Ethnocultural *Factors* in Clinical AD Phenotype

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Fordham University & Icahn School of Medicine at Mount Sinai

2022 Fall ADRC Conference: Directors Meeting
10/20/2022

FORDHAM UNIVERSITY
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@DrRiveraMindt

Mount Sinai

Acknowledgements* & Disclosures

Affiliations

- Professor of Psychology, Latin American Latino Studies, and African & African American Studies, Fordham Univ.
- Joint Appointment in Neurology, Icahn School of Medicine at Mount Sinai
- Affiliated Faculty, Future of Aging Research Seminar, Columbia University

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No Conflicts of Interest

Leadership/Advisory

- ALL-FTD External Advisory Board
- Alzheimer's Association, NYC Chapter Board
- Brown University Center for Alzheimer's Disease Research Advisory Board
- **CDC BOLD Public Health Center of Excellence on Dementia Risk Reduction Expert Panel***
- Harlem Community & Academic Partnership Board (Treasurer)
- Mayo Clinic Executive Advisory Committee
- National Centralized Repository for ADRD (NCRAD) Executive Committee
- UC San Francisco Alzheimer's Disease Research Center (ADRC) Advisory Board
- University of Texas Rio Grand Valley Resource Center for Minority Aging Research Advisory Board
- University of Washington Alzheimer's Disease Research Center (ADRC) Advisory Board

Land Acknowledgement

"We acknowledge the people of the Tribal Nations and tribes in New York City (e.g., Lenni Lenape, Cayuga, Mohawk, Erie, Seneca, Oneida), who are the traditional custodians of the land on which we work and live, and recognize their continuing connection to the land, water, and air that the United States consumes. We pay respect to their elders past, present, and emerging."

Consulted by: New York Indian Council, Inc.

Positionality

Axis of Adversity

- **Afro-Latinx, Indigenous daughter of immigrants**
- **6 of the 7 NIH criteria** for ”Disadvantaged Background."
  - SES, unstable housing….
- **Health**: No or inadequate insurance growing up
- **Education**: ESL until ~3rd grade
- **Occupational Exp.**:
  - 13 yrs old - started working

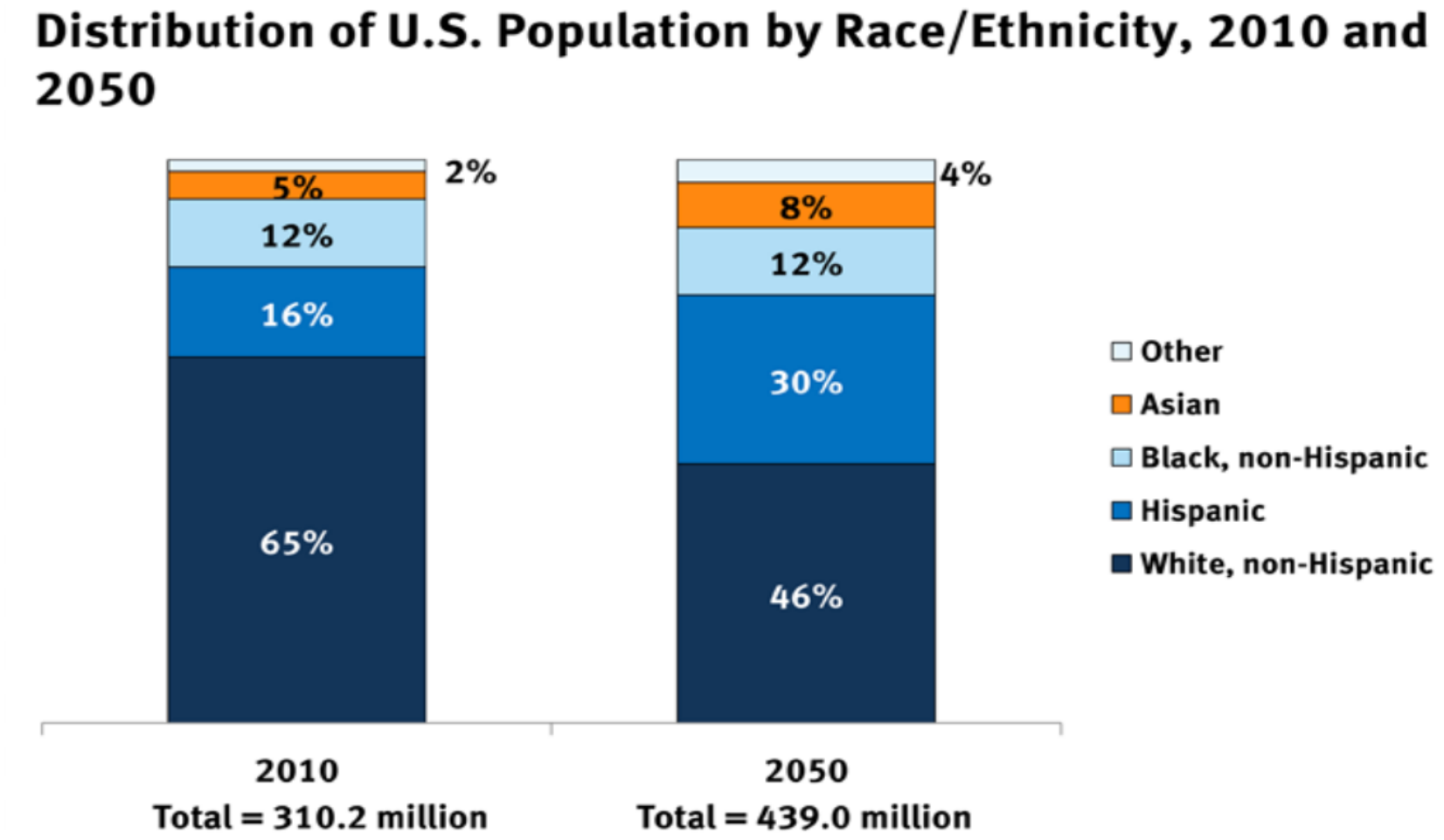
Axis of Privilege

- **Cis-gender/hetero**
- **US- born**
- **Able-bodied**
- **Education & Training (CBPR)**
- **Current middle-class status**
- ***Tremendous* social support**
- **Temperament** to withstand the sociocultural challenges & assaults of academia

Overview

- **Context: Demographics & Inequities**
- Framework
- Considerations for Clinical AD Phenotyping Across Populations
- Towards Brain Health Equity
  - Gaps & Key Questions
  - Moving Forward

