The Neuropsychological Assessment of Ethnically Diverse Patients: Theoretical and Practical Concepts

Patricia Garcia, Psy.D. HSPP
Assistant Professor of Clinical Neurology
Assistant Professor of Clinical Physical Medicine and Rehabilitation

February 28th, 2025

SCHOOL OF MEDICINE

INDIANA UNIVERSITY

Conflict of Interest/Disclosure

No conflicts of interest to disclose

Conflict of Interest/Disclosure

Although, my daughter Elena……

Outline

Learning Objectives:

1. Gain familiarity with the concept and theories of bilingualism

2. Learn how acculturation and bilingual factors affect neuropsychological performance

3. Gain an understanding of the challenges associated with the evaluation of the multicultural/bilingual adult patient

4. Expand clinical strategies for achieving a culturally competent assessment

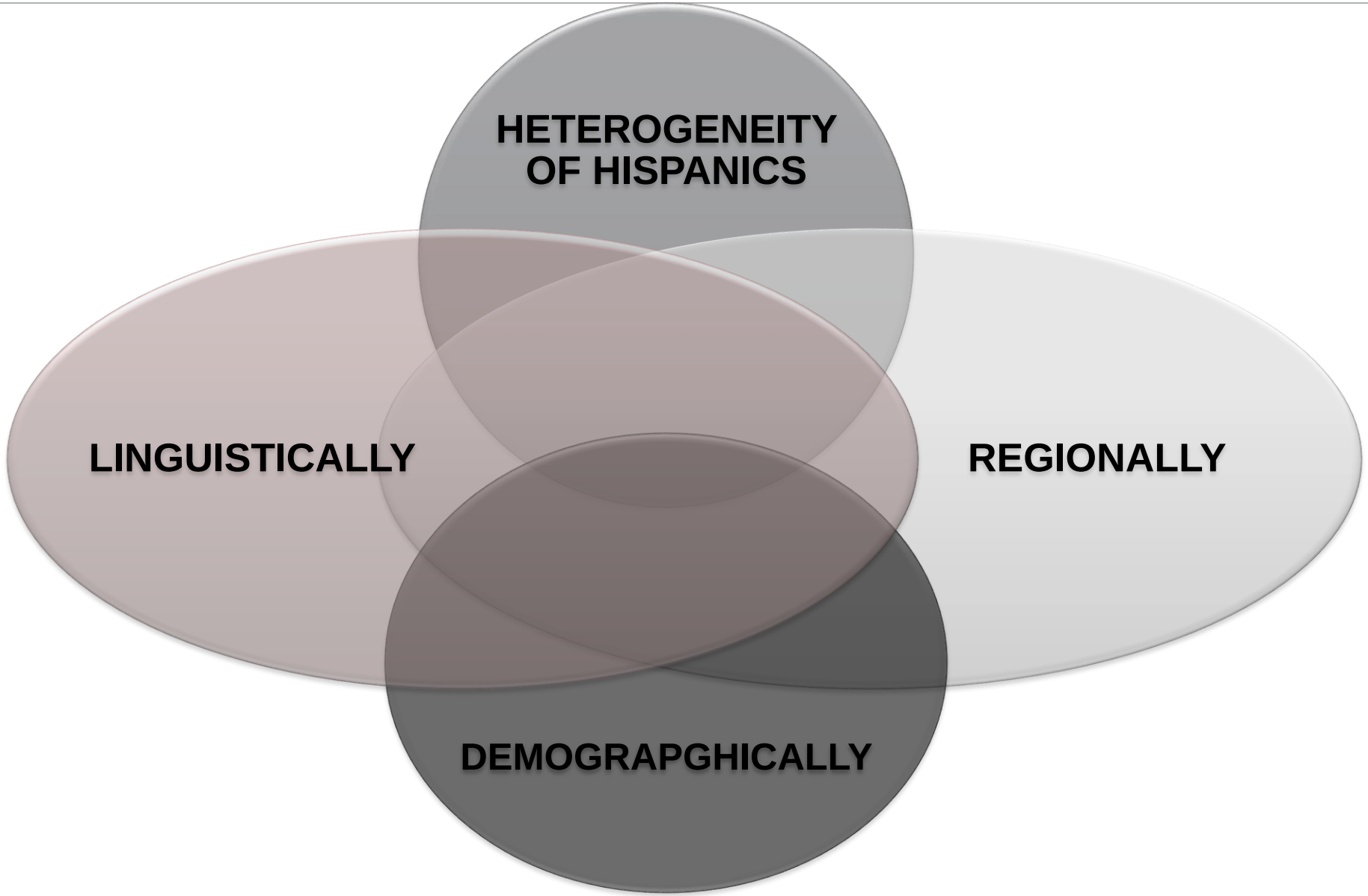
A growing population

- Cultural understanding and competence is increasingly emerging in various fields due to fast changing demographics
- The United States is the 1st, non-Hispanic country with the largest Spanish-speaking population (19% linguistic minority)
- The Hispanic/Latino population, which includes people of any race, was 62.1 million in 2020

Terminology

- *Hispanic* refers to a person with ancestry from a country whose primary language is Spanish.
- *Latino* and its variations refer to a person with origins from anywhere in Latin America (Mexico, South and Central America) and the Caribbean.
- The term "*Latinx*" offers a gender-neutral version of the term that does not end in "o" or "a."

