Memory Compensation Training and Computerized Cognitive Training in Older Adults

Glenn Smith PhD, ABPP
University of Florida

DISCLOSURES

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  - NIH
  - PCORI
  - State of Florida
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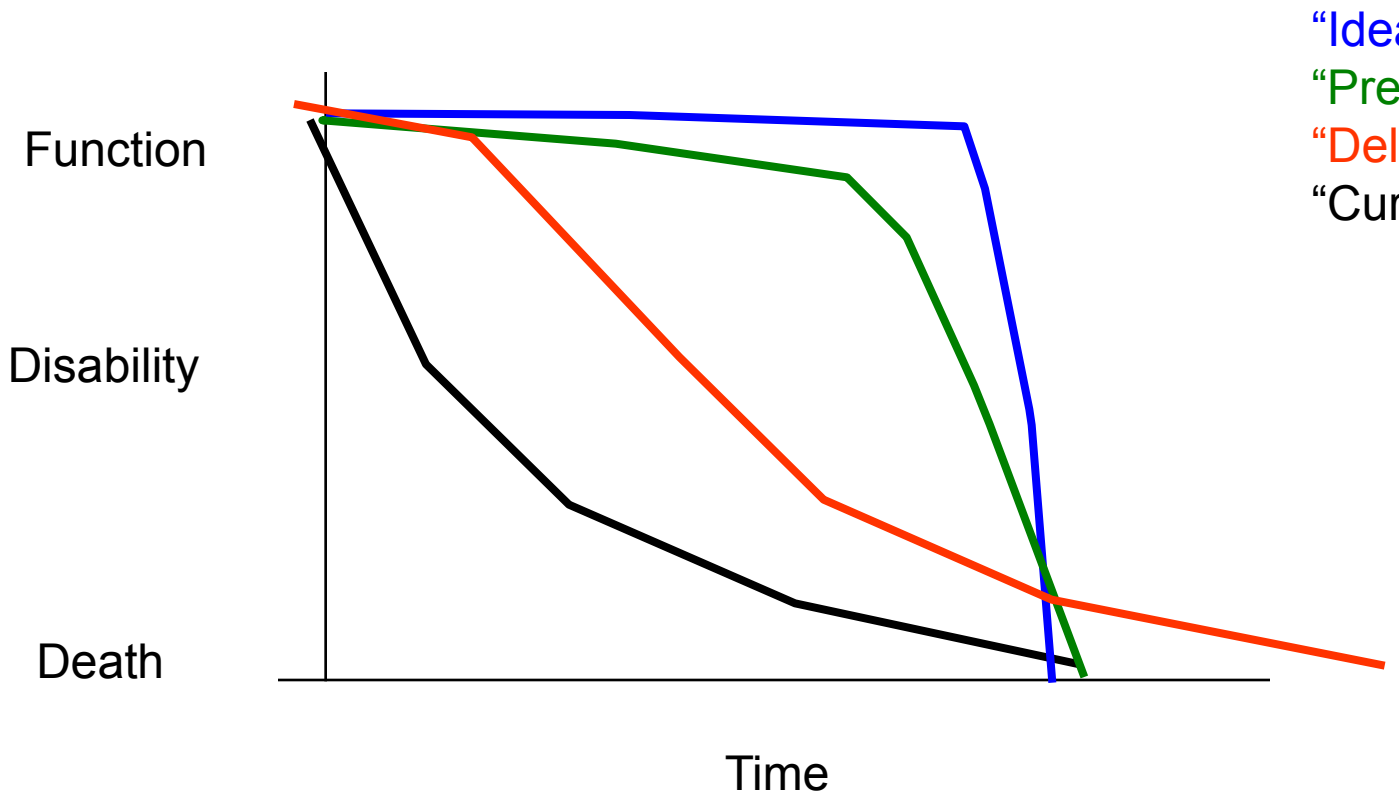
Prevention ?



