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# Body Mass Index is Associated with Neuropsychological Performance in College Students

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# Background

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- Obesity in the U.S.
  - Cardiovascular disease
  - Type 2 diabetes
- Obesity and Neuropsychological Function
  - Executive function and memory (Cournot et. al, 2006)
  - Relationship demonstrated independent of age (Gunstad et. al, 2007; Gunstad et. al, 2005)
  - Lack of research with young populations

# Purpose and Hypothesis

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- Purpose: To examine the relationship between BMI and neuropsychological function in college-aged students
- Hypothesis: There will be a significant relationship between BMI and cognitive function
  - Executive function and memory

# Participants and Methods

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- 77 students (44 females)
- Age: 18.98 years (SD=1.10 years)
- Ethnicity:
  - 55% Caucasian
  - 18% Asian American
  - 16% Hispanic
  - 10% African American
  - 1% Other
- 2 Session Assessment
  - Height, weight - BMI (kg/m<sup>2</sup>)
  - Neuropsychological functioning

# Cognitive Domains and Measures

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- Memory (CVLT-II; Spatial Span)
- Executive Function/Mental Flexibility (Trails B; Stroop)
- Verbal Fluency (COWAT; Animal naming)
- Attention (Trails A; Digit Span)
- Psychomotor Speed (Digit Symbol Coding; Symbol Search)

# Statistical Analyses

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- Hierarchical Regression
  - Step 1: BMI and Gender
  - Step 2: BMI by Gender Interaction

# Results

	Executive Functioning		Verbal Fluency		Attention	
	Stroop	Trails B	Animal Naming	COWAT	Digit Span	Trails A
BMI Beta (SE)	-.06 (.23)	.07 (.34)	-.06 (.11)	-.07 (.20)	-.02 (.07)	.17 (.11)

