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Self-perceived cognitive decline, neuropsychological functioning, and depressive symptoms in HIV+ Spanish-speakers

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SELF-PERCEIVED COGNITIVE DECLINE, NEUROPSYCHOLOGICAL FUNCTIONING, AND DEPRESSIVE SYMPTOMS IN HIV+ SPANISH-SPEAKERS

A clinical dissertation submitted in partial satisfaction

of the requirements for the degree of

Doctor of Psychology

by

Ahoo Karimian, M.A.

August, 2016

Cary Mitchell, Ph.D. – Dissertation Chairperson

This clinical dissertation, written by

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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

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TABLE OF CONTENTS

Page

Page

LIST OF TABLES

Page

LIST OF FIGURES

Page

DEDICATION

To my cherished ones, without whom life would have little meaning.

ACKNOWLEDGMENTS

First and foremost, I would like to thank to my dissertation committee. A big thank you to my Chair, Dr. Cary Mitchell, who has guided me through the infancy of this manuscript to its bitter end. Your encouragement, confidence in my abilities, and dedication to helping me achieve my goals were critical to my process. Additionally, a very big thank you to Dr. Enrique Lopez, who generously shared his data with me and spent numerous hours helping me explore, analyze, and evaluate the findings. Your guidance and mentorship have been blessings throughout my academic career. To Dr. Susan Himelstein, thank you for all of your support and contributions to my development both in the classroom and throughout the development of this study.

Next, I would like to thank my colleagues, many of whom provided me with the motivation and encouragement to keep moving forward. A big 'thank you' to Jessica Beadel, whose support, competence, and vision served as an inspiration. Your friendship was a godsend to me. Thank you to my cohort mates and road dogs, Rebecca Gutierrez, Sandra Slater, and Nardos Bellet. You ladies made graduate school infinitely better. And to the other members of our clan, Justin, Mark, Brian, and Bryce, I am honored to be a member of your ilk.

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VITA

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EDUCATION

2011-2016 **Pepperdine University, Graduate School of Education & Psychology**
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Doctoral Student in Clinical Psychology Program (Degree expected 08/2016**)**
Dissertation: ***Self-perceived cognitive decline, neuropsychological functioning, and depressive symptoms in HIV+ Spanish-speakers***

05/2011 **Pepperdine University, Graduate School of Education & Psychology**
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Master of Arts in Psychology

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CLINICAL EXPERIENCE

07/15-07/16
Dayton VA Medical Center
Neuropsychology Intern
Supervisors: Monica S. Malcein, Ph.D.; Kristin Rodzinka, Ph.D., ABPP; Andrea Bischoff, Psy.D., ABPP

- Rotations include Neuropsychology (6 mo.), Behavioral Health/Primary Care (6 mo.), & Trauma Behavioral Health Integration Program (12 mo.)
- Conduct comprehensive inpatient and outpatient neuropsychological evaluations and provide feedback to Veterans with a range of neurological, psychiatric, and medical concerns
- Conduct interventions employing empirically supported behavioral health and trauma-focused treatments (i.e., CPT, CBTi)

02/15-07/15
VA Long Beach Healthcare System
Psychology Pre-Intern, Neuropsychology and Rehabilitation Medicine
Supervisor: Duke Han, Ph.D., ABPP-CN

- Conducted neuropsychological and psychodiagnostic assessments with Veterans presenting with a multitude of medical, behavioral, psychiatric, and psychosocial concerns
- Provided client-centered feedback to Veteran's and their families
- Attended weekly neuropsychology seminars and individual supervision

08/14-02/15
VA Long Beach Healthcare System

Psychology Pre-Intern, Spinal Cord Injury/Disorders Center
Supervisor: David Kerner, Ph.D.

- Conducted brief inpatient neuropsychological screenings and psychodiagnostic assessments
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07/13-07/14
UCLA Longevity Center

Neuropsychology Extern
Supervisor: Karen Miller, Ph.D.

- Administered comprehensive neuropsychological clinical and research batteries and wrote integrative neuropsychological reports
- Participated in feedback sessions with patients and their families in order to discuss results and recommendations
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02/13-07/14
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Psychometrist for MBS study; PI: Patricia Ganz, M.D.

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Neuropsychology Extern
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09/11-04/13
Pepperdine University Community Counseling Center, Irvine & WLA, CA

Psychology Practicum Student
Supervisor: Joan Rosenberg, Ph.D.

- Conducted individual, family, and couples psychotherapy with adults from diverse backgrounds presenting with a variety of mood, personality, and trauma-related issues
- Administered, scored, and utilized outcome measures and mood assessments

06/11-11/11
Department of Mental Health, Long Beach Adolescent Center
Neuropsychology Extern
Supervisor: Brian Betz, Ph.D.

- Conducted neurocognitive testing on children from diverse cultural and socioeconomic backgrounds to assess for the potential impact of learning disabilities and mood disorders
- Wrote comprehensive assessment reports to inform IEPs

RESEARCH EXPERIENCE
07/14-06/15
UCLA Neuropsychology of Medical Illness Center
Staff Research Associate
Supervisor: April Thames, Ph.D.

- Facilitated and promoted progress of concurrent studies
- Trained, supervised, and supported psychology practicum students
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07/13-07/14
UCLA Neuropsychology of Medical Illness Center
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- Investigated the effects of HIV on cognitive functioning among ethnic/racial diverse populations by conducting comprehensive psychodiagnostic, neuropsychological, and functional assessments for a variety of studies related to the impact of acquired disease on cognition
- Attended weekly didactic seminars and group supervision focused on neurobehavioral syndromes and neuropsychological research methods

07/12-07/13
UCLA Center for Addictive Behaviors
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- Administered comprehensive neuropsychological batteries to ethnically and socioeconomically diverse adult participants (ages 18-65) for studies examining the effects of methamphetamine dependence on cognition

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05/10-09/12
Pepperdine University, Graduate School of Education and Psychology
Research Assistant
Supervisor: Yuying Tsong, Ph.D.

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01/10-07/11
UCLA Program for the Education & Enrichment of Relational Skills (PEERS)
Research Assistant, Certified PEERS Interventionist
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- Assisted in screening, intakes, administration, and scoring
- Managed clinic and research databases
- Assisted in trainings and workshops

PUBLICATIONS

Thames A., Mahmood, Z., Burggren A.C., **Karimian, A.,** & Kuhn, T. (2015) Combined effects of HIV and marijuana use on neurocognitive functioning and immune status. *AIDS Care*. doi: 10.1080/09540121.2015.1124983

Thames, A. D., **Karimian, A.,** & Steiner, A. J. (in press). Neuropsychological assessment of ethnic minority children. In S. Graves & J. Blake (Eds.), *Psychoeducational Assessment and Intervention for Ethnic Minority Children: Evidence Based Approaches*. Washington, DC: American Psychological Association.

PRESENTATIONS

Schwarz, L.J., Mahmood, Z., Ellis, M. U., **Karimian, A.,** Panos, A.H., Steiner, A. J., Sayegh, P., & Thames, A. D. (August, 2015). *Marijuana use, neurobehavioral functioning, and immune status among HIV+ adults.* Poster presented at the American Psychological Association's 123rd Annual Convention, Toronto, Ontario.

Karimian, A., Mahmood, Z., Steiner, A.J., Arentoft, A., Sayegh, P., Thaler, N.S., … Thames, A.D. (2015, February). *The interactive effects of age and stress on cognition and functional abilities among HIV+ individuals*. Poster presented at the International Neuropsychological Society's 43rd Annual Meeting, Denver, CO.

Thaler, N.S., Sayegh, P., Arentoft, A., **Karimian, A**., Mahmood, Z., Singer, E. J., & Thames, A.D. (2015, February). *Behavioral dysregulation is associated with increased neurocognitive variability*. Poster presented at the International Neuropsychological Society's 43rd Annual Meeting, Denver, CO.

Sayegh, P., Bellete, N.Z., Thames, A.D., Arentoft, A., **Karimian, A.,** Castellon, S.A., & Hinkin, C.H. (2014, November). *Medication Adherence in HIV-Positive African Americans: The Mediating Roles of Premorbid Intellectual/Reading Abilities and Health Beliefs*. Poster presented at the 34th Annual National Academy of Neuropsychology conference in Fajardo, Puerto Rico.

Karimian, A., Steiner, A. J., Lopez, E., Hardy, D. J., Alcala, S., & Smith, K (2014, April). *Evaluating motor dexterity for Spanish-speakers with HIV-1-Associated Neurocognitive Disorders*. Poster presented at the 94th annual Western Psychological Association conference in Portland, Oregon.

Steiner, A. J., **Karimian, A.**, Lopez, E., Hardy, D. J., & Smith, K. (2014, April). *Assessing processing speed of HIV-1-associated neurocognitive disorders (HAND) in Spanish-speakers.* Poster presented at the 94th annual Western Psychological Association conference in Portland, Oregon.

Karimian, A., Steiner, A. J., Lopez, E., Hardy, D. J., & Smith, K (2014, February). *Performance-based measures of visuospatial functioning used to screen for HIV-Associated Neurocognitive Disorders (HAND) within the monolingual Spanish-speaking population.* Poster presented at the 42nd Annual International Neuropsychology Society conference in Seattle, Washington.

Steiner, A. J., **Karimian, A.**, Lopez, E., Hardy, D. J., & Smith, K. (2014, February). *Verbal fluency measures used for assessing HIV-Associated Neurocognitive Disorders (HAND) within the monolingual Spanish-speaking population.* Poster presented at the 42nd Annual International Neuropsychology Society conference in Seattle, Washington.

Karimian, A. (2014). *Child Abuse, Elder & Dependent Abuse, and Domestic Violence.* Presented as guest lecturer at Pepperdine University Graduate School of Education and Psychology for PSY 623, Law & Ethics for Mental Health Professionals.

Karimian, A. (2013). *Multiple Relationships.* Presented as guest lecturer at Pepperdine University Graduate School of Education and Psychology for PSY 623 & 706, Law & Ethics for Mental Health Professionals.

Karimian, A., Miller, M., & Vargaz, S. (2012). *The In's and Out's of Bipolar Disorder.* Community outreach lecture series, Los Angeles Mission College, Sylmar, CA.

Tsong, Y., Stewart, J., & **Karimian, A.** (2011, August). *Role of culture and attitudes toward seeking mental health services in Cambodia: The provider's perspective*. Poster presentation at the 119th meeting of the American Psychological Association, Washington, DC.

DISTINGUISHED LEADERSHIP POSITIONS

01/13-06/14 **Los Angeles County Psychological Association, Student Leadership Committee Chair on Board of Directors**

- Participate in monthly board meetings as Chair of the Student Leadership Committee on the Board of Directors
- Develop, organize, and implement annual student leadership event aimed at enhancing the student experience and promoting professional development
- Manage and support the development of the newly assembled campus representative network, including providing personal assistance to campus representatives and relaying feedback to and from the Board of Directors

HONORS

Recipient of the *Distinguished Service by a Graduate Student to the Los Angeles County Psychological Association* award, October 2015

TEACHING EXPERIENCE

07/11-03/15 **Pepperdine University, Graduate School of Education and Psychology Los Angeles, CA**

Teaching Assistant to Pamela Harmell, Ph.D. (PSY 623 & 706, Law & Ethics for Mental Health Professionals)

- Conduct literature reviews on ethical issues related to psychotherapy in order to update/supplement lectures and assist with preparation and organization of lecture materials
- Provide support and teaching assistance for MA and PSYD students
- Serve as a guest lecturer on an as needed basis

05/10-07/10 **Pepperdine University, Graduate School of Education and Psychology Los Angeles, CA**

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- Attended all psychobiology and psychopharmacology lectures
- Provided support and teaching assistance for master's level students
- Proctored and graded exams

09/07-12/07 **University of California, Santa Cruz**

Teaching Assistant to Andrea Steiner, Ph.D. (Contexts of Clinical Healthcare)

- Taught supplemental discussion classes for undergraduate students
- Proctored and graded class assignments, reports, and exams

PROFESSIONAL AFFILIATIONS

- American Psychological Association, 2010-Present
- Los Angeles County Psychological Association, 2010-Present
- National Academy of Neuropsychology, 2012-Present
- International Neuropsychological Society, 2013-Present

- Iranian Psychological Association of America, 2013-2014
- Hispanic Neuropsychological Society, 2013-2015
- Psi Chi, 2010-present

CERTIFICATIONS

- UCLA Staglin Center, fMRI Safety Certification, 2014
- Didi Hirsch Suicide Crisis Line Counselor, 2011
- UCLA PEERS Program Interventionist, 2010

SUPPLEMENTARY TRAINING

- Cognitive Processing Therapy Certification Training (Presenters: Jennifer Lewis, Ph.D., J. Richard Monroe, Ph.D.), August 25-27, 2015
- Acceptance and Commitment Therapy Workshop (Presenter: Steven Hayes, Ph.D.), 2015
- Trauma Focused Cognitive Behavioral Therapy (TFCBT), 2013
- National Academy of Neuropsychology, Clinical Neuroanatomy Course, 2013
- Didi Hirsch Suicide Prevention Center, Applied Suicide Intervention Skills Training (ASIST), 2010

VOLUNTEER EXPERIENCE

- American Board of Professional Psychology Rehabilitation Psychology Conference, 2015
- International Neuropsychological Society Annual Convention, 2014, 2015,2016
- National Academy of Neuropsychology Annual Convention, 2014
- American Psychological Association Annual Convention, 2010, 2011, 2012
- Los Angeles County Psychological Association Annual Convention, 2011, 2012, 2013, 2014
- Los Angeles County Psychological Association “Mirrors of the Mind” event, 2012
- Los Angeles County Psychological Association Continuing Education Events, 2011-2013

ABSTRACT

Within the United States, HIV is a growing epidemic that has important neuropsychological and functional consequences. Early detection and treatment of HIV-associated neurocognitive disorder (HAND) is associated with better outcomes. In major metropolitan areas such Los Angeles County, HIV disproportionately impacts the Latino community. For those individuals who are primarily Spanish-speakers, there may be limited access to comprehensive neuropsychological assessment in the preferred language. Consequently, self-reports of cognitive functioning are often relied on to help determine the presence of HAND. However, self-reports of cognitive decline may be influenced by factors such as depressed mood, variable motivation, and culture, raising important validity questions. To date, relatively few studies have focused on the combined use of Spanish-language, self-report measures of cognitive functioning and mood among primarily Spanish-speaking, HIV-positive individuals. The aim of this study was to explore the relationships among self-reported cognitive decline, neuropsychological functioning, and mood symptoms within this population. Archival data from a sample of 100 HIV+, primarily Spanish-speaking adults who participated in the parent study at a major medical center in Los Angeles were examined. Measures included Spanish-language versions of the Beck Depression Inventory, Cognitive Difficulties Scale- Patient Version, Medical Outcomes HIV Health Survey, and an acculturation measure. An array of neuropsychological measures was used to determine the presence of HAND. It was predicted that depressive symptoms would be positively associated with self-reported cognitive decline. This hypothesis was strongly supported by the results of correlational analysis. The results also showed that for individuals with HAND, the difference in BDI scores between participants with cognitive complaints and

those without varied depending on whether the MOS-HIV or the CDS was used to assess cognitive complaints. The analyses revealed no significant impact of acculturation on the relationships among cognitive complaints, neuropsychological functioning, and depressive symptoms. The results of the present study highlight the complex relationship between neuropsychiatric and neuropsychological functioning in Spanish-speaking individuals infected with HIV. Clinical implications and limitations of the study are addressed. Future research that incorporates objective measures of neuropsychological functioning, the input of collateral informants, and self-report measures of mood and functional decline is recommended.

Self-Perceived Cognitive Decline, Neuropsychological Functioning, and Depressive Symptoms in HIV+ Spanish-Speakers

HIV infection and AIDS continue to be a growing epidemic in the United States. The Centers for Disease Control (CDC) estimate that there are currently 1.2 million people living with HIV infection, 20% of whom are unaware of their HIV-positive status (CDC, 2012). Furthermore, the CDC estimates that approximately 50,000 Americans become infected with HIV every year. At least one-third of those individuals with advanced HIV will experience some neurological complications, sometimes without a prior awareness or diagnosis of HIV infection (Brew, 2009). Due to the large prevalence and incidence of the disease, HIV-associated neurocognitive disorders (HAND) have become more common than other traditionally well-researched neurological disorders such as multiple sclerosis and motor neuron disease (Brew, 2009). In fact, HIV-associated dementia (HAD) has become the most common cause of dementia in individuals under the age of 50 (Brew, 2009; Tselis, 2009). Unlike other viral dementias, treatment of HAD can lead to significant improvement and even full recovery, highlighting the need for early detection and treatment (Brew, 2009). Furthermore, with the more widespread use of treatments such as combination antiretroviral therapies (cART), health professionals are more likely to see HIV+ patients presenting with milder forms of HAND, thus prompting the need for assessments that are sensitive to the more subtle changes associated with milder cognitive declines (Valcour, Paul, Chiao, Wendelken, & Miller, 2011).

Knowing which populations are most at risk for HIV infection is crucial to improving the odds of early detection. Research shows that HIV disproportionately impacts the Latino population in the United States. While Latino persons represent 16% of the U.S. population,

they accounted for 20% of new HIV infections in 2009 (CDC, 2012). In a report released by the Los Angeles Commission on HIV, Latinos were found to comprise the largest group living with HIV/AIDS in Los Angeles County, with an incidence of HIV infection that was more than double that of African Americans and Caucasians (CDC, 2012). A growing clinical concern is that diagnosis in this group is often significantly delayed, thereby increasing the risk of developing HAND (Levine et al., 2011; Wohl, Tejero, & Frye, 2009). In Los Angeles County, HIV was detected late in over 70% of Latino individuals with AIDS (i.e., progression to AIDS within one year of HIV detection; Frye, 2004).

In addition to the increased awareness of heightened vulnerability to HIV infection and HAND within a given population, assessments that are accurate, reliable, and valid are necessary for fully understanding the neurocognitive impact of HIV on each individual. Comprehensive neuropsychological assessments in the patients' preferred language are the ideal method of evaluation; however, these assessments can be expensive and at times impractical, thereby forcing clinicians to employ alternative methods of reliably assessing for the presence of cognitive impairment in high-risk individuals (Carter, 2001). Examples of alternative methods include using translated measures that have not been fully validated for use within a certain population or using untrained interpreters during test administration. Regardless of whether preferred or alternative methods are used, it is essential that cultural and contextual factors be considered in order to ensure the validity and usefulness of cognitive assessment (Manly, 2008).

It is well known that neuropsychological assessments are most valid and accurate when administered in the patient's primary language (Artiola i Fortuny & Mullaney, 1997; Cherner et al., 2007). Unfortunately, there is evidence that Latino individuals within the

U.S. are infrequently given the option to be assessed in Spanish (Manly, 2008). Rather, they are typically assessed using only English measures and instruments, even when their primary language is Spanish, thereby significantly increasing the probability of diagnostic error. This problematic practice is largely due to the relatively limited availability of Spanish language neuropsychological assessments, relevant norms, and appropriately trained bilingual neuropsychologists. In a study of 383 HIV+ Latino individuals in Los Angeles County, Wohl et al. (2009) found that completion of the study interview in Spanish was the main factor associated with delayed HIV detection among this group.

Of particular importance is the ability to reliably and accurately assess neuropsychological impairment (NPI) in an efficient manner. Given that comprehensive neuropsychological assessments in the patient's primary language are often not available or practical, clinicians must often rely on cognitive screeners or other brief measures instead. One method of screening involves the use of self-report measures of everyday functioning, as milder forms of cognitive impairment are often correlated with observable changes in functional ability (Heaton et al., 2004). Spanish-language self-report measures of everyday functioning have been found to be appropriate for use with Spanish-speakers (Rivera-Mindt et al., 2003). Such measures assess a variety of domains of functioning, including cognitive functioning, social functioning, and occupational functioning. The present study focused on one aspect of functional ability, self-perceived cognitive decline (i.e., cognitive complaints), which has been shown to be one of the first symptoms reported in patients presenting with HIV infection (Claypoole et al., 1998).

Though self-reported cognitive decline may be a promising method for identifying milder forms of HAND, there are important limitations to be considered. Unqualified

reliance on the self-assessment of cognitive decline is inadvisable, as such reports are highly susceptible to influence by various factors (e.g., mood, culture, motivation) and may not always accurately reflect a decline in functional ability (Blackstone et al., 2012; Branca, Giordani, Lutz, & Saper, 1996; Moore et al., 1997). While measures of self-reported cognitive decline alone are not adequate predictors of NPI, it is possible that using this method in combination with measures of mood might shed light on an individual's neuropsychological profile without sacrificing efficiency.

