therapists and examiners should explore socioeconomic status due to its impact on help seeking behavior. Asian immigrants often experience a downward shift in socioeconomic status, and they face all of the risks associated with poverty. Lower paying occupations often involve less safe work conditions and have limited opportunities for promotion. Unsafe working conditions can expose workers to toxins that could affect functioning in the central nervous system. Exposure tends to have a dose-response effect where more damage is caused the longer one is exposed. Also, dangerous working conditions increase the risk for head injury. Multiple brain injuries result in cumulative cognitive problems and

increase the susceptibility for additional neurological damage. Unfortunately, low income significantly impacts an individual's ability to access healthcare. If a family member exhibits signs of mental illness or cognitive impairment, treatment may be deferred or overlooked, especially if the psychological or cognitive process is in the early stages or not perceived as serious within the family (e.g., depression, learning disability). However, if an Asian family is faced with a crisis situation (i.e., self-harm, late stage dementia), medical expenses can devastate a low-income family. Himmelstein (2005) found that medical conditions contribute to approximately half of bankruptcies in the United States. While lack of insurance and financial barriers decrease help seeking behavior, studies have shown that even when health insurance plans do cover mental health services, treatment seeking does not increase for ethnic minorities (Hwang, Myers, Abe-Kim, & Ting, 2007). Further research is necessary to delineate the factors that contribute to the underutilization of mental health services with minority populations.

Harmful exposures or lack of nutrition due to poverty during early life can increase the likelihood of impairments in older age, such as derailing the maturation trajectory, promotion of pathological processes, and restricting compensation or resilience after pathological events (Glymour & Manly, 2008). Poverty affects the social trajectory of an individual's life and reduces access to education, which increases the likelihood of adult poverty, risk of depression, and diagnosis of cognitive impairment (Glymour & Manly, 2008). Additionally, a lack of access to quality education influences the cognitive aging process. The cognitive reserve hypothesis refers to the finding that during later life, those with more experiential resources (e.g., education, knowledge base) exhibit higher levels of cognitive functioning (Tucker-Drob, Johnson, & Richard, 2009).

Higher-level education appears to have a protective factor with respect to the cognitive declines associated with aging (Tucker-Drob et al., 2009). Asian families encourage their children to focus on their schoolwork in order to promote movement up the socioeconomic ladder. However, immigrant Asian parents may face cognitive issues later in life due to their lack of educational experience.

Individualistic foundations of psychology.

In the Introduction (Chapter 1), the individualistic foundation of psychology in the United States and its impact on Asian help seeking behavior was discussed. Hwang et al., (2007) express that while people all around the world experience mental illness, the manifestations of distress differ in terms of how they are communicated, experienced, expressed, and how society may view certain symptoms. The demarcation of etic (culture-universal phenomena) versus emic (culture-specific phenomena) syndromes is useful in expanding understanding of how mental illness can present across cultures. Hwang et al. argue that individuals from different cultures may endorse varying symptoms despite suffering from the same mental illness. For example, Asian cultures may manifest depression through more somatic symptoms such as stomachaches or headaches.

However, Asian individuals may not meet criteria for depression in the United States because the DSM diagnosis for depression does not place heavy emphasis on somatic symptoms to meet criterion (Hwang et al., 2007). Leong and Chau (1997) proposed a model for determining problems in the clinical diagnosis and assessment with Asian Americans using the concept of *threats to cultural validity*. These threats include: therapist bias in clinical judgment, inappropriate use of diagnostic and personality tests,

cultural factors influencing symptom expression, language capability of the patient, and diversity of etiology of psychological disorders (Leong & Chau, 1997). These threats to cultural validity in diagnosis all stem from a failure to recognize or a tendency to minimize cultural factors in diagnosis (Leong & Lau, 2001). Inaccurate psychological diagnoses not only affect an individual's current course of treatment, it also colors the differential diagnosis process of both psychological and cognitive problems later in life. Accurate psychological diagnoses are imperative to cognitive assessments because of its impact on determining etiology of cognitive problems. For example, within cognitive testing, a correct diagnosis of depression is important due its impact on assessment results. A depressed individual will typically have problems with attention, memory, and executive functioning due to lack of motivation or difficulty with concentration. If a person is unable to initially input information due to a lack of attention, he or she will not be able to remember the information at a later time. It may be difficult for an Asian American patient to hear that their cognitive issues stem from depression as opposed to cognitive issues due to the stigmas surrounding mental illness. Still, determining etiology with Asian Americans can be difficult because cognitive testing itself is a cultural concept. Western society has determined the procedures appropriate to the measurement of intelligence and has developed the scales that describe the types of expected abilities at different ages (Ardila, 2005). During a standard neuropsychological assessment, examiners utilize figures, blocks, pictures, etc., to evaluate different intellectual processes (Ardila, 2005). Asians who have not received education in the United States may not recognize these items, which place them at a disadvantage before testing even begins. Psychologists must be cautious during the diagnosis of psychopathology or cognitive

disorders, and conceptualize the Asian American patient with their cultural background in mind.

To this point, the challenges of applying Western psychological concepts to Asian Americans have been detailed; however, some Asian cultural values may actually enhance the therapeutic process. For example, the Asian cultural value of respect for someone in a position of authority may contribute positively to an Asian American's perception of a therapist or examiner's credibility, and the value placed on education achievement may increase an Asian American's willingness to seek cognitive assessment (Kim et al., 2001). This research raises the question of what makes the difference between Asian Americans who do not seek cognitive testing due to fears of a diagnosed learning disability they perceive will possibly derail their educational goals and those who desire cognitive testing to quickly receive a diagnosis and treatment options? Currently, there is no qualitative research available that specifically focuses on Asian Americans' motivation for seeking cognitive testing for themselves or their child. However, Asian cultures have been examined in research and within this dissertation, and knowledge about this culture's value on education and achievement is pervasive. Tews and Merali (2008) further explain that in Asian cultures, educational achievement is considered a family pursuit, as opposed to a reflection on personal goals. There is a great deal of personal investment that parents have in their child's educational future, and a qualitative study completed by Chao in 1996 revealed that Asian parents believed that if their child was not doing well in school, then the parents were not doing their jobs correctly. While these studies do not provide absolute answers about whether an Asian family is more or less likely to seek testing for their child, it suggests that Asian families

may be less inclined to search for outside help if their child is experiencing difficulty in school. Families may attempt to help their child themselves and attribute their child's poor grades to a lack of effort or willpower. Additional research should continue to investigate how collectivistic values can work within the context of individualistic informed therapy or assessment because the rates of Asian Americans seeking mental health in the United States continues to remain low. Treatment providers should also receive education about how mental health may present in this population (i.e, as somatic symptoms) or why families may not bring members with cognitive issues for assessments. When working with Asian Americans, clinicians may need to be more directive with their patients or their patient's family members to gauge the severity of cognitive or psychological issues. Cultural values, such as respect for professionals, may be utilized in a positive manner in order to garner more information from patients. Psychologists should take a moment to explain the purpose of gathering such information and by being informative, it may help Asian patients feel more comfortable and have trust that their clinician is knowledgeable. Additionally, psychologists should stress the importance of correcting any misunderstandings that the psychologist may have and welcome patients to clarify statements. Taking these added steps may encourage Asian patients who feel hesitation and encourage a more positive outcome with them.

Consequences of immigration that affect help seeking behavior. The previously outlined history of Asian entry into the United States reveals the unique motivations, circumstances, and experiences of immigration by differing Asian ethnicities. Immigration is both physically and psychologically difficult, but the experience is compounded when individuals face pre-immigration trauma. This process

is best exemplified by the most recent wave of Asian immigration into the United States. In 1975, the last large wave of Asian immigration occurred from the Southeast region, and included the countries of Vietnam, Cambodia, and Laos (Uba, 1994). This group fled from their native countries to escape persecution, and experienced trauma before, during, and after immigration (Uba, 1994). Each group faced differing traumatic experiences, and this may have an impact on their attitudes towards their new host country.

The final wave of Asian immigrants arguably endured the most sustained trauma before they arrived in the United States. A clinic in Boston discovered that 95% of Cambodian women seen in therapy had been sexually abused, and most of the women did not talk about the assault until after three years of therapy (Uba, 1994). In addition to the stressors associated with immigration (i.e, language barriers, lack of social support, downward socioeconomic spiral), refugees from Southeast Asia dealt with the guilt of surviving their journey and leaving their family members behind. Voluntary organizations in the U.S. that oversaw the sponsorship of refugees were helpful in finding housing and jobs and in helping with the ease of culture shock; however, a number of problems were experienced, such as efforts to convert refugees to the religion of the sponsor (Uba, 1994). Southeast Asians were met with hostility in their new country due to the unpopularity of the Vietnam War, and Laotians may be untrusting of the U.S. government because they did not follow through on their promise of help during the Pathet Lao regime. Cambodians may be illiterate in their native language due to Pol Pot's campaign for an agrarian culture, which may further hinder their ability to learn English.

Mental health professionals, including assessment examiners, begin every intake by gathering background information from patients in order to understand their global functioning. It is critical to gather trauma history in order to remain sensitive towards the patient and to begin comprehending the reasons behind a patient's skepticism towards clinicians of a different ethnicity. Southeast Asians may generalize their distrust of Americans to mental health professionals and either not seek treatment or display reluctance in sharing their history. The trauma related to Pol Pot's movement against education might affect a Cambodian's ability to participate in any type of cognitive assessment. If a cognitive assessment is conducted with Southeast Asians or individuals with trauma history, a diagnosis of post-traumatic stress disorder (PTSD) can complicate the differential diagnosis process between psychological or cognitive issues. Some diagnostic criteria for PTSD in the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV-TR) include efforts to avoid thoughts associated with traumatic events and an inability to recall an important aspect of the trauma (APA, 2000). Examiners need to recognize how PTSD can present in their patients in order to prevent misdiagnosis.

Furthermore, Southeast Asians may perceive mental health negatively due to their experience with mental health workers in refugee camps. U.S. statutes at that time excluded refugees with mental disorders, therefore, it was in the person's best interest to deny the presence of any mental illness (Uba, 1994). Additionally, parents who have had to cope with multiple traumas may not be sympathetic if their children have difficulties in school. These parents would be less likely to view learning disability as a serious issue, or they may not view their own cognitive issues as a problem in relation to their past

traumas. A thorough understanding of Asian immigration history can help an examiner begin to understand the decreased help-seeking behavior of this population.