U.S. Demographic Shifts

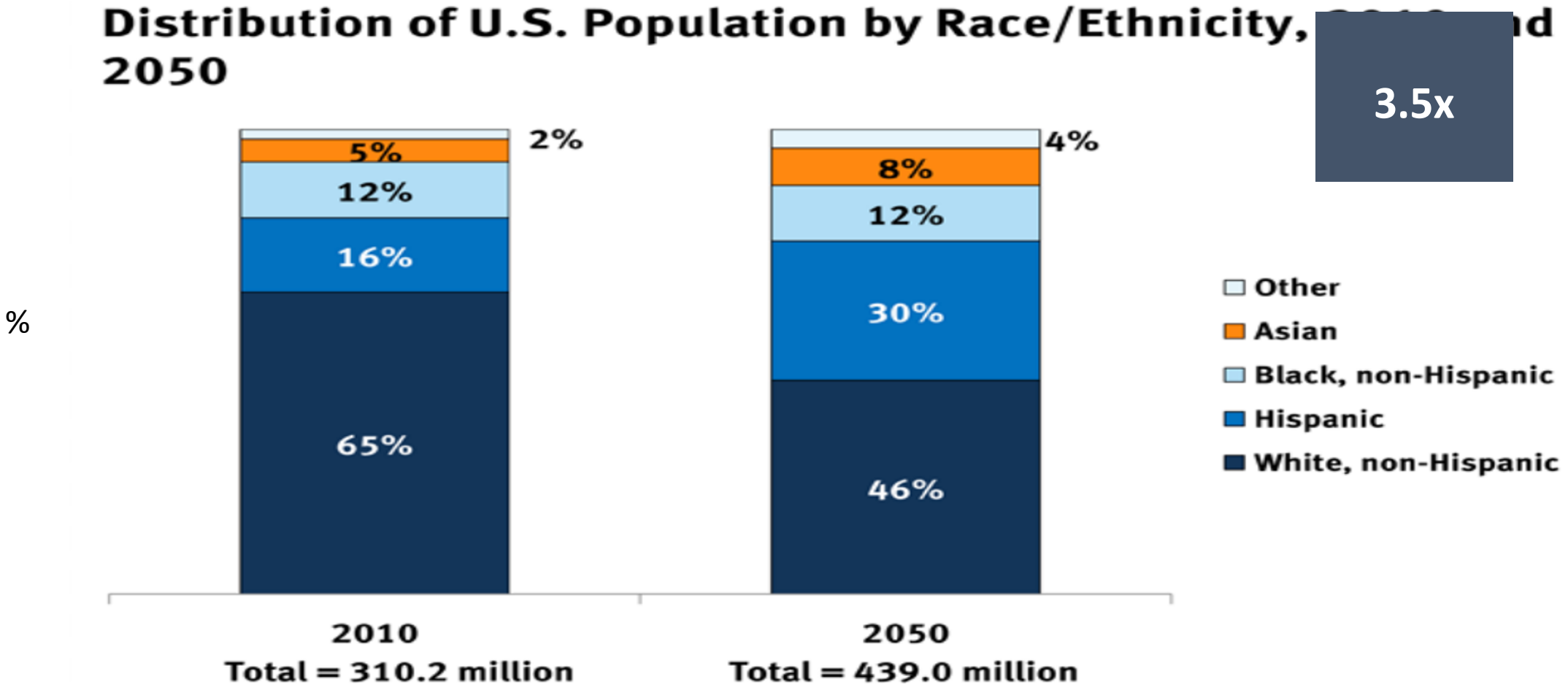


NOTES: All racial groups non-Hispanic. Other includes Native Hawaiians and Pacific Islanders, Native Americans/Alaska Natives, and individuals with two or more races. Data do not include residents of Puerto Rico, Guam, the U.S. Virgin Islands, or the Northern Marina Islands.

SOURCE: U.S. Census Bureau, 2008, Projected Population by Single Year of Age, Sex, Race, and Hispanic Origin for the United States: July 1, 2000 to July 1, 2050. http://www.census.gov/population/www/projections/downloadablefiles.html.

THE HENRY J. KAISER FAMILY FOUNDATION

Context: Ethnic Differences in U.S. 65+ Population Growth (2008 – 2030)



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1. Administration on Aging (2009)

Context of Disadvantage: Inequities in Brain Health

- **Black & Latinx older adults are up to 3x as likely to develop AD** than non-Latinx white adults* [2,3]

- **Younger age of onset[2,3]**

- **Greater severity of initial AD symptoms[2,3]**

***Note**. Research based on primarily older adults (65± yrs).

2. Alzheimer's Association (2015)
3. Campos et al (2013)

1. English only – 239 million
2. Spanish – 41 million
3. Chinese (including Mandarin and Cantonese) – 3.5 million
4. Tagalog (including Filipino) – 1.7 million
5. Vietnamese – 1.5 million
6. Arabic – 1.2 million
7. French – 1.2 million
8. Korean – 1.1 million
9. Russian – 0.94 million

https://www.usagainstalzheimers.org/learn/disparities

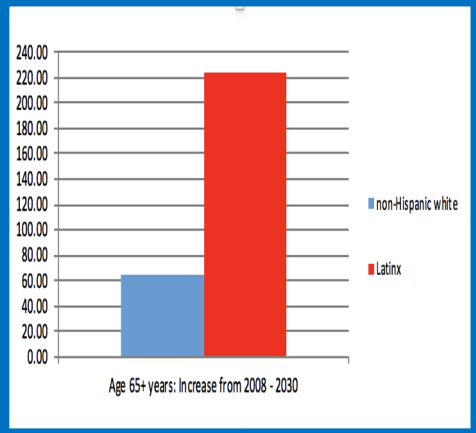
10. German – 0.92 million

Context of Disadvantage: Inequities in Dementia Care

Older Black and Latinx Adults 65+ yrs

- 30-40% *less likely* to access outpatient neurology care than non-Latinx whites[4,5]
- *More likely* to receive care in the ER, with longer hospital stays and higher inpatient costs, after neurologic diagnosis. [4,5]

Older Black and Latinx Adults < 65 yrs



4. Mehta et al (2017)
5. Saadi et al (2017)

Overview

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Culturally-Informed, Evidence-Based Clinical AD Phenotyping in a Biopsycho*sociocultural* Framework

Biological

Cognition

Socio-cultural

Shifting Demographics Are Placing Communities of Color in the Crosshairs of Alzheimer's

Emotion

Structural/ Systemic

Behavior

6. Rivera Mindt et al (2008)
7. Rivera Mindt et al (2010)

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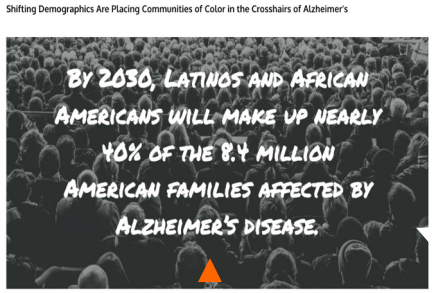

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7. Rivera Mindt et al (2010)

Biological

GENETIC FACTORS

APOE ε4

- ☒ Caribbean
- ☒ Mexican

PSEN 1

- ☑ Caribbean
- ☑ Mexican
- ☑ Colombian

PSEN 2

- ☑ Caribbean

O'Bryant et al., 2013a; O'Bryant et al., 2013b; Reitz et al., 2014; Vega et al., 2017