Focus on Hispanics; Spanish-speaking


HETEROGENEITY OF HISPANICS
LINGUISTICALLY
REGIONALLY
DEMOGRAPGHICALLY

Linguistic realities

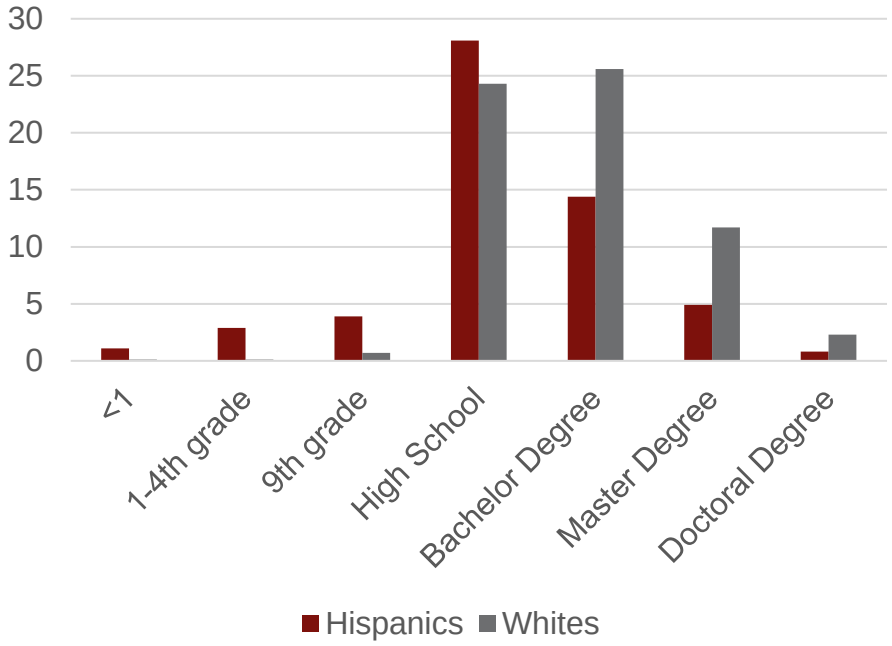
- Various degrees of language proficiency
- 22% US population that speaks another language at home
- 71% of Hispanics report they speak another language other than English
- 28.4% report not being fluent in English
- 30.6 million are bilinguals (English/Spanish)
- % of immigrants declined to 33%

<u>Demographics</u>
31% foreign born
79% US citizens

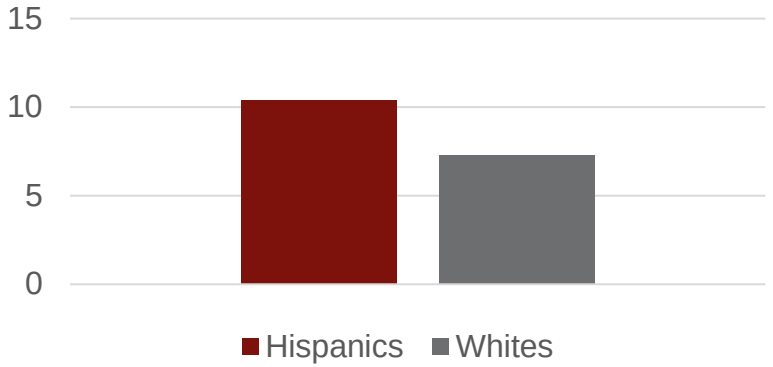
Healthcare Disparities among Hispanics

- Cardiovascular disease, uncontrolled hypertension, diabetes, unintentional injuries, AD, obesity, HIV, and cancer
- At risk for increased neurological (TBI and stroke) and psychiatric conditions, including suicide
- Rehabilitation outcome research not in favor of Hispanics
- Factors implicated in health outcomes for Hispanics:
  - 20% without health insurance (highest minority group)
  - Language and cultural barriers
  - Limited access to preventive care

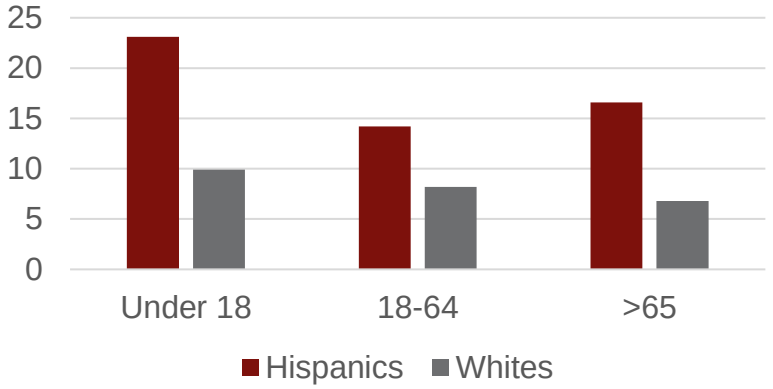
Education Level



Unemployment Rates



Population Below the Poverty Level



What is culture?

- Defined as the belief systems and value orientations that influence customs, norms, practices, and social institutions, including psychological processes (a way of life)
- Communicated from one generation to the next through learning (Enculturation); has explicit and implicit components
- Culture dictates behavior, and what is not relevant in a situation

Cultural Characteristics: Patient Presentation

Culture influences:

- Presentation of symptoms
- Rapport and communication
- Willingness to disclose information
- Perception of illness and disability
- Treatment adherence
- Expectation for recovery
- Health literacy

Evaluations in Spanish typically take longer because:

- More time is usually spent building rapport with patients and families
- *Personalismo (*distaste for impersonal interactions)
- Cultural values (best vs fastest performance)
- Opportunity to communicate concerns to a provider that understands them

Review of the Science

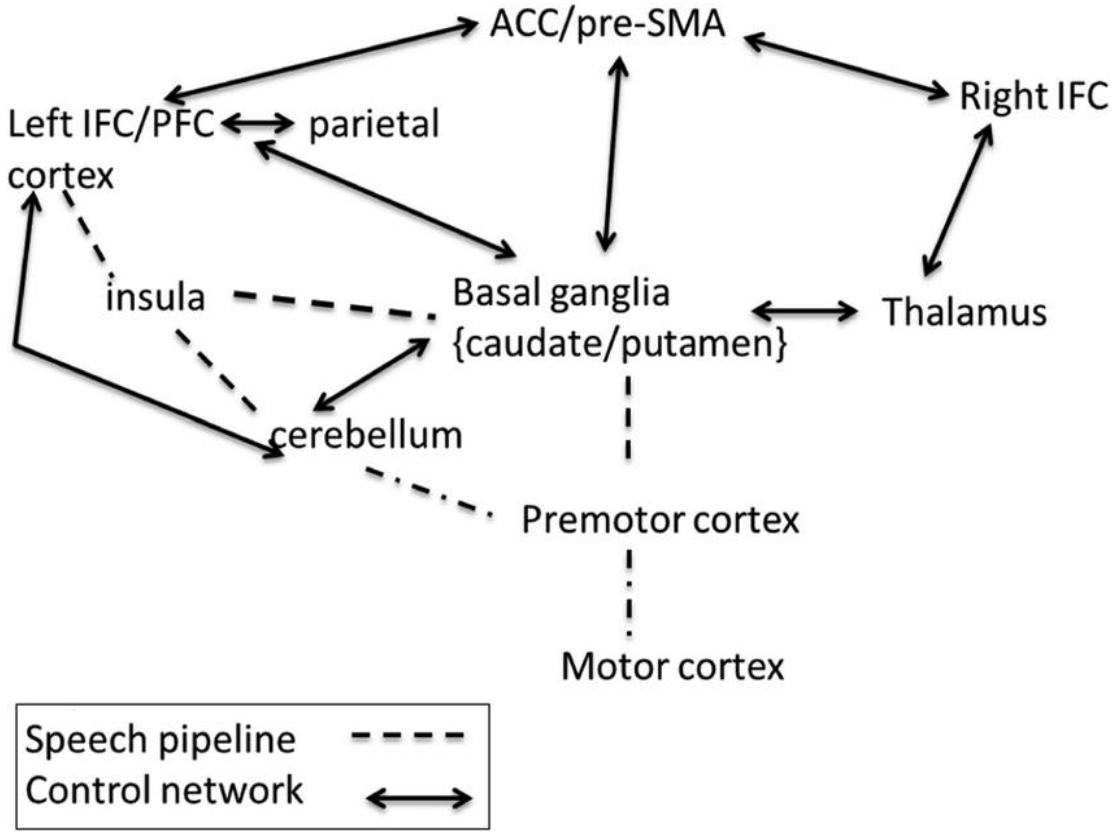
The Bilingual Brain: Theories of Bilingualism

