

Idea Density as a predictor of cognitive trajectories across four ethnolinguistic groups

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Research Question

Does spoken language efficiency (i.e. idea density) have a similar relationship to cognitive trajectories across diverse ethnolinguistic groups?

Specific Aim

- **Evaluate** effects of language efficiency (idea density) on late life cognitive trajectories by ethnolinguistic group
 - English speaking Whites, Blacks and Latinos
 - Spanish speaking Latinos

Background

- Idea Density (ID)
 - Measuring contentfulness vs. emptiness in language
- Low ID associated with high Alzheimer's risk →
 - Low early life ID links to increased risk for dementia in Nun Study (Snowdon et al. 1996)
 - Low late life ID associated with faster cognitive decline in ethnically and linguistically diverse sample (Farias et al. 2012)

Background

- Research on early life ID has relied on early written language
 - Unavailable for most populations
- Late life spoken language samples (Farias, et al. 2012)
 - Viable for both educated and illiterate populations
- Previous studies have not examined ID effects on late life cognition in specific groups defined by language and ethnicity
- ID may have different effect related to typological differences and/or culturally distinctive norms for speaking across dialects

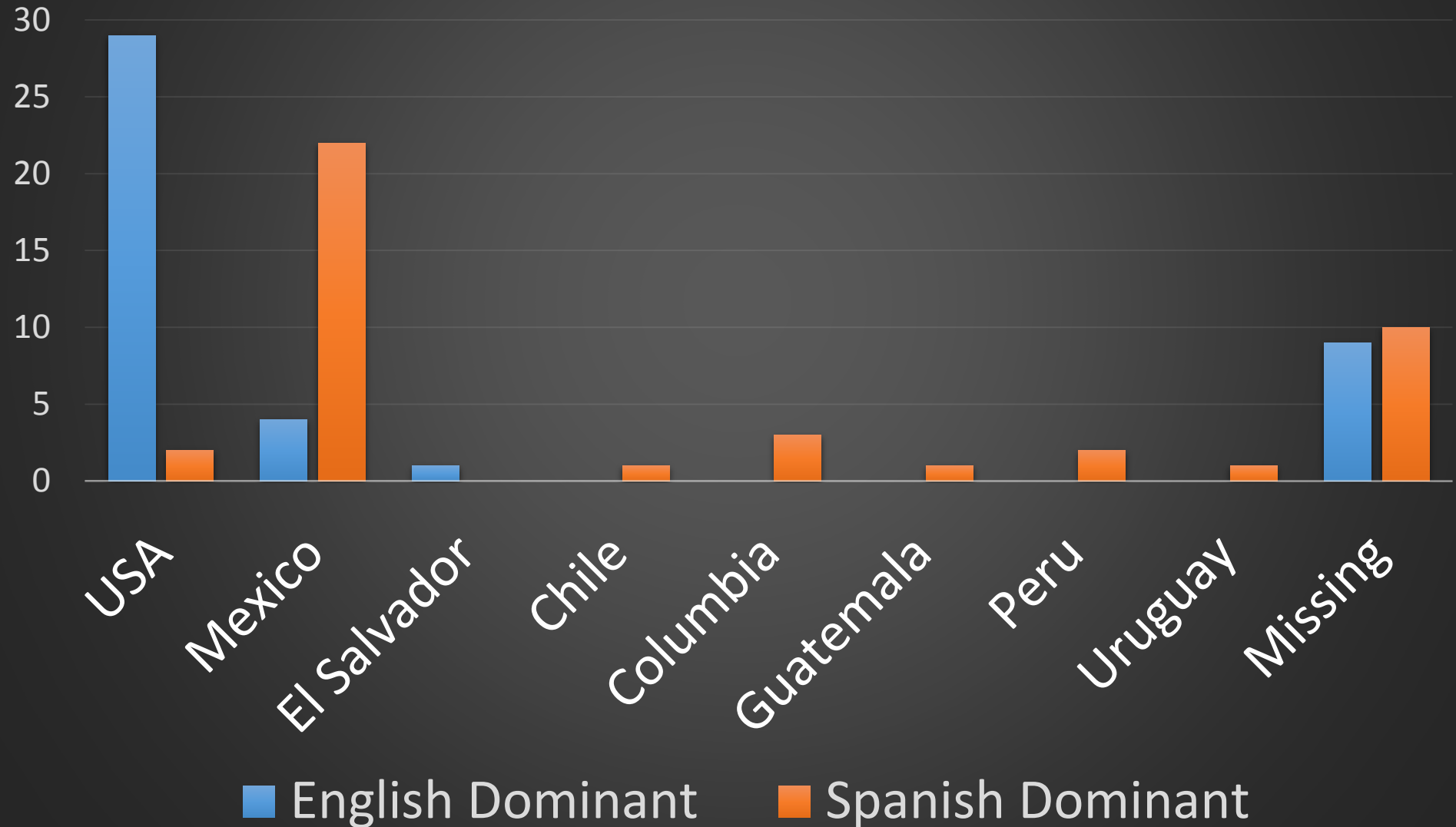
Methods

- Longitudinal cohort followed at UC Davis Alzheimer's Disease Center
 - African Americans, Latinos, Whites recruited from community
 - Cognitively diverse (normal, MCI, dementia)
- Spontaneous oral narratives, digitally recorded, targeting distant childhood memories, collected in late life
 - Transcribed and analyzed for Idea Density
- Cognitive outcomes including episodic memory, semantic memory, executive function and spatial ability