To date, relatively few studies have focused on the combined use of Spanish-language functional and mood measures within the primarily Spanish-speaking, HIV-positive, population. Indeed, most of the research looking at neuropsychological and functional assessment in HIV has been conducted on primarily English-speaking, non-Latino populations (Rivera-Mindt et al., 2003). Hence, the intent of this study was to examine the relationship of Spanish-language self-report measures of daily functioning to self-reported depressive symptoms among Spanish-speaking, HIV-positive individuals with varying levels of neuropsychological impairment. For the present study, assessment of daily functioning referred only to self-report of cognitive decline (i.e., cognitive complaints).

In order to provide more context and background for the study, brief reviews of the following bodies of research are provided: (a) the impact of HIV and HAND in the predominantly Spanish-speaking population, (b) current methods of cognitive assessment in the Spanish-speaking population, (c) the relationship between self-perceived cognitive decline and NPI, and (d) the relationship between self-perceived cognitive decline and mood. Details about the literature reviewed are provided in Appendix A.

HIV and Latinos

There has been a major effort to study the impact of HIV on various ethnicities and races over the past several decades. To date, much of the research on racial disparities in the HIV-positive population has highlighted the impact of HIV on the African American community (Gonzalez, Hendriksen, Collins, Durán, & Safren, 2009). While it is undeniable that HIV affects African Americans most disproportionately on a national basis as compared to all other ethnic groups (Centers for Disease Control, 2012; Los Angeles County Department of Public Health, 2007; Los Angeles County Department of Public Health, 2014), there has been much less research devoted to studying the impact of HIV/AIDS in the Latino community (Gonzalez et al., 2009). Indeed, the research that does exist consistently shows that Latinos have disproportionately higher incidence and prevalence rates of infection than Caucasians. In the National Vital Statistics Report on leading causes of death in 2002 published by the CDC, HIV/AIDS accounted for 10.4% and 6.5% of all deaths in Latino males and females between the ages of 35-44, respectively, a rate more than double that of White males (4.8%) and females (1.9%) in the same age group (Anderson & Smith, 2005). More recently, HIV-positive Latinos were additionally found to have significantly worse health outcomes than their HIV-positive Caucasian counterparts (Gonzalez et al., 2009).

While several notable researchers (e.g., Ardila, Artiola i Fortuny, Cherner, Rivera-Mindt, etc.) have made great strides in increasing awareness of assessment of Spanish speakers within the neuropsychological community, there remain relatively few studies within the literature that focus on the HIV-positive, predominantly Spanish-speaking subset of the Latino community. Indeed, many of the aforementioned researchers stress

the importance of continued neuropsychological exploration of Spanish-speaking communities. The need for increased research within these communities is further emphasized when one considers that the U.S. is home to the world's fifth-largest population of Spanish-speakers (Ardila, 2010). In fact, a study conducted on 600 Latino males and females living in Los Angeles found that 75% of the individuals reported Spanish to be their primary language (Kinsler et al., 2009). This finding highlights the clinical significance of studying and understanding the unique needs of this specific subgroup.

Although there appears to be consensus among researchers as to the need for further research on the impact of HIV in the Latino community (and in particular among predominantly Spanish-speaking persons), there also appears to be agreement that studying this group is associated with certain challenges. With regard to studying the HIV+ immigrant population, Deren, Sheldin, Decena, and Mino (2005) identified four main challenges: (a) the need for multilevel theoretical frameworks in order to address the complexity of the immigrant experience; (b) the need to differentiate between Latino subgroups, which can vary significantly based on area of residence within the U.S.; (c) difficulty recruiting and collecting data due to the "hidden" status of many members (e.g., those involved in illegal activities associated with drug use and those who are undocumented); and (d) ethical issues inherent in studying a multinational/multiethnic group that is highly marginalized and stigmatized. Research on the challenges faced by those who immigrate to the U.S. from various Latin countries and cultures by culturally competent, Spanish-speaking researchers may help to elucidate said complexities and help develop multilevel theoretical frameworks that are sensitive to the heterogeneity of the Latino population. Additionally, enlisting the help of local clinics and advocacy groups who

already have positive relationships established within these communities may help to improve recruitment and data collection. Finally, it might be useful to provide researchers and clinicians who plan to treat HIV-positive monolingual Spanish-speakers with advanced training that highlights some of the ethical issues that are inherent to studying and treating this vulnerable population.

Parallel to the challenges faced by researchers in accessing and studying the predominantly Spanish-speaking population are the challenges faced by these individuals in receiving adequate healthcare. Numerous studies have shown that individuals who speak Spanish as their primary language face various obstacles when attempting to seek services. For instance, in a study investigating the reasons for the disproportionate impact of HIV and AIDS in the Spanish-speaking community, Gonzalez et al. (2009) found that cost of services, lack of access to resources, and difficulty communicating with healthcare professionals were among the most significant barriers to care. In a study focusing on the relationships among acculturation, utilization of HIV services, and access to care in Spanish-speaking individuals at-risk for contracting HIV through sexual intercourse or injection drug use, Kinsler et al. (2009) found that when compared to their English-speaking counterparts, Spanish-speakers with lower levels of acculturation were less like to engage in HIV testing, more likely to test positive for HIV when they did get tested, and less likely to have access to healthcare services. Additionally, a phenomenological study of undocumented, HIV-positive, Spanish-speaking immigrants by Dang, Giordano, and Kim (2012) found that there were two major barriers to care and treatment retention: dealing with rejection from family and friends due to stigma, as well as experienced and perceived structural barriers of accessing care as an undocumented immigrant. Since the study of this

population is predicated on individuals accessing services, if services are not accessed, these individuals continue to be overlooked in the literature. Developing and implementing culturally sensitive intervention programs that target this population and address these barriers is necessary not only to improve access to care, but also to promote further research.

Assessment with Spanish Speakers

Spanish is considered to be the second most commonly spoken language in the U.S., where the world's fifth largest population of Spanish-speakers resides (Ardila, Ostrosky-Solis, Rosselli, & Gomez, 2000; Cherner et al., 2007). According to the 2010 U.S. Census Report, a little over 37 million residents 5 years and older reported speaking Spanish at home, a population that has more than doubled in the past two decades. Of that 37 million, approximately 16 million endorsed speaking English less than "very well," a fact that underscores the need for culturally and linguistically appropriate services, particularly in a domain as crucial as healthcare (U.S. Census Bureau, 2012). The importance of providing adequate healthcare resources to such a large portion of the population cannot be denied, and yet, as the population of Spanish-speakers within the U.S. continues to grow, the neuropsychological services that cater to Spanish-speakers remain relatively limited (Ardila et al., 2000; Cherner et al., 2007).

In the literature, the two most commonly cited challenges to providing neuropsychological services to Spanish-speakers include limited availability of validated Spanish language measures and sparse normative data, both of which contribute to the probability of misdiagnosis (Ardila et al., 2000; Artiola i Fortuny & Mullaney, 1997; Cherner et al., 2007). In fact, neuropsychological performance of ethnic minorities has been reliably

shown to be worse than that of their Caucasian counterparts across several studies on both verbal and nonverbal tasks (Brickman, Cabo, & Manly, 2006). This is thought to be mostly due to issues in validity and the availability of appropriate measures and normative data (Artiola i Fortuny & Mullaney, 1997). Furthermore, sociocultural influences such as the systemic bias that many ethnic minorities face significantly impacts construct validity. Indeed, there is evidence that the meaning and relevance of a test can differ between ethnic groups so much so that the cognitive construct a specific test was designed to measure is no longer valid (e.g., confrontation naming in a population that has limited exposure to the stimuli being presented; Brickman et al., 2006; Groth-Marnat, 2009). Such studies illustrate the need for development of culturally and linguistically appropriate measures when assessing individuals from diverse cultural backgrounds.

For over a decade, researchers and clinicians have been referencing the need for more widespread availability of validated Spanish language assessments. Historically, the biggest challenge with Spanish language measures had to do with quality of the translations. A review by Artiola i Fortuny and Mullaney (1997) found that many of the neuropsychological measures that had been translated into Spanish at the time contained syntactical, lexical, and grammatical errors that even native Spanish speakers with limited education could detect. The need for appropriately worded assessment measures is of particular importance in the early detection of HIV deficits, given that the earlier stages of the disease process are more likely to induce subtle changes and declines that may not be otherwise detected due to linguistic and cultural barriers. Although there have not been any comparable studies since then that reviewed the quality of available Spanish language measures, it appears that researchers have made concerted efforts to address the issue of

quality by suggesting guidelines for Spanish language test development, reevaluating the standards by which neuropsychologists conduct assessments within linguistically and ethnically diverse populations, and by continuing to propel the discussion forward within the scientific community (Ardila et al., 2000; Artiola i Fortuny & Mullaney 1997; Cherner et al., 2007; Horton, 2008; Manly, 2008; Romero et al., 2009).

In line with these efforts, there have been at least two major instrument validation studies in the past decade that have focused on the development of culturally and linguistically sensitive Spanish-language neuropsychological batteries for use with the HIV-positive population. The first was a study conducted by Wilkie et al. (2004) that focused on the development of the HIV/University of Miami Annotated Neuropsychological test battery in Spanish (HUMANS). The second study focused on the use of Spanish translated functional measures for detecting functional impairment in everyday functioning (Rivera-Mindt et al., 2003). However, despite these meaningful efforts, neuropsychological testing among culturally and linguistically diverse populations remains an area of weakness within the field (Manly, 2008).

Equally as important as the need for validated Spanish assessments, there is a dire need for demographically adjusted normative data with which to compare an individual's test results (Antinori et al., 2007). Many of the tests that are currently used as gold standards in the assessment of Spanish-speakers lack normative data for specific Latino groups with limited or very advanced educational backgrounds (Candelaria & Llorente, 2009). This is of grave importance, as studies have shown that a lack of appropriate normative data can significantly influence the interpretation of test results. For instance, a study by Cherner and colleagues (2007) at the HIV Neurobehavioral Research Center

focusing on the need for demographically adjusted norms for monolingual Spanish speakers along the U.S.-Mexico border found that when standard norms were used to interpret performance on a figure learning test, 31% of individuals tested were classified as cognitively impaired. However, when norms that were designed for Spanish-speakers were used, the base rate of impairment in the sample dropped to half of the original estimate (15%). Additionally, the authors demonstrated that among those individuals with more limited education (1-5 years), the use of education-adjusted norms resulted in a 50% decrease in the classification of impairment (from 40% to 20%; Cherner et al., 2007).

Self-Perceived Cognitive Decline and Objective Cognitive Functioning

According to the most current research nosology published in the journal of the American Academy of Neurology (AAN), HAND can be classified into three categories: (a) asymptomatic neurocognitive impairment (ANI), (b) HIV-associated mild-neurocognitive impairment (MND), and (c) HIV-associated dementia (HAD). ANI is assigned when an individual's cognitive performance is at least 1 standard deviation (*SD*) below demographically adjusted normative scores in at least two ability domains (e.g., processing speed and attention/concentration). In addition, there must be an absence of functional impairment, and the cognitive deficits cannot be better accounted for by the presence of delirium, dementia, or a preexisting cause. MND, on the other hand, is defined by an acquired mild-to-moderate decline in cognitive impairment in at least two ability domains that falls 1 *SD* below the mean, but *is* accompanied by functional impairment that, at least mildly, interferes with activities of daily living (ADLs). Similar to ANI, the impairment present in MND cannot be better accounted for by a diagnosis of delirium, dementia, or any comorbid conditions that can fully explain the impairment. The most severe category, HAD,

is classified by a moderate-to-severe decline in cognitive functioning in at least two ability domains that falls 2 *SD* below the normative mean and causes marked interference in functioning. Like ANI and MND, the impairment cannot be better accounted for by delirium and there must be no evidence of another, preexisting cause for dementia (Antinori et al., 2007).

In terms of cognitive functioning, at least five of the following areas must be assessed before a diagnosis of HAND can be given: executive function, episodic memory, processing speed, motor functioning, attention/working memory, language, and sensoriperception. A minimum of two abnormal test results is required to assign overall neurocognitive impairment, with at least one cognitive deficit present in a given domain (e.g., impairment in sensoriperception and motor functioning alone would not warrant a diagnosis of HAND). HIV-associated cognitive impairments are most commonly found in the domains of attention/working memory, information processing, learning and memory, and executive function, with memory and motor impairment most prevalent during the early stages of infection, (i.e., when patients are still in the asymptomatic phase of the disease; Bornstein et al., 1993). It is important to note that fluctuations in impairment, particularly cognitive impairment, are often seen throughout the course of HAND (Woods, Moore, Weber, & Grant, 2009).

In addition to cognitive decline, the presence of functional impairment is a critical criterion in the diagnosis of HAND (Woods et al., 2009). Functional impairment refers to an inability to perform everyday activities, often referred to as ADLs, and instrumental activities of daily living (IADLs). ADLs include basic functions such as bathing, dressing, and feeding oneself, while IADLs involve more cognitively demanding tasks, such as making and

keeping appointments, preparing meals, shopping for groceries, etc. Functional ability can be assessed through subjective self-report measures, a reliable third party such as a partner or caretaker, and/or objective measures that assess the individual's ability to successfully perform various cognitively related IADLs, such as management of finances and medications or driving ability (Antinori et al., 2007). At present, there is no gold standard for clinical assessment of everyday functioning (Heaton et al., 2004; Morgan & Heaton, 2009). While there is evidence to suggest that a multimodal approach (e.g., utilization of both self-report and performance based measures) is better at detecting symptomatic HAND than either objective or self-report methods alone (Blackstone et al., 2012), clinical assessment of everyday functioning more commonly relies on patient self-report due to factors such as limited time and resources (Antinori et al., 2007; Woods et al. 2009). Furthermore, self-report measures offer certain advantages, such as having high face validity, being low-cost, and placing minimal burden on the patient (Blackstone et al., 2012). As previously mentioned, self-report of cognitive status is one method of assessing a patient's everyday functioning that is widely used due to the cognitive nature of many of the tasks constituting ADL's and IADL's, such as driving, managing one's medications, and maintaining adequate hygiene (Heaton et al., 2004; Thames et al., 2011).

According to the AAN, functional impairment is divided into two categories: mild and major. Mild functional impairment requires at least two of the following: (a) reports of need for increased assistance with at least two IADLs; (b) if employed, loss of ability to perform aspects of one's job that cannot be attributed to medical sources (e.g., being too sick to get out of bed); (c) difficulty meeting demands due to decreased efficiency and accuracy or increased effort in performing tasks at work or at home; (d) lack of significant

depressive symptoms (e.g., scores less than 17 on the Beck Depression Inventory); and (e) performances of greater than 1 *SD* below the normative mean on performance-based, standardized functional tests (Antinori et al., 2007). Major functional impairment, on the other hand, requires that two or more of the following be present: (a) inability to maintain employment for reasons that are not attributable to systemic illness or other factors unrelated to cognitive impairment; (b) dependence or increased need of substantially greater assistance with more than two IADLs; (c) self and informant report of significant difficulty with four or more aspects of cognition (if the individual scores 17 or greater on the BDI, then self-reported cognitive decline alone is insufficient and requires corroboration from a reliable third party); and (d) scores that are 2 or more *SD* below the normative mean on performance-based, standardized functional tests. In both cases, these declines must not be more readily attributable to medical or other comorbid conditions, such as the effects of medication, opportunistic infection, or developmental or acquired conditions unrelated to HIV (Antinori et al., 2007). Because assessment of HAND is predicated on declines in everyday functioning, and because fluctuations in cognitive impairment are often seen throughout the course of HAND, it is imperative that functional status be accurately assessed and monitored in HIV-positive individuals (Woods et al., 2009).

As with any assessment, evaluation of functional abilities must be carried out within the context of culture. Sociocultural factors can significantly impact the presentation of functional abilities. For instance, IADLs often reflect a common way of living that can vary considerably across different cultures, family systems, and socioeconomic circumstances. As such, it is recommended that functional measures be adapted for cross-cultural use and

that clinicians carefully screen tests and questionnaires assessing IADLs to ensure that they are relevant to the individual's cultural context (Antinori et al., 2007). In terms of functional ability as measured by reports of cognitive decline, it is important to note that HIV-associated changes in cognitive decline may go unnoticed in cultures or individual living situations that pose relatively few demands for complex cognitive abilities (Antinori et al., 2007). Thus, clinicians must also account for the individual's current living situations in addition to factors such as culture, age, and education.

As with the relationship between basic cognitive functioning (as measured by neuropsychological tests) and everyday functioning, the relationship between self-reported functional impairment and neuropsychological performance is not clearly understood (Blackstone et al., 2012; Woods et al., 2009; Valcour et al., 2011). This is due in part to the susceptibility of self-reports to the influence of numerous psychiatric and psychosocial factors, including mood, motivation, secondary gain, etc. (Heaton et al., 2004). To date, several studies have attempted to explore the relationship between self-reported cognitive decline and neuropsychological performance with mixed results.

For example, there are several studies whose results support the use of self-perceived cognitive status to predict NPI in the HIV-positive population. An instrument validation study by Knippels, Goodkin, Weiss, Wilkie, and Antoni (2002) using a Dutch translated version of the MOS-HIV, a commonly used four-item cognitive status subscale, showed a significant association between self-reported cognitive impairments and decreased overall neuropsychological functioning. Another study by Bornstein et al. (1993) found a significant correlation between the subject's scores on the Sickness Impact Profile (SIP), another commonly used brief functional screener assessing cognitive functioning,

and neuropsychological performance, even after controlling for age, education, depression, and weekly alcohol consumption. A study by Derouesnè et al. (1993) found a weak but significant correlation between the Cognitive Difficulties Scale (CDS) and performance on a short neuropsychological battery. Perhaps most relevant, preliminary findings from a pilot study to determine the validity of using Spanish language functional measures to determine neuropsychological impairment in a small sample of Spanish speaking adults (*N* = 16) showed that self-reported functional impairment was significantly correlated with overall NPI (Rivera-Mindt et al., 2003). In this pilot study, NPI was measured with a comprehensive neuropsychological Spanish language battery that was previously developed for a study exploring neuropsychological performance in Spanish speakers. The results of these studies support the use of brief, self-report functional screeners in assessing for changes in cognitive abilities in the early stages of HIV-infection.

On the other hand, several studies have failed to find a relationship between self-reported functional impairment and neuropsychological functioning. A study aimed at determining whether self-reported measures of functional decline were as effective in characterizing HAND as performance-based measures found unemployment and immunosuppression to be more highly correlated with objective measures of functional impairment, while self-reported functional impairment was more highly correlated with depressive symptoms (Blackstone et al., 2012). Another study exploring the relationship between self-reported cognitive, motor, and affective complaints and objective neuropsychological performance failed to find a significant relationship between objectively measured cognitive functioning and cognitive complaints (Moore et al., 1997). However, Moore and coauthors did find a significant relationship between self-reported

cognitive difficulties and depressive symptoms. A study by Sadek, Vigil, Grant, and Heaton (2007) found depressive symptoms to be predictive of greater declines in IADLs and cognitive complaints in a sample of 362 HIV+ and HIV- individuals with and without methamphetamine dependence, while neuropsychological impairment was found to be more predictive of cognitive complaints than declines in IADL.

It is clear that controversy remains over the degree to which self-perceived cognitive decline is indicative of neuropsychological impairment in HIV-positive individuals. Some studies have found a significant relationship between self-perceived cognitive decline and neuropsychological impairment while others have not, with a number of studies identifying a relationship between self-perceived cognitive decline and the presence of mood symptoms (e.g., Bassel, Rourke, Halman, & Smith, 2002). Further research into the relationship between self-perceived cognitive decline and objective cognitive performance is warranted, as it may improve early detection and promote beneficial treatment for Spanish-speaking individuals with HIV. Moreover, it may be useful to further explore the relationship between self-perceived cognitive decline and mood as they relate to neuropsychological performance.

Mood, Cognitive Complaints, and Objective Cognitive Functioning

Much like literature on the relationship between subjective complaints and neuropsychological impairment, the literature on the relationship between depressive symptoms and neuropsychological impairment among HIV+ individuals has been variable. A landmark study conducted by Grant and colleagues (1993) addressed the early controversy over whether or not depression accounted for the neuropsychological impairment present in HIV. This study aimed to explore the relationship between

depressed mood and cognitive impairment in a sample of gay males (*N* = 139), 101 of whom were HIV+. Results showed that while HIV+ participants in later stages of the disease were more likely to present with both depressed mood and neuropsychological impairment, there were no significant relationships between depression and neuropsychological impairment observed. Similarly, a study by Claypoole et al. (1998) revealed that while memory complaints were highly correlated with depression, there was no greater improvement in neuropsychological functioning despite improvement in depressive symptoms. The results of these early studies made it clear that the cognitive declines seen in HIV cannot merely be attributed to the effects of depression.

