

Everyday Cognition and Memory Interventions

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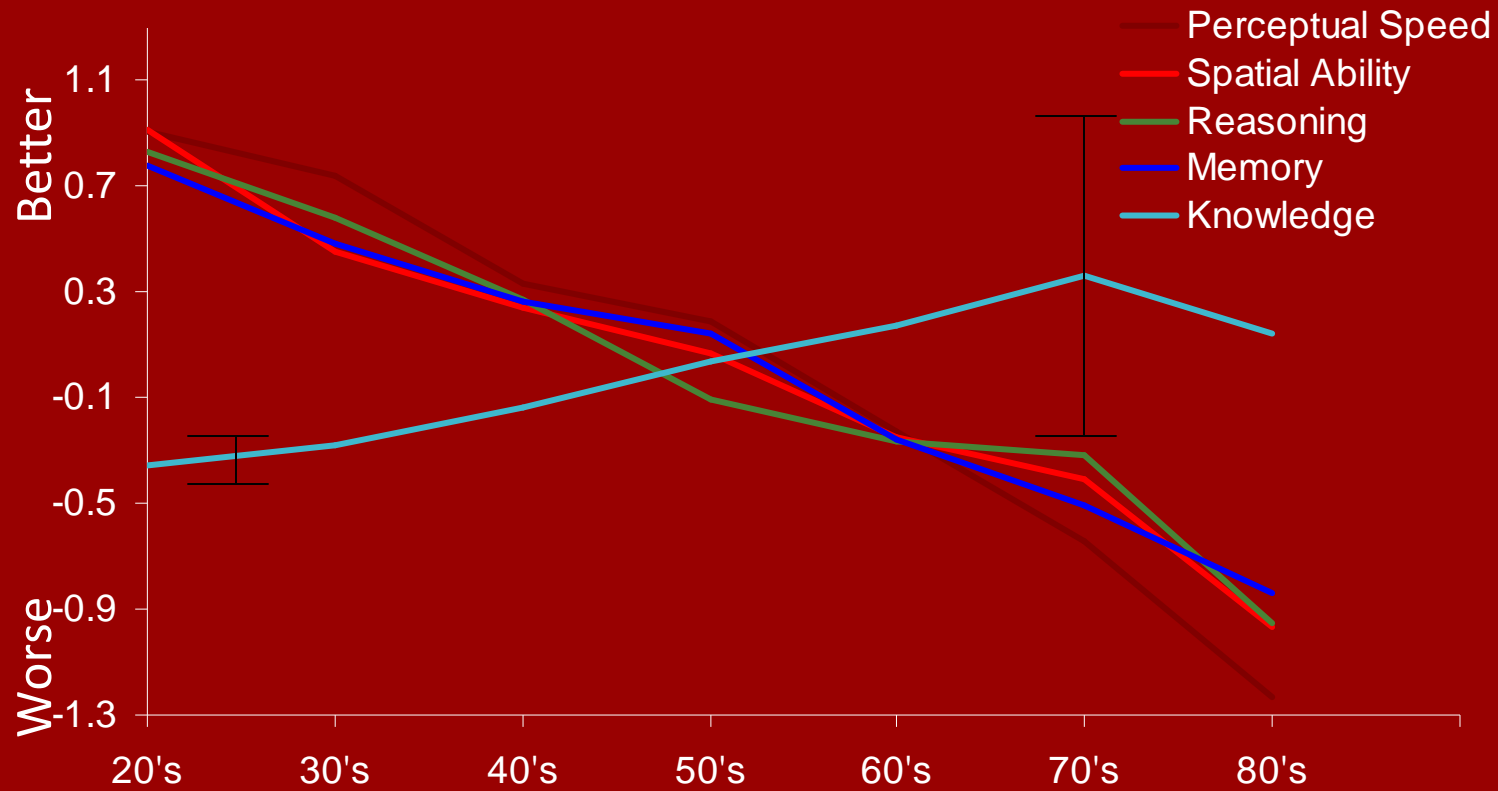
Introduction