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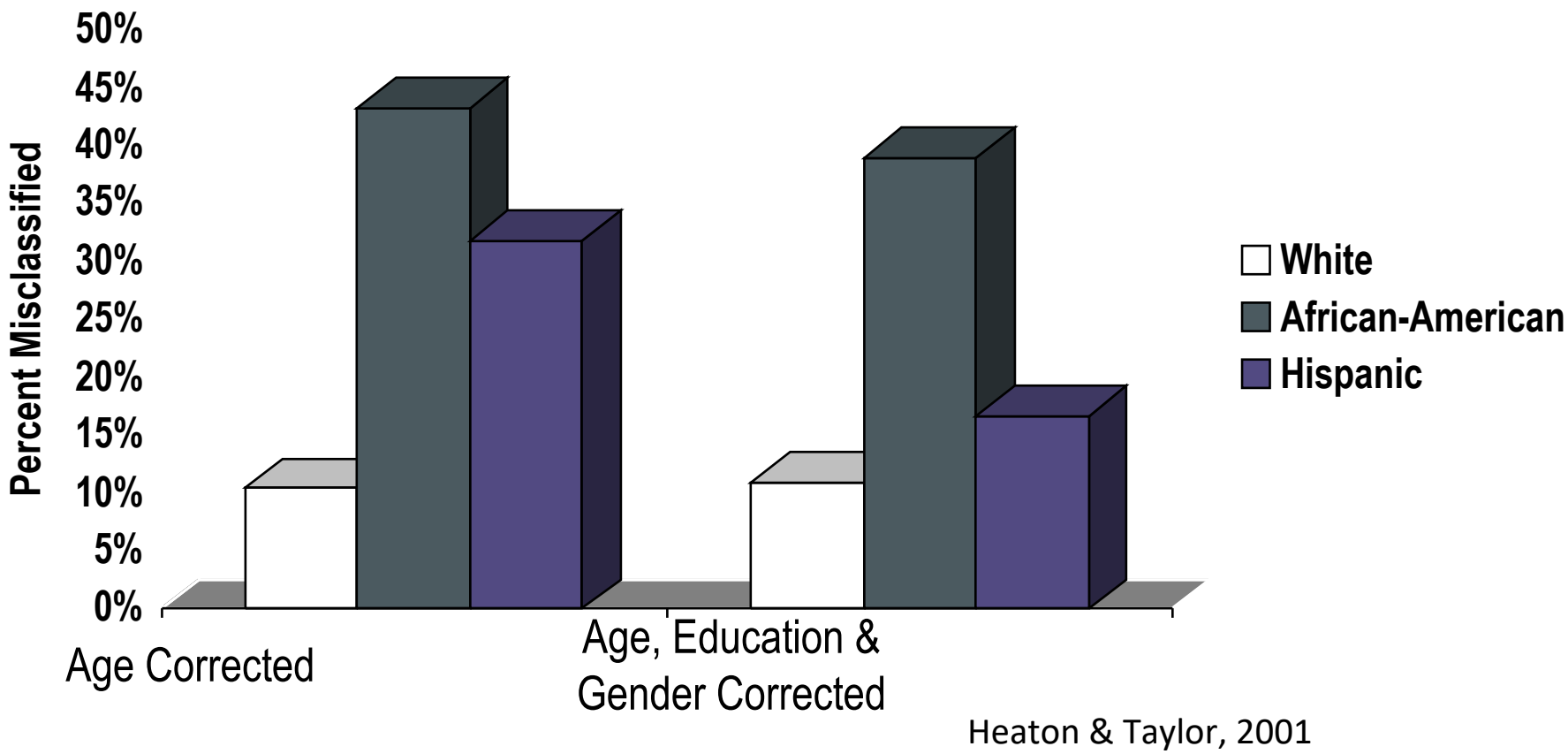
Cognitive Misclassification By Ethnocultural Status

- Cognitive tests are key tools for clinical AD phenotyping.
- Yet, misclassification risk is ***high*** w/out a culturally-informed, evidence-based approach



Heaton & Taylor, 2001

Modified slide courtesy A. Thames

Key Issues

- **Time** in history norms were created
- Adequate normative **sample size**
- Normative data are appropriately stratified in ways that best capture **demographic factors** that contribute to test performance.

-Brickman et al., 2006

Precision Normative Data is Necessary, But Not Sufficient for Precision AD Phenotyping

COMMENT

NATURE REVIEWS | NEUROLOGY

Check for updates

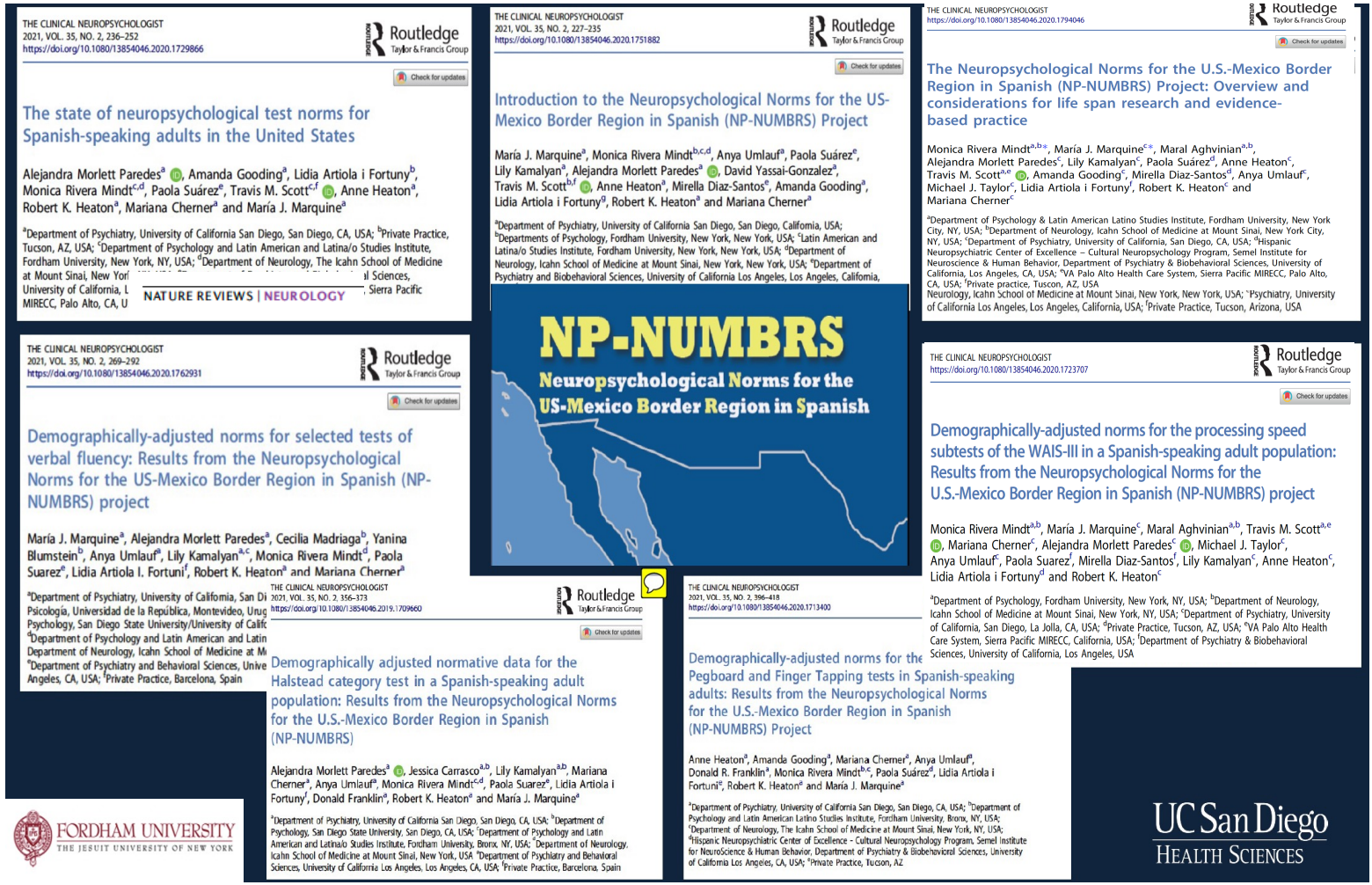
Neuropsychology's race problem does not begin or end with demographically adjusted norms