Thus, while there is evidence to support the notion that HIV-associated cognitive decline is not solely accounted for by depressive symptoms, there are contrasting studies that suggest the relationship between mood and objective cognitive decline is still unclear. One such study conducted by Vásquez-Justo, Rodriguez Alvares, and Ferraces Otero (2003) showed that although HIV-positive individuals who endorsed depressive symptoms performed more poorly on measures of attention, verbal and visual memory, visual-constructive abilities, manual skills and motor speed, motor-perceptive speed, and frontal functions, other studies using the same instruments did not find an effect of mood on neuropsychological performance (Bix et al., 1995; Grant et al., 1993). The authors went on to point out that while it is now widely accepted that HIV has a measureable negative impact on the central nervous system, these results suggest that neuropsychological impairment in individuals with HIV is likely due to a combination of factors that may or may not include depressive symptoms (Vázquez-Justo et al., 2003).

A major contributor to this lack of clarity within the literature is the fact that subjective self-report of daily functioning has been shown to be highly correlated with depressive symptoms, especially with respect to reports of cognitive decline (Antinori et al., 2007; Carter, Rourke, Murji, Shore, & Rourke, 2003; Heaton et al., 2004; Rourke, Halman, & Bassel, 1999; Thames et al., 2011). However, there is evidence to suggest that while depressed mood and medical symptoms can influence self-reported cognitive difficulties, cognitive complaints are independently associated with poorer neuropsychological performance in HIV-positive individuals; thus, the presence of depression or medical symptoms should not dismiss the usefulness of cognitive complaints in indicating neuropsychological impairment within this population (Carter et al., 2003; Carter, 2001).

Problem Statement

Research shows that HIV disproportionately impacts the Latino population. While Latino individuals represent 16% of the U.S. population, they accounted for 20% of new HIV infections in 2009 (CDC, 2012). A growing clinical concern is that diagnosis in this group is often delayed, thereby increasing the risk of developing HAND (Levine et al., 2011). Comprehensive neuropsychological assessments are the ideal method of evaluating neurocognitive deficits; however, these assessments can be expensive and at times impractical, thus forcing clinicians to employ alternative methods of reliably assessing the existence of cognitive impairment in high-risk individuals (Carter, 2001). Unfortunately, there is a lack of appropriate Spanish language measures and norms available for primarily Spanish-speaking individuals, resulting in increased probability of diagnostic error when these individuals are assessed. It has been suggested that using self-report measures of

functional ability may be an efficient method for indicating whether an individual needs further neuropsychological assessment. Self-report measures of functioning are useful because they capture cognitive complaints and other declines in functioning experienced by HIV+ individuals. However, the relationship of self-reported functioning to NPI may be moderated by the presence of depressive symptoms. A particular concern is whether depressive symptoms may lead individuals to over-report cognitive decline and cognitive deficits. Indeed, as per the AAN guidelines, self-reported declines in cognitive functioning alone are not sufficient to indicate the presence of HAND when an individual is endorsing significant depressive symptoms (i.e., scores 17 or higher on the BDI). The impact of subclinical depressive symptoms on the relationship of self-reported cognitive decline to NPI also needs research attention. Before that can be explored, however, more research is needed to better understand how depressive symptoms relate to self-reported cognitive decline in this population.

The aim of this study was twofold. First, the relationship between self-reported cognitive complaints and depressive symptoms was examined. It has been shown that the presence of mood symptoms is highly correlated with over-reporting self-perceived cognitive decline (see Heaton et al., 2004; Thames et al., 2011; Woods et al., 2009). In the present sample, it was predicted that greater self-reported cognitive decline would be associated with greater depressive symptoms. Moreover, it was expected that this relationship would hold regardless of HAND status. The second aim of this study was to explore how neuropsychological functioning and cognitive complaints impacted depressive symptoms. More specifically, the study investigated the depressive symptoms present among individuals who met criteria for a diagnosis of HAND and those who did not in an

effort to better understand the relationship between cognitive complaints and mood. Each group, HAND versus no-HAND, was further divided into two subcategories: those who endorsed self-perceived cognitive declines and those who did not. Depressive symptoms, as measured on the Beck Depression Inventory (Beck, Ward, Mendelson, Mock, & Erbaugh, 1961), were compared between the groups to see what differences existed. The main effect of HAND, as well as the interaction of HAND and self-reported cognitive decline, on depressive symptoms was examined but no a priori hypotheses were generated due mixed findings within the literature (Antinori et al., 2007; Carter et al., 2003; Heaton et al., 2004; Rourke et al., 1999; Thames et al., 2011; Vázquez-Justo et al., 2003).

Given the potential influence of cultural factors on self-report (see Brickman et al., 2006; Groth-Marnat, 2009), an acculturation scale was used to explore whether acculturation impacted the relationship between cognitive complaints and neuropsychological functioning on depressive symptom reporting.

Methods

The present study was an archival study based on data drawn from an original study conducted at Cedars Sinai Medical Center in Los Angeles, CA. The parent study was entitled: "HIV Neurocognitive Disorders among Primary Spanish-Speakers in Los Angeles." The principal investigator was Dr. Enrique Lopez and he gave permission for the present author to have access to a subset of de-identified data. The original study was supported by a grant from the National Institute of Mental Health (K23 MH087290). The archival data used in the present investigation was only accessed after IRB approval was received at Pepperdine University Graduate School of Education and Psychology.

Participants

The present study consisted of 100 predominantly Spanish-speaking, HIV-positive individuals (80 males, 11 females, 9 transgender) who consented to participate in the parent study at Cedars Sinai Medical Center. Participants ranged in age from 28-62, with a mean of 44.95 years (*SD* = 7.63). Their years of education ranged from 1 to 20, with a mean of 10.24 (*SD* = 3.36). In regard to health variables, their mean CD4 cell count at the time of assessment was 479.93 (*SD* = 224.22), with 65.1% of the sample possessing an undetectable viral load. The self-reported geographical origin for this sample was as follows: Mexico, 71%; Central America, 23%; and South America, 6%.

The parent study inclusionary criteria for subjects were as follows: 1) predominantly Spanish speaking HIV positive men and women, 2) early or late symptomatic CDC clinical disease stage of infection, 3) 18 years of age and older, and 4) willingness to provide documentation of HIV serostatus or consent to testing if serostatus was unknown or seronegative. The predominance of Spanish as the primary language was assessed using the Woodcock-Muñoz Language Survey-Revised to evaluate Spanish capacity (Alvarado, Ruef, & Schrank, 2005) while level of acculturation was assessed using a 23-item acculturation scale (Szapocznik, Scopetta, Kurtines, & Aranalde, 1978) that was part of the HUMANS battery (Wilkie et al., 2004).

Parent study exclusionary criteria included: 1) the presence of systemic, acute opportunistic infection or tumor requiring chemotherapy at entry into the study; 2) severe HIV-associated dementia (HAD), as characterized by the AAN 1991 criteria; 3) non-HIV associated neurological diseases (i.e., history of epilepsy, non-correctable visual or hearing impairments, prior cerebrovascular accident, Alzheimer's disease at entry, multi-infarct

dementia, etc.); 4) current or past history of major psychiatric disorder, including, but not limited to, schizophrenia, bipolar mood disorder, and major depressive disorder with melancholia; mental retardation, learning disorders, motor disorders, behavioral disorders, attention deficit disorder, and pervasive developmental disorder; 5) current alcohol or substance dependence, or any history of substance abuse within the three months prior to assessment (as assessed using the standardized psychiatric interview SCID-NP-HIV with an estimated cumulative prevalence of 17% across disorders); 6) collagen vascular disease; severe chronic obstructive pulmonary disease; severe congestive heart failure (class IV); unstable angina; myocardial infarction; 7) hepatic or renal failure; 8) any history of treatment with immunostimulant therapies and other trials of non-FDA approved antiretroviral medications; and 9) residence outside of Los Angeles, Ventura, San Bernardino, and Orange Counties. Individuals were given the Cognistat-Version Español (Kiernan, Mueller, & Langston, 1998) and the International HIV Dementia Scale (Sacktor et al., 2005) to screen for severe HAD. The current study's exclusionary criteria included all of the above, in addition to any individuals who did not complete the associated functional or mood measures.

Procedures

Overall data collected included HIV serology, CDC clinical disease stage, neuropsychological (NP) test variables, NP outcome measures, psychosocial measures, functional measures (e.g., cognitive complaints), categorical definitions of neurocognitive impairment and disorder, qualitative indices of neurocognitive impairment, and relevant control variables (i.e., mood state, acculturation, Spanish language preferred usage and ability). The current study focused primarily on a subset of this data relevant to

neuropsychological performance, the presence of neurocognitive impairment, self-reported cognitive functioning, self-reported depressive symptoms, and relevant demographic variables.

At the time of initial evaluation in the parent study, all successfully pre-screened participants were provided with an informed consent form approved by the Cedars-Sinai Medical Center IRB. Once the study staff answered all of the participant's questions, a signed informed consent was obtained along with the HIV antibodies testing consent form, a bilateral medical release form for access to the primary care provider, and additional required HIPAA forms. Furthermore, all data used were only available in a de-identified manner.

In the parent study, eligible participants were assessed via a comprehensive neuropsychological battery as well as a psychosocial battery. The neuropsychological battery (NB) included an estimate of pre-morbid intelligence and assessed the following domains: attention, processing speed, memory, language, visuospatial functioning, executive functioning, and fine and gross motor functioning (see Table 1 for measures used in each domain). The psychosocial battery administered included the Beck Depression Inventory (BDI; Beck, Ward, Mendelson 1961), Cognitive Difficulties Scale (CDS; McNair, Kahn, Crook, & Bartus, 1983), and Medical Outcomes Study HIV Health Survey (MOS-HIV; Wu, Revicki, Jacobson, & Malitz, 1997). Participants also completed an accompanying demographic questionnaire, adherence measures, a substance and drug abuse history questionnaire, a smoking questionnaire, and a questionnaire of daily activities.

Both batteries were administered in Spanish by trained bilingual English and Spanish-speaking neuropsychologists and doctoral level clinical psychology students.

Testing was conducted over the course of 5-8 hours and was typically initiated at 9 AM in order to control for diurnal variation in participant performance. Participants received monetary compensation for completing the assessment, as well as a parking validation and a meal voucher redeemable at the medical center cafeteria on the day of the assessment.

Classification of HAND vs. No-HAND

A variation of the current recommended nosology for HIV-associated neurocognitive disorders as provided by the AAN (Antinori et al., 2007) was used to distinguish HAND status. As noted earlier, HAND consists of three distinct subgroups. The first is ANI, which in this study will be characterized by performances between 1-2 standard deviations below the mean on objective tests of cognitive functioning in the absence of reported declines in daily functioning. Similarly, MND is characterized by performances that are 1-2 standard deviations below the mean in the presence of mild reported declines in daily functioning. Finally, HAD is characterized by performances that are 2 or more standard deviations below the mean with marked declines in daily functioning reported in multiple domains (i.e., employment, social functioning, medication management, etc.). For the purposes of this study, individuals who met criteria for ANI, MND, or HAD were categorized in the HAND group, while those who demonstrated relatively intact performances (i.e., within +/- 1 SD of the mean) comprised the no-HAND group.

Instruments

Instruments used in this study included only a subset of the larger battery of instruments used in the parent study. The primary variables of focus for the present study included the summary of NP outcome measures, the cognitive self-report measures, a

mood measure, and an acculturation measure. The quantitative definition of the degree of neurocognitive impairment was established by virtue of means and standard deviations that are separately calculated on each NP measure using appropriately adjusted norms. For specific tasks with more than one outcome variable, all the scores or measures within that specific test were collapsed and performance was considered as impaired if a composite score of the designated measures fell below a criterion value. The relevant values were as follows: within +/- 1 SD of the adjusted mean was designated intact; 1-2 SDs below the adjusted mean represented mild impairment; and 2 or more SDs below the adjusted mean represented major impairment. A composite score was used in an effort to prevent variance on the number of impaired test scores generated within tests from disproportionately influencing the summary impairment rating for a given domain.

For overall NP impairment, impaired performances (i.e., one or more SDs below the mean) had to be present in at least two of the eight domains assessed (i.e., attention/concentration, processing speed, language, verbal memory, nonverbal memory, visuospatial functioning, executive functioning, and motor functioning; see Table 1). It is important to note that each domain was represented by two or more measures, and as such an overall composite score for that domain was determined. A list of all the neuropsychological measures used to classify HAND status can be found in Appendix C. Each measure was compared to available normative data.

Self-perceived cognitive decline was assessed through the use of Spanish translated versions of the Cognitive Difficulties Scale – Patient Version (CDS; McNair, Kahn, Crook, & Bartus, 1983), and the Medical Outcomes Study HIV Health Survey (MOS-HIV; Wu, Revicki, Jacobson, & Malitz, 1997). A Spanish-translated version of the Beck Depression Inventory

(BDI; Beck, Ward, Mendelson, Mock, & Erbaugh, 1961) was used to assess for the presence of depressive symptoms. The Acculturation Scale (ACC; Szapocznik, Scopetta, Kurtines, & Aranalde, 1978) was used to assess the acculturation status among participants. More information about these measures is provided below.

Cognitive Difficulties Scale- Patient Version (CDS). The CDS (McNair et al., 1983) is a 39-item self-report questionnaire that assesses the degree to which an individual reports self-perceived cognitive declines that impact everyday functioning. Responses are made using a Likert scale of 0 to 4, with 0 being "*not at all,*" 1 being "*rarely,*" 2 being "*sometimes,*" 3 being "*often*," and 4 being "*very often*." Aspects of cognitive functioning that are assessed in this measure include immediate and delayed memory, attention, psychomotor functioning, language ability, and orientation to time. More specifically, the items cover symptoms such as trouble recalling phone numbers, needing to make lists to remember things, difficulty with orienting oneself to the task at hand, misplacing items, indecisiveness, thinking more slowly, difficulty with comprehension and concentration, distractibility, and needing to re-check tasks performed. Higher scores indicate more impaired cognitive functioning, with research indicating that the mean CDS score for a general sample of 1,628 cognitively intact, healthy adults aged 45-75 was 45.5 (*SD* = 21.4; Derouesne et al., 1993). Factor analysis has suggested that the CDS is comprised of the following 6 subscales: attention/concentration, delayed recall/memory, prospective memory, praxis, temporal orientation, and orientation for persons (Derouesne et al., 1993).

The CDS has previously been empirically validated for use among various adult populations, including those consisting of healthy adults, those with mild cognitive impairment, and those at risk for development of a neurodegenerative disease (Buelow,

Tremont, Frakey, Grace, & Ott, 2014; Derouesne et al., 1993). A study by Buelow and colleagues (2014) found that the CDS scores significantly differed between healthy controls and those with mild cognitive impairment; however, the authors also found that this significance decreased as level of impairment increased (i.e., progression to dementia).

Medical Outcomes Study HIV Health Survey (MOS-HIV). The MOS-HIV (Wu, Revicki, Jacobson, & Malitz, 1997) is a well-validated, 4-item, self-report measure that is widely used in HIV research and clinical trials (Revicki, Chan, & Gevirtz, 1998). The scale assesses the degree to which an individual reports difficulties with the following cognitive tasks over the past 4 weeks: abstract reasoning/problem solving, memory, attention, and concentration. Responses are made on a Likert scale from 1 "*All of the time*" to 6, "*None of the time*." Raw scores are converted to a 100-point scale using the following formula: (Raw Score/24) x 100. Lower scores reflect worse cognitive functioning, with research indicating that the mean MOS-HIV score for a sample of HIV+ individuals from Mexico was 82.68 (*SD* = 18.49; Peña de Leon, Aguilar Gaytán, Suárez Mendoza, & Reyes Terán, 2007).

The MOS-HIV has been shown to have excellent internal consistency and discriminant validity based on severity of HIV disease, performance based neurocognitive function, and self-reported change in cognitive function, even when controlling for depressive symptoms (Revicki et al., 1998). Additionally, it has been shown to be a valid tool to assess HIV-related functional declines among Spanish-speakers from Mexico (Peña de Leon et al., 2007).

Beck Depression Inventory (BDI) – Spanish Language Version. First developed in 1961, the BDI (Beck et al., 1961) is a self-report questionnaire that is frequently used for assessing depressive symptoms in Spanish speakers (Maxson, 2009, 2011). The scale

consists of 21 groups of statements, with each group consisting of three possible response choices. Responses are meant to reflect an individual's experience of depressive symptoms within the past week. Scores between 01-10 are within normal limits; scores between 11-16 suggest mild depressive symptoms; scores between 16 and 23 suggest the presence of moderate depressive symptoms; and scores 24 or greater indicate the presence of severe depressive symptoms (Azocar, Arean, Miranda, & Munoz, 2001). Although a newer version of this scale is available (BDI-II; Beck, Steer, & Brown, 1996), a Spanish-translated version of the original version of the BDI was used in the parent study and was therefore included in the present study.

A study by Azocar and colleagues (2001) using differential item functioning showed that four of the items on the BDI were biased for Spanish-speakers. More specifically, the authors found that, as compared to English-speakers, Spanish-speaking Latino individuals were more likely to endorse items reflecting tearfulness and punishment, and less like to endorse inability to work. Overall, the authors concluded that the BDI is an adequate measure for use with Spanish-speaking individuals, however, they strongly suggested that caution is needed when interpreting the results due to demonstrated bias in their study (Azocar et al., 2001).

Acculturation Scale (ACC). The Acculturation Scale (ACC; Szapocznik et al., 1978) is a 23-item, self-report measure that assesses factors such as context and patterns of language use and personal and social attitudes regarding cultural identity. The first 7 items on the scale assess the degree to which participants prefer to use Spanish or English in a variety of settings (e.g., at home, with friends) as well as use of and preference for English/Spanish media. Responses to these items were made on a 5-point Likert-type scale

ranging from “Spanish all the time” to “English all the time.” The next 7 items assess the preferences in cultural practices such as dancing style, music choice, methods of celebrating, and recreational activities. Responses to these items were also made on a 5-point Likert-type scale ranging from “Hispanic all of the time” to “American all of the time.” The final 9 items assess the respondent’s desired (versus actual) level of acculturation within various aspects of his or her life (e.g., preference for food, activities, surroundings, etc.), which were again assessed on a 5-point Likert-type scale ranging from “I wish this could be completely Hispanic” to “I wish this could be completely American.” Scores range from a minimum of 24 to a maximum of 120 and a midpoint of 72. Higher scores reflect greater degrees of acculturation and English-language use while lower scores indicate lower levels of acculturation (i.e., higher degrees of identification with native culture).

Data Management

All data used in this study were stored on a password-protected computer that only the researcher had access to. The USB drive remained in a drawer in a locked office in the researcher’s home when not in use. All data remained de-identified and will be retained for at least three years before being appropriately destroyed.

Data Analysis

All variables were plotted to examine the distribution of the data and check for normality. The data were also examined for outliers as determined by values exceeding 1.5 standard deviations from the mean. There were no randomly missing data, and as such, a listwise deletion of incomplete data was not necessary.

Descriptive statistics were calculated on all four primary measures, i.e., the MOS-HIV, CDS, BDI, and ACC. Additionally, Pearson product moment correlation coefficients

were computed to assess the relationship between the BDI and the MOS-HIV and the BDI and the CDS. It was hypothesized that the BDI would significantly correlate with each measure such that higher self-reported depressive symptoms on the BDI would be associated with greater self-reported cognitive decline as measured by the MOS-HIV and the CDS.

The sample of HIV+ participants (N = 100) was divided into two groups: those who met criteria for HAND (i.e., ≥1 *SD* below the mean on at least two domains of cognitive functioning with or without associated reductions/declines in functioning) and those who did not. Table 2 presents the mean demographic characteristics of the subgroups with and without HAND. As indicated in the table, very similar mean ages and educational levels were indicated for the two groups.

Each group was then further divided into two subcategories: those who endorsed cognitive complaints that interfered with everyday functioning and those who did not. It should be noted that the number of participants classified as reporting cognitive complaints or not reporting cognitive complaints varied based on the instrument being used to make the classifications (i.e., the MOS-HIV vs. the CDS). A series of 2x2 ANOVA's were run to determine if there were any statistically significant differences between the groups with regard to endorsement of mood symptoms (i.e., BDI scores). Individuals with self-reported cognitive decline were predicted to score higher on the BDI (i.e., endorse greater depressive symptoms) than individuals not reporting cognitive decline, irrespective of HAND status.