- Associate Professor of Psychology NCSU
- Cognitive Aging
 - Everyday cognition
 - Mild cognitive impairment
 - Cognitive interventions
 - Day to day fluctuations
- Brightleaf consultant
 - Marketing and business development for the senior living industry
 - Wellness program evaluation and development

A quick primer on cognitive change

- Fluid ability vs crystallized abilities
- General start of age related change is over 65
- Most abilities start to decline surprisingly early

Changes across the lifespan



Everyday Cognition

- Assess the real-world manifestation of cognitive functioning
 - testing older adults' ability to solve cognitively complex everyday problems
- Application of mental abilities and domain specific knowledge to solving problems that are integrated within instrumental domains of everyday functioning (Allaire & Marsiske, 1999; Willis, 1996)

Assessing Everyday Cognition

- The Everyday Cognition Battery (Allaire & Marsiske, 1999, 2002; Allaire et al., 2010)
- Three tests
 - Reasoning
 - Memory
 - Knowledge
- Three domains
 - Medication
 - Financial Management
 - Food preparation/nutrition

ECB Examples

CHILI BRAND A

Nutrition Facts	
Serving Size 1 cup (236 g)	
Servings Per Container about 2	
Amount Per Serving	
Calories 410	Calories from Fat 270
% Daily Values*	
Total Fat 30g	46%
Saturated Fat 13	61%
Cholest. 75mg	25%
Sodium 950mg	39%
Total Carbohydrate 16g	5%
Dietary Fiber 4g	14%
Sugars 4g	
Protein 20g	
Vitamin A 26%	Vitamin C 0%
Calcium 4%	Iron 18%
* Percent Daily Values are based on a 2,000 calorie diet	

CHILI BRAND B

Nutrition Facts	
Serving Size 1 cup (236 g)	
Servings Per Container about 2	
Amount Per Serving	
Calories 190	Calories from Fat 25
% Daily Values*	
Total Fat 3g	5%
Saturated Fat 1g	5%
Cholest. 75mg	25%
Sodium 1250mg	52%
Total Carbohydrate 17g	6%
Dietary Fiber 3g	12%
Sugars 3g	
Protein 19g	
Vitamin A 25%	Vitamin C 0%
Calcium 3%	Iron 15%
* Percent Daily Values are based on a 2,000 calorie diet	

(12) If she selects **Brand B**, which categories will she get more of?

- (1) fat
- (2) calories
- (3) sodium
- (4) sugar

Everyday Cognition gets Worse as we get Older

- Thornton & Dumke (2005) meta-analysis
 - 33 age comparative studies
 - Older adults performed significantly worse than middle-aged and younger adults
 - Age differences greater for instrumental problems vs. social problems

Outcomes of Everyday Cognition

- Everyday problem solving should assess the skills older adults need to adapt to their everyday context
- If everyday cognition assess cognition in the real-world, then it ought to be strongly related to real-world outcomes

Outcomes of Everyday Cognition

- Everyday cognition was significantly associated with self-reported medication (Gelb et al., 2010)
- Everyday Cognition closely related to self-reported difficulties performing tasks of daily living (Altaire & Marsiske, 2002)