The culmination of factors such as cultural values, intergenerational transmission of values, socioeconomic status, individualistic foundations of psychology, and consequences of immigration all contribute to the underutilization of mental health services by Asian Americans. Leong and Lau (2001) categorize these issues as barriers to the initiation of mental health services. However, they report that there are also barriers to the persistence in treatment once it is actually sought (Leong & Lau, 2001). First, there is a lack of ethnic minority psychologists and evidence suggests that providing patient-therapist ethnic matching can reduce premature treatment dropouts (Takeuchi, Sue, & Yeh, 1995). With cognitive testing, Asian patients may be more likely to show up for the appointment if they were informed that their examiner was also Asian. Ethnic matching can help increase therapist-patient alliance, and this also addresses potential English as a second language issues if the therapist is fluent in the patient's native language. Good rapport is also important during assessments because the examiner should do everything necessary to obtain the best performance from their patients. Next, lack of cultural competence or sensitivity may affect the maintenance of treatment. During cognitive testing, Asian patients may not agree to an assessment or stay for the duration of lengthy assessment sessions if they do not feel that they are being fully understood or if they believe that their examiner is not culturally competent. Takeuchi et al., (1995) found that the effects of being treated at a culturally sensitive treatment center seemed to outweigh the positive effects of being matched with an ethnically similar therapist. This research illustrates the importance of cultural

competence and more emphasis on cultural sensitivity may be necessary in training programs and universities.

Effect of Bilingualism on Neuropsychological Assessment

Recent estimates suggest that at least half of the world's population is bilingual (French & Jacquet, 2004). From a neuropsychological perspective, the study of bilingualism is imperative given its possible effects on the results of testing and the subsequent treatment planning and cognitive rehabilitation that may need to occur. The following section will explore the diversity in the definition of bilingualism and the ways in which researchers and bilingual individuals may classify *bilingualism*. Next, there will be an examination of the effect of second language acquisition on brain development, and the potential advantages or disadvantages of acquiring two languages. Research has revealed that bilinguals and monolinguals may store and process language in different ways. The differences will be highlighted and the effect on neuropsychological testing will be investigated.

Definitions of bilingualism. Apart from the obvious linguistic barriers that are inherent during a neuropsychological evaluation with a bilingual individual, there is a lack of research on the neuropsychological functioning of linguistic minorities as compared to English speaking monolinguals. A challenge for bilingual research has been the heterogeneous definitions of bilingualism, which range from individuals who learn two languages at a young age, use both languages frequently in daily life, and express competence in both languages to those who learn a second language later in life (Mindt et al., 2008). More broadly, bilingualism has been defined as speaking more than one language, and it has been used synonymously with the term multilingualism. However,

individuals may identify themselves as bilingual as long as they are able to speak a second language, irrespective of their ability to read that language (Myers-Scotton, 2006). Often, researchers determine the definition for bilingualism based on the subject group and their research question. Thus, it may be difficult to acquire a homogeneous definition of bilingualism, given the differing levels of bilingualism between individuals. Myers-Scotton (2006) expressed that few bilinguals are as proficient in any second language as they are in their first language, and if they do speak several languages, they generally do not speak them equally well. Several factors (i.e, age of arrival to United States, social exposure, education, frequency of use, etc.) determine individual fluency, and these features are salient with the Asian American population. Despite the difficulties in determining a firm definition of bilingualism, it is necessary to continue researching the effects of second language acquisition to find possible differences in brain development, which can affect neuropsychological testing and treatment.

Effect of second language acquisition on cognitive development and processing. Asian languages possess specific linguistic properties that are not used in more commonly examined languages, such as non-alphabetic scripts/writing systems, lexical tones, and flexible grammatical and syntactic structures (Li & Green, 2007). However, research has shown that learning to read involves the same initial step of comprehending the symbolic nature of print regardless of whether the writing system is alphabetic (e.g., English) or non-alphabetic (e.g., Chinese; Li & Green, 2007). Additionally, the development and learning of language appears to be universal across cultures. By the age of 18 months, children possess a vocabulary of 50 words; however, vocabulary learning accelerates to the point that a 6-year-old child will have learned

nearly 14,000 words (Li et al., 2007). Li et al. (2007) explain that this growth pattern is known as the vocabulary spurt and typically occurs when structural representations of semantic (word meaning) and phonological (structure of sound in language that conveys linguistic meaning) organization have occurred in the brain. Li et al. further expresses that once these patterns are consolidated in a child's brain, earlier learned words help make links and connections so that new words are acquired more easily, thus leading to the vocabulary spurt. Current studies unanimously agree that understanding print and learning language present similar challenges across cultures; however, a remaining question is whether the acquisition of two languages changes brain development.

Existing research on language acquisition reveals that early phonetic experience in one's primary language can lead to committed cognitive and neural structures that affect the processing of second language learning (Li & Green, 2007). Specifically, studies have focused on how native language reduces sensitivity for second language discrimination (Li & Green, 2007). For example, native Japanese speakers may experience difficulty differentiating between /l/ and /r/ sounds in the English language if they learn English at a later age (Li & Green, 2007). This may be problematic during neuropsychological testing if examiners regard mispronounced words as incorrect, or simply do not understand the examinee. For example, a confrontation naming test (i.e., Boston Naming Test) that is an integral part of language measurement necessitates that examinees correctly pronounce words. However, based on Li and Green's (2007) research, a Japanese speaker may have difficulty pronouncing words such as *rhinoceros* or *palette* and would subsequently be deducted for mispronunciations of these answers.

Additionally, bilinguals may have a much larger vocabulary than monolinguals due to their knowledge of two labels for many concepts; however, within each language, bilinguals have a smaller vocabulary size relative to monolinguals (Mindt et al., 2008). While some research has suggested that bilinguals catch up to monolinguals by adulthood, bilingual disadvantage has been observed by others (Hamers & Blanc, 2000). For example, young adult bilinguals recognize fewer difficult vocabulary words than monolinguals and have more tip-of-the-tongue retrieval failures than monolinguals (Gollan & Brown, 2006), name pictures more slowly than monolinguals (Gollan, Montoya, Cera, & Sandoval, 2008), and name fewer pictures correctly on tests such as the Boston Naming Test (Roberts, Garcia, Desrochers, & Hernandez, 2002), even when tested exclusively in their first-acquired and dominant language (Gollan & Acenas, 2004). These issues are problematic because it does not solely affect a patient's language performance during neuropsychological testing. For example, vocabulary is a subtest that is also utilized to determine an individual's overall general intelligence level. Gollan, Montoya, and Werner (2002) observed additional disadvantages in both younger and older bilinguals on verbal fluency tests. These initial findings warrant further investigation, given the possible advantages and disadvantages that emerge between bilinguals and monolinguals during neuropsychological testing.

Within bilingual research, focus is often given to children to determine the advantages or disadvantages related to simultaneously acquiring two languages. It appears that there is an initial disadvantage because children who learn two languages simultaneously may acquire language more slowly than monolinguals (Mindt et al., 2008). However, this disparity appears to dissipate once the children enter school, and

they receive an early opportunity to practice inhibitory control (i.e., the experience of controlling attention to the relevant language system in the face of competition from the other language, which is simultaneously active but irrelevant to the language task at hand). In fact, some research suggests that bilingual children may experience earlier development of executive functioning (as early as 3 years) as opposed to monolingual children who begin development of executive functioning at the age of 4-5 (Bialystok, 1999; Bialystok, 2007; Green, 1998; Mindt et al, 2008). Bialystok (1999) conducted her study utilizing 60 children separated into younger (ages 3.2-4.9) and older (ages 5.0-6.3) groups, and each group was evenly split into bilingual speakers of Cantonese or Mandarin and English and English only groups. She utilized a Peabody Picture Vocabulary Test-Revised (PPVT-R) to assure all children had English proficiency; the PPVT-R is a test of receptive vocabulary where a child is shown four different pictures and asked to indicate which picture best depicts a word given orally by the examiner (Bialystok, 1999). The children were additionally tested with a visually-cued recall task (i.e, an assessment of memory span and working memory) in an effort to ensure that the children were roughly equivalent in intelligence (Bialystok, 1999). In order to test the child's ability to selectively attend to relevant information (i.e., a word card) without being distracted by a picture, Bialystok utilized the Moving Word Task. In this task, a child was first introduced to two toy bunnies, then presented with two pictures of common objects (e.g., king and a tree) and the two objects were named for the child. A card with the name of one of the pictured objects was placed under the picture object, and the child was asked what the card says. The child's attention was distracted by the toy bunnies, who began a scuffle and "accidentally" kicks the name card under the wrong

picture. The child is then asked for the second time what the card says, and the objective is to see if the child is distracted by the picture card that the name card is under. The experimenter then asks the child to help clean up the mess and places the name card under the correct picture card again. The child is then asked what the name says. Bialystok indicated that this task is difficult because the child's attention is almost irresistibly drawn to the picture card in the interference portion and typically find it difficult to ignore the information. Another task was the Dimensional Change Card Sort Task (i.e., children first asked to sort cards based on color, then shape, then color and shape), which requires the child to practice mental flexibility and inhibition. This task is considered a nonverbal task in that there is no word association necessary to complete it like the Moving Word Task. On both tasks, bilingual children were more advanced than the monolinguals in the solving of problems requiring higher levels of control (Bialystok, 1999).

One point of interest with respect to neuropsychological assessment lies in the fact that children can typically acquire conversational proficiency in a non-dominant language within 2 years; however, they take much longer to acquire higher-order language proficiency that may be necessary for a neuropsychological evaluation (Collier, 1995). Mindt et al. (2008) highlights the fact that bilingual children are at risk for being tested in their non-dominant language prematurely, due to their perceived conversational fluency in the dominant language. This may explain why bilingual children in the U.S. and abroad may perform worse on standardized academic achievement tests compared to their native English-speaking counterparts (Cummins, 1984). Current assessments for bilingualism during neuropsychological testing may begin and end with the examiner

inquiring about the examinee's level of fluency in a given language. Given the heterogeneity of the definition of bilingualism, an examinee may be tested in a non-dominant language because they possess conversational fluency. This highlights the fact that a better assessment for multilingualism and guidelines for evaluating multilingual individuals needs to be developed.

Research has also explored the differences in second language acquisition between children and adults. The current consensus across literature appears to suggest that younger and older immigrants may go through different processes of L2 (second language) acquisition; younger immigrants switch their dominant language from the L1 (native language) to the L2, and older arrivals tend to maintain the L2 as their dominant language (Jia, Aaronson, & Wu, 2002). Several variables contribute to this phenomenon, and variance in L2 proficiency largely depends on amount of media input (i.e., television, movies, radio), stronger integrative motivation (e.g., gaining American friends), and instrumental motivation (e.g., doing well in school, getting a job; Jia et al., 2002). Also, L2 proficiency largely correlates with the immigrant's age of arrival to their new country (AOA); however, understanding how AOA impacts L2 acquisition has been difficult. Jia et al. (2002) found that accuracy in L2 grammar decreased and accuracy in L1 increased with older AOA and environmental variables predicted L2 proficiency (i.e., bilingual children whose mothers had higher L2 proficiency performed better on reading and listening tasks, participants surrounded by more L2 speakers at home performed significantly worse on L1 listening tasks). Unfortunately, the process of L2 acquisition is a complicated process, which involves the dynamic interactions of multiple variables (Jia

et al., 2002). Further research is necessary to determine actual causal factors between AOA and L2 acquisition.