Results

Mean scores for each of the primary measures within the overall sample can be seen in Table 3. Scores on the BDI ranged from 0-41, with a mean overall score of 12.68 (*SD* = 9.81), representing generally mild depressive symptoms within the present sample (*N* = 100). Scores on the CDS ranged from 3-144, with a mean score of 54.14 (*SD* = 30.22). This value is approximately 10 points higher than the mean in a general community sample (Durouesne et al., 1993), and therefore suggests mildly elevated cognitive complaints. Scores on the MOS-HIV ranged from 4-24, with a converted mean score of 69.13 (*SD* = 19.83) on a 100-point scale, with higher scores indicating better cognitive functioning. This value is -0.73 *SD* below the mean in a sample of HIV+ individuals in Mexico (Peña de Leon et al., 2007), suggesting a mild level of self-reported cognitive decline or complaints, similar to the level obtained on the CDS. Scores on the acculturation scale for the overall sample ranged from 13-105, with a mean score of 46.89 (*SD* = 17.80), which is approximately 16 points below the midpoint score of 72 and indicative of generally lower levels of acculturation within this group.

As predicted, there was a strong positive correlation between the BDI and the CDS, $r(100) = 0.54$, $p < 0.001$. On the CDS measure, higher scores are indicative of greater self-reported cognitive decline. Overall, increases in depressive symptomatology were significantly correlated with increases in cognitive complaints on the CDS.

There was a strong negative correlation between the BDI and the MOS-HIV, $r(100) = -0.53$, $p < 0.001$. This too was consistent with the researcher's prediction. As noted earlier, the MOS-HIV is scored such that lower scores are indicative of greater self-reported functional impairment (i.e., more cognitive complaints). Similarly to the CDS, this

correlation showed that greater self-reported cognitive complaints on the MOS-HIV were related to greater self-reported depressive symptoms.

Table 4 shows the intercorrelations among the four primary measures used in this study. There was a strong negative correlation between the CDS and the MOS-HIV, $r(100) = -0.63$, $p < 0.001$, indicating that increases in cognitive complaints on the CDS were significantly correlated with greater cognitive complaints on the MOS-HIV, as reflected by lower scores on the MOS-HIV. This represented strong evidence of convergent validity for the two measures used to assess self-reported cognitive decline in the study.

Table 4 also shows that there was no significant correlation between the ACC and any of the other three primary measures (i.e., BDI, CDS, and MOS-HIV; *p's* > .10). This indicated that acculturation scores did not appear to be significantly associated with scores on the other measures for the entire sample. Table 5 shows the means and standard deviations for the HAND and No HAND groups for each of the four primary measures in this study. Surprisingly, the scores appeared quite similar across groups. This raised questions about the actual meaning of the HAND vs. No HAND distinction for the present sample.

A 2 (HAND vs. No HAND) x 2 (Complaints on MOS-HIV vs. No Complaints on MOS-HIV) ANOVA was conducted to examine whether the presence of neurocognitive decline interacted with self-perceived cognitive decline to predict depressive symptom scores from the BDI. Individuals were considered to have complaints when their MOS-HIV scores were one or more standard deviations below the mean. The number of participants within each group was as follows: HAND/Complaints, $n = 18$; HAND/No Complaints, $n = 29$; No HAND/Complaints, $n = 17$; No HAND/No complaints, $n = 36$ (see Table 6 for mean BDI scores for each group). Results showed a main effect for the MOS-HIV such that those with

self-perceived cognitive decline reported greater depressive symptoms (BDI M = 18.17, SD = 9.53) than those who did not have cognitive complaints (BDI M = 9.72, SD = 8.67), $F(1,99) = 20.06$, $p < .001$, $\eta^2_p = .17$. There was no significant main effect for HAND, $F(1, 99) = .04$, $p = .834$, $\eta^2_p = < .0005$, meaning that neurocognitive functioning did not have a significant impact on depressive symptom reporting (HAND: BDI M = 13.09, SD = 9.62; No HAND: BDI M = 12.32, SD = 10.05). These findings were consistent with the study's main hypothesis that greater self-reported cognitive decline would be associated with higher BDI scores, regardless of HAND status.

There was a significant interaction between HAND and cognitive complaints on the MOS-HIV, $F(1,99) = 4.18$, $p = .044$, $\eta^2_p = .042$ (see Figure 1). Follow-up independent sample t tests showed that for individuals in the HAND condition, the difference in BDI scores between individuals with and without cognitive complaints was not significant at the .05 level, $t(45), = 1.60$, $p = .116$, $d = .48$. Among participants in the HAND group, those with cognitive complaints had a mean BDI score of 15.89 (SD = 9. 96), which was not significantly different than the BDI mean score of the participants without cognitive complaints (M = 11.34, SD = 9.14). However, those in the No HAND condition who reported cognitive complaints reported significantly greater depressive symptoms than those without cognitive complaints, $t(51) = 4.96$, $p < .001$, $d = 1.44$. Among participants within this No HAND group, the mean BDI score (M = 20.59, SD = 8.68) for those individuals reporting cognitive complaints was significantly greater than the mean BDI score of the individuals who reported no cognitive complaints (M = 8.42, SD = 8.17).

A 2 (HAND vs. No HAND) x 2 (Complaints on CDS vs. No Complaints on CDS) ANOVA was conducted to examine whether the presence of neurocognitive decline interacted with

self-perceived cognitive decline to predict depressive symptoms. Individuals with CDS scores one or more standard deviations above the mean were regarded as having significant cognitive complaints. The number of participants within each group was as follows: HAND/Complaints, n = 25; HAND/No Complaints, n = 22; No HAND/Complaints, n = 24; No HAND/No complaints, n = 29 (see Table 7 for mean BDI scores for each group). Results showed a main effect for the CDS, such that those with cognitive complaints (BDI M = 17.27, SD = 9.95) reported greater depressive symptoms than those who did not have cognitive complaints (BDI M = 8.27, SD = 7.42), $F(1, 99) = 25.27$, $p < .001$, $\eta^2_p = .208$. There was no significant main effect for HAND, $F(1,99) = .000$, $p = .983$, $\eta^2_p = .000$. Once again, this was consistent with the study's main hypothesis in that greater self-reported cognitive complaints on the CDS were associated with higher BDI scores regardless of HAND status.

There was no significant interaction between HAND and cognitive complaints on the CDS, $F(1,99) = .697$, $p = .406$, $\eta^2_p = .007$. In addition, an examination of acculturation as a covariate revealed that acculturation level did not impact the relationship of HAND status and cognitive complaints to depressive symptom scores from the BDI (p's > .10). Moreover, this was true for analyses with both the CDS and the MOS-HIV.

Discussion

In the present study, the relationship between self-perceived cognitive decline and neuropsychological functioning on depressive symptoms was examined. As hypothesized, higher levels of self-perceived cognitive decline (i.e., more cognitive complaints) were associated with higher levels of depressive symptoms regardless of the presence of objective cognitive decline (i.e., HAND vs. No-HAND status). These findings are consistent with extant literature that shows that endorsement of higher levels of depressive

symptoms is correlated with greater cognitive complaints among HIV+ individuals (Carter et al., 2003; Cysique et al., 2007; Hinkin, Castellon, Van Gorp, & Satz, 1998; Rourke et al., 1999; Sadek et al., 2007; Thames et al., 2011). In these studies, the discrepancy between cognitive complaints and objective neuropsychological performance is labeled over-reporting of cognitive decline, as the level of self-perceived cognitive decline was found to be greater than objectively measured on neuropsychological testing.

In addition, there was an interaction between self-perceived cognitive decline, as measured by the MOS-HIV, and neurocognitive functioning on depressive symptoms. For those individuals without objectively determined neurocognitive decline (i.e., the No-HAND group), those who reported cognitive complaints endorsed greater symptoms of depression compared to those with no cognitive complaints. This was consistent with the correlational findings for the entire sample: greater cognitive complaints were associated with greater depressive symptoms.

However, among those in the HAND group (n = 47), the difference in BDI scores between those with cognitive complaints on the MOS-HIV (n = 29) and those without (n = 18) did not reach the .05 level of statistical significance. The difference in BDI scores between these two subgroups was in the expected direction, i.e., those with cognitive complaints obtained a higher BDI mean score (15.89) than those without cognitive complaints (11.34). However, this difference in BDI scores between subgroups appeared smaller than the difference in BDI scores between subgroups in the No HAND condition. This finding raises questions about whether the relationship between self-reported cognitive decline and depressive symptoms may differ as a function of HAND status. This finding needs to be replicated and was based on a relatively small number of participants.

However, if replicated in larger samples this finding could be relevant to clinical practice because it might highlight the need for clinicians to be aware of HAND status among HIV+ Spanish speakers when considering the meaning of self-reported cognitive complaints and depressive symptoms.

One interesting and somewhat surprising finding was there were not greater differences between the HAND and No HAND groups in their mean scores on the CDS, the MOS-HIV, and the BDI. Indeed, comparison of the mean scores across these three measures revealed minimal differences between groups, which raised questions about the practical meaning of the HAND vs. No HAND distinction in this sample. In absolute terms, the greatest difference between groups appeared to be on the acculturation measure, with the HAND group obtaining the lower mean score. Clearly, more research with larger samples is needed to determine the extent to which the present findings will be replicated.

The relationship of self-reported cognitive complaints to depressive symptoms in HIV+ individuals who are Spanish speaking needs more attention. It is important to consider the literature examining self-report of symptoms. For example, there is evidence to suggest that individuals who exhibit trait negative affect also tend to be hypervigilant about monitoring themselves and have a lower threshold for noticing and reporting subtle changes (Pennebaker, 2000). While it may be tempting based on the literature to attribute self-reported cognitive decline in the absence of objectively determined neuropsychological impairment to over-reporting, there may be other considerations. For example, those who report cognitive complaints in the absence of objectively determined cognitive decline may perceive cognitive changes that are subtle or that are not being detected through conventional assessment. If such individuals' cognitive complaints are

minimized, they may feel invalidated, which may lead to lack of engagement in treatment and perhaps increased feelings of helplessness and depressive symptoms. Clearly more research is needed.

Given that self-report can be influenced by factors such as culture, this study explored the role of acculturation in the relationship between objective cognitive decline and neuropsychological functioning on depressive symptoms. Ultimately, the present analyses failed to support acculturation as a covariate in this relationship. Acculturation scores did not appear to be significantly associated with the three primary measures used in the present study. This is inconsistent with findings that acculturation status is correlated with depression among Latinos (Gonzales et al., 2009; Rivera, 2007) though this literature is equivocal and has been shown to be moderated by factors such as socioeconomic status (Cuéllar & Roberts, 1995) and intercultural competence (Torres & Rollock, 2007). It should be noted that overall, BDI scores were relatively low for the present sample, as was overall level of acculturation, particularly for the HAND group. Another important factor to note is that the measure used in the present study, the ACC (Szapocznik et al., 1978), was developed based on more traditional models of acculturation while more modern models of acculturation are assessed in a multidimensional manner (see Schwartz, Unger, Zamboanga, & Szapocznik, 2010). As such, future research using a multidimensional measure of acculturation among a sample with greater degrees of acculturation may better serve to evaluate its influence on self-reported cognitive decline and depressive symptoms. Overall, findings in the current study suggest that the role played by acculturation on these factors is not yet well understood and warrants further exploration.

Limitations

An important limitation of any archival study is that the researcher must accept the data as they have been collected, without the possibility of introducing any changes in procedure or any additional measures. The design of the present study did not permit the researcher to identify any causal relationships, given that a true experimental design was not employed. Additionally, the lack of a control group (i.e., HIV-negative Spanish-speakers) with which to compare means was an important limitation of the study. With the exception of the objective neuropsychological tests, much of the data obtained relied on self-report. As previously discussed, there are a number of limitations associated with the use of self-report measures, including the possibility of over- or under-reporting symptoms and impairment. As such, an ideal assessment of both mood and functional ability would have involved multiple methods (e.g., collateral informant ratings, clinician ratings, objective tests of functioning, etc.) rather than being limited to self-report.

One limitation of the guidelines used for establishing neuropsychological impairment in studies such as the present one is the relative non-equivalence of the number of tests utilized across domains. As a result, one domain may be represented by more than two tests, while another domain is represented by only two tests. To ensure that each domain's contribution to overall impairment is relatively equivalent, a composite score was used in each domain where more than one measure was used to assess functioning.

Another limitation of the present study had to do with the criteria for participation in the parent study. Persons with histories of severe mood disorders tended to be excluded from participation. As a result, this no doubt limited the variance in BDI scores.

In regard to identifying participants who reported cognitive complaints vs. those who did not, composition of the subgroups varied depending upon whether the CDS or the MOS-HIV was used. While the CDS and MOS-HIV showed good convergent validity, the fact that the subgroups differed as a function of the self-report measure used was an additional limitation of the study.

Other limitations included the fact that the sample of Spanish-speakers assessed in this study consisted entirely of individuals living in the greater Los Angeles area and is not therefore fully representative of HIV-positive Spanish-speakers living in other parts of California or in other states. There may also have been uncontrolled factors impacting the self-selection process for participation in the original study that could affect the generalizability of the results. For example, it could be that individuals who were motivated to participate in the original study were either doing exceptionally well or exceptionally poorly in their functioning.

With regard to sample characteristics, an important limitation to note is the overrepresentation of men as compared to women and transgender individuals. Furthermore, the inclusion of transgender individuals provides an interesting challenge in that supplementary information that could impact performance outcome was not fully assessed (i.e., age of transition, history of hormone replacement therapy, etc.). Furthermore, the overall acculturation level within the sample was generally low, which may also have limited the generalizability of the findings. Indeed, exploration of the impact of cognition, acculturation, and mood in this particular subset of the HIV-positive, Spanish-speaking community is sorely lacking.

Conclusion

In conclusion, the present study lends added support for the importance of assessing depressive symptoms in HIV+ Spanish-speaking individuals. In the current study, higher levels of cognitive complaints were strongly associated with increased depressive symptom reporting. This study highlights the importance of considering neuropsychological functioning, self-reported cognitive complaints, and depressive symptoms in Spanish-speaking persons who are HIV+. It would appear likely that diagnostic impressions will be more accurate and allocation of resources will be more appropriate when each of these factors is considered. Future studies including both subjective and objective measures of functional decline as well as studies aimed at exploring the potential underlying mechanisms may help to further clarify the impact of cognitive complaints and neuropsychological functioning on depressive symptoms within this population.

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Table 1

Neuropsychological Battery

Cognitive Domain	Measure	Author
Attention/Concentration	Digit Span Spatial Span Continuous Performance Test II (CPT-II)	Wechsler, 1987, 1997; Conners & Staff, 2000
Processing Speed	WAIS-III Symbol Search Digit Symbol	Wechsler, 1997
Verbal Memory	WMS-R Logical Memory Rey Auditory Verbal Learning Test (RAVLT) N-Back (Working Memory)	Wechsler, 1987; Schmidt, 1996; Cedrus Corporation, 1991
Non-Verbal Memory	WMS-R Visual Reproduction Picture Memory Interference Test (PMIT)	Wechsler, 1987; Maj et al., 1994
Language	Boston Naming Test California Oral Word Association Test	Kaplan, Goodglass, & Weintraub, 1983; Benton & Hamser, 1976
Visuospatial Functioning	WAIS-III Block Design Matrices	Wechlser, 1997
Executive Functioning	Color Trails Color Figure Mazes Wisconsin Card Sorting Test (WCST) Stroop Test (Golden Version)	D'Elia, Satz, Uchiyama, & White, 1994; Maj et al., 1994; Heaton, 1981; Golden, 1978
Motor Functioning	Grooved Pegboard Finger Tapping Timed Gait	Klove, 1963; Reitan, 1979; Fisher, White, Yack, Smolinski, & Pendergast, 1997

Table 2

Sample Demographics by HAND Status

Variable	HAND (*n* = 53)	No-HAND (*n* = 47)
Age *Mean*(*SD*)	45.21 (1.12)	44.72 (1.05)
Education	10.81 (0.58)	9.74 (0.36)
Gender		
% Male	55.2%	52.4%
% Female	37.9%	19.0%
% Transgender	6.9%	14.3%

Table 3

Descriptive Statistics on Functional, Mood, and Acculturation Measures

Variable	Minimum	Maximum	Mean (SD)
MOS-HIV (*N* = 100)	16.67	100	69.13 (19.79)
BDI (*N* = 100)	0	41	12.68 (9.81)
CDS (*N* = 100)	3	144	54.14 (30.22)
Acculturation Scale (*N*=100*)*	13	105	46.89 (17.80)

Note. MOS-HIV = Medical Outcomes Study HIV Health Survey. CDS = Cognitive Difficulties Scale. BDI = Beck Depression Inventory – Spanish Language Version. ACC = Acculturation Scale.

Table 4

Correlations Between Functional, Mood, And Acculturation Measures

	ACC	MOS-HIV	CDS	BDI
ACC	--			
MOS-HIV	.15	--		
CDS	-.07	-.63**	--	
BDI	-.14	-.53**	.54**	--

Note. $N = 100$, $^{**}p < .001$. ACC = Acculturation Scale. MOS-HIV = Medical Outcomes Study HIV Health Survey. CDS = Cognitive Difficulties Scale. BDI = Beck Depression Inventory – Spanish Language Version.

Table 5

Descriptive Statistics for the Sample Characterized by HAND Status

Variable	HAND *M (SD)*	No HAND *M (SD)*
BDI	13.09 (9.62)	12.32 (10.05)
CDS	54.43 (31.88)	53.89 (28.96)
MOS-HIV	68.25 (19.21)	69.88 (20.46)
Acculturation Scale	44.66 (19.12)	48.87 (16.48)

Note. N = 100, BDI = Beck Depression Inventory- Spanish Language Version, CDS = Cognitive Difficulties Scale. MOS-HIV = Medical Outcomes Study HIV Health Survey. HAND = HIV-Associated Neurocognitive Disorder.

Table 6

Mean BDI Scores by HAND Status and Presence of Complaints on MOS-HIV

Measure	+ HAND + Complaints	+ HAND - Complaints	- HAND + Complaints	- HAND -Complaints
BDI	15.89(9.96)	11.34(9.14)	20.59(8.68)	8.42(8.17)
	n = 18	*n* = 29	*n* = 17	*n* = 36

Note. N = 100, BDI = Beck Depression Inventory- Spanish Language Version. MOS-HIV = Medical Outcomes Study HIV Health Survey. HAND = HIV-Associated Neurocognitive Disorder. + HAND = -individuals with HAND. - HAND = individuals without HAND. + Complaints = individuals who scored > 1SD below the mean on the MOS-HIV. - Complaints = individuals who scored within 1SD of the mean on the MOS-HIV.

Table 7

Mean BDI Scores by HAND status and Presence of Complaints on CDS

Measure	+ HAND + Complaints	+ HAND - Complaints	- HAND + Complaints	- HAND -Complaints
BDI	16.56(8.96)	9.14(8.95)	18.00(11.04)	7.62(6.09)
	n = 25	*n* = 22	*n* = 24	*n* = 29

Note. N = 100, BDI = Beck Depression Inventory- Spanish Language Version. CDS = Cognitive Difficulties Scale. HAND = HIV-Associated Neurocognitive Disorder. + HAND = - individuals with HAND. - HAND = individuals without HAND. + Complaints = individuals who scored > 1SD above the mean on the CDS. - Complaints = individuals who scored within 1SD of the mean on the CDS.