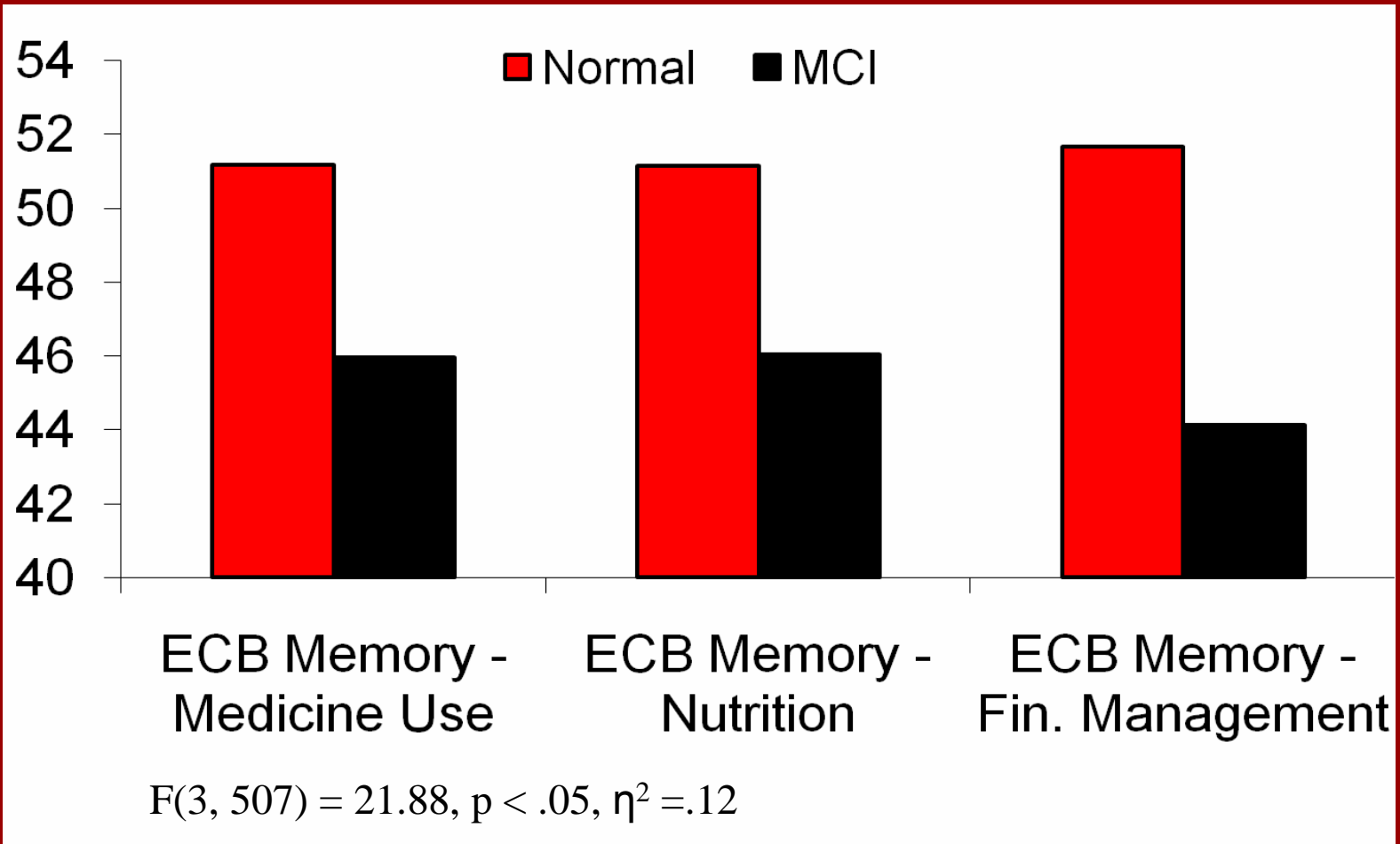
Mortality

- Participants who died since testing performed significantly worse than did still-living participants on the EPT and ECB (Allaire & Willis, 2006; Weatherbee & Allaire, 2008).
 - Everyday knowledge was a significant and unique predictor of death (Weatherbee & Allaire, 2008)
- The ability to solve problems in domains such as medication use, financial management, and nutrition should have significant and unique implications for survival

Mild Cognitive Impairment (MCI)

- Transitional period between normal aging and dementia
 - Impaired on one or more cognitive ability
 - *Maintenance of competency to perform tasks of daily living (ADLS)*
- The prevalence of MCI ranges from 3% to 25% of older adults over 65
 - *Often goes undiagnosed*