- **Inhibitory Control Model:** Competing potential outputs of the lexico-semantic system are inhibited depending on the goals of the speaker
- Inhibition of words in the unintended language by focusing on words in the intended language

Neuroanatomical Correlates:

- Prefrontal cortex
  - Cognitive control
  - Response selection and inhibition
- Anterior cingulate gyrus
  - Manages language during switching/interpretation
- Basal ganglia
  - Language planning/word selection
- Inferior parietal lobe
  - Stored lexical representation of terms/words in each language

The Bilingual Brain: Theories of Bilingualism Cont.



Adaptive Control Hypothesis:

- Identifying the demand on control processes
- Individuals increase cognitive control to achieve a desired goal

Adaptive Control Hypothesis

- High-proficient early successive bilinguals performed several linguistic tasks in only their first language
- Higher activity- left-hemisphere language-related brain areas (dorsal precentral gyrus, pars triangularis, pars opercularis, superior temporal gyrus and planum temporale)
- Monolinguals showed increases in activity in the same brain areas-only when the language processing demands in tasks were increased
- Increased processing demands for bilinguals-additional need to control the two languages, the requirement to resolve lexical competition, and/or the reduced frequency of articulatory rehearsal

Parker Jones et al (2012)

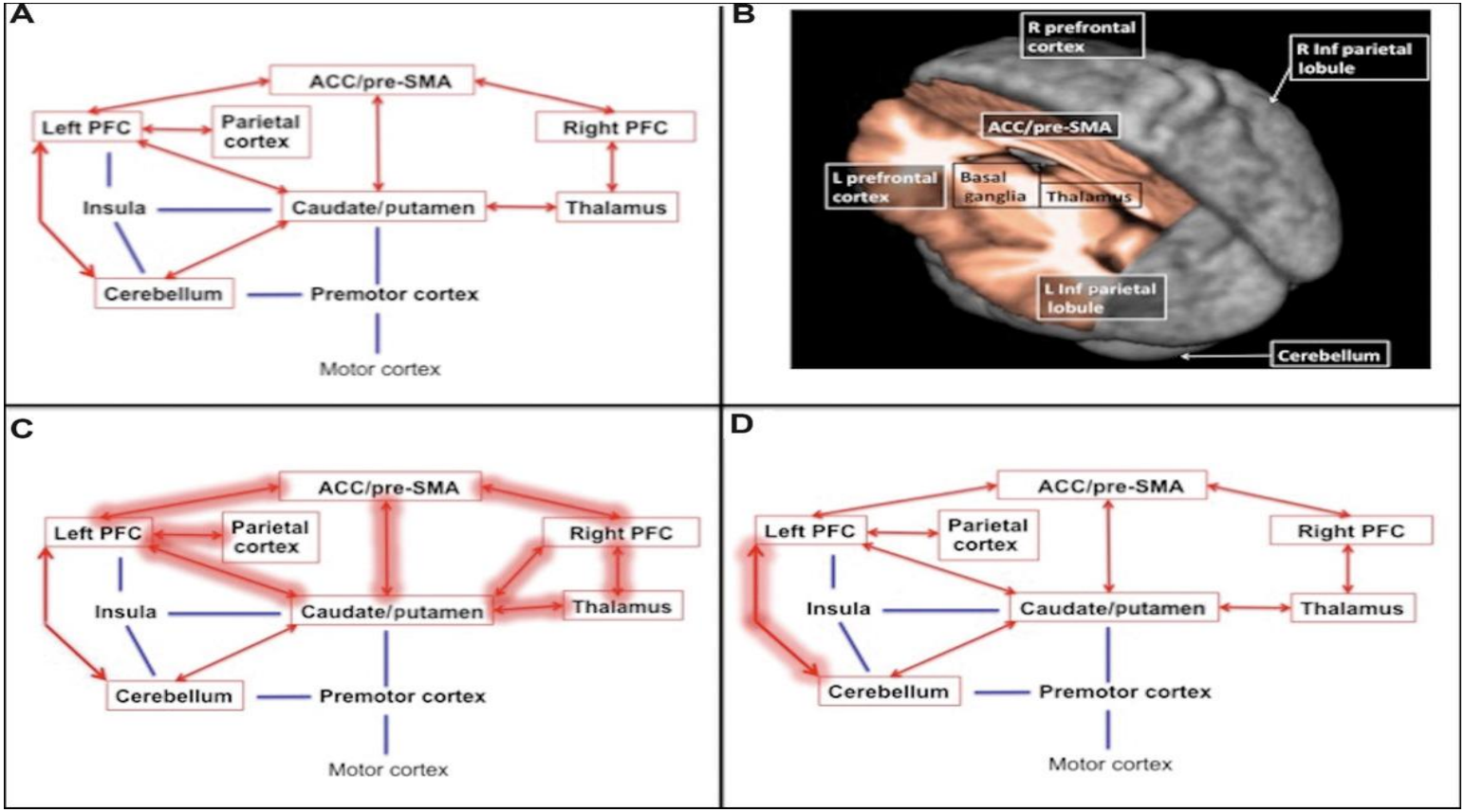
The Bilingual Brain: Theories of Bilingualism Cont.