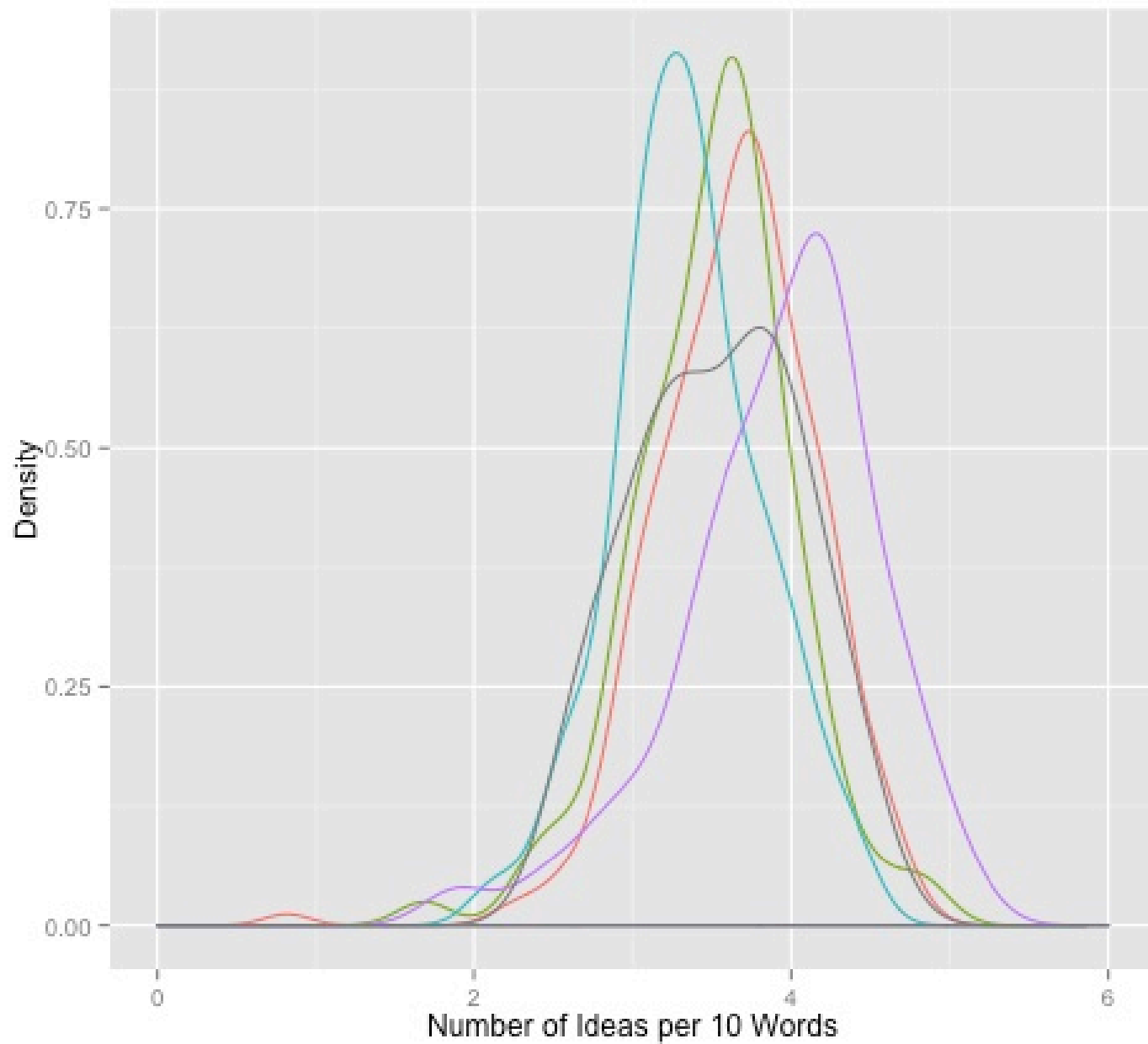
Sample Characteristics

	Black (N=76)	Hispanic- English (N=43)	Hispanic- Spanish (N=42)	White (N=84)	Total
Male N (%)	19 (25.0%)	13 (30.2%)	13 (31.0%)	33 (39.3%)	78 (31.8%)
Age Mean (SD)	78.2 (6.6)	76.4 (7.3)	76.9 (5.5)	77.6 (6.4)	77.5 (6.5)
Education Mean (SD)	13.8 (2.6)	11.6 (3.9)	7.0 (5.2)	14.4 (3.1)	12.4 (4.5)
Demented N (%)	11 (14.5%)	1 (2.3%)	6 (14.3%)	7 (8.3%)	25 (10.2%)
MCI N (%)	13 (17.1%)	6 (14.0%)	9 (21.4%)	30 (35.7%)	58 (23.7%)