MCI and Everyday Cognition

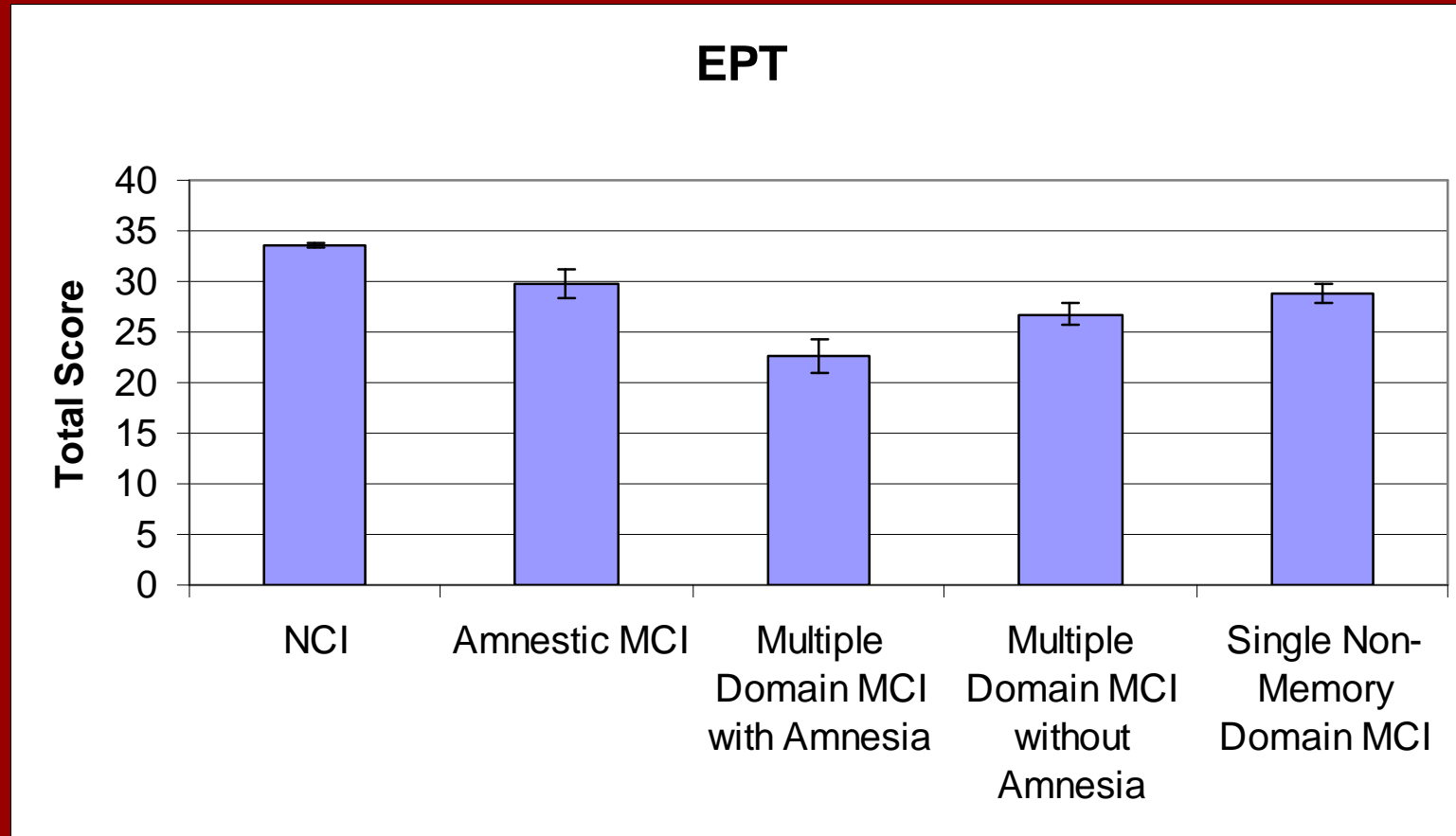


MCI and Everyday Cognition

	Step1		Step 2	
	<i>B</i>	<i>OR</i>	<i>B</i>	<i>OR</i>
ECB Medication Use	-.04	.96*	.00	1.00
ECB Nut./Food Prep.	-.03	.98	-.004	1.00
ECB Finance Management	-.07	.93*	-.04	.96*
SPMSQ			-.05	.96
MMSE			.11	1.12
Reasoning			-.07	.94*
Language			-.10	.91*
Memory			-.05	.95*
Speed			-.04	.96*
Executive Functioning			-.10	.91*

Allaire et al. (2009). *JAGS*.

