Keyword 3: psychometrics
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2 Reading Aloud Elicits Connected Speech and Autocorrection: a Novel Marker of Alzheimer's Disease and Risk

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Objective: Spontaneous speech involves tight coordination of a constellation of cognitive mechanisms (including planning, lexical selection, grammatical encoding, internal & external monitoring). Recent years brought a flurry of interest in detailed analysis of spontaneous speech in search of markers of prodromal Alzheimer's disease. This work dates back to the nun studies by Snowdon et al (1996) and reveals promise for early detection through identification of subtle but significant changes in the nature of speech output years prior to diagnosis of dementia.
A major challenge for neuropsychology is to develop methods to harness the potential sensitivity of language to subtle cognitive changes when testing individuals in clinical settings. In this talk I will present two lines of research that illustrate how reading aloud can be used to engage the cognitive mechanisms of spontaneous speech production in a manner that provides an easily accessible measure of Alzheimer's disease/risk.
Participants and Methods: In the first study, Spanish-English bilinguals with mild-to-moderate Alzheimer's disease (n=20) and proficiency matched controls (n=29) read aloud mixed-language paragraphs with a small number of language-switched words, and we recorded the number of times they automatically translated switch words by accident (e.g., saying pero instead of but; effectively autocorrecting language switches to avoid producing switches overtly). In the second study, cognitively normal monolinguals at risk for AD based on CSF biomarkers (n=14) and controls (n=50) read aloud short paragraphs in which ten critical target words were replaced with autocorrect targets (e.g., The player who scored that final [paint] for the local team reported [him] experience). Participants were instructed to avoid autocorrecting (e.g., avoid saying point instead of paint or his instead of him), and we recorded the number of times they autocorrected by accident.
Results: Bilinguals with AD translated switch words more often than controls, and ROC curves revealed good-to-excellent discrimination between patients and controls based solely on the number of errors produced during reading aloud (AUC or Area Under the Curve values ranged from .71-.92). In the second study, cognitively normal monolinguals with high CSF Tau/Aβ42 (i.e., an AD-like biomarker profile) produced more autocorrect errors (e.g., saying point instead of paint)than those below the biomarker threshold, and autocorrection errors showed potential for discriminating individuals with higher AD risk from controls (AUC=.76; 95%CI .62-.90).
Conclusions: Difficulty stopping automatic translation of language switch words and autocorrection during reading aloud reveals promise as a diagnostic tool. Reading aloud elicits rapid production of hundreds of words while maintaining tight experimental control over the content of speech and harnessing the power and complexity of language to enable detection of very subtle cognitive changes through simple analysis of critical targets. I will discuss the theoretical implications of this work for understanding how bilinguals choose a single language for production, the nature of cognitive impairments in early AD and areas of need for further research to maximize the potential utility of reading aloud for detection of cognitive impairment.

Categories: Dementia (Alzheimer's Disease)
Keyword 1: dementia - Alzheimer's disease
Keyword 2: cross-cultural issues
Keyword 3: psychometrics
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3 Ethnoracial Differences in Anchor Agreement and MCID Estimation in Alzheimer's Disease

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Objective: Alzheimer's disease (AD) clinical trials lack diverse representation, limiting their generalizability. In addition, the clinical meaningfulness of observed changes during treatment may vary as a function of participant characteristics. Defining meaningful change in AD within diverse ethnoracial groups is therefore greatly needed. Meaningful change in AD trials can be assessed by three different anchors: participants, informants, or clinicians. Previous research has suggested that estimations of the minimal clinically important difference (MCID) vary by disease severity, choice of anchor, and anchor agreement. These relationships have been studied primarily within non-Hispanic white (NHW) samples. This project evaluates anchor-based MCID within and across the three most prevalent ethnoracial groups in the United States, non-Hispanic White (NHW), Hispanic/Latino (H/L), and Black/African-American (B/AA).
Participants and Methods: Data from the National Alzheimer's Coordinating Center Uniform Dataset (NACC UDS) were used to investigate MCID within older adults (ages 50+) diagnosed as cognitively normal or cognitively impaired due to suspected AD. Data were taken from all versions of the UDS and consisted of all available participants with two consecutive annual visits. The identified sample (N=22,043) is approximately 83.6% NHW, 4.7% H/L, and 11.7% B/AA. Participant, informant, and clinician anchor variables were utilized to compare proportions of anchor agreement within and across ethnoracial groups. MCID on the Mini-Mental State Exam (MMSE) was estimated within each ethnoracial group and compared across the independent variables of anchor agreement and disease severity (cognitively normal (CN), mild cognitive impairment (MCI), and dementia) in 2x3 ANOVAs.
Results: Participant age (M = 71.56, SD = 9.03) did not significantly differ across ethnoracial groups; years of education significantly differed across groups, $p < .001$, with NHW (M=15.83 SD=3.05), H/L (M=12.49, SD=5.01), and B/AA (M=14.42, SD=3.22). Across all three anchors (participant, informant, clinician), unanimous agreement about the presence or absence of a decline in functioning was present in about 75.1% of the full sample. To further explore agreement differences across groups, anchor agreement was classified into a 3-level variable: 1) agreement that the participant remained stable over time, 2) agreement that the participant declined, and 3) disagreement. The proportion of each level within each ethnoracial group was significantly different, ($\chi^2(4, n = 22,043) = 179.16$, $p < .001$, phi = .09, NHW (34.5% agreement-stable, 41.4% agreement-declined, 24.1% disagreement), H/L (30.5%, 42.6%, 26.9%, respectively), and B/AA (42.2%, 28.1%, 29.7%, respectively). MCID estimates on the MMSE followed similar trends within each ethnoracial group. There was a significant main effect of disease severity, such that MCID estimates increased in magnitude with increasing disease severity. There were no significant main effects of anchor agreement for any ethnoracial group. Within the NHW sample only, an interaction effect between diagnostic severity and anchor agreement was significant ($p = .007$).
Conclusions: Across ethnoracial groups, MCID estimates on the MMSE are reliably influenced by the severity of disease. However, the benefit of anchor-based MCID estimates may vary by ethnoracial group with respect to both anchor choice and use of anchor agreement. The origins of anchor disagreement and perceived stability in functioning warrant further exploration.

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4 Advancing the science of recruitment and retention in ADRD clinical research among Hispanics/Latinos

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Objective: Inequity in Alzheimer's disease and related dementias (ADRD) clinical research is severely hindering our progress towards a cure for all, while inflating national costs. ADRD alone is currently costing United States 321 billion dollars in 2022, projected to increase to 1 trillion by 2050. Alzheimer's disease disproportionately impacts Black, Hispanic, Asian or Native Americans. Yet, ADRD clinical research to date

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