Note: All BMI by gender interaction analyses were non-significant

There were no significant main effects for gender

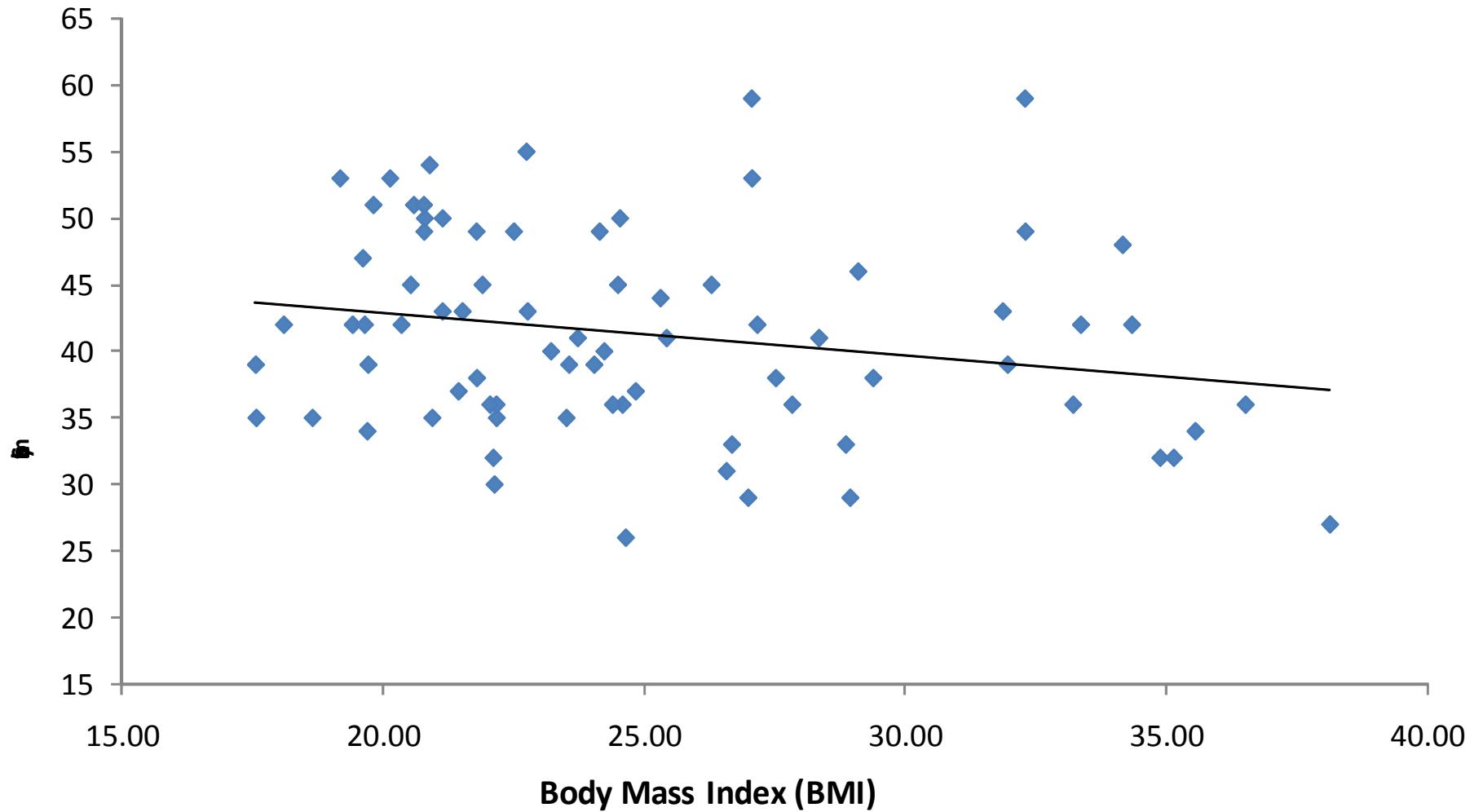
# Results

	Verbal and Visual Memory			Psychomotor Speed	
	CVLT Total	CVLT Delay	Spatial Span	Symbol Search	Digit Symbol Coding
BMI Beta (SE)	-.20 (.17)	-.04 (.06)	-.05 (.06)	-.23* (.16)	-.31** (.33)

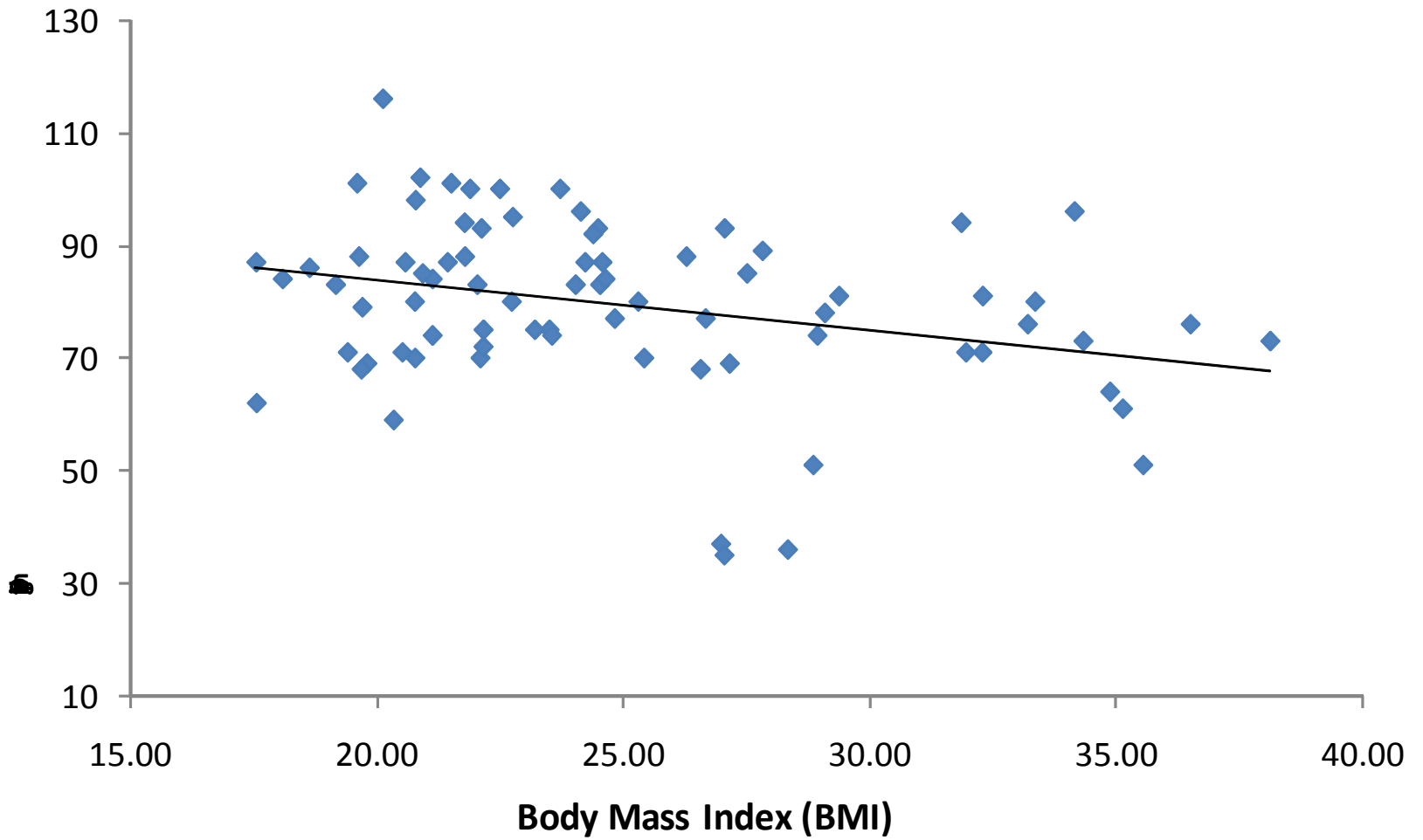
\*  $p < .05$

\*\*  $p < .01$

## Body Mass Index and Symbol Search Performance



## Body Mass Index and Digit Symbol Coding



# Discussion

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- Association between decreased psychomotor speed and elevated BMI
- Decreased psychomotor speed and memory in middle-aged adults (Cournot et. al, 2006)
- Independent of age (Gunstad et. al, 2007)
- Psychomotor speed as an early predictor

# Implications

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- Elevated BMI in a young, educated population
- Research should continue to focus on young populations
  - Children and adolescents
- Treatment and early intervention