Desiree A. Byrd[1,2,3,4] ✉ *and Monica G. Rivera-Mindt*[5,6,7]

Demographically adjusted norms that include sociocultural factors such as race can provide an evidence-based approach for addressing the chronic systemic and diagnostic inequities in the interpretation of neuropsychological tests. However, these norms have important limitations, and more work is needed to improve the diagnostic validity of neuropsychological assessments in diverse populations.

"neuropsychologists too often continue to apply ill-fitting norms to diverse examinees"

In the USA, a national controversy has emerged over what is being termed the 'race-based' normative process in neuropsychology, wherein scores from neuropsychological tests are interpreted according to a person's racial identification. As with most scientific issues that gain media attention, coverage of this topic has been decidedly unbalanced and decontextualized. The most widely promoted position has been the stance against these demographically adjusted norms (for example, race, ethnicity, education, age, gender), with accusations that assessment, gain an enhanced appreciation for the complexities of their use, and imagine the equitable systemic changes that would eliminate the need for them. Of note, this article includes abbreviated summaries of professional practices with the aim of providing readers with foundational information to allow more informed consideration of the points and opinions contained within this Comment. Although the word limit necessitated the use of more generalizations than details herein, we encourage readers to engage with the issues on a



Modified slide courtesy M. Marquine

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Ethnocultural Differences in Depressive Symptoms' Relationship to Cognition

Published in final edited form as:
J Int Neuropsychol Soc. 2021 March ; 27(3): 249–260. doi:10.1017/S1355617720000855.

Depressive Symptoms Differentially Predict Neurocognition in Latinx and non-Hispanic White People Living with HIV

Emily P. Morris[1], **Desiree Byrd**[2,3,4], **Angela C. Summers**[2,5], **Kayla Tureson**[6], **Vanessa Guzman**[7], **Cara L. Crook**[2,5], **Monica Rivera Mindt**[2,3,5]

BDI-II[a] Item Categorization

Cognitive/Affective	Somatic/Functional
Sadness (Item 1)	Guilty Feelings (Item 5)
Pessimism (Item 2)	Punishment Feelings (Item 6)
Past Failure (Item 3)	Crying (Item 10)
Loss of Pleasure (Item 4)	Agitation (Item 11)
Self-Dislike (Item 7)	Loss of Interest (Item 12)
Self-Criticalness (Item 8)	Indecisiveness (Item 13)
Suicidal Thoughts or Wishes (Item 9)	Worthlessness (Item 14)
	Loss of Energy (Item 15)
	Changes in Sleeping Pattern (Item 16)
	Irritability (Item 17)
	Changes in Appetite (Item 18)
	Concentration Difficulty (Item 19)
	Tiredness or Fatigue (Item 20)
	Loss of Interest in Sex (Item 21)

Notes.

[a]Beck Depression Inventory

Linear Regressions Predicting Global and Neurocognitive Domain Function BDI-FS and BDI-NFS in the Latinx Group (N = 100)

		Full Model		BDI-FS		BDI-NFS		WTAR		Detectable VL	
Neurocognitive Domain	R^2	*F (df)*	*p*	*β(SE)*	*p*	*β(SE)*	*p*	*β(SE)*	*p*	*β(SE)*	*P*
Global Functioning	.16	6.93 (3, 94)	<.01	.04 (.33)	.91	−.32 (.16)	.049*	.14 (.04)	.002**	-	-
Motor Functioning	−.02	.06 (2, 92)	.94	.13 (.52)	.80	−.09 (.26)	.72	-	-	-	-
Processing Speed	.09	5.75 (2, 97)	<.01	.46 (.46)	.32	−.63 (.22)	.006**	-	-	-	
Learning	.26	7.66 (4, 86)	<.01	−.61 (.55)	.27	−.08 (.27)	.78	.29 (.07)	<.001**	−3.74 . (2.19)	092†
Attention/Working Memory	.10	4.32 (3, 89)	.01	−.49 (.41)	.23	−.12 (.20)	.55	.11 (.05)	.03*	-	-
Memory	.19	4.98 (4, 86)	<.01	−.60 (.59)	.31	.77 (.29)	.79	.28 (.07)	<.001**	−3.53 (2.36)	.14
Verbal Fluency	.06	3.15 (3, 91)	.03	.38 (.57)	.51	−.52 (.28)	.06†	.14 (.07)	.07†	-	-
Executive Functioning	.03	2.63 (2, 95)	.08	−.23 (.49)	.65	−.26 (.25)	.30	-	-	-	-

Note.

†.05 < *p* < .10;

*$p < .05$;

**$p \leq .01$;

BDI-FS = Beck Depression Inventory – Fast Screen; BDI-NFS = Beck Depression Inventory – Non Fast Screen; WTAR = Wide Range Achievement Test; VL = Viral Load

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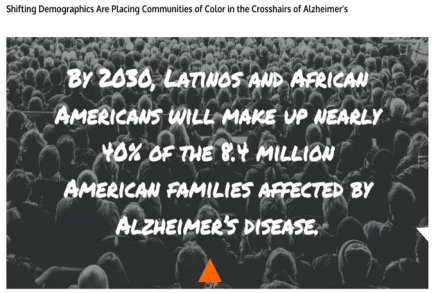

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Importance of Within-Group Heterogeneity in Clinical AD Phenotyping