- **Weaker Link Hypothesis:**
  - Bilingual individuals can only use one language at a time
  - Weaker connections between words and slower retrieval of less common words relative to monolinguals

Proposes a bilingual disadvantage because of the reduced frequency of use between two or more languages

The Bilingual Brain: Theories of Bilingualism

Neural basis of bilingualism



The Bilingual Brain: Theories of Bilingualism Cont.

- Two mechanisms identified as fundamental that explain most differences between monolinguals and bilinguals are 1) competition/interference of languages and 2) frequency of use (lexical accessibility)
- Earlier research tried to determine the extent bilinguals can "turn on and off" and function as monolinguals
- Both languages are always active, which introduces a need for control activation of the non-desired language
- Language control is more prominent in the nondominant/second acquired language

Bilingual Brain: Functional Neuroimaging

- Growing evidence to suggest the L2 (nondominant) is primarily stored in the same neural network as L1 (dominant)
- Language switching associated with greater activation of the DLPFC
- Cortical and sub-cortical structures have a dynamic interplay in resolving lexical competition through inhibitory control

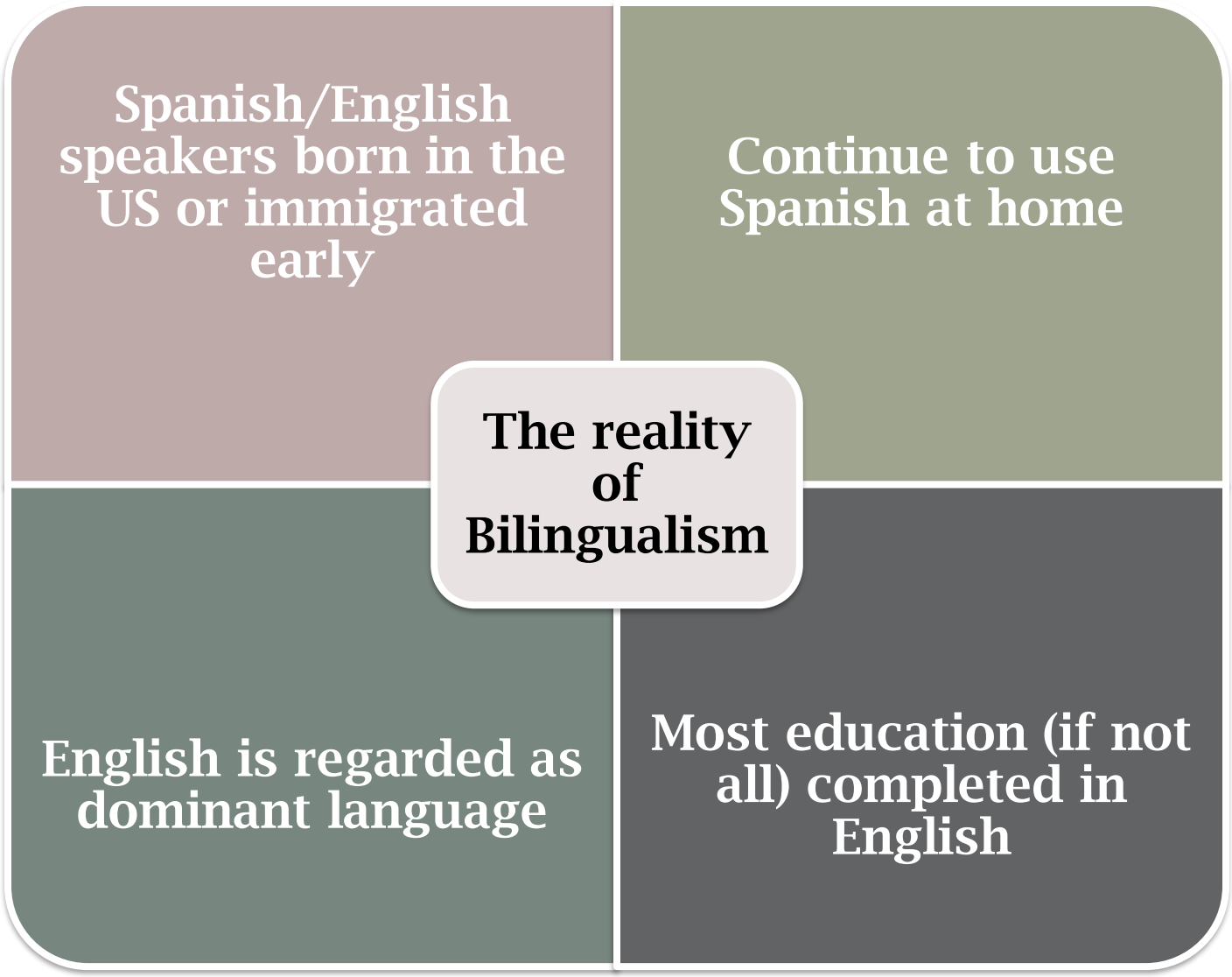
Bilingual Brain: Functional Neuroimaging Cont.

Network proposed by Abutalebi and Green (2007):

- Connects between prefrontal cortex, anterior cingulate cortex, inferior parietal region, and basal ganglia (implicated in language production for bilinguals)

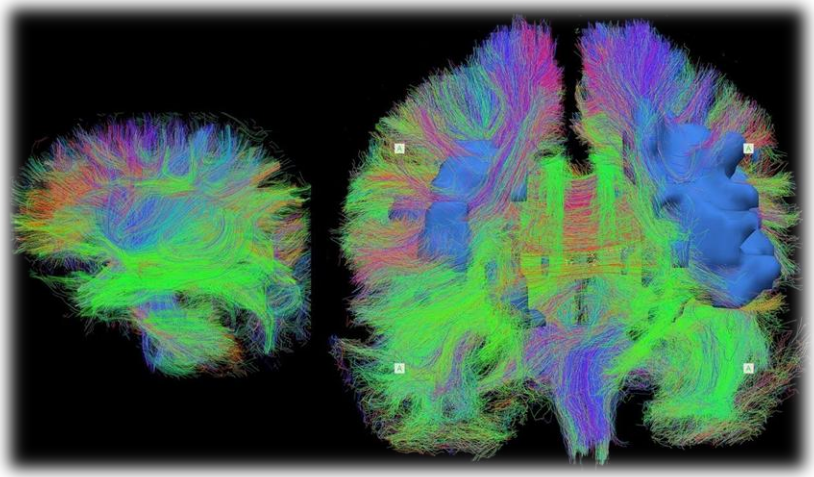
- Bilinguals are resolving ***verbal conflict*** (inhibiting one language, choosing the appropriate language) with activation in areas (DLPFC and cingulate cortex) that monolinguals use to resolve ***non-verbal conflict***