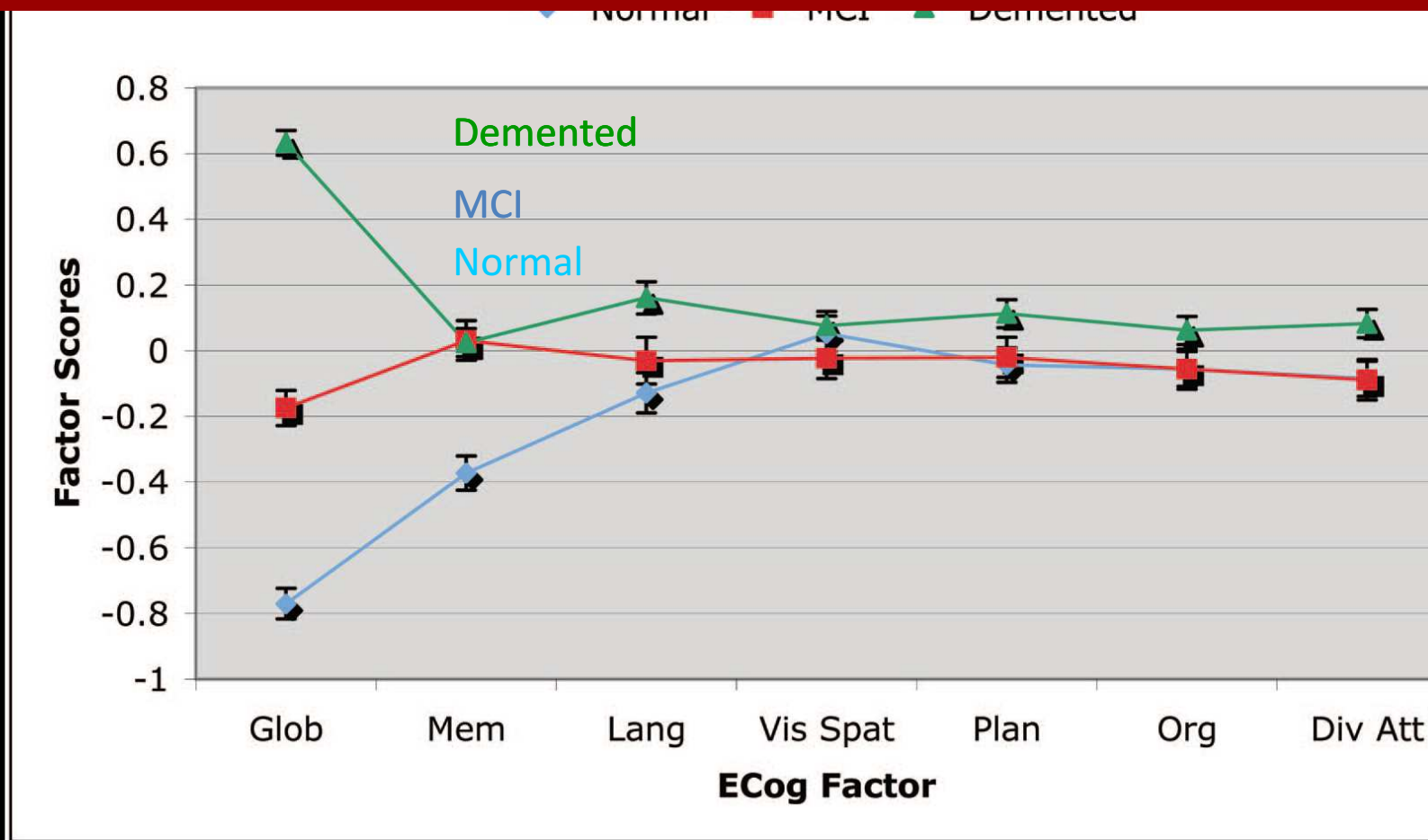
MCI and Everyday Cognition



EPT was also a unique predictor of MCI status

Burton, Strauss, Bunce, Hunter, & Hultsch (2009). *Gerontology*.