JINS, Marquine…Rivera Mindt..et al., 2018

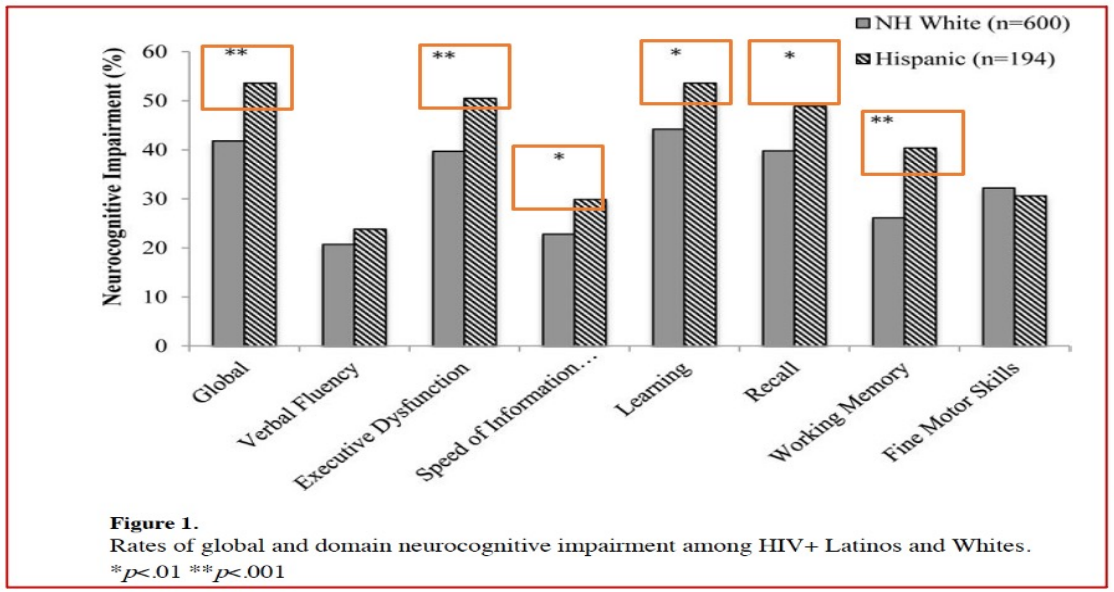

Figure 1.
Rates of global and domain neurocognitive impairment among HIV+ Latinos and Whites.
*p<.01 **p<.001

Between-Group Differences in NHW & Latinx Adults

Within-Group Differences in Latinx Subgroups

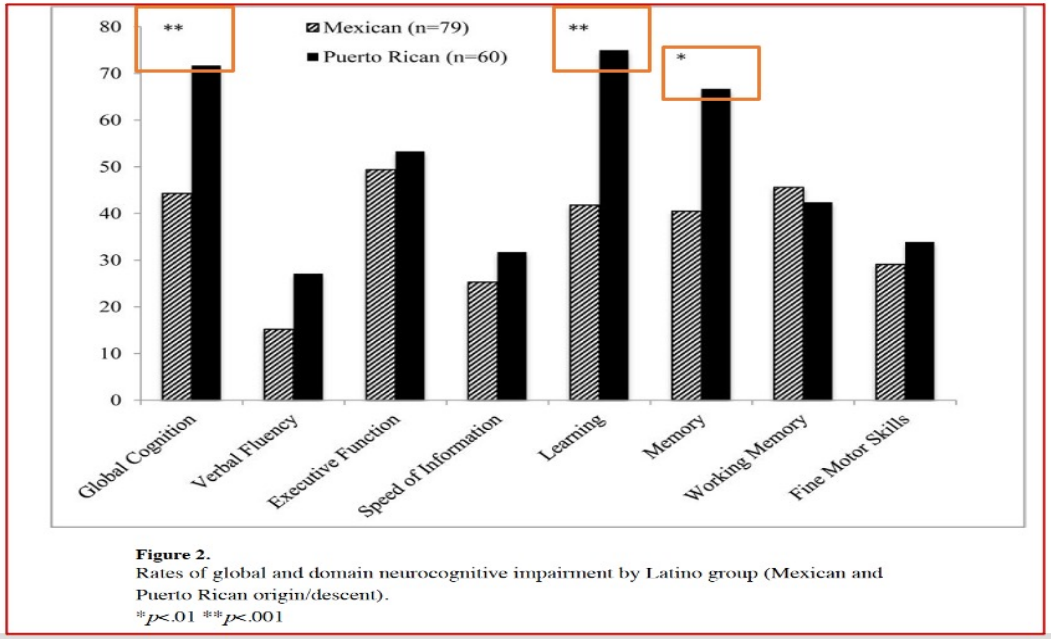

Figure 2.
Rates of global and domain neurocognitive impairment by Latino group (Mexican and Puerto Rican origin/descent).
*p<.01 **p<.001

NHW = non-Hispanic white
JINS, Marquine…Rivera Mindt..et al., 2018

Importance of Acculturation in Clinical AD Phenotyping

cite as: *J Gerontol B Psychol Sci Soc Sci*, 2021, Vol. 76, No. 4, e129–e139
doi:10.1093/geronb/gbaa156
Advance Access publication September 12, 2020

THE GERONTOLOGICAL SOCIETY OF AMERICA®

OXFORD

Research Article

Acculturation in Context: The Relationship Between Acculturation and Socioenvironmental Factors With Level of and Change in Cognition in Older Latinos

Melissa Lamar, PhD,[1,2,*] Lisa L. Barnes, PhD,[1,2] Sue E. Leurgans, PhD,[1,3] Debra A. Fleischman, PhD,[1,2] Jose M. Farfel, MD, PhD,[1,4] David A. Bennett, MD,[1,3] and David X. Marquez, PhD[1,5]

Table 2. Principal Component Analysis of Variables Reflecting Acculturation in Context (N=199)

	Factor 1	Factor 2	Factor 3
Tested in Spanish	**0.894**	−0.016	−0.002
Nativity status (non-US)	**0.802**	−0.127	−0.195
Parents' nativity status (both non-US)	**0.563**	−0.315	−0.356
SASH social	**−0.695**	−0.009	−0.070
SASH language	**−0.953**	−0.007	−0.006
SASH total	**−0.967**	−0.008	−0.025
Self-report of discrimination	0.004	**0.665**	0.101
Social network	0.011	**−0.664**	0.437
Social isolation	0.395	**0.711**	0.136
Familism	0.264	−0.014	**0.839**
Variance explained	43.136	15.083	10.957

Notes: SASH = Short Acculturation Scale for Hispanics. Factor loadings are unrotated with bold values representing the primary loading for each study variable.

Table 3. Correlation of Potential Covariates, Predictors, and Global Cognitive Outcome

	Acculturation-related composite	Contextually-related composite	Familism	Global cognition
Cumulative vascular disease burden	−0.01 (.85)	−0.12 (.07)	−0.005 (.95)	0.004 (.94)
Cumulative CVD risk factors	−0.11 (.12)	0.06 (.40)	0.07 (.35)	**−0.18 (.009)**
Body mass index	−0.06 (.39)	−0.03 (.60)	0.03 (.60)	−0.05 (.47)
CES-D	−0.04 (.57)	**0.44 (<.0001)**	−0.09 (.28)	**−0.25 (.0004)**
Income	**0.31 (<.0001)**	**−0.34 (<.0001)**	−0.11 (.20)	**0.39 (<.0001)**

Notes: CES-D = Center for Epidemiological Studies-Depression; CVD = cardiovascular disease. Values are Pearson correlation coefficient (*p* value) with the exception of the Spearman correlation coefficient (*p* value) for analyses involving income. Bolded values met significance set at $p < .05$.