- Fast reaction time usually attributed to DLPFC in monolinguals activates Broca's area in the bilingual brain


Spanish/English speakers born in the US or immigrated early
Continue to use Spanish at home
The reality of Bilingualism
English is regarded as dominant language
Most education (if not all) completed in English

Demographic/Cultural Variables Known to Impact NP Performance

- Age
- Gender
- Years of education
- Bilingualism
- Acculturation
- Literacy



Bilingualism: Cognitive Profiles

- **Advantages (Language):**
  - Dual language activation leads to facilitation effects in comprehension tasks rather than language interference (Lemhofer et al. 2008)
- **Disadvantages (Language):**
  - Lexical retrieval (Bialystok et al 2008)

Bilingualism: Cognitive Profiles Cont.

Advantages (Executive functions):

- More opportunity to practice inhibitory control for improved attention (Green 1998)
- Earlier development of EF skills in children as young at three (Diamond et al. 2005)
- Faster and more efficient responses on the Attentional Network Task (Fan et al 2002)
- More efficient executive control network (Costa et al 2008)
- Greater benefit in selective attention

Bilingualism and Cognitive Profiles Cont.

- No clear evidence to suggest memory and learning are enhanced in the bilingual brain, although a disadvantage in verbal recall may be noted in bilingual adults

- One could argue working memory could improve since it is partially considered a function of executive control

Cognitive Effects from Bilingualism in Young and Older Adults

- Less recognition of difficult vocabulary words in comprehension-based measures
- Greater tip of the tongue (TOT) retrieval failures (Gollan and Brown 2006)
- Name pictures more slowly
- Name fewer pictures correctly on standardized naming tests (Roberts et al. 2002)
- Greater disadvantage on verbal fluency tasks (Rosselli et al 2000)
- Experience more interference in lexical decision (Ransdell and Fischler 1987)

Acculturation

Important to know the patient's cultural identity, as this highly correlates with language use and fluency

"Merging of cultures as a result of prolonged contact"

"Process of learning and incorporating the values, beliefs, language, customs, and mannerisms of the new country"

"Acculturation occurs when the minority culture changes but is still able to retain unique cultural markers of language, food, and customs"

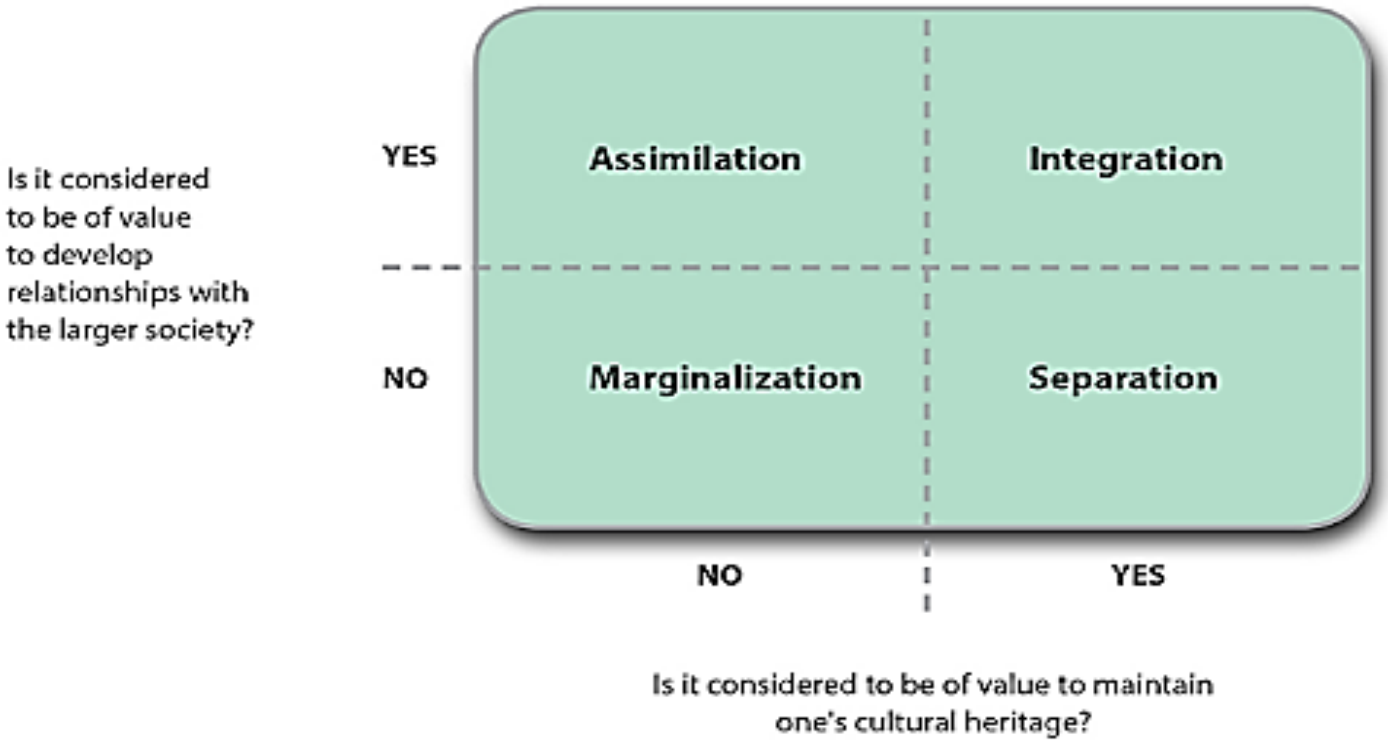
Acculturation Cont.

Hispanic studies have demonstrated the influence of acculturation and/or cultural variables on:

1. The utilization of health services (Wells, et al., 1989)
2. Neuropsychological test performance (Mendoza et al. 2020; Ardila, 2005; Arnold, 1994)
3. Medical and psychological treatment effectiveness. (Rogler, et al., 1997)

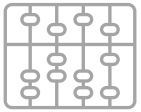
Acculturation Cont.