Monolingual vs. bilingual brain. Bilingualism research has focused on two key cognitive mechanisms that introduce differences between bilinguals and monolinguals: frequency of use and competition for selection within the language system in bilinguals (interference; Mindt et al., 2008). Research has revealed that both languages are always active within a bilingual's mind, which introduces a need to control activation of the non-target language (Mindt et al., 2008). Green (1998) found that an individual's dominant language is more accessible and may need to be suppressed to allow the non-dominant language to be produced, whereas bilinguals experience little or no interference from the non-dominant language when speaking from the dominant language. If an English as a second language Asian American is receiving neuropsychological testing, then this phenomenon can impact their scores, particularly during timed testing. For example, a task of semantic fluency such as animal naming, may be more difficult for a bilingual individual. Bilinguals may recall the name of an animal in their native language and then have to spend the time switching the word to English.

Research also reveals that bilinguals respond more slowly in the language that is otherwise dominant during mixed language tasks (Mindt et al., 2008). If the examiner speaks the native language of the Asian American patient, they may consider completing the entire neuropsychological exam in the native language or in English, rather than switching between the two, to prevent interference and delay in response. Bilingual research has also studied the connection between frequency of use and lexical accessibility. Mindt et al. (2008) explain that by virtue of speaking two languages some

of the time, bilinguals use each language less frequently than monolinguals, which decreases the lexical accessibility of words. This evidence is relevant for individuals who speak two languages roughly fifty percent of the time, and alludes to the fact that they may not possess language abilities that are as sophisticated as monolinguals in their dominant or nondominant language. Bilinguals may experience more difficulty on a task of phonemic fluency, where the patient is expected to name as many words that begin with F, A, and S, during a timed period of one minute. Neuropsychologists need to remain aware of the fact that assessment results may be an underestimation of a bilingual's true abilities.

Researchers have studied the bilingual versus monolingual brain in an effort to understand the similarities or differences in the storage and neural processes associated with language. A growing body of literature supports the idea that non-dominant language is primarily (though not entirely) stored in the same neural network as dominant language (Abutalebi, 2008; Green 2003; Vandenberghe, Price, Wise, Josephs, & Frackowiak, 1996). Studies agree that common areas of the brain are activated while reading in English and Asian languages (Tatsuno & Sakai, 2005). However, differences were observed between Chinese-English bilinguals and monolinguals in that the bilinguals revealed more bilateral activation when reading Chinese characters than English, and the bilinguals showed stronger activation in the left middle frontal and posterior parietal gyri than monolinguals while judging whether two English words rhymed (Liu & Perfetti, 2003; Tan, et al., 2003). Language switching (e.g., identifying a picture aloud in dominant or nondominant language depending on the language of the cue) was associated with greater activation of the dorsolateral prefrontal cortex (DLPFC),

which contributes to conflict control, higher order attentional processes (e.g., selective attention) and inhibition (Chen, Wei, & Zhou, 2006; Hernandez, Martinez, & Kohnert, 2000; Mindt et al., 2008).

Mindt et al. (2008) found that the consensus across bilingualism studies was that the frontal region of the brain played a major role in language processing in the bilingual brain. Mindt's research provides further support for the hypothesis that second language development results in earlier executive development in children. Initial work has begun to investigate whether increased executive activation in bilingual individuals provides any protection against late life cognitive decline. The relevance of this research is tied to the fact that the frontal cortex, or the region of the brain that is responsible for executive functions, are one of the first to deteriorate with aging (Bialystok, 2007). Preliminary studies show that bilingualism protected individuals by reducing the rate in which attentional processes declined in executive tasks compared to monolinguals (Bialystok, 2007). Additionally, Bialystok, Craik, and Ryan (2006) found that older bilinguals (ages 60-70) outperformed younger monolinguals (ages 30-60) on a task that required high levels of attention and inhibitory control. The most encouraging research comes from Bialystok, Craik, and Freedman (2007), who found that the bilingual patients in their sample exhibited a delay of 4.1 years in the onset of dementia symptoms in comparison to monolinguals. They argue that bilingualism does not affect the accumulation of pathological features associated with dementia, but rather enables the brain to better tolerate the accumulated pathology associated with dementia (Bialystok et al., 2007). Given the cost of medical care and full-time, long-term care, the delay of 4 years would be tremendous to any family with a member who is showing the early signs of dementia.

These findings are promising with regards to the study of aging and dementia. If subsequent studies reinforce the cognitive reserve theory due to multilingualism, then preemptive changes can be made in treatment and through recommendations with this population. However, examiners must be careful during testing with bilingual patients because their test scores may not reflect the beginnings of degenerative processes due to their delay in symptoms as compared to monolinguals. It may be beneficial to recommend neuroimaging to patients who complain of memory issues but do not display decline on cognitive tests and do not appear to be malingering.

A study comparing Italian American bilinguals to monolinguals found an increase in the density of grey matter in the left-inferior parietal cortex of bilinguals, which correlates with growing evidence that bilingualism can lead to cognitive processing advantages and that the human brain changes structurally in response to environmental demands (Mechelli et al., 2004). Repeated activation of neural pathways strengthens the networks, and eases the accessibility of particular brain functioning; in the case of the bilingual brain, executive skills such as selective attention and inhibition or left parietal lobe functioning (i.e., comprehension of symbols in language) may be easier comparatively than monolinguals. However, other researchers believe that the demonstration of increased frontal activation during certain language tasks with bilinguals does not necessarily imply that the neural representation for the second language is more extensive than that for the native language (Green et al., 2006). The possibility of the protective factors of bilingualism is exciting; however, stronger evidence for these claims is needed. With respect to neuropsychology, this research should be taken into account while interpreting assessments with bilingual individuals.

Pre-surgical patients often seek neuropsychological testing to determine whether language and memory will be intact after focal excisions are made in the brain. Bilingual individuals may have different brain involvement in terms of language functioning, and this must be taken into consideration before recommendations are made.

Indications of potential bilingual advantage. Existing research with bilingual individuals suggests potential cognitive advantages of learning a second language. Literature suggests that bilingual children develop executive skills earlier than monolingual children; this is significant because executive functions (i.e., controlling attention, planning, organizing, inhibition) are critical to higher-level cognition. In cognitive development, executive functioning is the last to develop and the first to deteriorate with aging. Bialystok (2007) found that bilingual individuals have shown reduced rates of attentional decline as compared with monolinguals. Bialystok speculated that the continued practice of controlling attention between two languages may result in more efficient processing, especially when executive demands become complex.

While this area of research appears promising and could potentially lead to advocating for the teaching of second languages earlier in the school curriculum, further investigation is required to causally link bilingualism with greater executive functioning. To date, there is no evidence that bilinguals are in any measurable sense more intelligent than monolinguals, and the potential cognitive handicaps of bilingualism have been expressed (Bialystok, 2007). For neuropsychologists, it is too premature to draw concrete conclusions about a bilingual patient's performance on executive tasks.

Current Research in Neuropsychological Assessment of Asian Americans

Given the unique and recent immigration history of Asian Americans, the continued influence of culture on global functioning, and the effects of second language acquisition on brain development, it seems implausible that Asian Americans' performance on neuropsychological assessment measures would be compared to normative data that are typically obtained from samples of predominantly Caucasian individuals. Unfortunately, this continues to be the reality for Asian Americans and other ethnic minorities who seek neuropsychological (or more broadly any psychological) assessment services. Despite the dearth of cognitive research with Asian participants compared to research with Caucasian individuals, significant movement has been made to examine cognitive performance in the Asian population. Increased research with this population will hopefully result in more accurate ways to determine normative functioning with neuropsychological testing. This section will discuss the current challenges that exist in the neuropsychological testing of ethnic minority populations and steps that have been taken to address the issues. Also, issues related to normative data will be identified, along with a discussion of the advantages and disadvantages of race-based normative data. Finally, existing neuropsychological research will be analyzed to determine how it can inform future neuropsychological examinations with ethnic minority groups, in particular Asian individuals.

Ethical practice. As an applied science, clinical neuropsychology is considered relatively new compared to clinical psychology or neurology (Wong, 2006). The specific origins of neuropsychology as a distinct discipline are hard to pinpoint; however, an editorial written in the journal *Neuropsychologia* may have been the first to coin the term *neuropsychology* (*Neuropsychologia*, 1963). Neuropsychology was described as an “area

of neurology of common interest to neurologists, psychiatrists, psychologists, and neurophysiologists” where the topic of concern was “disorders of language, perception, and action” (*Neuropsychologia*, 1963, p. 1). As with any new endeavor, clinical neuropsychology has been beset with controversy; at the forefront is the question of ethical or fair practices. The ethical concerns primarily stem from the lack of uniform agreement surrounding test selection, test administration, and test interpretation. Cognitive testing broadly follows the *Standards for Educational and Psychological Testing* set by the American Psychological Association. The most recent revision of these standards in 1999 acknowledged that it is difficult to provide every examinee with “absolute fairness” and that “fairness of testing in any given context must be judged relative to that of feasible test and non test alternatives” (APA, 1999, p. 73). The guidelines for cognitive testing appear to mirror those for therapy with diverse individuals, which is to utilize best practice measures. Unfortunately, the term *best practice measures* is vague and may vary from psychologist to psychologist.

Based upon APA standards, *fairness* during cognitive testing refers to the absence of bias and to the equitable treatment of all examinees in the testing process (APA, 1999). As an example of equitable treatment, the APA standards state that all individuals should be “afforded the same or comparable procedures in testing, scoring, and use of scores” (APA, 1999, p. 74). Regrettably, individuals from diverse backgrounds continue to be compared to Caucasian normative samples, which cannot be assumed analogous to comparisons with a person of the same ethnic background. Many researchers have responded to this issue by collecting race-specific normative data. The argument for this work has stemmed from the belief that the use of race-specific normative data will

improve the sensitivity and specificity of neuropsychological measures in detecting cognitive impairments (Manly, 2005). Race-specific normative data have been primarily created for use with the African American and Hispanic populations.