Socioeconomic Status

The Clinical Neuropsychologist, 2015
Vol. 29, No. 2, 232–254, http://dx.doi.org/10.1080/13854046.2015.1029974

Routledge
Taylor & Francis Group

Socioeconomic Status and Neuropsychological Functioning: Associations in an Ethnically Diverse HIV+ Cohort

Alyssa Arentoft[1,2], Desiree Byrd[3,4], Jennifer Monzones[1,5], Kelly Coulehan[1], Armando Fuentes[1], Ana Rosario[1], Caitlin Miranda[1], Susan Morgello[3,6], and Monica Rivera Mindt[1,3,4]

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[2]Department of Psychology, California State University, Northridge, Northridge, CA, USA
[3]Department of Neurology, Icahn School of Medicine at Mount Sinai, New York, NY, USA
[4]Department of Psychiatry, Icahn School of Medicine at Mount Sinai, New York, NY, USA
[5]Department of Psychology, New Mexico VA Healthcare Center, New York, NY, USA
[6]Departments of Pathology & Neuroscience, Icahn School of Medicine at Mount Sinai, New

Adult SES (Hollingshead) mediated the relationship between ethnicity w/ Learning & Memory.

Learning: ISP $R^2\Delta$=.08, β=.30, *SE* β=.09, p<.01, ethnicity ns

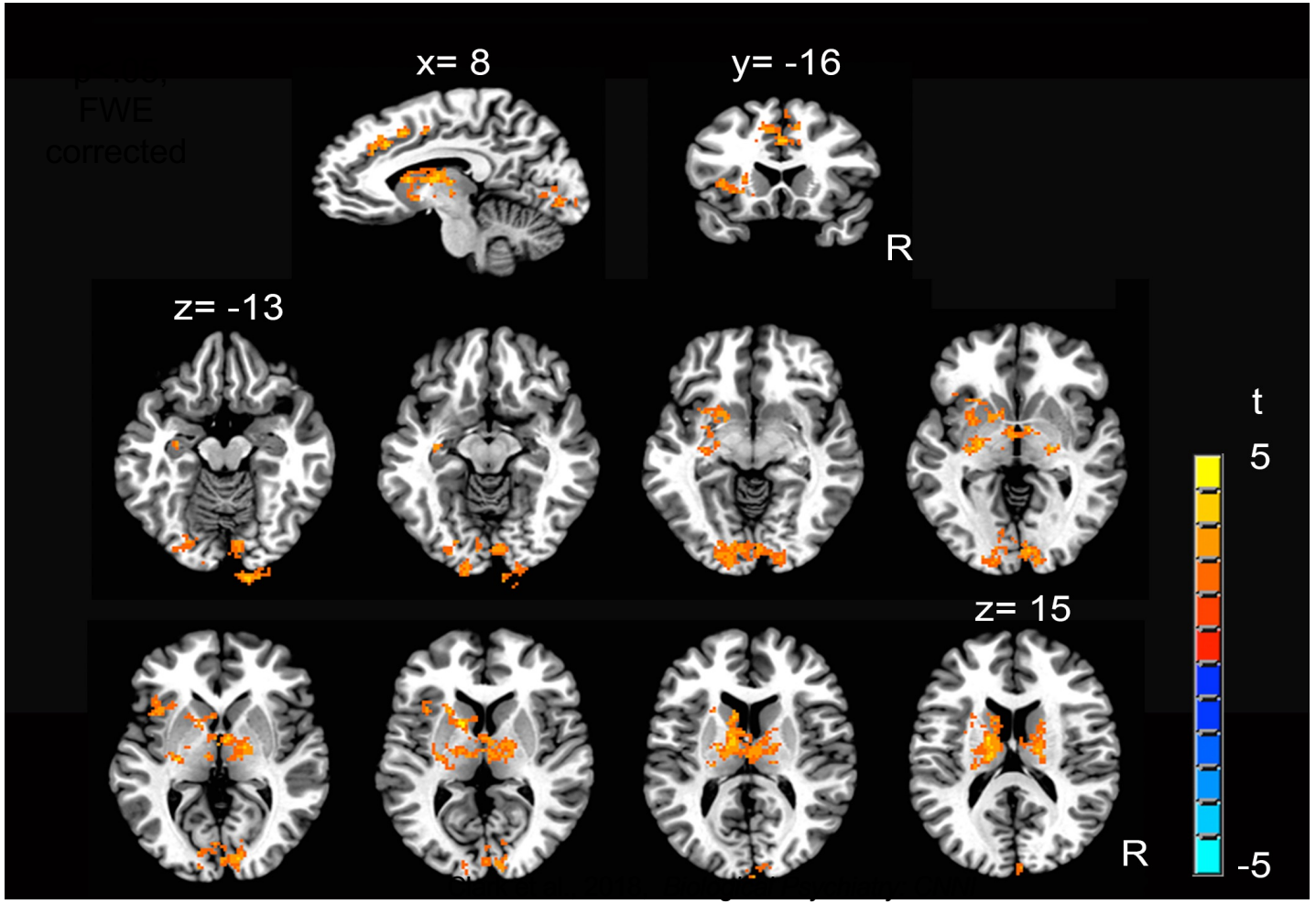
Memory: ISP $R^2\Delta$=.09, β=.34, *SE* β=.10, p<.01, ethnicity ns

Table 4. Correlations between SES estimates and neuropsychological raw scores (N = 128)

	Adult SES	Childhood SES
Verbal fluency		
COWAT (FAS) total	.27***	.19*
Animals total	.14	.31***
Attention/working memory		
WAIS-III LNS[b]	.31***	.14
PASAT[b]	.25**	−.02
Learning		
HVLT total[b,c]	.40***	.29***
BVMT total[c]	.20**	.13
Memory		
HVLT delay[c]	.39***	.15
BVMT delay[c]	.21**	.13
Processing speed		
WAIS-III digit symbol	.18**	.09
WAIS-III symbol search	.26***	.16
Trails A[a,b]	−.15*	−.22**
Executive functioning		
WCST perseverative responses[a]	−.03	.03
WCST perseverative errors[a]	.13	.25**
Trails B[a]	−.22**	−.12
Motor		
Grooved Pegboard—dominant hand[a,b,d]	−.01	−.06
Grooved Pegboard—non-dominant hand[a,e]	.06	−.05

[a]log transformed, after controlling for BDI.
[b]BDI.
[c]Substance abuse/dependence.
[d]Age.
[e]Gender.
*p < .10; **p < .05; ***p < .01.

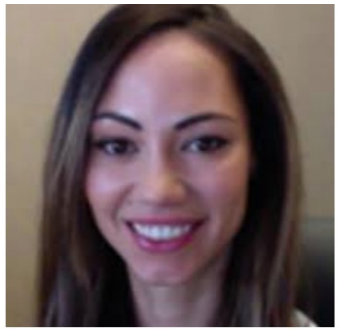
Greater Discrimination Associated with Greater Amygdala rsFC with Several Brain Regions in SN*



*SN=Salient Network; FWE=family wise error

Analyses controlled for current levels of stress, depression, anxiety, and PTSD-related symptoms.