MCI and Everyday Cognition



Everyday Cognition: Important Implications

- As people get older they have more difficulty solving cognitively challenging everyday instrumental tasks
- The ability to perform these tasks have clinically meaningful real-world implications
 - Mortality
 - MCI/Dementia

Everyday Cognition: Important Implications

- Older adults with even mild cognitive impairment (*perhaps undiagnosed*) may be having significant troubles
 - Taking medication
 - Handling financial issues
 - Food preparation
 - Proper nutrition

Cognitive Interventions

- Over 30 years of cognitive intervention research
- Primary focus is the development use of skills for a single task
- Memory Example:
 - A list of numbers or words
 - Teach mnemonic techniques (chunking, categorizing, etc)
 - Give a list again and see if they improve

Cognitive Interventions

- Largest intervention in NIH history found (Jobe et al., 2002)
 - Training in a specific ability produces significant gains for that target ability
 - Little to no evidence that improving an ability actually translates to improvements in real-life
 - No transfer

Nonscientific Interventions

- Brain Training Websites
 - Luminosity
 - Play With your Mind
 - Happy Neuron
 - CogFit
- All these sites use Flash games that are based on the principles of traditional interventions
- Brain Agetm and *Brain Age 2: More Training in Minutes a Day!*

Non-traditional Interventions

- National Institute on Aging (NIA) has called for non-traditional approaches to interventions
 - Quilting
 - Exercise
 - Acting class
 - Volunteering (mentoring)
 - **Commercial Video games**

Commercial Video games

- Reaction time – Super Tetris
 - Goldstein, et al., 1997
- Increased field of view – action video game (Grand Theft Auto, Half-life, Counter-Strike, Marvel versus Capcom, Rogue Speare, and Super Mario Kart)
 - Green & Bavelier, 2006a, 2006b, 2007
- Spatial ability - Medal of Honor: Pacific Assault
 - Feng, Spence, & Pratt, 2007
- Mental rotation – puzzle game
 - De Lisi & Wolford, 2002
- Problem solving and inductive reasoning – in-house games
 - Greenfield, et al., 1994; Rosas et al., 2003

Wii Study

- National Science Foundation
 - #0905127, Division of Information & Intelligent Systems
- Dr. Anne McLaughlin, PI