African American normative data. Several extensive studies have been conducted with African American participants including the Consortium to Establish a Registry for Alzheimer's Disease (Fillenbaum, Huber, & Taussig, 1997), the Washington-Heights-Inwood-Columbia Aging Project (Manly et al., 1998), and the San Diego African American Normative data Project (Gladsjo et al., 1999). The study conducted by Fillenbaum et al. (1997) with cognitively normal White and African American subjects was controlled for gender, years of education, and age on a 15-item short version of the Boston Naming Test. The subjects were 65 years of age or older and were annually interviewed to identify changes in health status and health service use (Fillenbaum et al., 1997). They found that with gender, education, and age controlled, the effect of race was still statistically significant (Fillenbaum et al., 1997, p. 206). The White subjects performed significantly better than the African American subjects, and Fillenbaum et al. hypothesized that the development of neuropsychological tests with White populations may place ethnic minorities at a disadvantage.

Previous studies of ethnic group differences in neuropsychological test performance among neurologically normal individuals have displayed substantial discrepancies between ethnic minorities and Whites, despite equating groups on age, education, sex, and socioeconomic status (Klusman, Moulton, Hornbostle, Picano, & Beattie, 1991; Manly et al., 1998; Stern et al., 1992; Welsh et al., 1995). For example, Manly et al. (1998) found that among neurologically normal African Americans,

traditional African-American practices, beliefs, and experiences (e.g., preferences for African-American music, arts, people; traditional foods, superstitions, interracial attitudes, family values, etc) were significantly associated with lower scores than White participants on measures of verbal ability. Statistically significant discrepancies were found between African American and White participants on the WAIS-R Information subtests and the Boston Naming Test (Manly et al., 1998). The subjects participating in this study were representative of the various age, education, and socioeconomic status levels of the adults in San Diego county and individuals with a history of serious mental illness, psychotropic medication use, substance dependence in the past year, history of head injury (i.e., loss of consciousness less than 5 minutes), or a diagnosis of neurological or medical condition likely to affect neuropsychological test performance were dropped from the study (Manly et al., 1998). The African American subjects ranged in age from 20 to 64 years and education levels ranged from 9 to 20 years (Manly et al., 1998). Age and education information of the White participants were unavailable. Subtests such as WAIS Information may not be measuring “general information normally available to persons growing up in the United States” (Lezak, 1995, p. 555) when utilized with African Americans who endorse the practice of traditional African American beliefs, practices, and experiences. Manly et al. (1998) argued that the lack of previous exposure to certain stimuli may similarly explain lower scores on tests like the Boston Naming Test. The Boston Naming Test is a confrontational naming test that presents line drawings of words that occur frequently in the English language, then words of medium frequency, and finally to words of low frequency. Consequently, the test becomes more challenging for the patient as it progresses. Fillenbaum et al. (1997) found that for

African American participants, the designated frequency level of words was not always accurate. For example, items such as volcano and mask were of low frequency instead of medium (Fillenbaum et al., 1997). Manly et al. (1998) makes the argument that the use of ethnic normative data for African Americans would be an improvement over the current use of demographic corrections based on mainly White samples. While a majority of the African American population do not have issues with English as a second language, the effect of acculturation is significant enough to potentially invalidate the results of neuropsychological tests.

Hispanic normative data. During neuropsychological testing, Hispanic patients may be given English language tests or translated tests depending upon their level of English language fluency. However, in both cases, the performance of Hispanic patients are often still determined utilizing normative data sets that were derived from primarily Caucasian samples. In this respect, normative data research with the Hispanic population closely mirrors research with Asian Americans. Like Asian Americans, the Hispanic population exhibits considerable within-group diversity depending on their country of origin, degree of mastery of Spanish and English, level of acculturation, socioeconomic status, and education; therefore, normative data cannot be generalized to all Hispanic groups. Researchers have recognized that current practices of testing have the potential to invalidate results; therefore, researchers have developed normative data for Hispanic groups that are stratified by age and education and with different Hispanic groups.

The NEUROPSI is a brief neuropsychological assessment that was developed, standardized, and tested for reliability with Spanish speakers (Ostrosky-Solis, Ardila, & Rosselli, 1999). This study included 883 volunteers with no neurological or psychiatric

history, absence of dementia, native Spanish speakers, and active and functionally independent (Ostrosky-Solis et al., 1999). Four age groups were formed (i.e., 16 to 30 years, 31 to 50 years, 51 to 65 years, 66 to 85 years) and each age group was further divided into four different educational levels (i.e., illiterate or zero years of education, 1 to 4 years of education, 5 to 9 years of education, 10 to 14 years of education; Ostrosky-Solis et al., 1999). The research participants were drawn from different states of the Mexican Republic, and thus a limitation of the battery is that it may not be generalized to other Hispanic/Latino populations (i.e., South America, Spain; Ostrosky-Solis et al., 1999). Within this population, statistically significant educational effects were noted on subtests such as those assessing visuoconstructional abilities, verbal fluency, and conceptual functions (i.e., Similarities, calculations, motor sequences) and learning opportunities played a critical role in the development of some abilities that are included in neuropsychological testing (e.g., written language, decision making; Ostrosky-Solis et al., 1999). Data is being collected in other Latin American countries and in Columbia in order to fill the need for a brief, reliable, and objective evaluation for a broad range of cognitive functions with Spanish-speaking individuals (Ostrosky-Solis et al., 1999).

In order to illuminate potential differences in the neuropsychological performances of Spanish speakers from different regions, Artiola i Fortuny, Heaton, and Hermosillo (1998) compared Spanish speakers from Spain and the U.S.-Mexico border on 16 Spanish-language neuropsychological measures. These two groups differed in terms of socioeconomics (e.g., the average wage in Mexico in 1992 was \$1.96, while the average wage in Spain was \$11.34) and education (e.g., the percentage of Mexicans who completed less than 1 year of schooling over the age of 25 was 18%, while in Spain it

was 5%; Artiola i Fortuny et al.,1998; United Nations, 1994). Also, they varied with regards to access to health services, culture, and acculturation (i.e., Hispanics living in U.S. border cities like Tucson, Arizona; Reddy, 1994). Overall, the normative sample ranged in ages from 15 to 76 years and years of formal education varied from zero to 20 or more years of education (Artiola i Fortuny et al., 1998). Artiola i Fortuny et al. adapted tests from standard English versions that were assembled to create a short battery that measured attention, learning and memory, and executive functioning. They found that the Spanish and borderland samples obtained similar results on the majority of the measures, with the exception of a statistically significant difference on a test of figural learning, where the Spanish sample outperformed the borderland participants (Artiola i Fortuny et al., 1998). Artiola i Fortuny et al. hypothesized that the difference may stem from the educational realities in Mexico, which would result in less exposure to educational experiences that would make participants succeed at traditional tests of cognitive ability. This may have clinical relevance and Artiola i Fortuny et al. stated that these results are deserving of further exploration. All of the borderland participants were educated in Mexico, although to varying degrees (Artiola i Fortuny et al., 1998). The conclusion from this study was that while it may not be necessary to develop normative data for every test for differing Spanish-speaking populations, it is still problematic to broadly compare all Spanish-speaking groups to the same normative data set for every translated test (Artiola I Fortuny et al., 1998). Research must continue to investigate different Spanish speaking subpopulations to determine which measures can be broadly used across Spanish populations.

Finally, Ponton et al. (1996) developed a neuropsychological screening battery for Hispanics (NeSBHIS) based on a normative sample consisting of Hispanics from countries including Mexico, Central America, Puerto Rico, and Cuba. The final sample of 300 subjects living in the greater Los Angeles area (i.e., Santa Ana, Pasadena, Montebello, Pacoima, Van Nuys) ranged in age from 16 to 75 years of age and their educational level ranged from 1 to 20 years (Ponton et al., 1996). The average duration of residence in the United States was 16.4 years and the sample mostly consisted of monolingual Spanish speaking individuals (i.e., 70%; Ponton et al., 1996). Subjects with a history of neurological disorder, psychiatric disorder, substance abuse, head trauma, or questionable health histories were excluded from the study and the socioeconomic status of the participants were unknown (Ponton et al., 1996). Ponton et al. believed that the current practice of neuropsychological testing with Spanish-speaking people (e.g., lack of appropriate tests, absence of normative data, use of interpreters, in-house translations) posed an ethical dilemma. An acculturation scale and the NeSBHIS was administered to participants, and the NeSBHIS consists of tests that were adapted from a battery used by the World Health Organization or had proven validity and reliability based upon the body of research behind it (Ponton et al., 1996). This study found that none of the examined measures of cognitive functioning were free from education effects and age effects, including measures of psychomotor speed, visuospatial reasoning, and visuoconstructive skills (Ponton et al., 1996). In this study, 9 out of 17 variables of interest were affected significantly by education (i.e., Pin Test [both hands], P-S BNT, Digit Span Backwards and Total, Digit Symbol, Block Design, Rey-Osterrieth Copy, and Raven's SPM) (Ponton et al., 1996). Ponton et al. found that nonverbal measures are not the best

estimate of true ability in ethnic minorities and that paper and pencil tests were highly influenced by education and occupation. Ponton et al. indicated that the normative data resulting from this research might help to provide more accurate information for Spanish-speaking individuals who seek neuropsychological testing. These studies reveal the differences that exist not only between Hispanic and Caucasian populations in neuropsychological test performance, but between the different ethnicities that fall under the broad category of Hispanics. The Hispanic population may share a language; however, factors such as socioeconomic status and education that may vary considerably across different subgroups significantly affect test results.

Regrettably, the same type of large-scale research has not been performed with the Asian population, and neuropsychological test batteries with corresponding ethnic normative data do not exist for this population. The current state of neuropsychology necessitates some type of agreement with respect to test selection, administration, and diagnostic formulation for all individuals. In order to move in the direction of greater consistency and organization in the field of neuropsychology, increased research must begin to create sound validation data for the tests that are employed with Asian patients and the manner in which they are administered (Wong, 2006). Fortunately, the acknowledgement of this problem within neuropsychology has prompted research.

Normative data. Normative data provide the clinician with a reference to compare the performance of an individual patient in the determination of cognitive ability and help maximize the diagnostic utility of the neuropsychological test that was administered (Brickman, Cabo, & Manly., 2006). A major consideration is deciding which normative data set should be selected (i.e., broadly represented group or specific

subgroups as defined by education, ethnicity, and/or socioeconomic status) because it is a prerequisite for reliable and valid test results and results are directly tied to measurable consequences such as diagnosis and treatment recommendations (Strauss, Sherman, & Spreen, 2006). Norm-based testing is currently the standard in neuropsychological testing, and there are distinct advantages and disadvantages associated with its use.