Slide Courtesy Dr. U. Clark; Clark et al., 2018



Perceived Discrimination & Stereotype Threat

Journal of the International Neuropsychological Society (2013), **19**, 583–593.

doi:10.1017/S1355617713000076

Effects of Stereotype Threat, Perceived Discrimination, and Examiner Race on Neuropsychological Performance: Simple as Black and White?

April D. Thames,[1] Charles H. Hinkin,[1,2] Desiree A. Byrd,[3] Robert M. Bilder,[1] Kimberley J. Duff,[4] Monica Rivera Mindt,[3,5] Alyssa Arentoft,[1,2] AND Vanessa Streiff[2]

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[4]Department of Psychology, Cerritos College, Norwalk, California
[5]Department of Psychology, Fordham University, New York, New York

(RECEIVED September 17, 2012; FINAL REVISION January 4, 2013; ACCEPTED January 7, 2013; FIRST PUBLISHED ONLINE February 7, 2013)

N = 92 adults

- African American (*n* = 45)
- non-Hispanic white (*n* = 47)

Randomly assigned to stereotype threat or non-threat condition; then, same race or different race examiner.

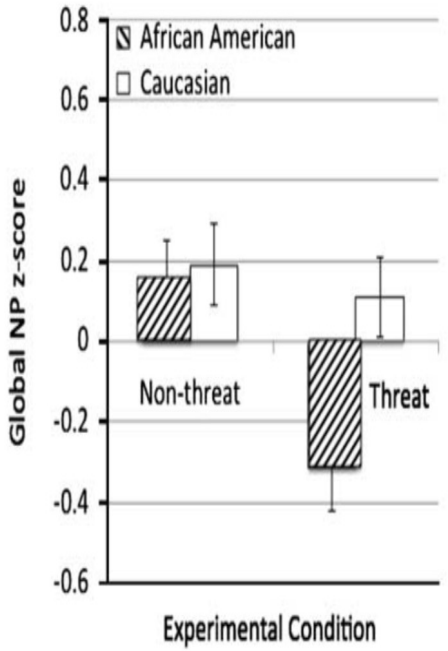

Fig. 1. Interaction between examinee race and experimental condition interaction on global neuropsychological performance. Error bars represent standard error.

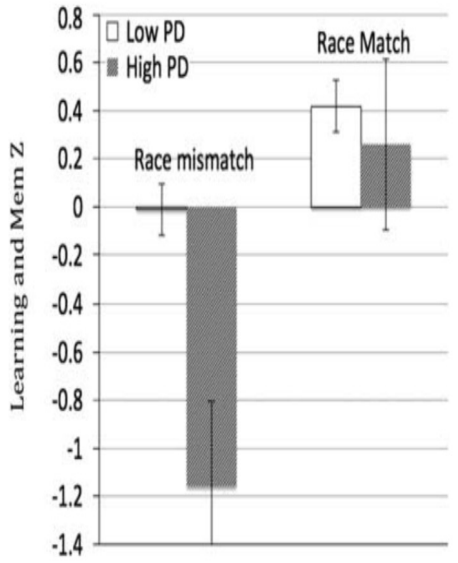

Fig. 2. Interaction between perceived discrimination and examiner race on learning/memory performance in African Americans (*n* = 45). Error bars represent standard error.

it is critical that interpretations of test performance account

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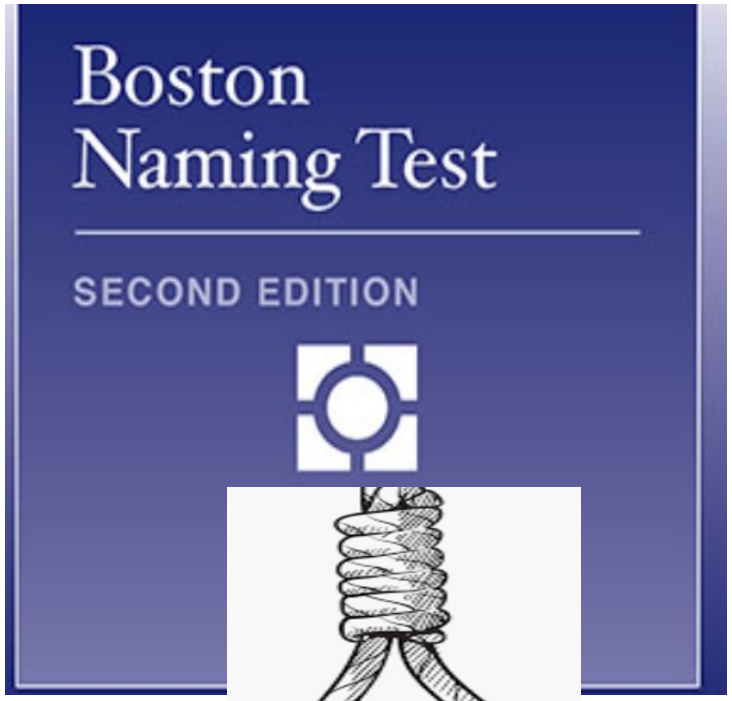
Structural Racism in Assessment



Item # 48

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COMMENTARY

Creating an Antiracist Psychology by Addressing Professional Complicity in Psychological Assessment

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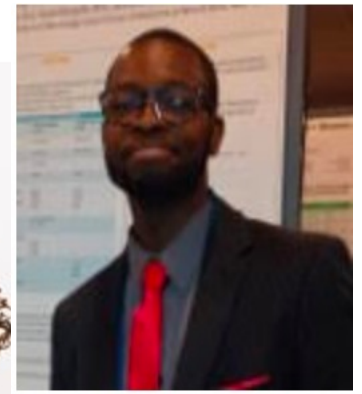


*Co-1st Authors

Overview

- Context: Demographics & Inequities
- Framework
- Considerations for Clinical AD Phenotyping Across Populations
- **Towards Brain Health Equity**
  - **Gaps & Key Questions**
  - **Moving Forward**

Brain Health Equity in AD &Related Dementias

The fair distribution of *brain health* determinants, outcomes, and resources within and between segments of the population, regardless of social standing.