Berry's **Acculturation Model**



Challenges: Neurocognitive Evaluation

Existing Drawbacks in the Neuropsychological Assessment



TEST-SPECIFIC

CLINICIAN-SPECIFIC

PATIENT-SPECIFIC

Clinician Barriers

Professional

- Lack of culturally tailored services and culturally competent professionals
- Shortage of bilingual and cross culturally trained neuropsychologists
- Comfort level when working with ethnic populations
- Lack of formal training

Instrument Shortcomings

- The cognitive abilities assessed by most neuropsychological tests are highly trained and not inborn universal skills.

- Most neuropsychological tests employ procedures and materials to assess cognitive abilities that are common in school and therefore people with more experience at school are likely to do better (Gasquoine, 1999).

Psychometric Shortcomings

- Consider factors such as *test equivalence*
- *Diagnostic validity*

- Cognitive abilities assessed are highly trained and not inborn universal skills.
- Procedures and materials common in school and therefore people with more experience at school are likely to do better (Gasquoine, 1999).

The Issue of Translation and Use of Interpreters Cont.

- Many tools have been translated into Spanish versions
  - Important psychometric concerns with this practice (reliability, test validity)

***Not all tests are "translatable"**

The Issue of Translation and Use of Interpreters Cont.

Translator: Translates written language
Interpreter: Translates spoken language
Separate skills and profession (some do both)

Findings from Echemendia and Harris (2004)

- *11% of neuropsychologists in the US reported Spanish proficiency in the "adequate" to "fluent" range.*
- *>50% use Spanish interpreter/translators with monolingual Spanish speakers*
- *80% use interpreters with no formal neuropsychological training*

Patient Barriers

Nature of brain injuries

- Fluctuating performance
- Potential for denial/lack of self-awareness
- Need for test adaptation based on communication deficits
- Motor and sensory changes

Assessment Challenges: Cultural characteristics

- There are different degrees of acculturation, which may have an effect on test performance
- Regional variations in vocabulary and pronunciation
- Different names for everyday objects, making language knowledge largely based on experience and context
- Concept of time/speed and Understanding of “best performance”

Moving Forward: Culturally adaptive evaluations

Neuropsychological Assessment with a Cultural Lens

NAVIGATING NEUROPSYCHOLOGY

During the Initial **Clinical Interview**:

- Include family members/caregivers
- Review history related to educational attainment, prior exposure to testing, and languages spoken at home
- Consider conducting the interview in both languages

Neurocognitive Evaluation of Bilinguals

- American Psychological Association, Ethical Principles of Psychologists and Code of Conduct, provides little to no specific guidelines for working with bilinguals

- ***First step*** is to determine the patient's degree of language fluency/proficiency

Neurocognitive Evaluation of Adult Bilinguals

- Proficiency may differ depending on the skill assessed (reading, writing, speaking, listening)
- Judgment of the patient's interpersonal fluency
- Option of administering questionnaires regarding linguistic preferences, language frequency of use
- Measures of acculturation
- Bilingual Dominance Scale
- Bidimensional Acculturation Scale

Neurocognitive Evaluation of Adult Bilinguals Cont.

- Objective measurement: Assessment of
  - Fluency in both languages (FAS vs PMR)
  - Naming (BNT vs Ponton Satz)

- Additional areas may include
  - Oral and reading comprehension (WJ Oral Language subtests)
  - Word knowledge (WAIS-IV subtests)

Neuropsychological Evaluation of Bilinguals Cont.

- Evaluate academic achievement in both languages
- When doing this in Spanish, consider using Woodcock-Munoz language surveys, Woodcock Language Proficiency Batteries, or the Word Accentuation Test

- **English-dominant bilingual**: Testing can be completed in English by an English-speaking clinician
- Interpretation of test scores will still need to highlight that bilinguals are at a disadvantage
- **Spanish-dominant bilingual**: Testing should be completed in target/native language
- Consider using test batteries normed in Hispanic subgroups (Bateria III Woodcock Munoz, NEUROPSI, BNE, NeSBHIS, SENAS)
- **Balanced bilingual**: Examination of US acculturation level can be useful
- Best to have bilingual clinicians evaluate bilingual patients, as this client may attain best performance when allowed to use both languages

Test Interpretation and Norm Selection

Test selection:

- Attempts should be made to identify the most appropriate test versions available
- Document assumptions in using tests and norms and identify limitations in the interpretation of test results (American Psychological Association, 1993; Ethical Standard 9.02, American Psychological Association, 2002).

Norm Selection

Clinical recommendation:

- ↑**degree of acculturation, +bilingualism** (both English and Spanish)-US based norms *with limitations
- ↓**degree of acculturation, -bilingualism** (monolingual Spanish)-Latin America and Spain based norms*with limitations

Test interpretation:

- Cognitive evaluations may require a non-standard approach with bilingual and Spanish speaking populations, including testing limits, allowing for two languages in the assessment, and completing US vs Latin America normative comparisons

- Any limitation to test interpretation needs to be discussed (use of interpreters during the session, acknowledgement of language limitations)

Bilingual patient

"Acculturation level and degree of English proficiency was obtained through specific questions through the interview guided by formal instruments. This was done to better determine the preferred testing language for guaranteeing optimal performance. The clinical interview was conducted by a bilingual licensed clinical neuropsychologist in both English and Spanish languages. The testing battery was administered primarily in Spanish, with some English tests added to compare performance in both languages. The battery was also tailored to include tests that have normative data for Spanish speaking individuals, with some limitations (e.g. very small sample sizes, not all norms are based on individuals born in Mexico, few norms available accounting for limited education). While every attempt was made to reduce the impact of language and culture on the results of testing, most tests have inherent bias towards English/mainstream culture, highlighting cultural relevance from test items as another possible limitation. Test results should be reviewed with the aforementioned considerations in mind."

Monolingual Spanish-speaking patient

"……..Based on the history provided, first and primary language is Spanish. However, X obtained very limited formal education in Spanish and no formal education in English. He minimally knows to read and write the alphabet in Spanish. Regarding English exposure, X reported to understand words, phrases, and conversational speech in English, but fluency in his verbal responses is very limited in English. Fluency in Spanish is intact . Acculturation wise, X does not adhere to the mainstream culture in the US, instead continuing to interact and engage in activities in his primary language and consistent with his ethnic background. Thus, the clinical interview was conducted by a bilingual licensed clinical neuropsychologist in Spanish. The testing battery was administered also in Spanish. It was tailored to include tests that have normative data for Spanish speaking individuals, with some limitations (e.g. very small sample sizes, not all norms are based on individuals born in Mexico, very few norms available for limited education). Tests were also adapted appropriately to account for low educational history……..The test results should be reviewed with the aforementioned considerations in mind."