Advantages in the use of normative data. The norm based testing approach is when the clinician uses tests like the Wechsler series of tests or the California Verbal Learning Test (CVLT) which have been standardized, normed, and validated (Fujii, 2010). The strength of this method is that the science is based in the empirically validated tests and their psychometric properties (Fujii, 2010). Neuropsychologists around the world have adapted Western based neuropsychological tests in an effort to provide comprehensive services to patients in their country. This is the case for many Asian countries where neuropsychology and psychology are slowly becoming respected fields. The applicability of translated Western neuropsychological tests on Asians has been studied, some with hopeful results. Several studies have shown that many East Asian groups, including Koreans, do as well if not better than Westerners on measures of general intelligence and visual spatial tasks (Lynn & Song, 1994). For example, the study performed by Lynn and Song (1994) administered the Raven's Standard Progressive Matrices as a measure of general intelligence, the Space Relations and Perceptual Speed Test, and Verbal Fluency to 107 Korean and 115 British children (mean age = 9.75 years). Apart from a small, non-statistically relevant advantage of the British children on the test of Verbal fluency, the Korean children performed better than the British children on all other measures (Lynn & Song, 1994). Additionally, mean raw

scores between the standardization sample of the Wechsler Intelligence Scale for Children-III (WISC-III) and translated versions of the WISC-III in Asian languages were found to be similar, which suggests that the U.S. norms of non-verbal WISC-III tasks may be comparable for Asian children (Jo & Dawson, 2010). Further research in this domain may be beneficial to determine if this practice could be utilized in clinical settings where Asian normative data is not available.

Additionally, researchers have utilized neuropsychological tests with Asian Americans to determine its diagnostic reliability. The Consortium to Establish a Registry for Alzheimer's Disease (CERAD) neuropsychological battery was administered to both demented and non demented older (i.e., 65 and up) Japanese Americans to compare performance and the battery was able to distinguish non demented individuals from those with dementia (Fillenbaum et al., 2005). The CERAD was translated in Korea and the resulting normative data was found to be very similar to the US version (Lee et al., 2004). These results are clinically significant, and Lee et al. (2004) suggested that the normative data be utilized in the clinical interpretation of the CERAD in the Korean elderly. In another study, the Cognitive Abilities Screening Instrument (CASI), a brief screening instrument for dementia, was administered to dementia patients and control subjects in two sites in Japan (Osaka and Tokyo) and the United States (Los Angeles and Seattle; Tsushima, Tsushima, & Fujii, 2010). At all four sites, performance on the CASI by the control subjects increased with education and decreased with aging within each education range (Teng et al., 1994). The most sensitive and the least sensitive items for distinguishing dementia patients from the controls were consistent across the sites as well (Teng et al., 1994). These studies are clinically promising, especially in situations where

neuropsychologists may be unable to refer an older Asian patient out and need to provide testing to rule out possible dementia. The neuropsychologist may be unable to give a definitive diagnosis, but can state that there is a high probability of a neurodegenerative etiology.

Disadvantages in the use of normative data. Mitrushina, Boone, Razan, and D’Elia (2005) stated two truths about normative data: there is no such thing as the best normative data for any test and all normative data are of limited use. The idea of “the best normative data” does not exist; for example, the Wechsler tests are primarily normed with Caucasian samples, and Asian participants are notably minimal. Interpretation using normative data is limited because it should optimally be utilized with patients whose demographic characteristics are similar to those of the research sample. When considering the use of a data set, examiners should always consider the sample size of the research participants and the subject demographics. The variance in a small sample is positively skewed, and Mitrushina et al. (2005) suggested utilizing normative data that use a sample of at least 50. Mitrushina et al. also recommended the consideration of age, sample size, education/IQ, gender, and handedness when considering an appropriate normative data set and always investigating procedural variables (i.e., method of administration and scoring, order of testing). It may be easier to utilize available normative data during test interpretation, but neuropsychologists should research to find normative data that has been collected from a comprehensive sample, and one whose demographics best fit their patients.

Neuropsychologists may experience a more difficult time in finding normative data for Asian American clients. Certain translated versions of nonverbal

neuropsychological tests have shown positive results in terms of cross cultural use; however, the same cannot be said for translated versions of verbal neuropsychological tests. For example, in Korea, several items from the Boston Naming Test were omitted and substituted for items more appropriate for a Korean-speaking population, and the test was administered without basal or ceiling rules while gathering normative data (Jo & Dawson, 2010). Therefore, the Korean BNT normative data would not be applicable for Korean patients who were administered the BNT in the United States. Also, the CVLT was modified in Korea with research subjects from each educational group (i.e., 0, 0-6, 6-9, 9-12, 12+) as opposed to the U.S. CVLT sample group who had a mean educational level of 14 years (Kim & Kang, 1999). The normative data from the U.S. CVLT was inflated as compared to the Korean CVLT, most likely in part to the higher level of education for the U.S. sample (Kim & Kang, 1999). Regrettably, the K-CVLT normative data cannot be applied to Koreans who live in the United States.

Potential drawbacks of ethnicity specific normative data. Unfortunately, Asian American patients may be at a greater risk for receiving inaccurate test interpretations. Very few normative data sets exist for the Asian population, and many of these are normed for Asians living in Asia. Typically, Asian American patients receiving neuropsychological testing will be compared to Caucasian research samples. The comparison of Asian American individuals to Caucasians in neuropsychological testing has been criticized, which in part conveys a subtle message that the Caucasian, majority culture was the standard with which to base performance on, and that any other form of behaving may be worth investigating or pathological (Puente & Perez-Garcia, 2000). However, there have also been criticisms to the use of race-specific normative data.

First, setting lenient cutoffs for impairment among ethnic minorities may potentially exclude ethnic minorities from receiving help that they need (Manly, 2005). Some neuropsychologists may attribute lower scores on tests to a patient's ethnicity and explain away certain impairments. Another criticism of race-specific normative data has been that separation by race can neglect other important factors such as education and culture (Manly, 2005). Ethnic minorities may mistakenly not receive a necessary diagnosis when they are experiencing cognitive deficits. Setting more forgiving cut-off levels for Asian Americans may do a disservice to more acculturated individuals.

Also, normative data that is collected from ethnic minorities tend to be regional. For example, university research institutions will typically collect normative data from local populations in order to avoid the cost considerations of stratified random sampling. For example, the normative data for popular tests such as Trailmaking Test (TMT) and Controlled Oral Word Association Test (COWAT) typically stem from data that have been collected at research or clinical sites and this restricts the normative sample. Depending on the research or clinical site, the sample population may be from low/high socioeconomic backgrounds or primarily consist of non-diverse ethnicities (i.e., Caucasian or a specific Asian population), which have an impact on test performance. This could be problematic if normative data with Asian Americans are collected in a similar manner for popular tests. Asians living in larger cities such as Los Angeles or New York will differ from those living in Midwestern states. Specifically, large cities (e.g., Los Angeles, New York, San Francisco, etc) have concentrated Asian areas where it may not be necessary to learn English to navigate independently. This markedly contrasts from individuals who may be the only Asian living in a small city. Differing

research institutions may also conduct their research on only one ethnic group (e.g., Chinese) but consumers of this research may subsequently generalize the research findings to all Asian Americans. However, given the number of Asian American ethnic groups, it would be impractical to generate race-specific normative data for each group and for all neuropsychological subtests (Gasquoine, 2009). Gasquoine (2009) indicated that the limited number of ethnic minority research participants can delay the publication of normative data to the extent that there is a risk of it becoming out of date before being published. For example, Heaton, Miller, Taylor, and Grant (2004) published normative data with the African American population on the Wechsler Adult Intelligence Scale –R (WAIS-R) and the California Verbal Learning Test (CVLT) subsequent to the publication of the WAIS-III and the CVLT-II. Additionally, given the increase in biracial and multiracial individuals, it would be difficult to generate normative data that would account for all of the differing types of mixed ethnic backgrounds that exist. Clinically, psychologists must make the decision as to which set of existing race-specific normative data would be most appropriate for multiracial patients, and this decision may differ between clinicians.

Neuropsychologists utilize tools in the form of tests that have been standardized, normed, and validated, in order to make diagnostic decisions. The testing of Asian American patients presents a challenge because there is a lack of a normal sample with which to compare them to. Fortunately, there is neuropsychological research that is taking place in Asia, which shows promising results in terms of comparability in the normative data found on non-verbal neuropsychological tests. Continued progress is

needed to meet the demands of Asian American patients who require neuropsychological help.

Neuropsychological research. These issues in cross-cultural testing present a dilemma for neuropsychologists who receive referrals for Asian American patients. They must make clinical decisions regarding whether to utilize certain cognitive tests and determine whether to use normative data that have been primarily derived from Caucasian participants, normative data that comes from studies utilizing a small Asian sample, or correct normative data based on demographic information. In February 2008, a Multicultural Problem Solving Summit was held to develop a plan for the future of cross-cultural neuropsychology. The Summit recognized the impact of reading level, acculturation, time in the United States, English fluency, English versus native language reading level, nationality of origin, quality of education, length of time in school, educational resource variables (e.g., per student expenditures, student/teacher ratios, etc.), wealth/income, and early life experiences on test performance (Romero et al., 2009). Additionally, psychologists stressed the importance of continuing the search for variables that may help explain ethnic differences in test performance, such as cultural differences that may affect the expression of cognitive abilities (Romero et al., 2009). The Summit detailed guidelines for when the use of demographically corrected normative data are useful, may be useful, or are not useful:

- A. Demographic corrections are useful when they are used to identify and characterize acquired neurocognitive impairment in an adult who:
 - (1) is a native of the country of assessment;
 - (2) developed normally
 - (3) had a mainstream education (e.g., no special education);
 - (4) speaks English as his/her first language (for U.S. normative data).

- B. Demographic corrections are sometimes useful (i.e., should be used with caution as the appropriateness of the normative data is uncertain) to help identify and characterize acquired neurocognitive impairment in:
- (1) teenagers or young adults who have not completed their education;
 - (2) adults who may not have had a mild developmental disorder (e.g., mild or specific learning disorder, some psychiatric conditions);
 - (3) anyone with a linguistic, cultural or educational background that would be unusually or poorly represented in the normative subject sample (e.g., ESL, someone partly educated in another country).
- C. Demographic corrections are not useful and are not recommended:
- (1) to characterize “absolute” levels of functioning in the abilities assessed (e.g., is the person disabled?). In such a case, it is recommended to use census or age-based normative data;
 - (2) to identify or characterize possible acquired impairment in capital punishment cases or when determining qualifications for special services;
 - (3) in cases of possible acquired impairment in individuals who have developmental disability (including mental retardation), severe psychiatric disorder such as schizophrenia, etc;
 - (4) to characterize acquired cognitive impairment in people who have major background differences from people in the normative sample (e.g., non-English, ESL);
 - (5) for predicting future performance in employment or academic settings;
 - (6) for employment selection decisions (laws exist that prohibit the use of race-based adjustments for this purpose) (Romero et al., 2009, p. 770-771).