Graduate students -

- Laura Whitlock
- Taryn Patterson
- Amanda Trujillo



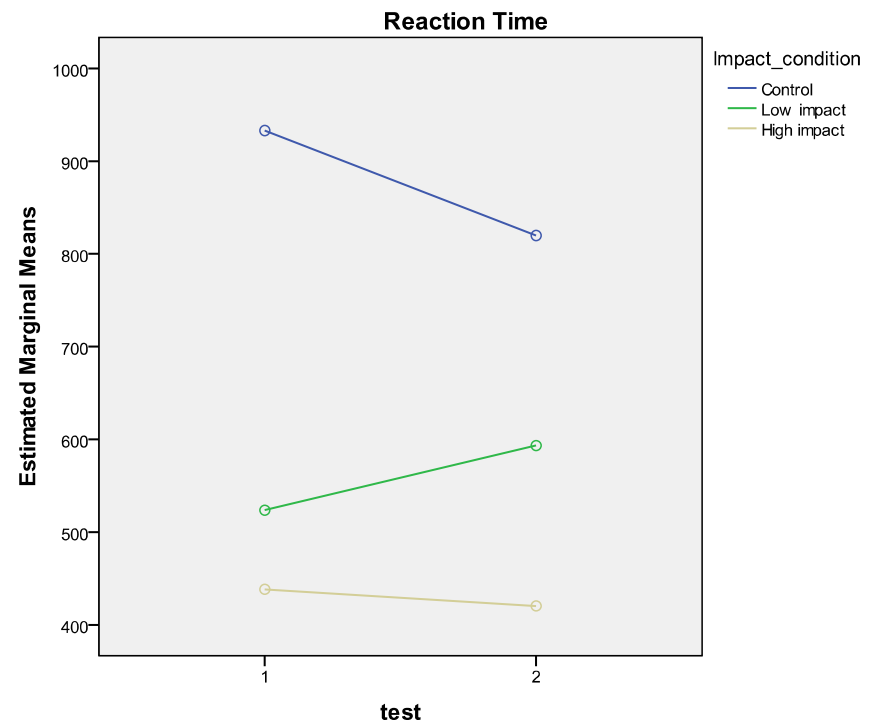
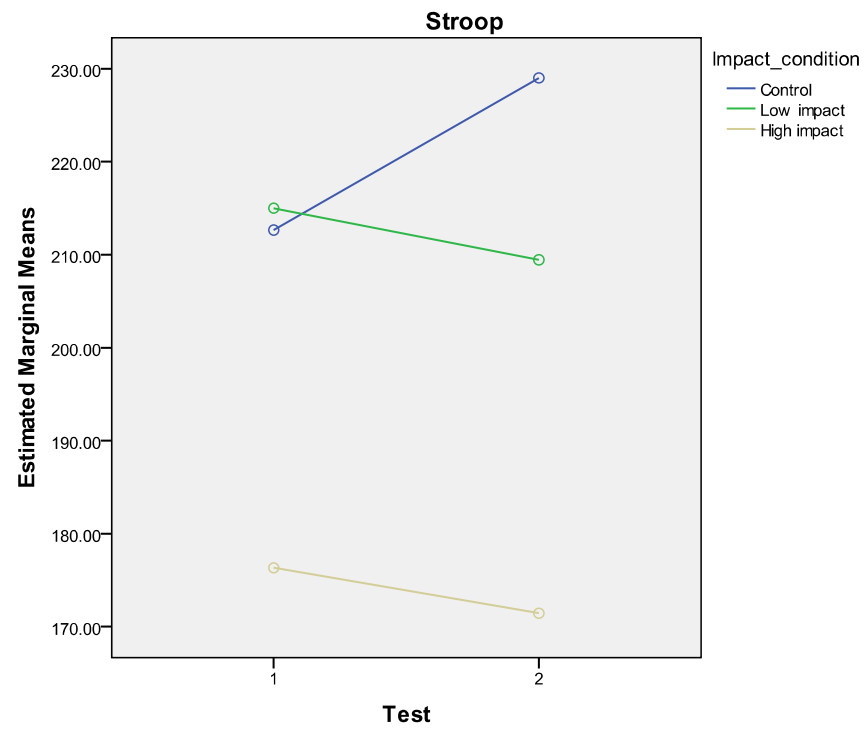
Design of Study

- Groups:
 - Attentional demand
 - Lower
 - Higher
 - Control (no game)
 - Social interaction
 - Alone
 - In a group
- Measures:
 - Pre and post test performance on cognitive tests
 - Performance on transfer tests and tests of everyday cognition