Neuropsychological Assessment with a Cultural Lens Cont.

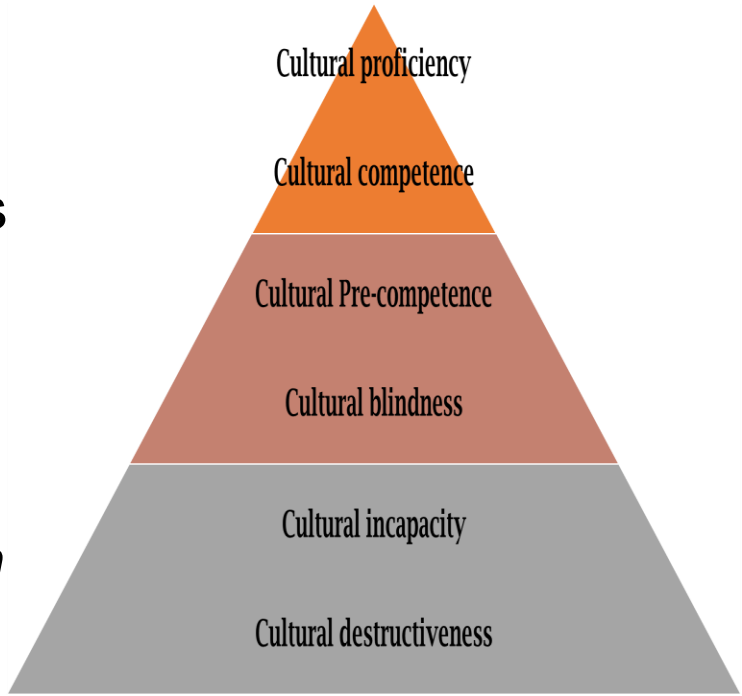
During **Feedback Session:**

- Communicate results taking into consideration patient's and family's education level
- Avoid jargon or technical terms when describing results
- Bring practicality into the session; how do scores translate to daily function?
- Recommendations tailored to the patient's cultural system and realistic access to resources

Enhancing Culturally Competent Assessment and Interventions

*It starts with a **self-assessment:***

- Recognize a possible cultural and language barrier between you and your patient
- Consider your current place in the competency development model
- Awareness of one's linguistic limitations
  - *Do I understand it?*
  - *Can I read and write it?*
  - *Have I received formal training/education?*
  - *Will I be able to distinguish between dialects?*



Enhancing Culturally Competent Assessment and Interventions Cont.

- Recognize training barriers or gaps:
  - *Have I received prior training in the cognitive evaluation of the bilingual patient?*
  - *Have I received adequate supervision on these cases?*
  - *Has my training curriculum encouraged cultural competence trainings?*

This training can involve formal coursework and clinical training, continuing education, consultations with colleagues, and/or independent reading in cross-cultural psychology, cross-cultural medicine, and cross-cultural testing.

Enhancing Culturally Competent Assessment and Interventions Cont.

Developing cultural competence:

- Cultural background
  - Am I familiar with the patient's cultural and ethnic background?
  - Am I aware of any barriers for accessing healthcare services by this ethnic group?
    - Familiarity with language development in Hispanic and bilingual patients
  - Am I familiar with bilingual lang. development?
  - Can I proficiently administer tests in Spanish?
  - Are there cultural nuances that should be considered when interpreting cognitive data?

Essential steps when evaluating Hispanic populations

1. Determining language proficiency and level of acculturation

2. Knowing when to utilize interpreters and translators

3. Properly select and evaluate appropriate tests

4. Document appropriately

5. Provide useful and understandable feedback to Hispanics and their caregivers

Final Thoughts

- The cognitive assessment of the ethnically diverse patient has its challenges, but research has identified important avenues for change and further exploration

- A culturally competent assessment involves many elements ranging from clinician's self-awareness, taking active steps to complete additional training and education, and an ethical obligation to do what's right for the patient

References

Abutalebi, J., & Green, D. (2007). Bilingual language production: The neurocognition of language representation and control. *Journal of neurolinguistics*, *20*(3), 242-275.

Aera, A. P. A. (1999). Standards for educational and psychological testing. *New York: American Educational Research Association*.

Ardila, A. (2005). Cultural values underlying psychometric cognitive testing. *Neuropsychology review*, *15*(4), 185-195.

Arnold, B. R., Montgomery, G. T., Castañeda, I., & Longoria, R. (1994). Acculturation and performance of Hispanics on selected Halstead-Reitan neuropsychological tests. *Assessment*, *1*(3), 239-248.

Bialystok, E., Craik, F., & Luk, G. (2008). Cognitive control and lexical access in younger and older bilinguals. *Journal of Experimental Psychology: Learning, memory, and cognition*, *34*(4), 859.

Bialystok, E., Craik, F. I., & Freedman, M. (2007). Bilingualism as a protection against the onset of symptoms of dementia. *Neuropsychologia*, *45*(2), 459-464.

Bialystok, E., Craik, F. I., & Luk, G. (2012). Bilingualism: consequences for mind and brain. *Trends in cognitive sciences*, *16*(4), 240-250.

Campinha-Bacote, J. (2002). The process of cultural competence in the delivery of healthcare services: A model of care. *Journal of transcultural nursing*, *13*(3), 181-184.

Carlson, S. M., & Meltzoff, A. N. (2008). Bilingual experience and executive functioning in young children. *Developmental science*, *11*(2), 282-298.

Collier, V. P. (1995). Acquiring a second language for school. *Directions in language and education*, *1*(4), n4.

Corson, D. (2000). *Language diversity and education*. Routledge.

Costa, A., Hernández, M., Costa-Faidella, J., & Sebastián-Gallés, N. (2009). On the bilingual advantage in conflict processing: Now you see it, now you don't. *Cognition*, *113*(2), 135-149.

Cross, T. L. (1989). Towards a culturally competent system of care: A monograph on effective services for minority children who are severely emotionally disturbed.