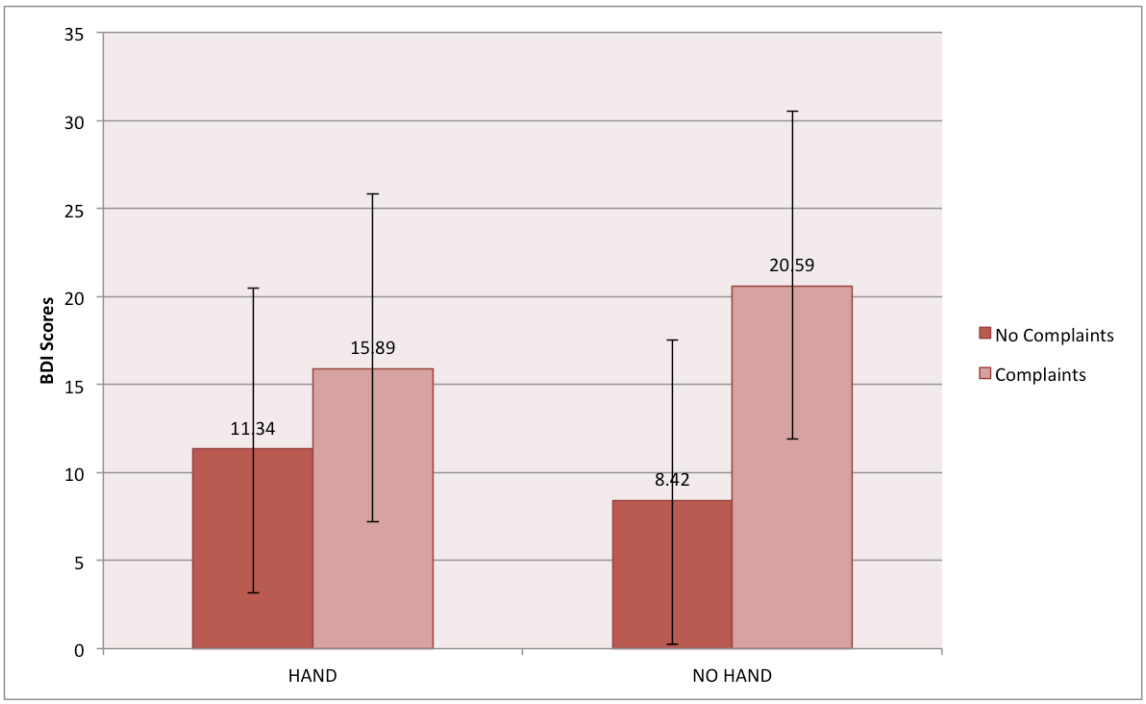

Figure 1. Interaction between cognitive complaints and HAND status on depression
Note. N = 100. BDI = Beck Depression Inventory- Spanish Language Version. MOS-HIV = Medical Outcomes Study HIV Health Survey. HAND = HIV-Associated Neurocognitive Disorder. Complaints = scores >1 SD below the mean on MOS-HIV. No Complaints = scores within 1 SD of mean on MOS-HIV. HAND/No Complaints, *n* = 29. HAND/Complaints, *n*= 18. No HAND/No Complaints, *n* = 36, No HAND/Complaints, *n* = 17.

APPENDIX A

Summary Table of Selected Literature

Summary Table of Selected Literature

Study	Objectives	Sample	Methods	Relevant Findings
Antinori, A., Arendt, G., Becker, J. T., Brew, B. J., Byrd, D. A, Cherner, M., … Wojna, V. E. (2007). Updated research nosology for HIV-associated neurocognitive disorders. *Neurology*, *69*(18), 1789–1799.	Present updated nosology research on classification of HIV-associated cognitive disorders	N/A	Review	-Expansion of the 1991 AACN HIV/AIDS nomenclature to reflect the impact of HAART - Introduction to classification of HAND, including the proposal of an asymptomatic form (ANI) - Discusses impact of comorbidities such as depression - Recommends collateral information a BDI of ≥17 is endorsed by patient
Ardila, A. (2010). Applied Neuropsychology : Adult Assessment of Spanish-Speaking Populations. *Applied Neuropsychology*, *7*(1), 1–2.	Introduce issues specific to assessment with Spanish-speakers	N/A	Introduction	- Psychological and neuropsychological services in Spanish are limited des - Contrary to popular opinion, Spanish in US is well-unified
Ardila, A., Ostrosky-Solis, F., Rosselli, M., & Gómez, C. (2000). Age-related cognitive decline during normal aging: The complex effect of education. *Archives of Clinical Neuropsychology, 15*(6), 495-513.	To analyze effects of education on cognitive decline in normal aging	806 adults ages 16-85 from different regions of Mexico	-Participants grouped based on level of education (e.g., illiterate, 1-4, 5-9, 10+) and age (e.g., 16-30, 31-50, 51-65) -Assessed via NEUROPSI, administered in Spanish -ANOVA run to compare groups on NP performance across cog domains	- Test scores strongly associated with level of education - Differences among age smaller than differences among education groups - Interaction between age and education; among illiterate individuals, scores of participants in the 31-50 age range were higher than scores of participants in the 16-30 age range for over 50% of tests - Study suggests that lifespan changes in cognition are affected by education -Study also suggests the relationship between age-related cog decline and education is different dependent on cognitive domain
Artiola i Fortuny, L., & Mullaney, H. A. (1997). Neuropsychology with Spanish speakers : Language use and proficiency issues for test development. *Journal of Clinical and Experimental Neuropsychology*, *19*(4), 615–622.	Discuss common problems found in Spanish translations and adaptations of NP tests & proposition of cautionary guidelines	N/A	Review	- Materials used with Spanish-speakers in North America is generally of poor quality with lexical, syntactical, & spelling errors - Both translated and adapted instruments contain threats to validity by introducing item (e.g., non-words), method (e.g., differences in social desirability and response format), and construct (e.g., differences in measurement of construct across cultures; how anxiety is conceptualized in US vs Mexico vs Cuba) bias

				- Provide examples of how non-words are present in some confrontation naming tasks, how syntax and cultural heterogeneity among Spanish speakers can influence construct validity
Azocar, F., Arean, P., Miranda, J., & Munoz, R. F. (2001). Differential item functioning in a Spanish translation of the Beck Depression Inventory. *Journal of Clinical Psychology*, *57*, 355–365.	- to analyze the BDI for bias in responses between Spanish and English speakers	-292 medical outpatients - BDI completed in both Spanish & English	- Differential Item Functioning with Mantel Haendzel Approach for Ordered Response Category used to analyze how likely groups were to endorse each response category	- Regardless of depression level, Latinos more likely to endorse items reflecting tearfulness and punishment (items 6, 10, 14), and less likely to endorse inability to work (item 15) -Overall, BDI is an adequate measure of depression for use among Spanish-speakers, but caution should be used when administered in primary care settings -Screening should be used to alert need for further evaluation vs. determination of mood diagnosis - Seeking mental health help in Latino community potentially stigmatizing; often first seek help from prime-care physicians -Depression more likely to go unrecognized or untreated among Latinos due to cultural and linguistic barriers
Bassel, C., Rourke, S. B., Halman, M. H., & Smith, M. L. (2002). Working memory performance predicts subjective cognitive complaints in HIV infection. *Neuropsychology*, *16*(3), 400–410.	To determine if working memory performance is related to subjective-cognitive complaints in individuals with HIV infection beyond the influence of depressive symptoms	-36 adults (1 female, 35 male) - 3 asymptomatic, 14 mildly symptomatic, 19 w/AIDS defining illness - Age (*M* = 44.52) - Ed (*M* = 15.44)	- 2 groups: 1) HIV+ without AIDS and 2) AIDS, but no differences were detected in NP performance, age, or education, as such add analyses ran on group as a whole - Hierarchical linear regression analyses - Cognitive complaints measured by Cognitive Failures Questionnaire - Depressive symptoms measured by	- Significant pos. correlations were found between BDI and mod. BDI and cognitive complaints (CFQ; $p<.01$). - Cognitive complaints also significantly inversely correlated with HVLT Trial 1 (initial acquisition of memory; $p<.05$), positive correlated with TMT-B & SOPT errors ($p<.001$). - No significant correlation between NP tests and modified BDI - Working memory is a sig. predictor of subjective and objective memory complaints in ind. With HIV infection, even after accounting for depressive symptoms, age, and education in a regression analysis. -Findings suggest may not be appropriate to conclude patients are inaccurate in self-assessment when no relationship is found between subjective cognitive complaints and NP test performance. - Questionable to assume those without cognitive complaints have no brain dysfunction

			total and modified BDI (items 1-13; items 14-21 excluded to ensure that somatic--vegetative items that could be elevated secondary to systemic HIV infection would not confound results) - NP: SOPT, HVLT, TMT	
Bix, B., Glosser, G., Holmes, W., Ballas, C., Meritz, M., Hutelmyer, C., & Turner, J. (1995). Relationship between psychiatric disease and neuropsychological impairment in HIV seropositive individuals. *Journal of the International Neuropsychological Society, 1*(6), 581-588.	To explore relationship between psychiatric disease and NPI in a heterogeneous groups of HIV+ individuals		Groups divided based on HIV status	- Neuropsychological and psychiatric disorders common among HIV+ group, but no relationship between these two aspects of neuropsychiatric dysfunction in HIV+ patients -Results indicate psychiatric disorder in HIV+ individuals tend to predate infection and decrease over time following knowledge of HIV infection, suggesting that they are primarily a function of psychosocial factors -NP disorders are specific to HIV+ patients and tend to increase over time following seroconversion, suggesting that they are due to neurological effects of HIV-infection
Blackstone, K., Moore, D. J., Heaton, R. K., Franklin, D. R., Woods, S. P., Clifford, D. B., Collier, a C., … Grant, I. (2012). Diagnosing symptomatic HIV-associated neurocognitive disorders: Self-report versus performance-based assessment of everyday functioning. *Journal of the International Neuropsychological Society : JINS*, *18*(1), 79–88.	To determine if self-report measures of everyday functioning are as effective in characterizing HAND as performance-based measures.	-674 HIV+ adults - 223 met criteria for HAND	- Self-report measures: PAOFI (assesses self-perceived cognitive complaints) & modified Lawton and Brody scale (assesses dependence in performing IADLs) Performance-based measures: Medication Management Task	-Those who with self-reported functional impairment had more depressive symptoms. -Those with performance-based impairment were more likely to be unemployed and more immunosuppressed. -Multimodal methods of assessing everyday functioning facilitate detection of symptomatic HAND better than either performance only or self-report only methods of assessing functional decline. - Performance-based measures were associated with objective functional and disease-related factors. - Reliance on self-report of functional decline may be biased by depressive symptoms.

			(functional); MESA SF2 & COMPASS - Data analyses: McNemar-Bowker nonparametric test for non-independent samples used to compare HAND diagnoses frequencies - Chi square analyses - Multimodal regression model	
Boone, K. B., Victor, T. L., Wen, J., Razani, J., & Pontón, M. (2007). The association between neuropsychological scores and ethnicity, language, and acculturation variables in a large patient population. *Archives of clinical neuropsychology : The official journal of the National Academy of Neuropsychologists*, *22*(3), 355–365.	To compare performance of African-American, Hispanic, Asian, and Caucasian (non-Hispanic) NP patients on a battery of common NP tests -To examine the separate impact of language/acculturation on cognitive test performance	-*N* = 161 adults - 83 Caucasian, 31 African-American, 30 Hispanic, 17 Asian -Convenience sample of patients referred for OP NP evaluation at a public hospital	-Archival study -Statistical methods of analysis included ANOVA (to compare groups based on age and education) and ANCOVA (to explore group differences on NP test scores) with age and education as covariates -Boneferroni contrasts used to explore differences in scores between ethnic groups	-Significant group differences found on some measures of language (BNT), attention (DS), visuospatial construction (ROCFT-Copy), nonverbal processing speed (TMT-A), and executive functioning (WCST) -Comparison of native English speakers and ESL speakers revealed significantly higher performance in the native speakers for DS, BNT, FAS -ESL speakers had higher ROCFT-Copy scores -BNT test scores significantly related to number of years in the US -Specifically w/in Hispanic group, no significant differences were detected between native English speakers and ESL speakers, with the exception of superior RO figure copy in the ESL group -Results suggest ethnic differences are not attenuated by presence of psychiatric or neurological illness -Findings also caution the use of normative data derived from Caucasian samples for use with ethnic minority samples -Recommend that future normative studies stratify data based on cultural factors, rather than race
Bornstein, R. A., Nasrallah, H. A., Para, M. F., Whitacre, C. C., Rosenberger, P., & Fass, R. J. (1993).	-To examine cognitive function in patients at various	*N* = 310 HIV+ (*n*= 233) and HIV- (*n* = 77) homosexual and bisexual	-Subjects administered extensive battery of NP tests	-Patients with symptomatic infection differed from controls on a large number of measures -Asymptomatic patients had more circumscribed patter of deficits

Neuropsychological performance in symptomatic and asymptomatic HIV infection. *AIDS (London, England)*, *7*(4), 519–524.	stages of HIV infection -To determine the nature and severity associated with different stages of illness	men who had been previously screened for neurological illness -All subjects volunteers in longitudinal study of neurobehavioral complications of HIV infection -90% sample was White	-Examined mean performances on each NP measure as well as proportion of subjects rated as impaired across all measures -Defined impairment on each test as a score 1SD or more below mean of HIV-negative homosexual male control group that the authors have described in previous studies -Also evaluated the possibility of depression in the sample using the Hamilton Depression Rating Scale -Sickness Impact Profile used to assess for changes in daily functioning -Groups were matched on age and education	- Twofold increase in prevalence of impairment in asymptomatic patients relative to controls, and four-fould increase in symptomatic patients - Memory and dexterity problems appear to be early features of neurobehavioral dysfunction, and frontal lobe deficits were found in patients with symptomatic infection -Degree of NP impairment has a negative influence on several areas of daily functioning (as measured by the Sickness Impact Profile).
Bousman, C. A, Salgado, H., Hendrix, T., Fraga, M., & Cherner, M. (2011). Assessing neuropsychological performance in a migrant farm working Colonia in Baja California,	1) To determine the feasibility and appropriateness of conducting NP assessments	*N* = 21 presumably healthy adult volunteers (8 M, 14 F), aged 17-57 (*M* = 32, *SD* = 10) recruited in 2010 from an on-going and	Patients were administered a test battery consisting of Animal Fluency, Figure Memory Test, HVLT-R, Grooved	-Figure Memory Test does not appear appropriate for use within this sample - Contrary to expectation, majority of participants in the sample performed well on both verbal and nonverbal tests -Findings support previous studies that show verbal fluency and semantic memory test performance

Mexico: A feasibility study. *Journal of immigrant and minority health / Center for Minority Public Health*, *13*(4), 742–747.	among a migrant farm worker population in Baja CA -To provide preliminary descriptions of NP test performance s within this unique population	longstanding international health services and research collaboration	Pegboard, Color Trails, WMS-III Spatial Span, and Academic Skills Assessment (9-item interview) - Statistical analyses included Spearman correlations to explore associations between demographic variables and raw NP performance	is dependent on the ecological relevance of the test content rather than the literacy level (See da Silva et al). -Limitations include small sample size; limited range of age and education; inability to rule out potential confounding effects of infectious disease, chronic medical conditions, and exposure to environmental toxins -Acculturation was not assessed in this study
Branca, B., Giordani, B., Lutz, T., & Saper, J. R. (1996). Self-report of cognition and objective test performance in posttraumatic headache. *Headache*, *36*(5), 300–306.	To examine the factor structure of the CDS in a group of post-traumatic head pain patients	111 adults aged 15-67 years (*M* = 38.22, *SD* = 11.37) referred with post-traumatic head injury syndrome complaining of memory dysfunction and treated at a CARF-accredited private clinic -Ed ranged from 8-19 years (*M* = 13.26, SD = 2.37)	-Estimates of post-traumatic amnesia based on patient report -CDS administered to assess level of cognitive complaints -BDI also administered to assess presence of depressive symptoms - MMSE used as screening at start of study but discontinued after 26th participant - WMS-R for memory -Factor analysis employed to examine items of CDS	-Factor analysis revealed seven meaningful factors corresponding to the types of memory inefficiencies often associated with neurological dysfunction -Further analysis comparing CDS factor scores to objective tests of mental status, memory, and depressed mood demonstrated limited relationships between specific CDS factor scores and these measures of cognitive performance and behavior - CDS appears helpful in assisting this patient population with tx planning and specific remediation tied to everyday situations

Brickman, A. M., Cabo, R., & Manly, J. J. (2006). Ethical Issues in Cross-Cultural Neuropsychology. *Applied Neuropsychology*, *13*(2), 91–100.	To highlight important and complex ethical issues to aid the clinician in the evaluation of ethnically diverse patents and to stimulate future research in this area	N/A	Review Article	- Factors not directly related to brain functioning can have significant influences on the outcome of NP performance across cultures and have been shown to persist despite matching groups on demographic variables such as chronological age, years of formal education, sex, and income -Most studies that have explicitly examined ethnic group differences in NP have found reliable discrepancies in test scores that have been shown to persist despite matching groups on demographic variables such as chronological age, years of formal education, sex, and income - Factors potentially accountable for discrepancies in test performance amongst different ethnic/racial groups: a) objective biological/structural differences among groups b) specific NP tests can measure different cognitive constructs in different groups c) race/ethnicity are correlates of other factors that affect brain functioning d) examiner's experience, cultural competency, and language competency - Overall, extant literature on this topic suggests that while group differences do indeed exist between ethnic groups, they are more likely the results of sociocultural factors such as quality of education, acculturation, literacy, test-wiseness, and racial socialization (i.e., stereotype threat) rather than representative of purely genetic or biological differences -Most NP tests used in clinical practice were developed and validate on primarily non-Hispanic White normative cohorts -Construct validity is sensitive to influences such as systematic bias and can change between ethnic groups so much so that the cognitive construct a specific test was designed to measure is no longer valid (i.e., confrontation naming in a population that has limited exposed to the

				stimuli being presented). -Group differences cannot be attributed to ethnicity or race; rather, familiarity with an individual's race/ethnicity can inform the examiner as to potential unique cultural experiences and sociocultural factors that may be impacting patient performance. -Simply knowing a patient's race/ethnicity does not adequately provide the clinician with the necessary information to determine the impact of these factors on performance, but it may help the clinician understand the potential unique cultural experiences the patient has had. -When interpreting patient performance on NP tests, it is critical to consider the appropriateness of the norms with which their performance is being compared. -While many factors responsible for discrepancies in scores among ethnic groups have been identified, many remain undiscovered -Argument for having race based norms lies in the fact that race is a strong predictor of NP performance and a powerful correlate of several non-brain related factors that can impact performances. -Argument against race-based norms: race is a social construct that acts as a surrogate for socioeconomic variables that might influence brain functioning or development -The vast amount of heterogeneity in cultural groups and increasing multiculturalism (e.g., individuals with mixed racial and ethnic backgrounds) can make it difficult to determine which norms to utilize. As such, it can sometimes be helpful to report scores derived from multiple normative data sets and explore the possible implications of discrepancies in a clinical evaluation report -2 main ethical issues ~~involved~~ in the development of linguistically diverse NP measures: 1) method by which tests are developed