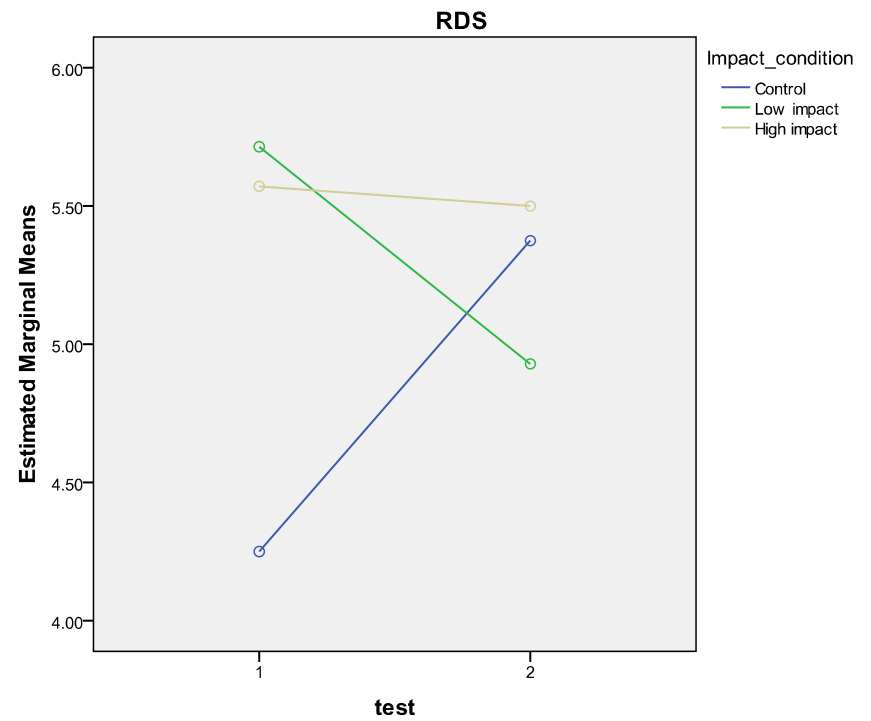
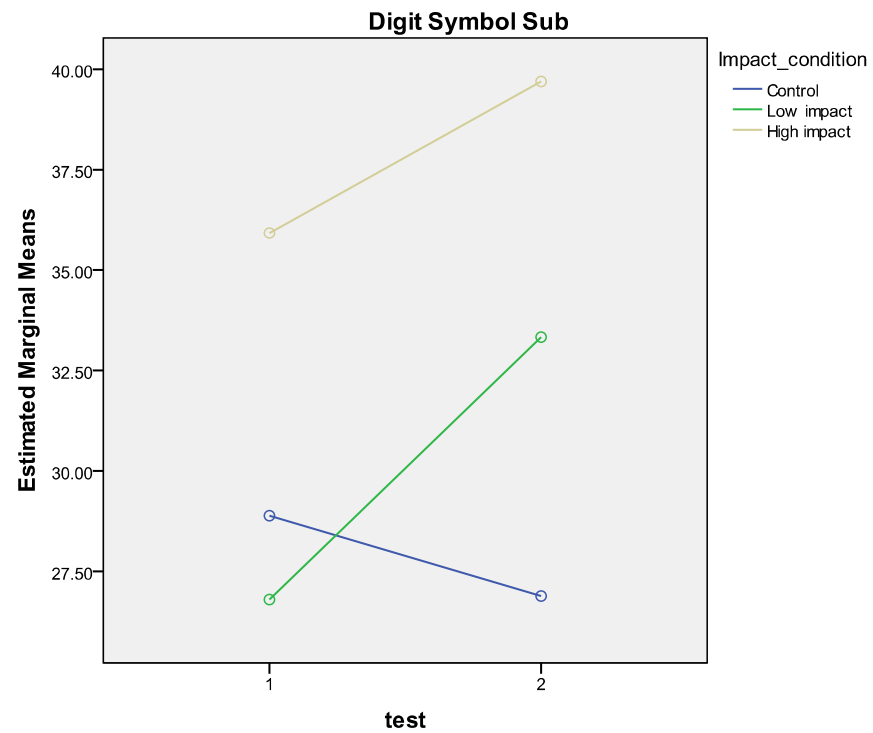
- Game
 - Boom Blox and Boom Blox Bash Party



Training Effects



Training Effects



Additional Work

- Reminisce is a powerful tool for increased long-term memory, increased well-being, and life satisfaction



- FamPhotory
 - Durham based older adult owned small business
 - Digital archiving of photos
 - Recorded reminiscence alongside photos

Conclusions

- Increasing performance on a *test* is not the same as increasing the ability the test assesses
- Increasing an ability is not the same as increasing the ability's use in the real world
- Easy interventions
 - Keep environment mental stimulating
 - Encourage social interaction