Unfortunately, most Asian Americans will fall in the ambiguous category where demographic corrections are “sometimes useful,” and clinicians are still placed in the position of using their individual judgment. Asian American patients will continually require assessment services, and it is unrealistic and unethical to stop neuropsychological testing until normative data for all Asian ethnicities are collected on all major cognitive tests. The development of translated cognitive tests specifically for Asian Americans are not feasible at this time because there is a lack of sufficient consumer demand to offset the costs of test translation (Romero et al., 2009). Also, translating a test would only be

the first step in a process of translating and norming the test with Asian participants. Continuing neuropsychological research is needed to begin the process of resolving the dilemma surrounding normative data with ethnic minority populations. It is necessary to recognize that an elegant solution is not around the corner and that much trial and error may be required before a standardized method of neuropsychological testing is available for Asian Americans.

Possibilities for ethnic group differences. Research surrounding cross-cultural neuropsychology has revealed several possibilities that may account for ethnic group differences in neuropsychological test performance. Some of these possibilities, such as biological differences in brain organization among ethnic groups, the effect of ecological factors on brain functioning, and the impact of examiner's experiences with ethnic groups have been previously discussed in this dissertation as factors that could affect test performance within ethnic groups. Brickman et al. (2006) indicated that another potential factor could affect test performance is that specific neuropsychological tests may measure different cognitive constructs in different ethnic groups. For example, some research has demonstrated that African Americans demonstrate poorer performance on tasks of visual confrontation naming than Whites (Carlson, Brandt, Carson, & Kawas, 1998; Ross, Lichenberg, & Christenesn, 1995; Welsh et al., 1995) and that ethnic minorities perform significantly lower than Whites on tasks of nonverbal abilities (Campbell et al., 1996; Miller, Bing, Selnes, Wesch, & Becker, 1993). These differences persist despite controlling for or matching for highest level of educational attainment (Artiola i Fortuny et al., 1998).

While these findings suggest that there are potential neurobiological differences between ethnic minorities and Whites, Brickman et al. (2006) proposes that racial characterizations are socially or politically determined and have little basis in genetic or true biology. Brickman et al. (2006) believe that many scientists have identified relevant factors that may account for discrepancies in neuropsychological test performance among ethnic groups. These factors include the quality of education, literacy, test-wiseness, and racial socialization (Brickman et al., 2006). Previous research on cognitive test performance of African Americans compared to Whites have revealed that despite equivalence on demographic variables such as years of education and socioeconomic status, African Americans obtain lower scores on both verbal and nonverbal cognitive tasks (Manly, Jacobs, Touradji, Small, & Stern, 2002). This may be attributed to factors such as differences in quality of education or familiarity with standardized tests. Manly et al. (2002) utilized the Reading Recognition subtest from the Wide Range Achievement Test-Version 3 (WRAT-3) to estimate quality of education and administered a comprehensive neuropsychological battery to African American and White elders. Years of education matched African American elders obtained statistically significant lower scores than Whites on measures of word list learning and memory, figure memory, abstract reasoning, fluency, and visuospatial skill; however, after adjusting the scores for the WRAT-3 reading score, the overall effect of race was reduced and racial differences (with the exception of category fluency and a drawing measure) became non-significant (Manly et al., 2002). This study reveals that determining the *quality* of education of individuals is just as important as the individual's highest level of education obtained. Factors such as teacher quality, student/teacher ratio, special facilities (e.g., science lab),

length of school year/days attended, and peer characteristics can make a difference in terms of school quality (Manly et al., 2002). A challenge is that many assessors are unlikely to inquire about such details when gathering educational history and that even if such questions were asked of patients, many might not be able to accurately recall and/or describe these details.

Literacy is another potential factor that can account for discrepancy in testing among ethnically diverse individuals. Manly, Touradji, Tang, and Stern (2003) argue that literacy is a more powerful indicator of brain reserve than years of education because the act of acquiring literacy skills may change the organization of the brain and increase protection against cognitive decline. The literacy level of English speaking African American, Caucasian, and Hispanic elders was assessed utilizing the WRAT-3 reading subtest, and results showed that elders with low levels of literacy had a steeper decline in both immediate and delayed recall of a word list over time as compared to high literacy elders (Manly et al., 2003). Manly et al. (2003) suggest that the use of literacy as an estimate of the quality of education one received may serve as a more meaningful measure of comparison as opposed to number of years of education. Additionally, Manly et al. (2002) suggests that racial group differences may simply reflect a higher level of *test-wiseness* which they define as the ability to use the format and characteristics of a test to achieve a high score and the use of deduction and item cues to answer questions. Years of education can reflect the level of an individual's test-wiseness; however, schools differ between districts, public vs. private sectors, states, and quality of education differs more dramatically from country to country. A school that does not emphasize grades or employ different measurements of achievement may produce students who are not as test

savvy. Also, a poorly funded school district may regularly test students, but may not spend time with students to teach them ways to excel when abilities are measured in a written test format.

Finally, racial socialization may influence performance on neuropsychological tests. Steele (1997) suggests that in order to sustain school success, one must be identified with school achievement in the sense of it being a part of one's self-definition. This identification would mean that high achievement in school would result in good feelings about the self. Steele asserts that in order for this identification to form, one must have the interest, skill, resources, and opportunities to prosper and have a sense of being accepted and valued in school. This may not occur if a person feels threatened about achieving success in the school. Stereotype threat is a situational threat that affects members of any group about whom a negative stereotype forms (Steele, 1997). Steele stated that Black students begin school with standardized test scores that are not too far behind White peers; however, by the sixth grade, Black students are, on average, two full grade levels behind White peers. These gaps persist even in the middle and upper socioeconomic classes (Steele, 1997). Asian Americans possess the stereotype of the model-minority, and examiners may expect Asian patients to perform well. Also, an Asian who does not identify with the stereotype may feel anxiety surrounding what is expected of him or her during neuropsychological tests.

Current research cannot provide answers regarding the precise impact of these factors on neuropsychological test scores between differing ethnic groups. It is widely known that most neuropsychological tests have been developed and validated with White normative samples; therefore, there may be an inherent bias in the tests, and the construct

of each neuropsychological test may be designed to assess something subtly different among ethnic groups (Brickman et al., 2006). However, the general consensus appears to be that ethnicity or race does not cause significant variability in cognitive test performance, but rather is one of several factors (e.g., age, level and quality of education, acculturation) that impact performance (Brickman et al., 2006). Given these conclusions, the clinician should employ a holistic approach in terms of assessing factors that may impact their patient's test performance. The role of the neuropsychologist is to understand the complete person in terms of physical and psychological health, and the information that is gathered from the patient should be as comprehensive as possible.

The clinical interview should begin with the patient's birth and assess the mother's health and the amount of medical attention she received to the environment into which the patient was born (i.e., SES status). The patient's educational history should be as exhaustive as possible (e.g., quality of education, school district, teacher to student ratio, exposure to standardized testing, standardized test scores, etc) as should their social history and cultural background. For adult examinees this will likely require interviewing collateral sources such as parents or other caregivers (if available) who had familiarity with details of the patient's schooling. The neuropsychologist should understand the cultural diversity of the patient's social circles and the impact of culture on a range of aspects of the patient's life (e.g., amount of native language use, time spent on cultural activities, etc). The interview should include an assessment of how the patient feels in the testing room and his/her level of comfort. Available neuropsychological tests are not perfect; therefore it is imperative to gather information to corroborate with test findings.

Chapter IV

Recommendations

This dissertation has attempted to illustrate the ways in which neuropsychological testing with Asian Americans could be impacted including factors such as cultural beliefs/practices, expression of psychological distress, race related trauma, level of acculturation, socioeconomic status, language, psychometric issues, test bias, and use of tests lacking sufficient normative data. The field of psychology has recognized that issues related to the neuropsychological testing of differing ethnic minorities have become progressively more significant (Ardila, 2005). With this recognition, a more concrete set of guidelines for neuropsychological testing with ethnically diverse individuals is needed; however, more research and funding may be necessary before this occurs. In the meantime, this section will highlight some recommendations derived from existing research on neuropsychological testing with Asian Americans that address issues raised in the critical review and analysis completed earlier in this dissertation. First, the Houston conference guidelines for neuropsychologists will be described in order to reveal how the American Psychological Association is attempting to ensure the development of competent neuropsychologists. This dissertation explored the *threats to cultural validity* (i.e., therapist bias in clinical judgment, inappropriate use of diagnostic personality tests, cultural factors influencing symptom expression, language capabilities of the patient, diversity of etiology of psychological disorders) that stem from a tendency to minimize cultural factors during diagnosis (Leong & Lau, 2001). The Houston conference attempted to standardize training to ensure that future neuropsychologists are informed in the area of cultural diversity and comprehend the impact of cultural factors on

neuropsychological test performance. Competent neuropsychologists will be able to gauge whether they possess sufficient education and training to test Asian American patients. Next, the APA standards for educational and psychological testing will be reviewed to determine the current ethical standards for testing. APA recognizes the impact that culture and second language can have on cognitive test performance, and it attempts to address these issues. Finally, recommendations will be made regarding neuropsychological test selection, test administration, and normative data that address the issues previously discussed in this dissertation, in order to improve neuropsychological testing with Asian Americans.

Neuropsychology as a discipline is relatively new to the field of psychology, and it continues to evolve through research and clinical practice (Wong, 2006). In 1981, the International Neuropsychological Society (INS) and American Psychological Association Division of Clinical Neuropsychology (APA Division 40) recognized the need to develop uniform training and credentialing procedures in clinical neuropsychology (Yeates & Bieliauskas, 2004). In 2004, the Houston Conference guidelines for education and training in clinical neuropsychology were incorporated as a mandatory process in order to be eligible for board certification (Yeates & Bieliauskas, 2004). The Houston Conference served an important purpose in that it defined the clinical neuropsychologist in terms of necessary education, knowledge, and experience. The guidelines defined by INS state that a neuropsychologist should possess a specific knowledge base, including: general psychology core, general clinical core, foundation for the study of the brain-behavior relationship, foundation of practice in clinical neuropsychology, and background in cultural and individual differences and diversity (Ardila, 2005). The U.S.

will continue to see an influx of immigration into this country. Active research into the effects of bilingualism on neuropsychological assessment will continue to be relevant and training and understanding of the impact of second language acquisition on brain development is necessary. Additionally, the establishment of guidelines for neuropsychological training is essential because it facilitates the development of more competent neuropsychologists with a greater knowledge base and increased training to work with ethnically diverse individuals.