				2) how the patient's performance is evaluated when their primary language differs from that of the examiner
Brew, B. J. (2009). HIV and the acquired immunodeficiency syndrome: an overview of neurological complications. In R. Lisak, D. Truong, W. Carroll, & R. Bhidayasiri (Eds.), *International neurology: A clinical approach* (pp. 340-341). Hoboken, NJ: Wiley-Blackwell.	N/A	N/A	Book chapter	- At least 1/3 of patients with advanced HIV will present with neurological complications, sometimes in the absence of known HIV - The neurological complications of HIV are now more common than MS, motor neuron disease, and other neuropathologies that have traditionally been the focus of the medical community - HIV-associated dementia (HAD) now most common cause of dementia in young to middle-aged persons - HIV-associated dementia is the only viral dementia that can be treated, often leading to significant improvement if not full recovery.
Buelow, M. T., Tremont, G., Frakey, L. L., Grace, J., & Ott, B. R. (2014). Utility of the Cognitive Difficulties Scale and Association With Objective Test Performance. *American Journal of Alzheimer's Disease and Other Dementias*, *29*(8), 755-761.	1) To examine the presence of subjective memory complaints on the CDS in older adults 2) To examine relationship between CDS scores and current cognitive ability	-*N* = 234 community dwelling older adults aged 55-85 -50 dx with AD -100 with MCIa - 84 healthy controls - All English speaking - No discussion of ethnic/racial identities	- Participants completed NP eval (MMSE, DRS-2, HVLT, Initiation/Perseveration and Memory subtests) and self- and informant-reported CDS -Statistical analysis: A) 1-way ANOVA and Pearson's chi square tests as needed; significant omnibus ANOVAs f/u with Tukey's HSD post hoc pairwise comparisons B) Series of hierarchical linear regressions conducted for both patient and informant	-Research is mixed on the relationship between self-reported cognitive complaints and objective cognitive decline - Greater self-reported memory complaints were noted within the MCI group, though self-reported CDS scores were associated with cognition only in the control group. - Informant-reported CDS scores predictive of cognitive ability in the dx of MCI but not AD, indicating importance of obtaining caregiver report in the evaluation of memory disorders -Given the neurodegenerative nature of AD, subjective memory complaints lose predictive value in determining degree of impairment as the disease stage increases -Self-reported CDS scores only predictive of concurrent NP test performance for controls - Extent of current cognitive difficulties and the source of the information (e.g., self vs. informant) may matter in utility of the information to understand current cognitive status -Although there were higher self-reported CDS scores in the MCI and higher informant-reported CDS scores in AD groups as compared to

			versions of CDS -Age & Ed entered first, self-reported CDS total, attention or memory score second	controls, there few significant relationships between subjective complaints and objective test performance within these groups - Lack of link between CDS scores and objective neuropsychological performance may be in part due to decreased awareness in individuals diagnosed with MCI or AD and possibly psychic denial -DEPRESSION MAY HAVE IMPACTED THE RESULTS; AUTHORS SPECULATE THAT THE HIGHER CDS SCORES IN MCI GROUP MAY BE IN PART DUE TO HIGHER LEVELS OF DEPRESSION (though no formal analysis was completed; see page 5)
Candelaria, M. A., &Llorente, A. M. (2009). The assessment of the Hispanic child. In C. Reynolds & E. Fletcher-Janzen (Eds.) *Handbook of clinical child neuropsychology* (pp. 401-424). New York, NY: Springer Publishing Co.	To provide an overview of current assessment practices with Hispanic children	N/A	Book Chapter	Many of the tests that are currently used as gold standards in the assessment of Spanish-speakers lack normative data for specific Latino groups with limited or very advanced educational backgrounds.
Carter, S. (2001). *Subjective Cognitive Complaints in HIV Infection: Utility in Predicting Neuropsychological Deficits* (Doctoral Dissertation, University of Windsor, Ontario, CA). Retrieved from scholar.uwindsor.ca	To clarify the relationship between subjective cognitive complaints and actual NP skills in HIV+ samples	*N* =156 HIV+ adults - 148 M - 8 F - Asymptomatic = 18 - mildly symptomatic = 61 - 76 AIDS defining illness	- Structural equation modeling used to examine interrelationships among variables affecting cognitive complaints - - Decision tree analysis used to develop screening protocol for HIV-related impairment	- Overall, cognitive complaints did not demonstrate a strong relationship with NP impairment - SEM identified that cognitive complaints independently predicted poorer NP performance despite influence of depressed mood and systemic illness on cog complaints; may be a recommendation for future research as using SEM allows flexibility in examining relationship btwn cog complaints and NP while accounting for depression -Cognitive complaints most strongly associated with psychomotor skills - Symbol Digit Modalities Test was best predictor of global NP impairment
Carter, S. L., Rourke, S. B., Murji, S., Shore, D., & Rourke, B. P. (2003). Cognitive complaints,	To use SEM to clarify relationship between subjective	Convenience sample of 160 HIV+, primarily gay Caucasian	-All participants completed NP tests, modified BDI	-Literature on utility of cog complaints to accurately predict cog status is inconclusive -Especially important to detect HIV-related NP changes early on given the

depression, medical symptoms, and their association with neuropsychological functioning in HIV infection: A structural equation model analysis. *Neuropsychology*, *17*(3), 410–419.	cognitive complaints and NP functioning -Hypotheses: 1) Depressed mood and med. Sx would be sig. associated w/each other, and both would be sig. associated with subjective cog. Complaints 2) med sx and mood would be sig. associated with NP skills indirectly through influence on or relationship w/cog complaints 3) cog complaints would be sig. associated with NP skills	males - 151 M, 9 F -17 asymptomatic, 45 mildly symptomatic, 98 AIDS-defining illness -12% on ART, 70% on HAART - Age *M* = 40.86(7.89) - Ed *M* = 14.41 (2.73) - Mean BDI for total sample = 18.08 (10.05), indicating mild-mod depressive sx	(only items 1-13 to avoid confound of physical effects of HIV), 12-item HIV medical sx inventory (modified from Gorman et al, 1991), and PAOF -SEM used to test models of relationships among cog complaints, mood, and medical sx with NP functioning, as SEM affords the opportunity to examine both independent and interactive effects of variables influencing cog. complaints	potential for effective intervention is better than in later stages of disease progression in which there may be more NP impairment and medical comorbidities -Subjective cog complaints more frequently reported in symptomatic individuals vs. asymptomatic individuals - Although depressed mood (β = 0.32, p < .01) and medical sx (β = 0.31, p < .01) influence cog complaints, cog complaints independently associated with poorer NP performance (β = 0.39, p < .01) -Mood and medical sx sig correlated but no sig. associated with NP performance -Both depression and med. Sx associated with increased cog. complaints, but their influence on cog. complaints yielded only small, indirect relationship with NP performance -increased cog. complaints can reflect NP impairment even in individuals who are depressed or medically symptomatic - Individuals with depressed mood or increased med. Symptoms more likely to report NP deficits -Further studies needed to differentiate btwn sx that stem from NP impairment and those from other causes (e.g., depression, symptomatic HIV) -Depressed mood not useful in predicting NP performance in HIV infection (consistent with other literature) -Though there appears to be a relationship between complaints and NP functioning, the strength of this relationship is a relatively weak one.
Castellon, S. A., Hinkin, C. H., & Myers, H. F. (2000). Neuropsychiatric disturbance is associated with executive dysfunction in HIV-1 infection. *Journal of the International Neuropsychological*	1) To extend previous findings by exploring participants' performance on two other nuerocog tasks thought to be sensitive	*N* = 65 HIV+ adults - 21 HIV-controls - 28 HIV+, medically asymptomatic - 37 HIV+, symptomatic - 43% AA	Measures included: -Dual-Task choice with auditory probe reaction time paradigm: single task simple RT - Single-task	- Findings suggest apathy and irritability may be relatively common neuropsychiatric consequences of HIV-associated CNS disturbance - Findings in the current study showing that depression was present in both HIV- and HIV+ groups, albeit to a higher degree in the latter group, suggest that apathy and irritability may be more specific markers of HIV-associated CNS involvement

Society : JINS, *6*(3), 336–347.	to the frontal-subcortical integrity 2) to examine irritability as a potentially meaningful neuropsychiatric sx that has not been previously studied in HIV	- 48% W - 9% Latino -81% M - 19% F - Majority self-identified as either gay or bisexual men (52% of controls and 61% of HIV+ group)	choice RT - Dual-task visual choice with auditory probe RT -Stroop task - Neuropsychiatric measures (Neuropsychiatric Inventory + BDI) - Data analyses: ANOVA and post-hoc Tukey's *t* test; Pearson's *r* calculated to determine correlation between continuous variables; non-normally distributed variables used Spearman's *r*.	- The etiology of depression in HIV-associated CNS involvement is more heterogeneous than that of prominent apathy or irritability - Apathy and irritability likely to arise together in frontal-subcortical structure/circuit involvement, particularly in context of subcortical pathology -Pronounced apathy and/or irritability associated with poor performance on those cognitive tasks thought to be dependent on effortful, controlled, attentional processing (e.g., dual-task RT, Stroop interference)
Cherner, M., Suarez, P., Lazzaretto, D., Fortuny, L. A. I., Mindt, M. R., Dawes, S., Marcotte, T., … HNRC Group. (2007). Demographically corrected norms for the Brief Visuospatial Memory Test-revised and Hopkins Verbal Learning Test-revised in monolingual Spanish speakers from the U.S.-Mexico border region. *Archives of clinical neuropsychology : the official journal of the National Academy of Neuropsychologists*, *22*(3), 343–353.	To develop norms for Spanish speakers on two widely used tests of learning and memory: the BVMT-R and the HVLT-R	*N* = 127 native Spanish speakers (73 women, 54 men) from the US-Mexico border regions of AZ & CA		- Linguistic and cultural appropriateness are necessary factors in both neuropsychological assessment and interpretation of ethnic minorities - The number of validated Spanish-language neuropsychological assessment instruments are limited despite the large number of primary Spanish speakers both within the US and throughout the world - The norms that currently exist for the BVMT-R and HVLT-R are based on a non-representative sample that significantly differs an a variety of factors that can invalidate interpretation of test results within this population, particularly with reference to level of education - Application of these published norms to a sample of neurologically normal Spanish speakers lead to high rates of misclassification - Results indicated that while education level is very important on

				predicting test performance, other unknown factors may also be involved.
Claypoole, K. H., Elliott, A. J., Uldall, K. K., Russo, J., Dugbartey, A. T., Bergam, K., & Roy-byrne, P. P. (1998). Cognitive functions and complaints in HIV-1 individuals treated for depression. *Applied Neuropsychology, 5*(2), 74–84.	To examine relationship between severity of depression, cognitive complaints, NP functioning, and tx response in HIV+ patients diagnosed with MDD	-*N* =75 -Subjects part of randomized placebo-controlled tx study of imipramine and paroxetine in depressed HIV+ outpatients -Exclusion criteria included SMI, SUD, hx of IV drug use in past 6 months, hx of neurological d/o, HI, dx psychotic, bipolar, or other psychiatric d/o	- All subjects met criteria for MDD but not dementia at baseline - Subjects prospectively treated with antidepressants for 12 weeks and re-assessed 3 months later - Scores on measures of depression, cognitive complaints, and np performance compared at T1 and T2. - 97.6% sample male -Mean age = 35.71(6.81) -Mean ed = 13.64(1.72) -Hamilton Depression Scale, *M*(*SD*) = 24.33(5.35) -Hamilton Anxiety Scale, *M*(*SD*) = 22.55(7.97)	-Severity of depression but not NP performance was strongly associated with complaints of memory difficulties at baseline -NP dysfunction and depression essentially unrelated in this sample - Cognitive complaints declined sig. across course of tx for patients who responded to antidepressant tx - All patients, regardless of antidepressant tx response, demonstrated parallel improvement at T2 NP exam. -Findings suggest treatment of depression affects cog complaints in HIV+ individuals and that cog complaints of patients in asymptomatic or early stages of infection may signal need for evaluation of depression -In patients with more advanced disease progression, investigation into basis of cog complaints may require dual assessment of mood and NP status -Cognitive complaints, neuropsychological dysfunction, and depression are all common features of HIV infection. Treatment plans can differ greatly depending on the source of cognitive decline (i.e., HIV-symptomology vs. depressive symptomatology), it is important to screen patients early on. -Findings on numerous studies exploring the relationship between cognitive complaints, mood, and neuropsychological functioning are inconsistent.
Cuéllar, I., & Roberts, R. E. (1995). Relations of depression, acculturation, and socioeconomic status in a Latino sample. *Hispanic Journal of Behavioral Sciences, 19*(2), 230-238.	To investigate relationship between depression, acculturation, and SES in a young adult Latino sample	*N* = 1,271 Latino first year college students - 89% self-identified as Mexican American or Hispanic - 11% self-identified as Mexican National	-Symptoms of depression were compared for various acculturation levels and bicultural groups - SES and gender were controlled for -Accult.	-Variance in depression scores more influenced by gender and SES than by acculturation or ethnic identity - Assimilated Mexican Americans reported sig. fewer sx of depression than more traditional counterparts -Ethnicity and acculturation not found to lessen or increase risk for depression, but SES associated with ethnicity found to directly affect depression scores

			assessed via Acculturation Rating Scale for Mexican-Americans-II (ARSMA-II). -Depressive symptoms measured via DSD26 Symptom Scale	
Cysique, L. A., Deutsch, R., Atkinson, J. H., Young, C., Marcotte, T. D., Dawson, L., … HNRC Group. (2007). Incident major depression does not affect neuropsychological functioning in HIV-infected men. *Journal of the International Neuropsychological Society*, *13*(1), 1–11.	To explore effects of MDD on NP functioning in HIV+ individuals in a longitudinal fashion	-227 HIV+ males - 98 had lifetime history of MDD - 23 met criteria for incident MDE on of the f/u evals	- Retrospective study - Subjects did not have MDE at baseline -Were followed for a median of 24 months -Subjects assessed for NP functioning, lifetime and current psychiatric disorders, and cog complaints -Subjects assigned two diff. groups based on trait vs. state status to determine whether MDD "trait status" was associated with differences in NP performance at baseline -Groups w/ and w/o lifetime prevalence of MDD did not differ on demographics	-Lifetime MDD associated with greater cog complaints of daily functioning - Incident MDE associated with substantial increases in depressed mood and cog complaints, though changes in mood and cog complaints not accompanied by evidence of increase in NP impairment on a comprehensive NP battery (this is consistent with findings from cross-sectional studies such as Millikin et al., 2003)-Detailed group comparisons revealed no NP performance differences in association with either lifetime or incident major depression - Norms for change developed using NP data from consistently non-depressed participants -Findings generally consistent with findings from existing cross-sectional studies showing that 1) MDD is not responsible for substantially increased rates of NP impairment that are seen in HIV infected populations and 2) MDD is not usually a significant confound in interpreting NP results of individual patients with HIV. - Findings strongly suggest that self-reports of cognitive complaints in HIV+ individuals with depressed mood should not be accepted uncritically (in contrast to the findings by Carter et al. 2003 suggesting that reports by depressed patients have some validity) -Findings support view that depression and cog complaints should be considered as two independent processes.

			, HIV disease status and treatment histories at baseline, and numbers of intervening assessments between baseline and the final follow-up -Depression assessed via BDI and HDS -Cog complaints assessed via PAOFI	
Cysique, L. A., Maruff, P., & Brew, B. J. (2004). Prevalence and pattern of neuropsychological impairment in human immunodeficiency virus-infected/acquired immunodeficiency syndrome (HIV/AIDS) patients across pre- and post-highly active antiretroviral therapy eras: a combined study of two cohorts. *Journal of Neurovirology*, *10*(6), 350–357.	To asses prevalence and patter of NP impairment in HIV cohorts across pre- and post-HAART eras	*N* = 141, Pre-HAART era/monotherapy group (*n* = 51) vs. HAART (*n* = 90)	-Groups compared in 9 NP domains (both prevalence and pattern of NP deficits explored)	- No sig difference in prevalence of impairment (i.e., ≥-2 SD on two measures) across groups -Prevalence of NP impairment not sig reduced in patients with undetectable plasma load - Pattern of NP impairment was different across groups, with improvement in attention, verbal fluency, and visuocostruction deficits but deterioration in learning efficiency and complex attention -Overall, NP deficits remain common in HAART era -Finding that some np functions improve while others deteriorate support that deficits are related to unknown active intracerebral processes occurring in HIV vs. burnt out damage
Deren, S., Shedlin, M., Decena, C. U., & Mino, M. (2005). Research challenges to the study of HIV/AIDS among migrant and immigrant Hispanic populations in the United States. *Journal of urban health : Bulletin of the New York Academy of Medicine*, *82*(2), 13–25.	To describe research challenges to study of HIV/AIDS among immigrant Hispanic populations	N/A	Review of how two studies of Hispanic immigrants and migrants in the New York area addressed challenges unique to studying this population	4 challenges to conducting research among this population: 1) need to use multilevel frameworks incorporating structural, social, and individual level factors, 2) need to differentiate between Hispanic subgroups, 3) challenges to recruitment and data collection from "hidden" populations poses a threat to validity and generalizability of data, 4) ethical issues such as sensitivity to cultural norms, attention to human subjects protections, and need for dissemination of research findings to community members

				- AIDS case rate for Hispanics is ~4x > than Whites -Hispanics more likely to be diagnosed with HIV and AIDS than Whites - Increased risk for HIV infection associated with migration through substance abuse/increased injection and sex-related risks -Obstacles to receiving services in new locations include eligibility, language, and knowledge barriers -Acculturative stress also critical factor in understanding immigrant experience
Dang, B. N., Giordano, T. P., & Kim, J. H. (2012). Sociocultural and structural barriers to care among undocumented Latino immigrants with HIV infection. *Journal of Immigrant and Minority Health*, *14*(1), 124-131.	To examine the circumstantial, situational, and social factors that uniquely affect entry and retention in care for this population	22 un-documented Latino immigrants living with HIV infection	Qualitative study conducted between 06/06-08/06; grounded theory approach to data analysis	-Emergent themes related to health care barriers included: 1) stigma and rejection from family & community 2) experienced and perceived structural barriers to accessing care as an undocumented individual - Social intolerance of HIV and stigma related experiences → feelings of secrecy and shame
Derouesne, C., Dealberto, M., Boyer, F., Lubin, S., Sauron, B., Piette, F., Kohler, F., … Alperovitch, A. (1993). Empirical evaluation of the "Cognitive Difficulties Scale" for assessment of memory complaints in general practice: A study of 1628 cognitively normal subjects aged 45-75 years. *International Journal of Geriatric Psychiatry*, *8*, 599–607.	To assess the validity of the CDS to evaluate memory complaints	- 1648 cognitively normal subjects aged 45-75 recruited from visits to GP -data from sample collected 01/01/1990 – 07/31/1991 -Appears study was conducted in Paris, France -No specific mention of ethnicity	-Multivariate analysis used to analyze subjects' scores on CDS while controlling for following variables: sex, age, ed, blood pressure, and use of psychotropic meds - Subjects assigned to one of 3 groups based on ed status: low (<6 yrs), avg (7-13 yrs), and high (>14yrs). -2 age groups, above and below 60,	- CDS M = 45.5 (21.4) -Mean CDS scores increased with age and decreased with education level; influence of these factors persisted even after adjusting for them - Overall, CDS is a good tool for assessing cog complaint in the elderly, with results close to those obtained from related measures - Advanced age, low educational status, and psychological/mixed motives for visiting GP were only predictive factors included in highest 25th %ile of CDS as determined by multivariate analysis -Relationship between memory complaints and NP performance is controversial -Results showed slight correlation between severity of complaints and NP performance - Discrepancy between cog. complaints and performance found in a 3.4% of sample (n = 46) such that these individuals were reporting severe cog. complaints with very

			were defined by some analyses	good NP performance, suggesting role of psychoaffective factors in memory complaints, though present study did not assess for affective status -IN contrast, few people with low test performances had a low memory complaints score; main predictive factor for belonging in this group was advanced age, "suggesting possibility of incipient dementia"
Derouesne, C., Lacomblez, L., Thibault, S., & Leponcin, M. (1999). Memory complaints in young and elderly subjects. *International Journal of Geriatric Psychiatry, 14(4),* 291–301.	To compare qualitative and quantitative aspects of memory complaints in cognitive normal subjects under and above age 50	-260 non-depressed, cognitively intact healthy adults recruited from memory clinic located in gen. hospital in suburb outside Paris, France	- Sample split into two groups: 1) over 50 (*n* = 183) and under 50 (*n* = 77) -Subjects rated severity of cog complaints as major or minor and filled an 8-item questionnaire assessing various memory difficulties in daily life -relationship between severity of memory complaints and demographic data, memory performance, and affective status compared between groups	- Semiologic aspects and correlates of memory complaints did not differ among groups. - No close relationship found between severity of memory complaints and memory performance - memory complaints strongly related to affective status in both groups, especially with respect to severity of anxious symptomatology -Conclude that memory complaints of elderly do not appear basically different from memory complaints of younger subjects
Gibbie, T., Mijch, A., Ellen, S., Hoy, J., Hutchison, C., Wright, E.,… & Judd, F. (2006). Depression and neurocognitive performance in individuals with	-Assess changes in depression and NP performance over time -Explore relationship		- 80 HIV+ recruited from community clinics in Melbourne, AU. - 95% were	-Sample was impaired in 9/10 NP domains as compared to healthy controls -NP performance slightly improved for those reporting no baseline depressive symptomatology (i.e., <14 on BDI). - Multivariate analysis revealed 40%