Diamond, A., Carlson, S. M., & Beck, D. M. (2005). Preschool children's performance in task switching on the dimensional change card sort task: Separating the dimensions aids the ability to switch. *Developmental neuropsychology*, *28*(2), 689-729.

Echemendia, R. J., & Harris, J. G. (2004). Neuropsychological test use with Hispanic/Latino populations in the United. *Book Reviews*, *484*.

Fan, J., McCandliss, B. D., Sommer, T., Raz, A., & Posner, M. I. (2002). Testing the efficiency and independence of attentional networks. *Journal of cognitive neuroscience*, *14*(3), 340-347.

Gasquoine, P. G. (1999). Variables moderating cultural and ethnic differences in neuropsychological assessment: The case of Hispanic Americans. *The Clinical Neuropsychologist*, *13*(3), 376-383.

Gollan, T. H., & Brown, A. S. (2006). From tip-of-the-tongue (TOT) data to theoretical implications in two steps: when more TOTs means better retrieval. *Journal of Experimental Psychology: General*, *135*(3), 462.

Green, D. W. (1998). Mental control of the bilingual lexico-semantic system. *Bilingualism: Language and cognition*, *1*(2), 67-81.

Hamers, J. F., Blanc, M., Blanc, M. H., & Hamers, J. F. (2000). *Bilinguality and bilingualism*. Cambridge University Press.

Lawton, D. M., Gasquoine, P. G., & Weimer, A. A. (2015). Age of dementia diagnosis in community dwelling bilingual and monolingual Hispanic Americans. *Cortex*, *66*, 141-145.

effects of grammatical gender in bilingual word recognition and production. *Journal of Memory and Language*, *59*(3), 312-330.

References

Lee, C., & Richardson, B. L. (1991). Multicultural issues in counseling: New approaches to diversity. Alexandria, VA: American Association for Counseling and Development.

Lemhöfer, K., Dijkstra, T., Schriefers, H., Baayen, R. H., Grainger, J., & Zwitserlood, P. (2008). Native language influences on word recognition in a second language: a megastudy. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, *34*(1), 12.

Lemhöfer, K., Spalek, K., & Schriefers, H. (2008). Cross-language

Mendoza, L., Garcia, P., Duara, R., Rosselli, M., Loewenstein, D., Greig-Custo, M. T., ... & Rodriguez, M. J. (2022). The effect of acculturation on cognitive performance among older Hispanics in the United States. *Applied Neuropsychology: Adult*, *29*(2), 163-171.

neuropsychology, *7*(1), 17-24.

Mpofu, E., Chronister, J., Johnson, E. T., & Denham, G. (2012). Aspects of culture influencing rehabilitation and persons with disabilities. *Handbook of rehabilitation. Cambridge: New York, NY*.

Parker Jones O, et al. Where, When and Why Brain Activation Differs for Bilinguals and Monolinguals during Picture Naming and Reading Aloud. Cerebral Cortex. 2012; 22:892–902. [PubMed: 21705392]

Pedersen, P. (1988). *A handbook for developing multicultural awareness*. American Association for Counseling.

Roberts, P. M., Garcia, L. J., Desrochers, A., & Hernandez, D. (2002). English performance of proficient bilingual adults on the Boston Naming Test. *Aphasiology*, *16*(4-6), 635-645.

Rosselli, M., Ardila, A., Araujo, K., Weekes, V. A., Caracciolo, V., Padilla, M., & Ostrosky-Solí, F. (2000). Verbal fluency and repetition skills in healthy older Spanish-English bilinguals. *Applied*

Ransdell, S. E., & Fischler, I. (1987). Memory in a monolingual mode: When are bilinguals at a disadvantage?. *Journal of Memory and Language*, *26*(4), 392-405.

Sanders, A. E., Hall, C. B., Katz, M. J., & Lipton, R. B. (2012). Non-native language use and risk of incident dementia in the elderly. *Journal of Alzheimer's Disease*, *29*(1), 99-108.

Yeung, C. M., John, P. D. S., Menec, V., & Tyas, S. L. (2014). Is bilingualism associated with a lower risk of dementia in community-living older adults? Cross-sectional and prospective analyses. *Alzheimer Disease & Associated Disorders*, *28*(4), 326-332.

https://www.census.gov/library/stories/2021/08/improved-race-ethnicity-measures-reveal-united-states-population-much-more-multiracial.html

https://health.gov/healthypeople/objectives-and-data/social-determinants-health

https://www.kff.org/racial-equity-and-health-policy/issue-brief/beyond-health-care-the-role-of-social-determinants-in-promoting-health-and-health-equity/


GRAZIAS
DANKIE
QUJAN
THANK YOU
QUIANARSUAQ
TODA
ASANTE
MITELA
MERCI
KIITOS
XIE XIE
THANK YOU
DANKIE
THANKS
TAKK
ASANTE
GRAZAS
MAHALO
THANK YOU
GRACIAS
OBRIGADO
APACHE
TODA
SPASIBO
MERCI
OBRIGADA
THANK YOU
GRACIAS
OBRIGADO
MUCHAS GRACIAS
YEWO
DANKIE
THANK YOU
SUKRIA
TODA
TAKK
XIE XIE
MITELA
TÄNAN
KIITOS
ДЯКУЮ
SPASIBO
DANKE
ДЗЯКУЙ
HVALA
PAXMET!
多謝
GRAZIE
DZIEKUJE
DEKUJI
TAK
GRACIAS
TESEKKÜR EDERIM
唔該
DO JEH
THANKS
TODA
KIITOS
MULTUMESC
SPAS
THANK YOU
FOOLE TUNK
MERCI
धन्यवाद
XIE XIE
THANK YOU
CHOKRAN
SHUKRAN
ASANTE
SUKRIA
SPAS
DANKIE
ASANTE
SPASIB
WILIWNI
BAIE DANKIE
NGIYABONGA
FAKAAUE
NGIYABONGA
HVALA
SUKRIA
XIE XIE
TODA
THANK YOU
TA
多謝

The Neuropsychological Assessment of Ethnically Diverse Patients: Theoretical and Practical Concepts

Patricia Garcia, Psy.D. HSPP
Assistant Professor of Clinical Neurology
Assistant Professor of Clinical Physical Medicine and Rehabilitation
patgarc@iu.edu

February 28th, 2025

SCHOOL OF MEDICINE

INDIANA UNIVERSITY