Clinical neuropsychologists are bound by the ethical standards as determined by the American Psychological Association. The APA recognized the potential harm that could be caused by the improper use of tests during cognitive assessment. The establishment of the standards for educational and psychological testing stemmed from the APA's attempt to promote the sound and ethical use of tests and to provide criteria for the evaluation of tests, testing practices, and the effects of test use (APA, 1999). The standards devote attention to the testing of individuals with diverse linguistic backgrounds, due to the significant impact of language on cognitive tests. For example, the standards recognize that non-verbal tests are not truly without language because the tests are explained and administered in the English language, thus impacting the reliability of the measure (APA, 1999). Cultural background also affects cognitive testing, and individuals may be unfamiliar with Western methods of testing, which place them at a disadvantage. The APA acknowledges the diversity in skill among bilingual individuals in terms of degree of ability to speak, write, comprehend, and read, and these abilities are affected by the social or functional situations of communication (APA, 1999). An individual may be proficient in conversational and social English; yet, he or

she may experience difficulty with tasks that require more advanced understanding of the English language (e.g., such as the ability to define increasingly uncommon English language words or perform tasks involving the application of abstract verbal reasoning). This would be exhibited on tasks such as the WAIS-IV Vocabulary and Similarities subtests. Additionally, because of such factors, individuals may perform more slowly, less efficiently, and less accurately on particular tasks, which impact scores and perceived level of functioning as measured by cognitive tests (APA, 1999).

The APA Standards for Educational and Psychological Testing provide the following criteria for working with individuals with diverse linguistic backgrounds:

1. Testing practice should be designed to reduce threats to the reliability and validity of test score inferences that may arise from language differences.
2. When credible research evidence reports that test scores differ in meaning across subgroups of linguistically diverse test takers, then to the extent feasible, test developers should collect for each linguistic subgroup studied the same form of validity evidence collected for the examinee population as a whole.
3. When testing an examinee proficient in two or more languages for which the test is available, the examinee's relative language proficiencies should be determined. The test generally should be administered in the test-takers most proficient language, unless proficiency in the less proficient language is part of the assessment.
4. Linguistic modifications recommended by test publishers, as well as the rationale for the modifications, should be described in detail in the test manual.
5. When there is credible evidence of score comparability across regular and modified tests or administrations, no flag should be attached to a score. When such evidence is lacking, specific information about the nature of the modification should be provided, if permitted by law, to assist test users properly to interpret and act on test scores.

6. When a test is recommended for use with linguistically diverse test takers, test developers and publishers should provide the information necessary for appropriate test use and interpretation.
7. When a test is translated from one language to another, the methods used in establishing the adequacy of the translation should be described, and empirical and logical evidence should be provided for score reliability and the validity of the translated test's score inferences for the uses intended in the linguistic groups to be tested.
8. In employment and credentialing testing, the proficiency level required in the language of the test should not exceed that appropriate to the relevant occupation or profession.
9. When multiple language versions of a test are intended to be comparable, test developers should report evidence of test comparability.
10. Inferences about test takers' general language proficiency should be based on tests that measure a range of language features, and not on a single linguistic skill.
11. When an interpreter is used in testing, the interpreter should be fluent in both the language of the test and the examinee's native language, should have expertise in translating, and should have a basic understanding of the assessment process (APA, 1999, p. 97 – 100).

The Houston conference guidelines and the APA standards for educational and psychological testing both attempt to address the importance of informed neuropsychological testing with Asian Americans. The Houston conference attempted to take a firm stance with regards to the training of future neuropsychologists. The guidelines highlight the need for future clinicians to have a background in cultural diversity, which is reflective of the growing diversity in the United States. The APA standards provide relevant criteria for working with individuals with diverse linguistic backgrounds and some of these points have been acknowledged in this dissertation. These standards provide an adequate guideline for clinical neuropsychologists to follow;

however, they should be recognized as a baseline standard for testing. The Houston conference guidelines state that neuropsychologists should have some background in cultural and individual differences and diversity; however, these guidelines are vague and seemingly simplify a topic that is vast and integral in neuropsychological test conceptualization. More specific recommendations can be made that would help decrease factors affecting validity in neuropsychological testing with Asian Americans. The research provided in this dissertation highlights manners in which testing with Asian Americans can specifically be improved, and additional recommendations will now be broken into three domains: neuropsychological test selection, administration, and use of normative data. These domains were chosen based on the current state of neuropsychological research and clinical practice, and the need for some type of agreement with respect to these three categories.

Neuropsychological test selection. The greatest challenge in the neuropsychological testing of Asian Americans lies in the lack of apparent validity for many commonly used tests of cognitive functioning. Most neuropsychological tests have been standardized on Caucasian populations. In the future, an increase in the number of clinically validated tests may be available for use with individuals of differing Asian ethnicities; however, for the time being, neuropsychologists must be critical in their use of cognitive tests. First, language fluency should be assessed through multiple sources (e.g., language spoken majority of the time, location of education) to determine if English language neuropsychological tests can be administered with an Asian patient. An Asian American may have an accent despite English language fluency. With these individuals, tests that deduct points for mispronunciation of words should not be utilized (i.e., WTAR,

Boston Naming Test). Also, an Asian patient may be fluent in English, but still consider their native language to be their dominant language. In this case, timed tests may not accurately reflect their true abilities and should be used with caution. The bilingual research that was explored in this dissertation showed that bilinguals may have to suppress their dominant language in order to produce in their non-dominant language (Green, 1998). Therefore, timed fluency tests such as the Controlled Word Association Test may not represent a patient's actual abilities. Depending on the client's level of acculturation, tests with obvious cultural biases should be avoided, such as the WAIS-IV Vocabulary, Information, Comprehension subtests, and the Boston Naming Test. Wong (2010) acknowledges that the temptation to use less language dependent or nonverbal tests may be present; yet, these tests may not be "culture fair," especially when used with individuals with low educational levels. Ostrosky-Solis et al. (1999) demonstrated that educational effects were noted on visuoconstructional and conceptual tasks (e.g., calculations, motor sequencing tasks) with Hispanic/Latino populations; therefore, non-translated neuropsychological testing should not be performed with native language dominant Asian Americans who have received little education in their native country and no education in the United States. This dissertation has highlighted numerous research articles that discussed the impact of education (including location of education, quality, emphasis on standardized testing, etc.) on cognitive development and neuropsychological test performance. If an individual has not received their education in the United States, subtests that measure knowledge garnered from the U.S. school system (i.e., WAIS-IV Information) should not be administered. At this point, neuropsychologists do not have a checklist of tests that can and cannot be utilized with ESL individuals. These general

principles may place neuropsychologists in a better position to make good clinical decisions with regards to test selection.

There has been an increase in the number of clinically validated tests available for use with patients of differing Asian backgrounds. Most of these tests have been translated from English versions and normed on individuals from their respective countries, but efforts are being made to develop neuropsychological tests that address the unique needs of specific cultures (Chey, 2007). Research surrounding the utilization of indigenous and adapted tests with less acculturated Asian Americans will be an exciting area in the field of neuropsychology, and the results have the potential to change the manner in which testing is performed. Until the research surrounding indigenous tests show promising results, neuropsychologists will have to rely on translated tests during assessments with less acculturated individuals. Research and community centers differ with respect to how test translation occurs, and neuropsychologists should be cautious when utilizing translated tests. For example, a Hong Kong List Learning Test was developed for use with Chinese patients (Chan & Kwok, 1999). However, this test was normed in Hong Kong with Cantonese-speaking subjects, and its properties with Mandarin-speaking or other Chinese language/dialects groups are unknown (Wong, 2010). Despite this qualification, it is still preferable to use neuropsychological tests that are normed on a group that is closer in linguistic and cultural background to the patient, as this may provide a more accurate approximation of the client's cognitive status (Wong, 2010). There have been promising research studies that provide evidence for Wong's (2010) recommendation; for example, the findings from Artiola I Fortuny et al. (1998) study which demonstrated similar results on neuropsychological measures from Spanish

and U.S.-Mexico border individuals. Research findings such as this may help a neuropsychologist to feel more confident in testing particular ethnic groups when research supported neuropsychological tests are utilized. A caveat is that there is a lack in the availability of translated tests. The neuropsychology community would benefit from an open forum where translated neuropsychological tests can be readily available and shared. Copyright laws may prohibit certain reproductions of test stimuli, but such a forum can also serve as a site for sharing information, recommendations, or networking to connect neuropsychologists with one another. However, if certain translated neuropsychological tests are available to neuropsychologists through colleagues, then issues such as level of education, level of acculturation, frequency of English use, and occupation all play a role in this decision making process. Neuropsychologists must become smart consumers with regards to the use of translated tests and consider the method of translation (e.g., test previously translated by unknown member at a testing site vs. test that has been translated by a neuropsychologist who has in-depth knowledge of the culture and language to which the test is being translated), normative sample size, and validity/reliability before they make the decision to use a test on an Asian American client.

Administration. Many critical errors can be made during an administration phase of testing with Asian Americans. First, every clinician needs to consider whether it is appropriate to test a referred client. During the decision making process, the clinician should consider their knowledge of previously discussed Asian cultural values and honestly assess their ability to incorporate this information during the interpretation phase of testing. If he or she does not feel comfortable, the clinician should provide the client

with a more appropriate referral. Regrettably, this may not be possible in rural areas, or in areas of the United States where an Asian neuropsychologist is not available. If an appropriate referral is not available, the clinician should read books and research the cultural background of the client before seeing them, and consult with an impartial neuropsychologist who is a native speaker and familiar with the client's culture (Brickman et al., 2006). Clinicians can find bilingual neuropsychologists through networking, consultation, or membership with clinical neuropsychology organizations such as Division 40 or the International Neuropsychological Society. The neuropsychological report should also explicitly describe and discuss the potential caveats and ramifications of language differences (Brickman et al., 2006). The clinician should possess cultural expertise or competence in working with Asian American clients, and in an ideal situation, the clinician would speak the client's language at the level of a highly educated native.