Latinos by Dominant Language and Birthplace

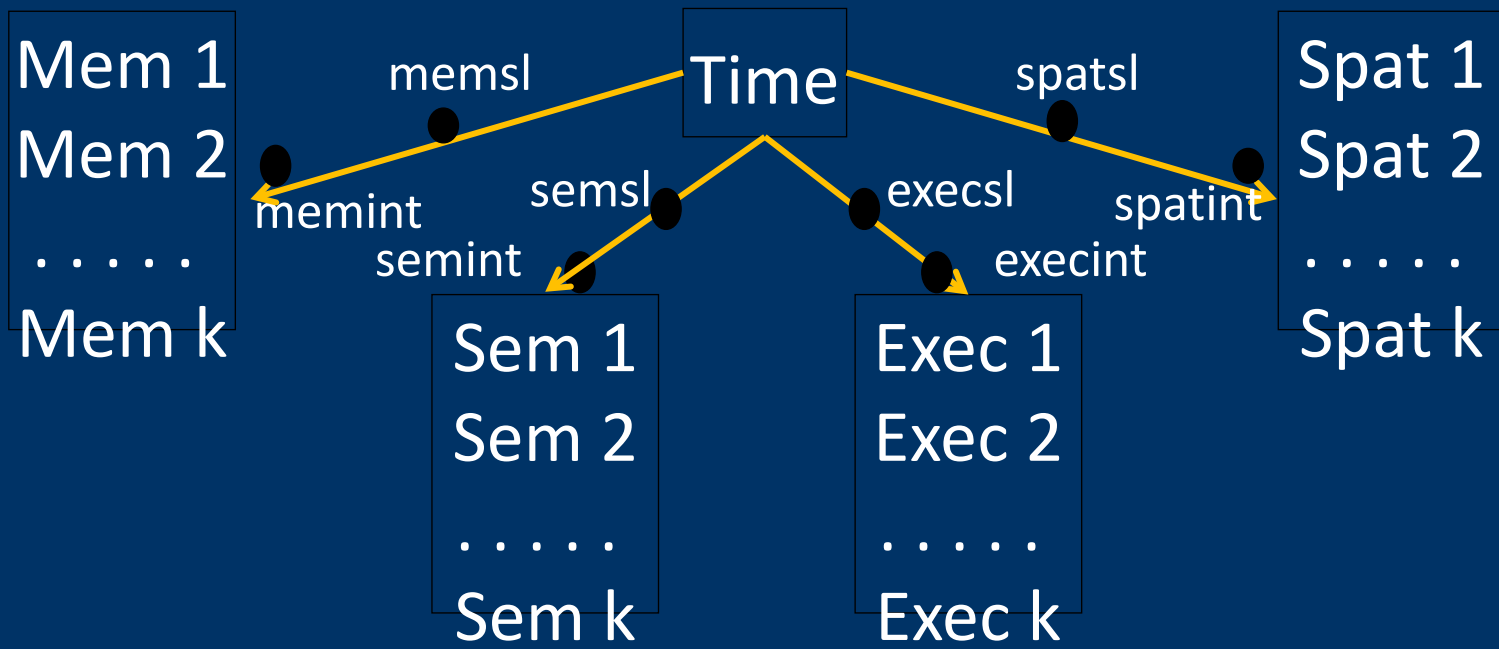


Group White Black Hispanic-English Hispanic-Spanish



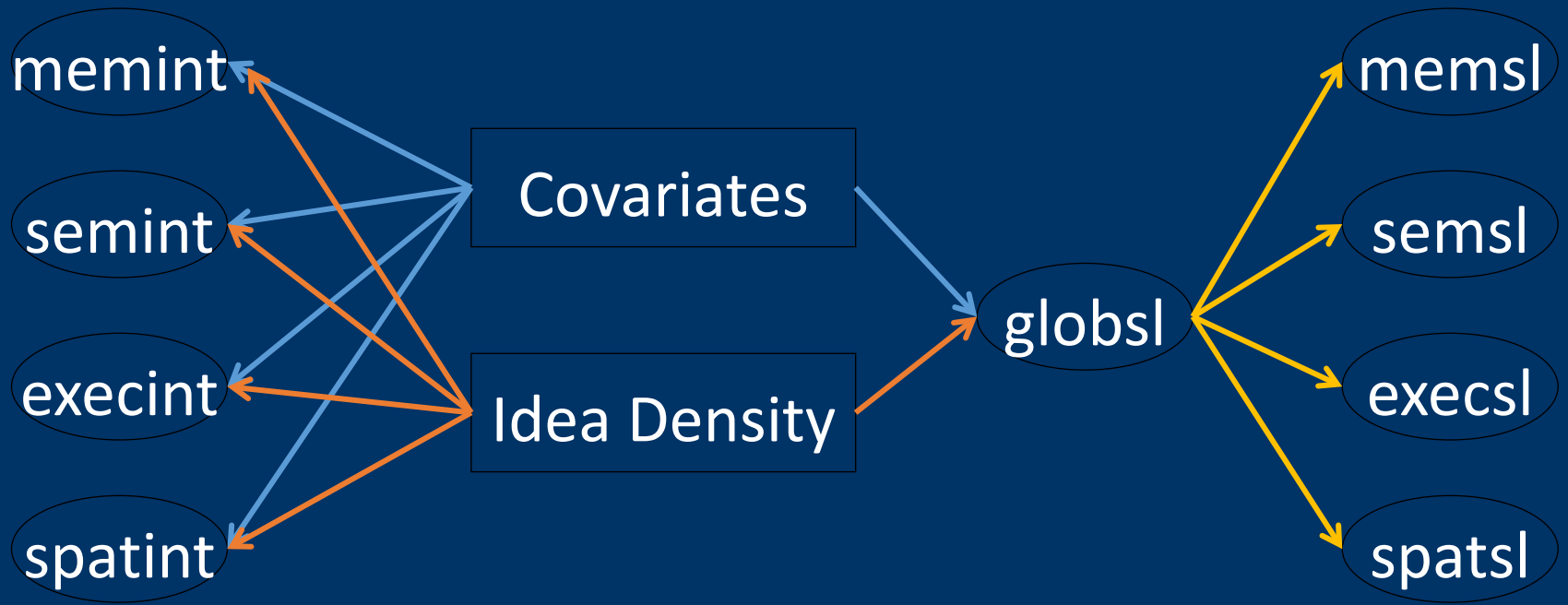
Analytic Methods

- Multiple group mixed-effects regression analysis of ID on cognitive baseline and change within each ethnolinguistic group
 - Dependent variables include episodic memory, semantic memory, executive function and spatial ability
 - Final model estimated individual estimates for baseline, but identified a second order global factor that explained change across the four cognitive domains
 - Age, gender and education were used as co-variates