-Modified from CDC definition of Health Equity

Risk Factors for Cognitive Impairment (CI) & Dementia in *Older* Black & Latinx Adults (65± yrs)

Biological Risk Factors

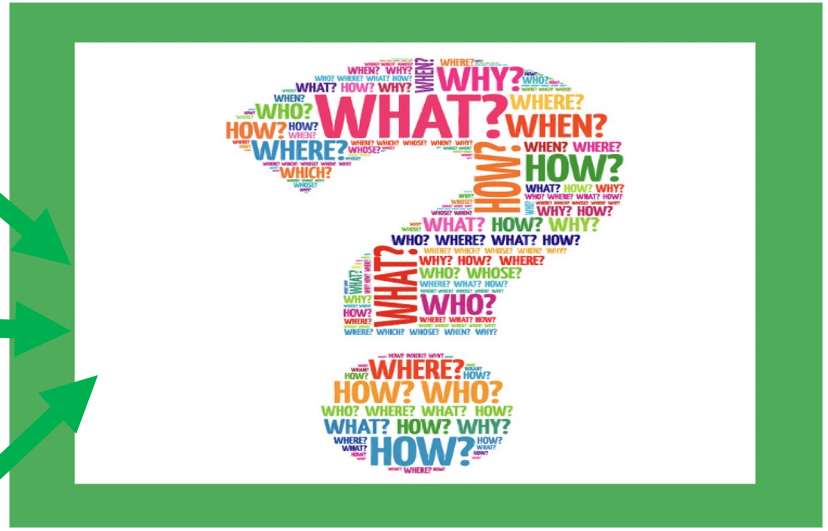
Diabetes[8]
Hypertension[8]
Comorbid Conditions (e.g., TBI, HIV)[9,10]

Psychological Risk Factors

Depression (Cultural diffs)[11]
Stress (Early life, current)[12]
Social Isolation[13]

Sociocultural & Structural Risk Factors

Racism/Discrimination[14]
Cultural Exposures[15]
SES & Healthcare Barriers[16,17]
Quality of Ed/Literacy[18,6]
Environmental Exposures[19]



Increased Risk for CI/Dementia

8. Shiekh et al (2021); 9. Bailey et al (2020); 10. Rivera Mindt et al (2014); 11. Morris et al (2021); 12. Pechtel & Pizzagalli (2011); 13. Hold-Lunstad et al (2015); 14. Thames et al (2013); 15. Arentoft et al (2012); 16. Kind et al (2014); 17. Alzheimer's Association (2021); 18. Manly (2006); 19. Liu & Lewis (2014)

Resilience Factors for Cognitive Impairment (CI) & Dementia within the Context of Disadvantage in Minoritized Populations?

Biological Resilience Factors

Genetics (APOE-4 diffs)?[3,20]

Physical Activity (dancing, sports)[21]

Addressing Food Insecurity[22]

Psychological Resilience Factors

Familismo?[23]

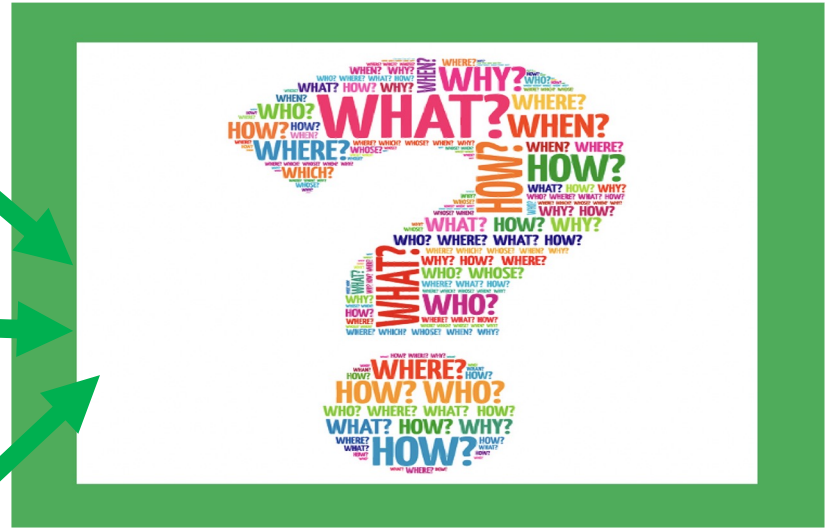
Sociocultural & Structural Resilience Factors

Acculturation?[15]

Bilingualism?[24]

Social & Health Policies?

(Discrimination, Educ., Medicaid)[17,25]



Decreased Risk for CI/Dementia?

20. Chan et al (2022); 21. Fausto et al (2022); 22. Zenk et al (2022); 23.Rote et al (2019); 24. Calvo et al (2016); 25. CDC (2022)

Gaps & Key Next Steps

Gaps:

- **Sociocultural level factors**
  - *Cultural Factors*
    - Acculturation, within-group variance, culturally-mediated health beliefs/attitudes
  - *Intersectionality*
    - Dimensions of diversity; e.g., ethnocultural status, religion, gender/gender identity, rurality, poverty, immigration status, region, ability status
  - *Discrimination/Persecution* due to any individual- or contextual-level factor (see above)

Key Next Steps:

- Flipping our lens from a **Deficit Model** to an **Empowerment & Resilience Model** of **Brain *Health***
- Authentic community-engagement & inclusion in AD & dementia research
- Moving beyond pan-ethnicity to mechanisms of resilience & change
- Implementation through public health settings and policies

Towards Brain Health Equity

Alzheimer's Association, 2021

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(AA, MAR, FA, AF, KF, VG, EPM, JPO, PS, RR, TSS, ACS, KT & more!)

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Gratitude

The Alzheimer's Association recommends the following actions to address discrimination and bias:

- Prepare providers to care for a racially and ethnically diverse population of older adults
- Increase diversity in dementia care
- Increase diversity of participants for research and clinical trials

The report stresses that health care providers and researchers must remain committed to addressing these disparities for older adults. It recommends actions be taken to ensure the burden of Alzheimer's disease and dementia is not made worse by discrimination and unequal access to health care.

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ADNI Alzheimer's Disease Neuroimaging Initiative

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Thank you!

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¡Muchas Gracias!

Questions?

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Linguistic Diversity in the U.S.

Top 10 Languages spoken in U.S.

1. English only – 239 million
2. Spanish – 41 million
3. Chinese (including Mandarin and Cantonese) – 3.5 million
4. Tagalog (including Filipino) – 1.7 million
5. Vietnamese – 1.5 million
6. Arabic – 1.2 million
7. French – 1.2 million
8. Korean – 1.1 million
9. Russian – 0.94 million
10. German – 0.92 million

~21% of the US population speaks a language other than English

American Community Survey (ACS); US Census Bureau, 2015

Health Inequities

Definition

- A particular type of health difference that is **closely linked with social, economic, and/or environmental disadvantage**.
- Adversely affect **groups of people who have systematically experienced greater obstacles to health** based on…..characteristics historically linked to discrimination or exclusion (e.g., race; ethnicity; SES; gender; age; mental health; cognitive, sensory, or physical disability; sexual orientation).

Exemplars

Env. Stress: ↑ risk for childhood asthma, hyper-tension, substance use, diabetes, obesity & depression (Quinn et al, 2010; Russell et al, 2010; Nandi et al, 2010; Lee, et al., 2009; Braveman, 2009; Latkin et al, 2007).

Perceived Discrimination & Stigma: ↑ risk for psychiatric morbidity & substance use in LBGT persons, particularly LGBT youth (McCabe et al, 2010; Lehavot & Simoni, 2011).

Acculturation Stress: Related to substance dependence & anxiety disorders (Ehlers et al, 2009).

Long-term Poverty & Family Stress: ↓ Physical mobility & cognitive functioning at older ages In African-Am. Women (Kasper et al,

https://www.apa.org/topics/health-disparities/fact-sheet-stress; Healthy People 2020; US Health & Human Services, 2010