HIV/AIDS: 2-year follow-up. *HIV Medicine*, *7*(2), 112–121.	between depression, HIV, & NP performance -Examine effect of HAART on depression and NP performance		male	of change in cog performance was attributable to age, AIDS, and HAART regimen.
Gonzalez, J. S., Hendriksen, E. S., Collins, E. M., Durán, R. E., & Safren, S. A. (2009). Latinos and HIV/AIDS: examining factors related to disparity and identifying opportunities for psychosocial intervention research. *AIDS and Behavior*, *13*(3), 582–602.	To examine reasons for disproportionate impact of HIV/AIDS on Latinos in comparison to whites To address ways in which psychosocial research could contribute to better addressing the needs of this underserved, rapidly growing US minority group	N/A	Literature Review	-While clear that African Americans face most disproportionate burden of HIV/AIDS among all ethnic groups, little research has focused on Latinos - In 2002, death rates due to HIV/AIDS among 34-45 yo Latinos and Latinas was 2x that of their White counterparts (10.4% and 6.5%, respectively), ranking it the 3rd and 4th more common cause of death among these groups respectively. -AIDS prevalence among Latinos increased 130% between 1993-2001 -Data indicate that HIV+ Latinos have significantly worse outcomes than HIV+ Whites -There are significant within-group variations in HIV rates within Latino population (e.g., Latinos born in US an Puerto Rico have higher HIV/AIDS rates than foreign born Latinos) -Most HIV+ Latino males infected through either unprotected sex with men or shared needles from injection drug use (similar to Whites); though differences exist in risk depending on nationality -MSM make up largest risk factor among Latinos born in Mexico, the US, Central or South America and Cuba, while IDU is largest risk factor for Puerto Ricans -Latinas most likely to become infected via heterosexual contact (73%) and to a lesser degree IDU (23%) per CDC, 2007 - In the 2002 National Survey of Latinos conducted by Pew Hispanic Center and the Kaiser Family Foundation, socioeconomic barriers to receiving care within this group were found to include difficulty communicating with healthcare providers due to language barriers, difficulty obtaining care due to

				ethnicity, and delaying seeking care because of costs or lack of transportation (e.g., 19% of Latinos with HIV reported postponing care due to lack of transportation compared to 11% of Whites, and ere more likely to postpone care due to being too ill or having competing needs. -Also more likely to delay care after diagnosis as compared to Whites (23% vs. 15%) -In the Providence/Boston areas, Latinos were found to be less likely to receive HAART as compared to Whites (50% vs. 75%) -Ethnic minorities have largely been underrepresented in studies of psychosocial factors in HIV-treatment adherence -Depression is associated with poor treatment adherence as symptoms of depression make the already difficult task of adhering to HIV treatment even more difficult for patients -Latinos have an increased risk for depression given that they experience depressive symptoms at the same rates as Whites but are less likely to receive/seek treatment
Grant, I., Olshen, R., Atkinson, J., Heaton, R. K., Nelson, J., McCutchan, J. A., & Weinrich, J. D. (1993). Depressed mood does not explain neuropsychological deficits in HIV-infected persons. *Neuropsychology, 7*(1), 53-61.	To explore relationship of depressed mood to cognitive disturbance	139 HIV+ gay males	Participants grouped according to CDC guidelines into HIV- (*n* = 38), Group IV (*n* = 39), Group II + Group III (*n* = 62); Mood measured using the POMS; Classification approach of analysis employed	- While depression and NPI more prevalent in HIV+ subjects at more later disease (i.e., symptomatic) stages, there was no systematic relationship between depression and neuropsychological functioning.
Groth-Marnat, G. (2009). *The handbook of psychological assessment* (5th ed.). Hoboken, NJ: John Wiley & Sons, Inc.	N/A	N/A	Textbook	- Test validity is of central importance when assessing ethnic minorities - Cultural bias in tests used to assess intelligence and functioning can negatively impact content validity, although elimination of these sorts of

				biased items (i.e., those that discriminate between minorities and non-minorities) in some studies have not been successful in altering overall test score - SES appears to have an even greater impact on test scores than culture in some studies -Familiarity with client's culture, values, beliefs, and relevant literature is essential in assessment of ethnic minorities - Determination of the language most familiar to the patient and attention to the extent and manner to which language differences might bias the results -Of equal importance is the degree of assimilation
Heaton, R. K., Marcotte, T. D., Mindt, M. R., Sadek, J., Moore, D. J., Bentley, H., McCutchan, J. A., … HRNC Group. (2004). The impact of HIV-associated neuropsychological impairment on everyday functioning. *Journal of the International Neuropsychological Society*, *10*(3), 317–331.	To evaluate the functional, or "real-world" impact of HIV-associated NP impairment	267 HIV+ adults recruited by HNRC	All participants received comprehensive NP, neuromedical, and standardized functional evaluations that included laboratory measures of shopping, cooking, financial management, medication management and vocational abilities.	- HIV-associated cognitive impairment can interfere with everyday functioning. - Lack of sensitive, comprehensive functional battery for use with HIV patients - Assessment of an individual's everyday functioning is important as less severe declines (which make up the majority of HAND now due to improvements in treatment) have been correlated with measureable changes in functional abilities. - Compared to NP-normal participants, those with NP impairment performed significantly worse on all laboratory measures of everyday functioning. - Multivariate analyses revealed that the NP ability domains of Abstraction/Executive Function, Learning, Attention/Working Memory and Verbal abilities most strongly and consistently predicted failures on the functional battery. - Both NP impairment and impairment on the functional battery were significantly associated with subjective experiences of cognitive difficulties, as well as unemployment and increased dependence in activities of daily living - Impairment on the functional battery and depression were the only unique predictors of all three indicators of "real-world"

				functioning. - Future studies should use objective, laboratory based functional measures to compliment NP testing in future studies to better understand the impact on quality of life of CNS disorders and their treatments. - Additional research investigating the apparently independent effect of depression on level of everyday functioning in HIV infected persons is needed.
Hinkin, C. H., Castellon, S. A., van Gorp, W. G., & Satz, P. (1998) Neuropsychological features of HIV disease. In Wilfred G. van Gorp & Stephan L. Buckingham (Eds.), *Practitioner's Guide to the Neuropsychiatry of HIV/AIDS* (pp. 1-41). New York, NY: Guilford Press.	To provide an overview of typical cognitive and behavioral sequelae of HIV-1 infection; it also covers such issues as epidemiology of HAD, neuroimaging findings, the relationship between cognition and depression, and thaccuracy of patients' self-reported cognitive status.	N/A	Book Chapter	- The following topics are addressed: terminology and diagnostic criteria, secondary neurological illnesses in HIV infection, natural history and clinical course, neuropsychological performance by domain in HIV infection (mental status/intelligence, attention/concentration, speech and language, visual–spatial function, memory, executive functions, motor functions), computerized assessment in HIV-1 infection, HIV-related cognitive decline compared with the normal aging process, when should a patient be referred for evaluations, and neuropsychological batteries for the assessment of dementia due to HIV disease.
Horton, A.M., Jr. (2008). Multicultural neuropsychological assessment: The future of neuropsychology. In D. Wedding (Ed.), *The neuropsychology handbook* (3rd ed., pp. 345–366). New York, NY: Springer Publishing Co.	-To elucidate the complexities of multicultural NP assessment - To give a brief overview of what is currently known about NP	N/A	Book chapter	- A standardized battery allows for multiple lines of inference (which can help reduce cultural bias) and is therefore recommended when testing individuals from diverse ethnic backgrounds. - The term standard refers to not only test procedures but also the existence of a group that consists of a representative number of persons with which the results of the individual 's performance can be compared; however, most of the normative data that exists for NP

	assessment in diverse populations - To propose ways in which to improve NP practices in the future			batteries has been retrieved from samples that underrepresent diverse cultural and ethnic groups and are based primarily on Euro-American beliefs, traditions, and values. - Author asserts that additional research is necessary for establishing appropriate strategies for correcting for cultural biases and other inherent problems of standardization. - Although there is controversy among clinicians and scientists as to exactly how and to what degree culture influences NP testing, research suggests that culture and ethnicity have a significant on brain processes. - The field of NP has grossly neglected exploring and understanding the impact of cultural and ethnic differences on NP functioning, and has historically relied on dominant Euro-American standards for interpreting non-Euro-American individuals' results. - Acculturation is a complex process that cannot simply be measured by the number of years an individual resides in a dominant culture; failing to account for an individual's level of acculturation can produce test bias error. - The level of acculturation (the process by which an individual adopts the values, practices and beliefs of a dominant culture) or transculturation (the development of a new hybrid culture that results from the interactions between the dominant and non-dominant cultures) are important variables that can potentially influence NP test performance and results. - While it is essential for the individual to be tested in a language in which they are fluent, translating tests into other languages can present it's own concerns if the translations are not accurate. Furthermore, cultural biases inherent within the development of the tests themselves can lead to inaccurate assessment *despite* consideration for linguistic factors. - It is equally important to consider

				the subpopulation cultural differences and how they impact NP testing. For example, there are three major Hispanic subpopulations in America (Puerto Rican, Cuban, and Mexican American) and numerous other subpopulation groups that are distinctly different with regard to not only culture but also dialect. - Using a blanket reference such as Hispanic does not take into account the variation in neuropsychological ability that research suggests is present within this diverse population. - Never forget that all testing, including NP testing, occurs in the context of culture!!
Kinsler, J. J., Lee, S., Sayles, J. N., Newman, P. A., Diamant, A., & Cunningham, W. (2009). Impact of acculturation and utilization of HIV prevention services and access to care among an at-risk Hispanic population. *Journal of Healthcare for Poor and Underserved, 20*(4), 996–1011.	To explore and evaluate the relationship between acculturation and HIV/Hep C testing and access to care among the at-risk Hispanic population	600 primarily Spanish speaking male & female (female > male) Latinos in Los Angeles recruited from STD clinics, community-based orgs, and needle exchange programs	Statistical methods employed = bivariate analyses, multiple logistic regression, and multivariate linear regression - Level of acculturation was varied and explored as a variable	- 75% of the individuals reported Spanish to be their primary language - Acculturation was measured on four dimensions: a) primary language (Spanish vs. English), b) US born or foreign born, c) number of years living in the US (>10 or <10), and d) documented vs undocumented - Low levels of acculturation were significantly related to decreased likelihood of getting tested for HIV and Hep C, an increased likelihood of testing positive for HIV, and lower levels of access to health care services. - Authors assert that more tailored interventions and assessments are necessary for this at-risk population.
Knippels, H. M. A., Goodkin, K., Weiss, J. J., Wilkie, F. L., & Antoni, M. H. (2002). The importance of cognitive self-report in early HIV-1 infection: Validation of a cognitive functional status subscale. *AIDS*, *16*(2), 259–267.	To determine the concurrent validity of the Dutch four-item MOS-HIV cognitive functional status subscale and its clinical significance in predicting NP test performance	-85 HIV-1-infected homosexual men who participated in an ongoing longitudinal research project designed to study the effects of a support group	Instrument Validation Study - AVLT - TMT A & B - Digit-Symbol Substitution (subtest from WAIS-R) - Verbal fluency test for semantic categories (animals and occupations subtest from the Groningen Intelligence Test: GIT)	- The MOS-HIV cognitive functional status subscale showed significant associations with NP test performance overall and, specifically, with the domains of abstraction, language and visuospatial abilities, controlling for CD4 cell count and Centers for Disease Control and Prevention (CDC) clinical disease stage. - A trend toward significance was also found in the memory domain. To our knowledge, this is the first report of a cognitive functional status subscale used with HIV-1-infected subjects in a language other than English. The MOS-HIV cognitive functional status subscale seems particularly sensitive to changes in

			- Pin test to assess motor ability - Visual Reproduction (subtest from the Dutch version of the WMS-R) - Digit Span (subtest from the Dutch WMS-R)	NP test performance in early HIV-1 infection. - These results suggest the potential for clinical utility of a brief functional status self-report measure related to cognitive abilities in early HIV-1 infection for the screening and diagnosis of HIV-1 associated cognitive-motor disorders.
Levine, A. J., Palomo, M., Hinkin, C. H., Valdes-sueiras, M., Lopez, E., Mathisen, G., … Singer, E. (2011). A comparison of screening batteries in the detection of neurocognitive impairment in HIV-infected Spanish speakers. *Neurobehavioral HIV Medicine, 3,* 79–86.	Authors compared the accuracy of three screening measures in detecting neurocognitive impairment in what was primarily a monolingual Spanish-speaking, HIV-positive sample from Mexico and neighboring Central American countries.	21 (18 M, 3 F) Spanish-speaking, HIV-positive adults who migrated from Mexico or Central America	- Used NEUROPSI in addition to the standard NNAB protocol, which included the HDS, MMSE, and compre-hensive neuropsychological testing.	-A substantial number of Spanish-speaking individuals from Mexico and Central America are now living in the United States. - These individuals are at heightened risk for HIV infection and, due to late diagnosis and limited resources, for HIV-associated neurocognitive disorders (HAND). -Early detection is key, yet adequate methods for detecting HAND in Spanish speakers, especially in resource-poor areas, remains problematic. -It is necessary to identify accurate yet efficient neurocognitive screening tools that are appropriate for use in resource-limited AIDS clinics serving Spanish-speaking patients. - The scarcity of tests developed specifically for Spanish- speaking groups often results in clinicians turning to direct translations from their English-language counterparts
Manly, J. J. (2008). Critical issues in cultural neuropsychology: profit from diversity. *Neuropsychology Review*, *18*(3), 179–183.	To highlight that addressing cultural diversity in cognitive test performance is critical	N/A	Literature review	- Neuropsychological testing among culturally and linguistically diverse people is an area of weakness - It is our ethical duty as clinicians to provide our patients with culturally competent care - The exponential growth of culturally diverse individuals has revealed an critical area of vulnerability within the field of neuropsychology. - It is imperative that neuropsychologists take into account the cultural, educational and linguistic background of an individual, not only in terms of practice, but also in terms of

				development of measures and normative standards
Maxson, J. (2009). *Assessment of Depression in the Latino Community*. School of Professional Psychology, Pacific University.	This thesis reviews the use of the BDI and other methods of assessing depression in the Latino community.			- Protective factors such as familismo and the Hispanic paradox may guard against depression in Latinos. - BDI scores of 16-23 = moderate depression and >24 = severe depression - Maintaining strong interpersonal relationships has been shown to play an important role in combatting depression. - Familismo may promote social support, even when increased environmental risk is present - 3 potentially contributing factors to the inconsistency in reported prevalence rates for depression among Latinos are 1) not accounting for impact of culturally bound syndromes, 2) perceptions and attitudes about depression, and existing barriers and risk factors.
Maxson, J. (2011). *Latino Conceptualization of Depression*. School of Professional Psychology, Pacific University.	The current study examined whether there are differences between the way self-generated conceptualizations of depression by Latino and Caucasian participants are aligned with factors of the Center for Epidemiological Studies for Depression (CES-D).	N/A	- Study was only administered in English and not intended for monolingual Spanish speakers	- Currently, there is no extensive research on the prevalence rates of depression in Latinos - Of the literature that does exist, there is contradictory information regarding the prevalence rates of depression within Latino populations when compared to non-Latino Caucasian populations - Study did not find any significant effects and had a small sample size, as such no definitive conclusions were drawn. - Trends suggest Latinos may be more likely to conceptualize depression as related to their appearance and or performance at work. - Less acculturated, monolingual Spanish speakers may not share the same conceptualization of depression as more acculturated Latino individuals' conceptualization - Extant research shows that acculturation has an effect on depression rates and more acculturated US-born Latino individuals are diagnosed with depression more often than foreign-born, less acculturated Latinos.

Moore, L. H., Van Gorp, W. G., Hinkin, C. H., Stern, M. J., Swales, T., & Satz, P. (1997). Subjective complaints versus actual cognitive deficits in predominantly symptomatic HIV-1 seropositive individuals. *The Journal of neuropsychiatry and clinical neurosciences*, *9*(1), 37–44.	To explore the relationship between self-reported cognitive, motor, and affective complaints and actual NP functioning in HIV+ individuals	92 symptomatic HIV+ subjects who were referred for testing by their physicians for suspected cognitive decline	Correlational approach used.	- No relationship was found between cognitive functioning and subjective complaints. - Significant relationship was found between self-reported difficulties and measures of affect and mood.- Failed to show a significant positive correlation between actual NP impairment and self-reported cognitive complaints as compared to a control group. - Did find a significant relationship between self-reported difficulties and endorsement of depressive symptoms. - Suggested reasons for lack of accuracy in self-reports of HIV+ positive individuals who failed to endorse cognitive difficulties despite the presence of neurocognitive impairment include impaired memory as well as lowered awareness of deficits in general - No relationship between subjective cognitive complaints and poor performance on specific cognitive measures known to be highly sensitive to HIV was found.
Morgan, E. E., & Heaton, R. K. (2009). The neuropsychological approach to predicting everyday functioning. In I. Grant & K. Adams (Eds.), *Neuropsychological Assessment of Neuropsychiatric Disorders* (3rd ed., pp. 632–651). New York, NY: Oxford.	N/A	N/A	Book Chapter	- Many methods for assessing real-world functioning (i.e., functional ability), including self-report, proxy/caregiver report, clinician ratings - These subjective, report based measures have limitations that may obscure relationship between basic abilities and adequacy of everyday functioning.
Murphy, D. A., Roberts, J. K., Hoffman, D., Molina, A., & Lu, M. C. (2003). Barriers and successful strategies to antiretroviral adherence among HIV-positive monolingual Spanish-speaking patients. *AIDS Care, 15,* 217–230. doi:10.1080/0954012	To identify successful strategies for HAART adherence among Spanish Speakers	81 HIV+ monolingual/ bilingual Spanish speakers		-The most significant contributor to medication non-adherence was cited by participants was feeling depressed or overwhelmed. -Other important factors included simply forgetting

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Pennebaker, J. W. (2000). Psychological factors influencing the reporting of physical symptoms. In A.A. Stone, J.S. Turkkan, C. A. Bachrach, J. B. Jobe, H. S. Kurtzman, & Virgina S. Cain (Eds.), *The science of self-report: Implications for research and practice* (pp. 299-315). Mahwah, NJ: Lawrence Erlbaum Associates, Inc.	Discussion of psychological factors that influence To discuss self-report of physical symptoms	N/A	Book Chapter	-Individuals who exhibit trait negative affect also tend to be hypervigilant about monitoring themselves and have a lower threshold for noticing and reporting subtle changes
Peña de León, E., Aguilar Gaytán, S. S., Suárez Mendoza, A. A., & Reyes Terán, G. (2007). A validation of the MOS-HIV quality of life measure in HIV-infected patients in Mexico. *Revista Panamericana de Salud Pública, 21*(5), 313–319.	To validate the Medical Outcomes Study HIV Health Survey (MOS-HIV) quality of life instrument for its application in clinical research in Mexico.	120 HIV+ (14F, 106M) and 102 HIV- (20F, 82M) individuals	Statistical analyses: (1) internal reliability (Cronbach alpha coefficient), (2) discrim. validity (the receiver operating characteristic (ROC) curves derived from the scores of the two groups), & (3) convergent validity	- The MOS-HIV measure is valid for use in clinical research among HIV-infected persons in Mexico. - M(SD) on MOS for the HIV+ group was 82.68(18.49)
Rivera, F. I. (2007). Contextualizing the experience of young Latino adults: Acculturation, social support and depression. *Journal of Immigrant and Minority Health*, *9*(3), 237-244.	To analyze the effects of acculturation on the mental health of Latinos by testing whether family support mediates or moderates this relationship	- 850 South Florida Latinos from Miami Dade County	Statistical analysis: multivariate statistical methods were used to examine the correlates of and association between acculturation, family support and depressive symptoms.	-Family values are an important cultural factor for Latinos and potential buffering function in mental health - Acculturation was measured by thirteen items derived from the Marin, Sabogal, Marin, Otero-Sabogal, Perez-Stable (1987) Short Acculturation Scale for Hispanics, which has been widely used as an acceptable acculturation scale. - Findings suggest a significant relationship between acculturation and depression that was mediated by family social support. - No moderating effects found - Acculturation was measured by thirteen items derived from the Marin, Sabogal, Marin, Otero-Sabogal,