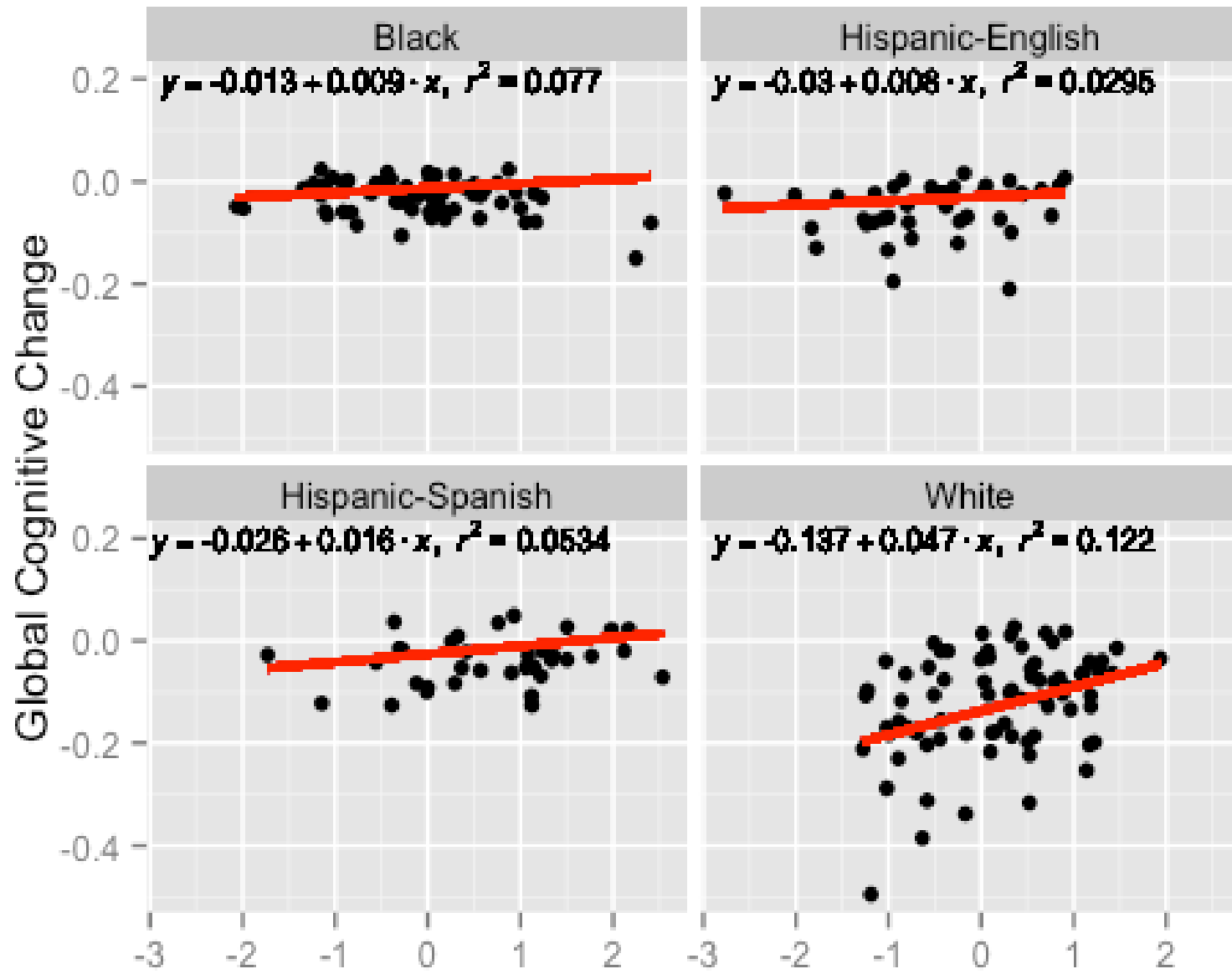


Within

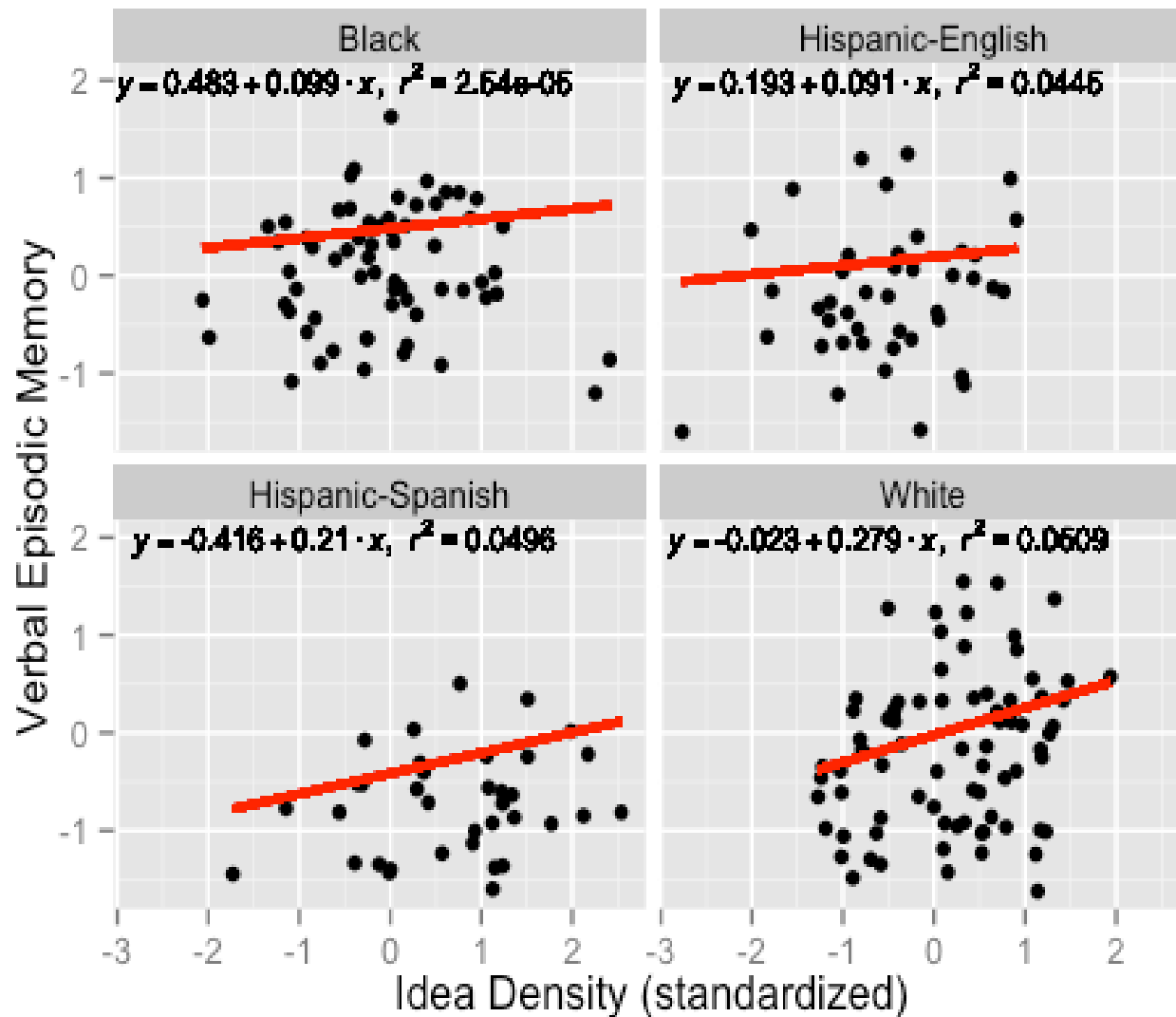
Between



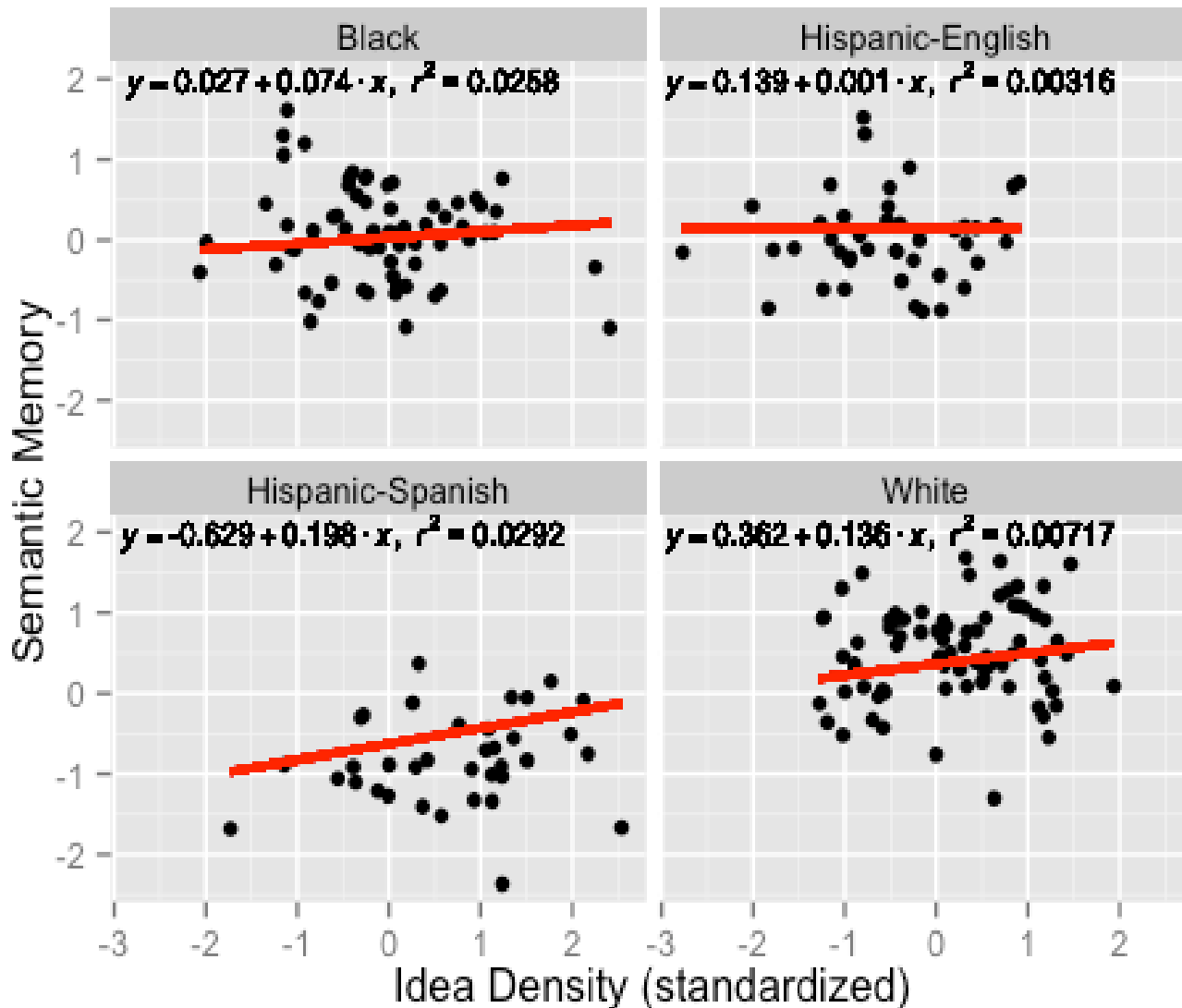
Results: Global Cognitive Slopes by ID



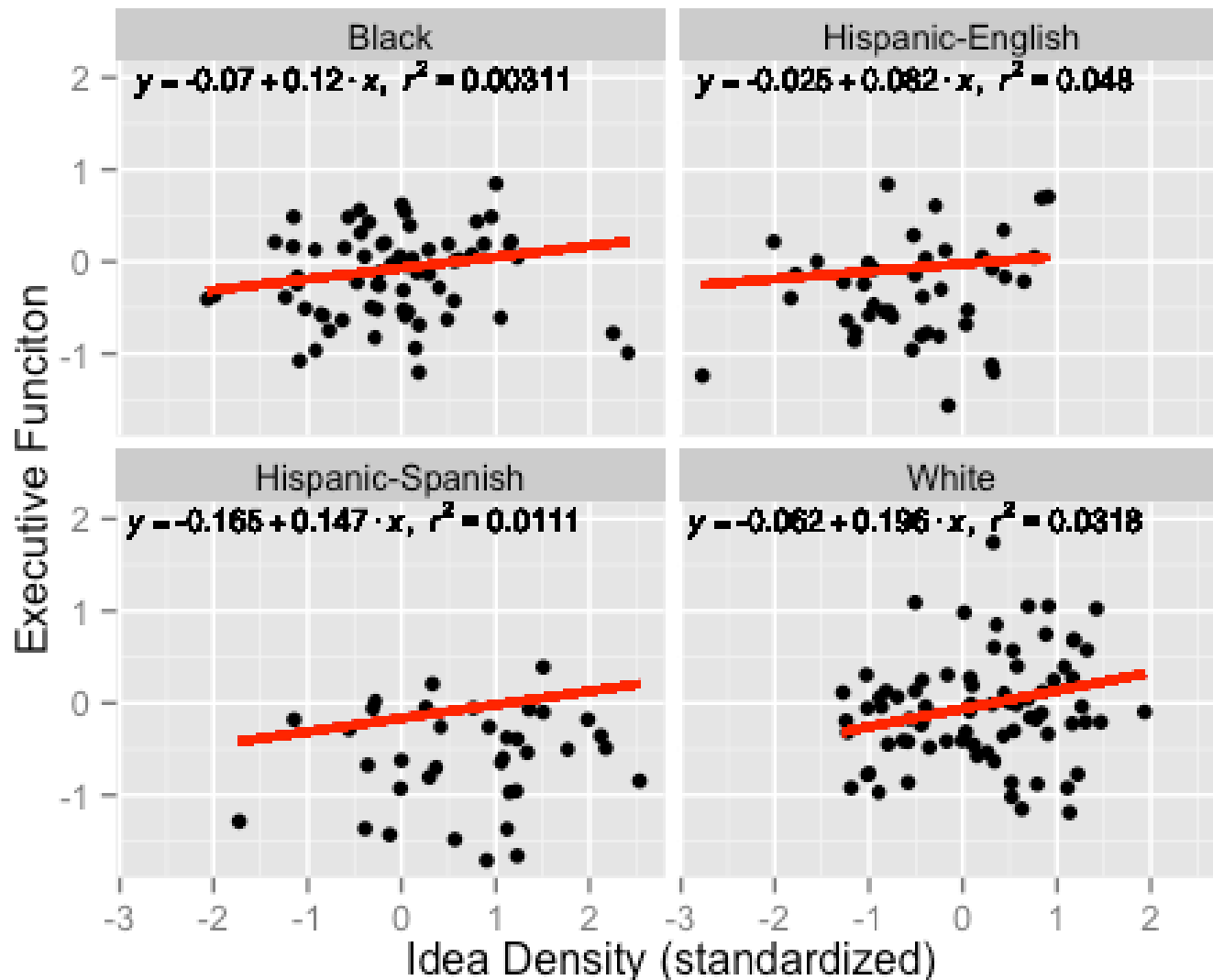
Results: Episodic Intercept by ID



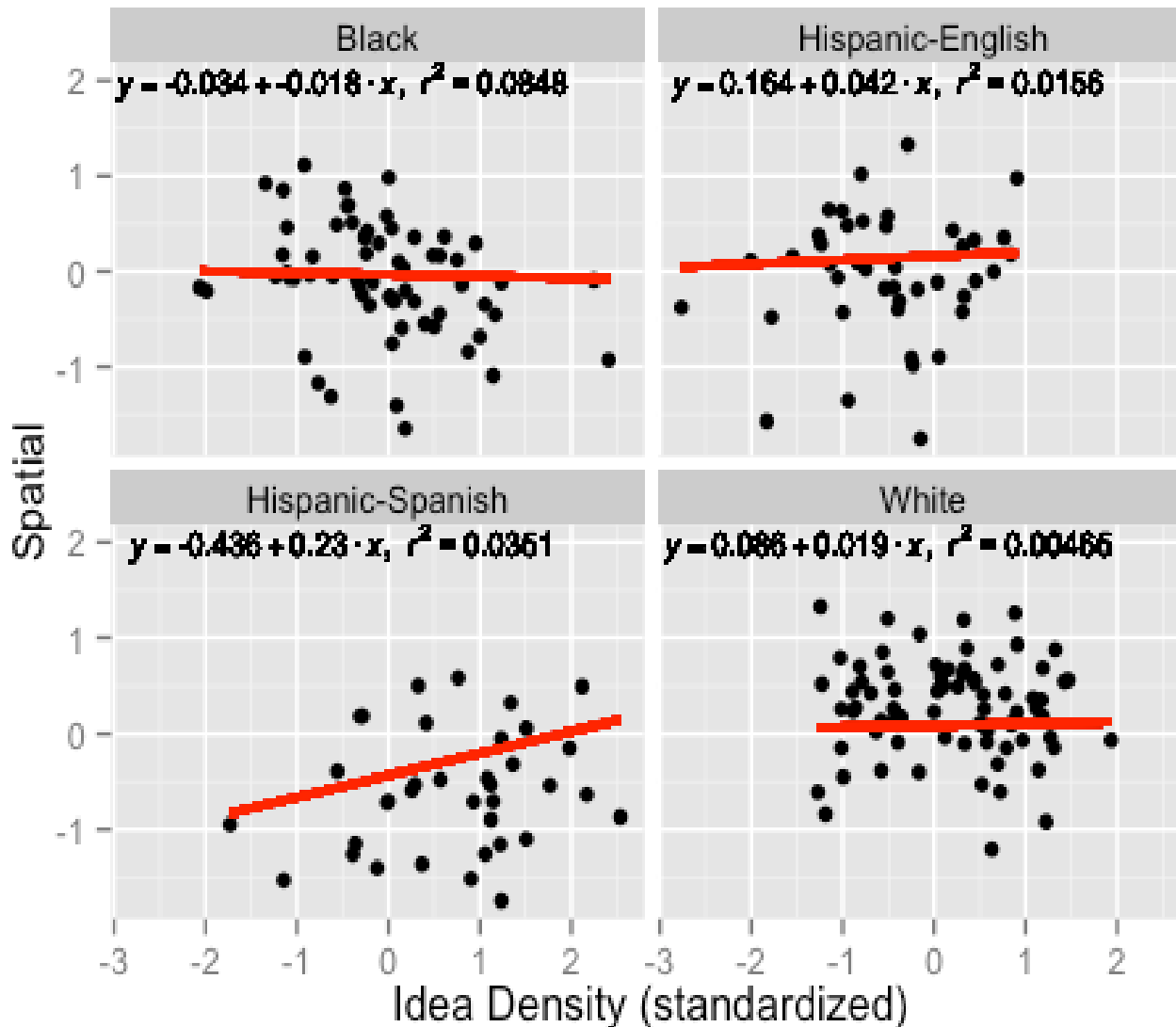
Results: Semantic Intercept ID



Results: Executive Intercept by ID



Results: Spatial Intercept by ID



Summary of Results

- Low ID associated with faster cognitive decline in Whites
 - Not significant in Blacks or Latinos
- Low ID associated with lower intercepts in Spanish speaking Latinos
 - Less robust effects in Whites, Blacks, and English speaking Latinos

Discussion

- ID does not show the same relationship to global cognition or specific cognitive measures across the 4 ethnolinguistic groups
- Language patterns distinguish ID across ethnic groups
- ID analysis relies on linguistic structures to calculate 'ideas'
 - English ethnolects use distinct constructions, rhetorical, prosodic cues to organize and elaborate discourse in narratives

Future Directions

- Clarify ID & ethnolinguistic diversity effects
 - Larger sample
 - More direct identification of dialect use—
Currently indirect, using ethnicity as a proxy
- Additional Avenues
 - Consider dialect-neutral global linguistic measures (e.g. TTR)
 - Multilingual proficiency effect on late life cognition