Realistically, however, it may be difficult for an Asian American client to receive neuropsychological testing from an Asian American neuropsychologist, given the number of registered clinicians with the International Neuropsychological Society. There are 115 registered Asian American neuropsychologists in this organization, but this is a rough estimate given that there may be unregistered practicing neuropsychologists (Fujii, 2010). Given these numbers, non-Asian neuropsychologists must be prepared to provide testing for Asian American clients, and examiners should possess knowledge of cultural characteristics that clients may present with during the clinical interview and test administration in order to provide the best care possible. Previous analysis of the research revealed that 0% of Asian Americans sought mental health services despite a

history of mental illness (SAMHSA, 2008). This information highlights the care that neuropsychologists must take in ensuring that the Asian Americans who do seek help feel understood and not further stigmatized. A more comprehensive list was discussed earlier in the dissertation; some of these items are listed below:

1. Respect for authority: which may present as a reluctance to disagree, disapprove, or show concern about testing in front of examiner (e.g., can present as nodding in agreement with examiner even if the patient disagrees with their recommendations or do not completely understand the clinician).
2. Failure to volunteer critical information (i.e., on part of patient or family member) due to fear of stigmatization – clinicians should be more directive in gathering information. Due to the questionable validity of tests, detailed collateral information may be the best information for conceptualizing the presence or severity of cognitive deficits.
3. Tendency to somaticize because it is more socially acceptable. Neuropsychologists can take advantage of this cultural preference for physical manifestations and explanations of behaviors by framing neuro-behavioral sequelae of brain injury or neurologic disease as symptoms of a medical problem rather than as mental health problems.
4. Tendency to only seek outside help when individuals become unmanageable. Illness of any kind is treated within the family—so help seeking behavior may be an indication that the family is in distress. Validation of the family members for making the difficult decision to bring the client in and also explaining the etiology of disorders can ensure that family members do not blame themselves or feel shame (Wong & Fujii, 2004 p. 31-32).

Examiners should preface the clinical interview that accurate information is critical to the interpretation of tests and in formulating a diagnosis. The analysis of literature showed that the cultural value of *respect for authority* may then prompt an Asian individual to share pertinent information if the necessity of accurate information is reiterated by the examiner. Additionally, examiners should be directive in obtaining information and consistently check-in with clients and family members to ensure an accurate

understanding. Factors such as possible immigration related trauma, relevant cultural values (e.g., deference, face, shame), potential stigma surrounding psychological help, and socioeconomic status, should be considered given the possible impact of these issues on test performance.

Before the actual administration of the neuropsychological battery, neuropsychologists should assess a client's level of language fluency. A degree of fluency can be obtained during the clinical interview, and examiners must consistently assess the frequency and context of language use, the extent to which language is blended into composite languages (e.g., Konglish; blending of Korean and English), level of receptive and expressive English skills, the quality of English education, use of dialects, and level of acculturation (Romero et al., 2009). As previously discussed in this dissertation, it is important to assess which language the patient is more comfortable with and proceed with testing completely in one language to avoid interference and delays in responses (Mindt et al., 2008). Future research in this area can include the development of brief expressive and receptive language screens with differing Asian languages in order to garner a more valid and reliable indicator of language fluency. Another important assessment to consider is an individual's level of acculturation. Acculturation refers to the level to which an individual participates in the values, language, and practices of the majority culture versus those of his or her own community (Manly et al., 1998). An individual's level of comfort and participation in American culture is an important factor to address because research has shown that level of acculturation accounted for a significant proportion of variance on several neuropsychological measures (Manly et al., 1998). Previous analysis of neuropsychological testing with

African Americans revealed that the effects of acculturation were significant enough to potentially invalidate the results of tests. This raises legitimate concerns surrounding the population of Asian Americans who may be fluent in English, yet unacculturated to American culture. Questions regarding the individual's primary peer group, recreational/community interests and involvement, and other related information to gain an understanding of his or her general acculturation level may be helpful in this regard (Wong, 2010).

At times, it may be necessary to utilize a translator to assist in test administration if the examiner is not proficient in the language of the examinee. In these situations, the translator must be fluent in both the language of the test and the examinee's native language. Currently, a majority of research surrounding the use of translators in psychological settings uses the term bilingual and bicultural synonymously. Again, this highlights the heterogeneous definitions of bilingualism that exist in clinical practice and research. However, bilingualism does not necessarily connote biculturalism and vice versa, but there is a lack of research into the percentage of bicultural/bilingual versus bilingual only translators. Translation is enhanced by knowledge of culture because so much is conveyed without language, and the ability to read behavior is an integral part of an interpreter's job. Unfortunately, there are no studies that explore the performance of bilingual translators as opposed to the performance of bilingual and bicultural translators. Additionally, within the realm of neuropsychological interpretation, it is beneficial if the interpreter has a basic understanding of the process of psychological testing, including the importance of following standardized procedures, the importance of accurately conveying to the examiner an examinee's actual responses, and the role and

responsibilities of the interpreter during testing (APA, 1999). Currently, training programs that would prepare translators in the area of psychological assessment do not exist. However, given the growing need of translators in psychology, this would be a beneficial support for the field. When neuropsychologists utilize interpreters, they should make it a practice to meet with interpreters before testing to educate them about psychological testing if they are unaware of the procedures, and to answer any questions that interpreters may have. Non-verbal cues, such as facial expressions or body language should be addressed as well.

Normative data. Once a neuropsychological battery has been chosen and administered by a clinician, the next task is to determine the population with which to compare an individual's scores. Many cognitive tests provide their own normative sample set, and the norms may be broken down based on age, gender, and/or ethnicity. The norms are based on the administration, standardization, and validation of the cognitive test on a sample set of individuals; however, the sample of participants tends to be represented by a Caucasian majority. Normative based testing is currently the standard procedure of neuropsychological assessment (Fujii, 2010). This standard of neuropsychological test interpretation may explain the motivation of researchers to develop race-specific normative data. The growth of research in race-specific normative data primarily surrounds African American and Hispanic populations as evidenced earlier in this dissertation. Another method of cognitive test interpretation is the hypothesis testing approach. In this approach, the clinician develops a hypothesis of normative functioning or a pattern of deficits based upon the etiology of a known neurological disorder and data from different sources (i.e, behavioral observations, history, medical

reports, collateral reports; Fujii, 2010). With hypothesis testing, the neuropsychologist would utilize a set of norms to compare the individual's scores. However, the comparison of an Asian American's scores to a Caucasian majority raises questions about the validity of the results. Therefore, the use of collateral information such as behavioral observations and medical reports would be utilized to provide more support for the norm-based findings. Neurodegenerative processes such as Alzheimer's disease have a relatively predictable pattern of deficits, therefore a working diagnosis can be formed if an Asian American's scores show deficits in memory, executive functioning, visuospatial skills, and language, and if functional declines are noted by family members. The hypothesis testing approach is typically implicit in the clinical decision making process; however, Fujii (2010) suggests that this process be made explicit in a neuropsychological report.

Fujii (2010) detailed guidelines for the use of the norm-based testing approach as opposed to the hypothesis testing approach when working with Asian American clients.

Norm-based testing with Western-based tests is recommended when:

1. the client received a college-level education with courses that are generally taught in English,
2. the client has lived in the United States for many years from a young age and is competent in English,
3. English is the primary language spoken at home,
4. the client has performed at the average level or higher on national standardized tests (Fujii, 2010, p. 8).

A hypothesis testing approach is recommended when:

1. a client does not match American demographics for neuropsychological test samples due to low level of education or quality of education, and poor command of English,

2. there is no supportive literature suggesting equivalent performances on similar neuropsychological tests, and
3. there are no normed tests developed in the client's language or country (Fujii, 2010, p. 8).

Studies of translated Western neuropsychological tests in East Asia showed that East Asians performed as well, if not better than some Westerners on certain measures (i.e., general intelligence, visual spatial tasks; Lynn & Song, 1994). These studies are important because they reveal significant differences between ethnicities in various aspects of cognitive functioning, which help researchers to hypothesize about the possible reasons for these discrepancies. However, until further research is completed in this area, the hypothesis testing approach is the best practice approach when working with Asian Americans who do not meet criteria for norm based testing.

Another important factor in analyzing test scores is determining how scores compare to an individual's premorbid level of functioning. Typically, premorbid level of functioning is gauged utilizing reading tests (e.g., Wechsler Test of Adult Reading), vocabulary tests (e.g., WAIS-IV Vocabulary subtest), or based on an individual's educational or occupational history. Unfortunately, estimating premorbid abilities with the Asian American population is challenging because reading/vocabulary tests may underestimate their level of functioning and an Asian individual's current occupation may be a poor indicator of intellectual ability. Also, the Korean language does not include any silent letters or irregularly spelled words, so it would not be possible to develop a test analogous to the Wechsler Test of Adult Reading (WTAR; Jo & Dawson, 2010). Wong and Fujii (2004) suggest utilizing information such as the native country where a person was born and raised, date and reason for immigration to the United States,

occupation and education level in the native country, parent's occupation and educational level in native country, occupation and education in the United States, and comparison of the client's intelligence to family members or siblings in order to gain a fuller understanding of an individual's premorbid level of functioning. It may be beneficial to assess the quality of the patient's education in their native country and in the U.S. because Manly et al. (2002) showed that the quality of education was just as important as the highest level of education obtained. An individual from a country with competitive education (e.g., Korea, Japan) will differ from another individual who may come from a more poverty stricken Asian country. An additional contribution to Wong and Fujii's suggestion is to consider the family's socioeconomic status in their native country and in the United States. A review of Hispanic normative data showed that factors such as socioeconomic status could create neuropsychological test score variance across individuals who share a common language. A comparison of a client's current level of functioning based on cognitive testing as compared to his or her premorbid level of functioning provide rich information with regards to treatment recommendations and future prognosis.

Currently, the ability of cognitive tests to estimate cognitive strengths and weaknesses in poorly acculturated Asian Americans are imprecise. Determining etiology of cognitive problems is made more difficult by the differing ways in which Asian Americans may express symptomatology. For example, Asian Americans may express psychological issues in a somatic fashion (e.g, complaints of physical pain when the individual is feeling depressed) and the examiner may miss a critical piece of information that could affect differential diagnosis. Nevertheless, the clinician can rule out particular

deficits with some confidence if a patient performs well on neuropsychological testing (Fujii, Umetsu, Schwartz, & Hostetter, 2002). Also, if deficits are found, the clinician can be more confident if the pattern is consistent with a neurological syndrome (Wong & Fujii, 2004). In general, Western measures of cognition may underestimate an individual's actual abilities, particularly for verbal tests; therefore the limitations of test interpretations should be stressed in reports. However, the consensus of the preceding critical analysis of literature revealed that ethnicity or race does not cause significant variability in cognitive test performance, but is rather one of several factors that impact performance (Brickman et al., 2006). The neuropsychologist should employ a holistic approach with Asian American patients and understand the complete physical, psychological, and cultural history of the individual in conjunction with their current clinical picture.

Asian Americans represent a diverse group and are comprised of 24 different ethnicities, each with their own language, culture, and values. As the fastest growing ethnic minority group in the United States, neuropsychologists will inevitably be referred an Asian client. The field of psychology has recognized the glaring issues that exist in the neuropsychological testing of Asian Americans, and an increase in research has resulted from this. Hopefully, progress will continue to be made and research findings will lead to changes in clinical practice.

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