				Perez-Stable (1987) Short Acculturation Scale for Hispanics, which has been widely used as an acceptable acculturation scale. - Support was also found for education, gender, and socioeconomic status as strong predictors of depression
Rivera-Mindt, M., Cherner, M., Marcotte, T. D., Moore, D. J., Bentley, H., Esquivel, M. M., Lopez, Y., … HRNC Group. (2003). The Functional Impact of HlV-Associated Neuropsychological Impairment in Spanish-Speaking Adults - A Pilot Study. *Journal of Clinical and Experimental Neuropsychology, 25*(1), 122–133.	To determine the validity of functional measures that had been translated to Spanish; to see if NPI was correlated to everyday functional impairment	*N* = 16 HIV+ monolingual Spanish speaking adults (15 from Mexico, 1 from Honduras); lived in US for avg 7.1 years	Spanish-translated NP Battery; functional measures included Direct Assessment of Functional Status (DAFS) Financial Skills; DAFS, Shopping Skills, Cooking, Medication Management, Restaurant Scenario. Manifest Functioning included: Katz Adjustment Scale- Patient version (KAS-P); Patient's Assessment of Own Functioning Inventory (PAOFI)	- Spanish language functional assessments appear to be valid tools for detecting functional deficits in everyday functioning - Due to the high rates of infection and lack of current empirical evidence, there exists a practical need for studying the relationship between NPI and functional declines in HIV+ Spanish-speaking individuals. - There was no significant difference in level of depression between NPI and NP normal groups. - Overall functional impairment was sign. correlated with overall NPI. - Authors did not find an association between level of acculturation and NP results, but this could be due to the fact that they used an NP test battery designed for Spanish speaking Latinos.
Romero, H. R., Lageman, S. K., Kamath, V. V., Irani, F., Sim, A., Suarez, P., Manly, J. J., … Summit Participants. (2009). Challenges in the neuropsychological assessment of ethnic minorities: Summit proceedings. *The Clinical neuropsychologist*, *23*(5), 761–779.	The overarching goal of the Summit was to develop a plan for the future of cross-cultural neuropsychology.		Proceedings from the Multicultural Problem Solving Summit held Hawaii, February, 2008	- Specific targets for discussion included the delineation of the proper use of ethnic norms, allocation of resources for research, scientific approaches to the study of multicultural neuropsychology, education and training, and the development and dissemination of products from the Summit - Race was noted to have tenuous scientific meaning and the potential for racial classifications to increase misinterpretation of test findings was acknowledged. - The value of the construct of race is that it serves as an easily assessed

				proxy for more meaningful but complex variables -The majority of participants agreed that a greater understanding of the variables that influence performance on neuropsychological tests would help reveal the ''real'' source of variance in predicting individual and group differences, better inform norms, and support more sophisticated and accurate clinical interpretation of neuropsychological data
Rourke, S. B., Halman, M. H., & Bassel, C. (1999). Neurocognitive complaints in HIV-infection and their relationship to depressive symptoms and neuropsychological functioning. *Journal of clinical and experimental neuropsychology*, *21*(6), 737–756.	To determine which specific NP abilities were assoc. with neurocog complaints, and to quantify the independent contribu-tions of both neuropsycho logical test performance and depressive symptoms to neurocog complaints	100 HIV-infected individuals with varying levels of systemic disease and no history of neurological disease	-PAOF used to assess functional ability - BDI used to assess depressive symptoms	- Majority of variance in self-report of cognitive complaints are accounted for by depressive symptoms vs. objective NP performance -Depressive symptoms correlate highly with reporting of subjective neurocognitive complaints of problems with memory, language and communication, sensory-motor skills, and higher-level cognitive and intellectual functions - As depressive symptoms increase, so does the reporting of neurocognitive complaints - First group to quantify the degree to which depressive symptoms contribute to neurocognitive complaints - Analyses indicated that NP measures of attention/working memory, psychomotor efficiency, and recall of verbal information correlated sig. with both total neurocognitive complaints as well as specific complaint areas (e.g., memory, language, etc.)
Sadek, J. R., Vigil, O., Grant, I., & Heaton, R. K. (2007). The impact of neuropsychological functioning and depressed mood on functional complaints in HIV-1 infection and methamphetamine dependence. *Journal of clinical and experimental neuropsychology*, *29*(3), 266–276.	Examination of the complex relationships between depression and NP impairment, and self-report of problems with everyday functioning	362 adults with HIV infection or meth dependence, or both -86 HIV+ and meth dependence - 91 HIV+ and no meth dependence - 96 HIV- with meth dependence - 89 HIV	- NP test battery measuring verbal ability, attention/wo rking memory, abstraction/e xecutive functioning, information processing speed, learning, delayed recall, and	- Comorbid HIV and meth did not increase the likelihood of complaints regarding everyday functioning, beyond what was seen with either single risk factor. - Across all groups, depressive symptoms predicted greater IADL decline and cognitive complaints, while NP impairment predicted cognitive complaints more than IADL decline - Results indicate that depressive symptoms should not be used to dismiss subjective complaints related to everyday functioning even though depressive symptoms account for

		negative control (no Hx of meth dependence)	motor ability - BDI - Modified Lawton & Brody (1969) IADL scale (self-report) - Karnofsky scale (clinician rating of patient disability)	significant variance in self-reported complaints.
Schwartz, S. J., Unger, J. B., Zamboanga, B. L., & Szapocznik, J. (2010). Rethinking the concept of acculturation: Implications for theory and research. *American Psychologist*, *65*(4), 237.	To raise some of the questions and issues related to the operational definition, contextual forces, and relationships to psychosocial and health outcomes. - To propose an expanded, multidimensional model of accult. & of the demo. & contextual forces that can influence the accult. process	N/A	Review Article	- Acculturation is proposed as a multidimensional process consisting of the confluence among heritage-cultural and receiving-cultural practices, values, and identifications. - An expanded operationalization of acculturation is needed to address the "immigrant paradox," whereby international migrants with more exposure to the receiving cultural context report poorer mental and physical health outcomes. - Acculturation was originally conceptualized as a unidimensional process in which retention of the heritage culture and acquisition of the receiving culture were cast as opposing ends of a single continuum (Gordon, 1964). - An unfavorable context of reception may result in what has been termed acculturative stress. Acculturative stress refers to adverse effects of acculturation such as anxiety, depression, and other forms of mental and physical maladaptation (see Berry, 2006a, and Rudmin, 2009, for reviews).
Thames, A. D., Becker, B. W., Marcotte, T. D., Hines, L. J., Foley, J. M., Ramezani, A., … Hinkin, C. H. (2011). Depression, cognition, and self-appraisal of functional abilities in HIV: an examination of subjective appraisal versus objective performance. *The Clinical*	To examine the effects of depression and cognitive deficits on self-appraisal of functional ability in HIV positive individuals	107 HIV+ adults in LA	-Measures used: BDI-II, PAOFI, Medication Management Task-R, driving history questionnaire, driving simulator - Statistical analyses:	- Self-report measures are susceptible to overestimation biases due to depressed mood - Among HIV+ individuals, the variance in cognitive and functional complaints are largely accounted for by depressive symptoms - Under-reporters of functional deficits performed significantly more poorly across the following domains than those who over-reported or assessed accurately: attention, information processing speed,

Neuropsychologist, *25*(2), 224–243.			ANOVA, partial correlations, cross tabulations, discriminant function analysis	language, learning and memory, executive functioning, and motor functioning. - Over-reporters demonstrated higher levels of depression. - Depression and the cognitive domains of attention, information processing speed, learning and memory, verbal functioning, motor functioning, and executive functioning were found to be significant predictors of whether or not an individual would tend to over-report or under-report
Torres, L., & Rollock, D. (2007). Acculturation and depression among Hispanics: The moderating effect of intercultural competence. *Cultural Diversity and Ethnic Minority Psychology*, *13*(1), 10-17.	To explore the relative contributions of typical acculturation indicators, general coping, and intercultural competence in predicting depression among Hispanic adults.	- 96 adults		- The results indicated that intercultural competence served to moderate the relationship between acculturation and depression. - The combination of high acculturation and high intercultural competence was associated with fewer symptoms. - General coping accounted for significant amounts of variance in predicting depression, over and above traditional acculturation variables alone, suggesting that an active problem-solving style was associated with a healthier outcome. - The findings are discussed within the context of integrating competence-based variables into psychological conceptualizations of cultural adaptation and the importance of group-specific abilities as potential buffers against negative mental health consequences.
Tselis, A. C. (2009). Human immunodeficiency virus: Biology and general overview of seroconversion and early infection. In R. Lisak, D. Truong, W. Carroll, & R. Bhidayasiri (Eds.), *International neurology: A clinical approach* (pp. 342-344). Hoboken, NJ: Wiley-Blackwell.	The objective of this chapter was to introduce and give a brief overview of the early stages of HIV infection.	N/A	Chapter	- 2 groups of HIV: HIV-1 and HIV-2 - HIV-1 most dominant, both in number and severity - HIV has prominent neurological manifestations and is probably the most common cause of viral encephalitis and other brain infections around the world - 3 overall groups of HIV [M (main), O (outlier), & N (non-M and non-O)] - M group consists of 9 subgroups, or clades - Circulating recombinant forms (CRFs): a subtype of HIV the combines components of 2+ viruses of different subtypes to create a hybrid

				- Bulk of research and clinical trials based on clade B, which come from North America and Europe - Enzyme-linked immunosorbent assay (ELISA): based on clade be viruses - Viruses of different clades may respond to treatment differently - CD4+ T lymphocytes and macrophages are most prominently affected by HIV - Acute HIV infection may be entirely asymptomatic, but often is characterized by acute illness, with fever, sore throat, fatigue, weight loss, maculopapular rash, and myalgia. - Acute retroviral syndrome can resemble other acute systemic infectious syphilis, hepatitis A or B, measles, and toxoplasmosis, and may be accompanied by septic meningitis. - HIV classified into several stages depending on viral load, clinical characteristics, and CD4 count. - Acute retroviral syndrome (first few weeks of infection prior to development of HIV-antibodies) - Primary or early HIV infection (first few months following development of anti-HIV bodies) - Clinically latent stage (post primary infection) - Advanced HIV or AIDS as defined by several criteria including low CD$ (below 200 cells/µl), presence of any one of several particular opportunistic infections, and certain HIV-specific syndromes such as HIV dementia, HIV-associated sensory neuropathy, and HIV-associated vacuolar myelopathy.
Valcour, V., & Paul, R. (2006). HIV infection and dementia in older adults. *Clinical infectious diseases : an official publication of the Infectious Diseases Society of America*, *42*(10), 1449–1454.	To provide an overview of HIV cognitive impairment as it relates to aging and presents some emerging issues in the field	N/A	Review Article	- HIV infection in older patients becoming more common as advances in antiretroviral therapies allow HIV+ people to live longer - Development and expression of dementia among HIV+ patients is evolving in HAART era and immune reconstitution. - How long-term HAART interacts with HIV infection and advanced age with regard to cognition is no well understood.

Valcour, V., Paul, R., Chiao, S., Wendelken, L. A., & Miller, B. (2011). Screening for cognitive impairment in Human Immunodeficiency Virus. *HIV/AIDS*, *53*, 836-842.	To describe the clinical presentation of HAND, review existing data related to screening tools, and provide preliminary and practical recommendations in the absence of more definitive studies.	N/A	Review Article	-Prevalence of HAND >50%, and likely even higher among older patients. - Cognitive impairment can impact medication adherence -Symptomatic impairment linked to mortality, emphasizing need for early detection - Currently insufficient data to inform solid recommendations on screening methods - Most HIV-specific tools have poor performance characteristics for all but most severe forms of impairment, which accounts for <5% of cases - Reliance on symptoms is likely to miss a substantial portion of people with HAND due to poor insight, confounding mood disturbances, and lack of well-informed proxies. -In the aging HIV+ population, broader screening tools may be required to allow sensitivity for both HIV and neurodegenerative disorders
Vázquez-Justo, E., Rodríguez Alvarez, M., & Ferraces Otero, M. J. (2003). Influence of depressed mood on neuropsychologic performance in HIV-seropositive drug users. *Psychiatry and clinical neurosciences*, *57*(3), 251–258.	To study whether neuropsychological performance across multiple domains is affected by the presence of depressive symptoms in group of HIV+ drug users.	*N* = 127 male subjects into 4 groups (HIV+ w/depression, HIV+ w/o depression, HIV- with depression, HIV- w/o depression)	-BDI used to measure depressive sx	- The findings on the impact of depressive symptoms on NP functioning have been inconsistent thus far; some studies have found a relationship between depressive symptoms and poorer np performance while others have not. Possible explanations for this inconsistency have been proposed in the literature to be due to the measures themselves and the stage of infection at time of evaluation. - The author's propose that the variability of the existent data on the neuropsychological disturbances found within this population suggests that there is another factor that may be increasing the neuropsychological vulnerability of individuals with HIV. - The results of this study showed that HIV+ individuals who endorsed depressive symptoms performed more poorly on measurs of attention, verbal and visual memory, visual-constructive abilities, manual skills and motor speed, motor-perceptive speed, and frontal functions; however, the authors pointed out that other studies using the same instruments had not found an effect of mood on NP performance.

				- The authors found no effect of mood on NP in HIV- individuals, suggesting that depression alone is not sufficient to produce NP disturbance, and that it is likely a combination of factors found in HIV+ individuals that is responsible for NP impairment in this population.
Wilkie, F. L., Goodkin, K., Ardila, A., Concha, M., Lee, D., Lecusay, R., ... O'Mellan, S. (2004). HUMANS: An English and Spanish neuropsychological test battery for assessing HIV-1-infected individuals—initial report. *Applied Neuropsychology*, *11*(3), 121-133.	-To present a rationale for test selection in HUMANS battery -To present rationale for translation and adaptation of these tests in Spanish	N/A	Instrument development and validation study	- HUMANS measures 7 cognitive domains: attention, verbal and visual memory, information processing speed, abstraction and executive functioning, language, visuospatial and visuo-constructive, and motor. - Deficits in processing speed, attention, verbal and visual memory, visuouspatial and visuoconstructive abilities, abstraction and executive functions and motor skills present as the disease progresses. Contrarily, most language skills remain intact, with the exception of diminished verbal fluency. (See page 3 for references that support these statements) - Meta-analysis by Reger et al. (2002) found that when cognitive processes were examined as a function of disease progression, the greatest declines were observed in motor functioning, executive and problem-solving skills, and information processing speed. - Despite the growing number of Spanish speaking individuals infected with HIV, there remains a dearth of research about cognitive impairment in primarily Spanish-speaking, HIV+ individuals. - Clemente-Millana and Portellano (2000) emphasize a need for improving the sensitivity and specificity of NP measurements used to detect cognitive impairment in Spanish-speaking HIV+ individuals. - Norms for the HUMANS were in the process of being developed when this article is presented. - The majority of the tests in the HUMANS battery are widely used NP tests
Wohl, A. R., Tejero, J., & Frye, D. M. (2009). Factors associated with late HIV testing	To explore factors related associated	Adult Latinos 18 years of age and older diagnosed	A population-based interview study was	- Latinos are more likely to test late for HIV infection compared to other racial/ethnic groups in the United States.

for Latinos diagnosed with AIDS in Los Angeles. *AIDS care*, *21*(9), 1203-1210.	with late detection of HIV among Latinos in LA	with AIDS, who were reported to the LAC HIV/ AIDS Reporting System (HARS)	used to examine factors associated with late HIV testing for Latinos diagnosed with AIDS in Los Angeles County (LAC) to develop more effective HIV testing outreach strategies.	- Latinos testing for HIV within one year of an AIDS diagnosis were considered as late testers, while those diagnosed with AIDS more than one year after an HIV diagnosis were defined as non-late testers. -After adjusting for age, education, country of birth, and injection drug use in a logistic regression analysis, completion of the interview in Spanish was the main factor associated with late testing (adjusted Odds Ratio (AOR) = 2.9, 95% Confidence Intervals (CIs): 1.4, 6.0). - Latinos testing late for HIV more likely to test due to illness (p<0.0001) and less likely to test as part of a clinical screening (p<0.0001). - Late testers were more likely to receive their first positive HIV test as a hospital inpatient (p<0.0001) and less likely to test positive at a community health center or public clinic (p = 0.05). - To accomplish widespread and timely HIV testing for Latinos in LAC, Spanish-language social marketing campaigns are needed and Spanish-speaking patients should be offered HIV testing in all clinical settings.
Woods, S. P., Moore, D. J., Weber, E., & Grant, I. (2009). Cognitive neuropsychology of HIV-associated neurocognitive disorders. *Neuropsychology Review*, *19*(2), 152–168.	To critically evaluate extant literature on HAND, particularly in the realm of cognitive	N/A	Literature Review	- HIV-associated cognitive impairments have been noted in the following domains: attention/working memory, information processing, learning and memory, and executive function.
Wu, A. W., Revicki, D. A., Jacobson, D., & Malitz, F. E. (1997). Evidence for reliability, validity and usefulness of the Medical Outcomes Study HIV Health Survey (MOS-HIV). *Quality of Life Research*, *6*(6), 481–493.	Authors reviewed the evidence for the reliability, validity, and usefulness of the MOS-HIV as a measure of patient-experienced outcomes in		Instrument Validation Study	- MOS-HIV final questionnaire consists of 35 questions which assess 10 dimensions of health (page 482) - Data from numerous studies support internal consistency reliability - Convergent and discriminant construct validity of the scales were supported, suggesting the scales measure distinct aspects of health across different stages of illness. - Scales were found to be responsive

	HIV.			to clinically important changes - Scales were found to have adequate internal consistency for women; however, scores did appear to be lower than previously found for male patients. - Adequate psychometric performance in women, patients with lower SES, and African-American patients (485) - When the measure was administered via interview rather than self-report, proxy respondents tended to view the patients as having poorer well-being than did the patients themselves - MOS-HIV = gold standard against which to base hypotheses testing for the development of newer instruments.

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infection. *AIDS*, *7*(4), 519–524. Retrieved from www.ncbi.nlm.nih.gov/pubmed/8507418

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APPENDIX B

IRB Approval Letter

PEPPERDINE UNIVERSITY

Graduate & Professional Schools Institutional Review Board

August 21, 2015

Ahoo Karimian

Protocol #: P0715D03
Project Title: Self-Perceived Cognitive Decline, Depressive Symptoms, and Neuropsychological Functioning among HIV+ Spanish Speakers

Dear Ms. Karimian:

Thank you for submitting your application, *Self-Perceived Cognitive Decline, Depressive Symptoms, and Neuropsychological Functioning among HIV+ Spanish Speakers*, for exempt review to Pepperdine University's Graduate and Professional Schools Institutional Review Board (GPS IRB). The IRB appreciates the work you and your faculty advisor, Dr. Mitchell, have done on the proposal. The IRB has reviewed your submitted IRB application and all ancillary materials. Upon review, the IRB has determined that the above entitled project meets the requirements for exemption under the federal regulations (45 CFR 46 - http://www.hhs.gov/ohrp/humansubjects/guidance/45cfr46.html) that govern the protections of human subjects. Specifically, section 45 CFR 46.101(b)(2) states:

> (b) Unless otherwise required by Department or Agency heads, research activities in which the only involvement of human subjects will be in one or more of the following categories are exempt from this policy:
>
> **Category (2) of 45 CFR 46.101**, research involving the use of educational tests (cognitive, diagnostic, aptitude, achievement), survey procedures, interview procedures or observation of public behavior, unless: a) Information obtained is recorded in such a manner that human subjects can be identified, directly or through identifiers linked to the subjects; and b) any disclosure of the human subjects' responses outside the research could reasonably place the subjects at risk of criminal or civil liability or be damaging to the subjects' financial standing, employability, or reputation.

Your research must be conducted according to the proposal that was submitted to the IRB. If changes to the approved protocol occur, a revised protocol must be reviewed and approved by the IRB before implementation. For any proposed changes in your research protocol, please submit a **Request for Modification Form** to the GPS IRB. Because your study falls under exemption, there is no requirement for continuing IRB review of your project. Please be aware that changes to your protocol may prevent the research from qualifying for exemption from 45 CFR 46.101 and require submission of a new IRB application or other materials to the GPS IRB.

A goal of the IRB is to prevent negative occurrences during any research study. However, despite our best intent, unforeseen circumstances or events may arise during the research. If an unexpected situation or adverse event happens during your investigation, please notify the GPS IRB as soon as possible. We will ask for a complete explanation of the event and your response. Other actions also may be required depending on the nature of the event. Details regarding the timeframe in which adverse events must be reported to the GPS IRB and the appropriate form to be used to report this information can be found in the *Pepperdine University Protection of Human Participants in Research: Policies and Procedures Manual* (see link to "policy material" at http://www.pepperdine.edu/irb/graduate/).

Please refer to the protocol number denoted above in all further communication or correspondence related to this approval. Should you have additional questions, please contact Kevin Collins, Manager of the

Institutional Review Board (IRB) at gpsirb@peppderdine.edu. On behalf of the GPS IRB, I wish you success in this scholarly pursuit.

Sincerely,

Thema Bryant-Davis, Ph.D.
Chair, Graduate and Professional Schools IRB

cc: Dr. Lee Kats, Vice Provost for Research and Strategic Initiatives
Mr. Brett Leach, Regulatory Affairs Specialist
Dr. Cary Mitchell, Faculty Advisor

APPENDIX C

List of Neuropsychology Measures Used to Determine HAND Status

List of Neuropsychology Measures Used to Determine HAND Status

Domain Assessed	**Assessment Measure**
Premorbid Intellectual Functioning	WAIS-III Vocabulary Test
Attention/Concentration	WAIS-III Digit Span, Spatial Span; Continuous Performance Test II (CPT-II)
Information Processing Speed	WAIS-III Symbol Search, Digit Symbol; CPT-II
Language	Boston Naming Test; Controlled Oral Word Association Test (COWAT, PMR); Category Fluency (Animals)
Visuospatial Functioning	WAIS-III Block Design, Matrices
Executive Functioning	Color Trails 2; Wisconsin Card Sorting Test (WCST); Stroop Test (Golden Version)
Motor Functioning	Grooved Pegboard; Finger Tapping; Timed Gait
Memory	Rey Auditory Verbal Learning Test (RAVLT); WMS-IV Logical Memory I & II, Visual Reproduction; Picture Memory Interference Test-3