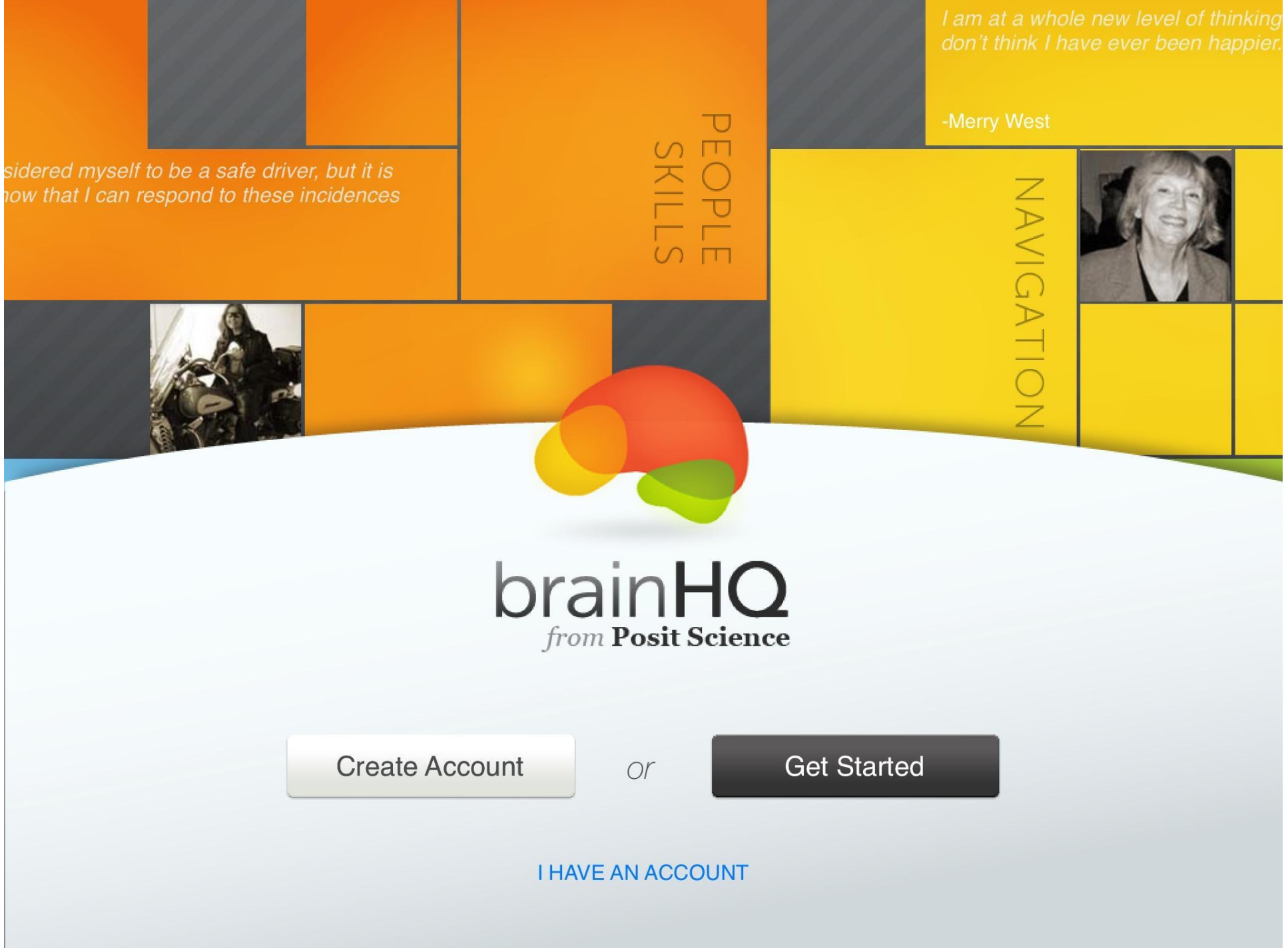
"Ideal"
"Prevention"
"Delay"
"Current Dementia"

Behavioral Interventions in MCI

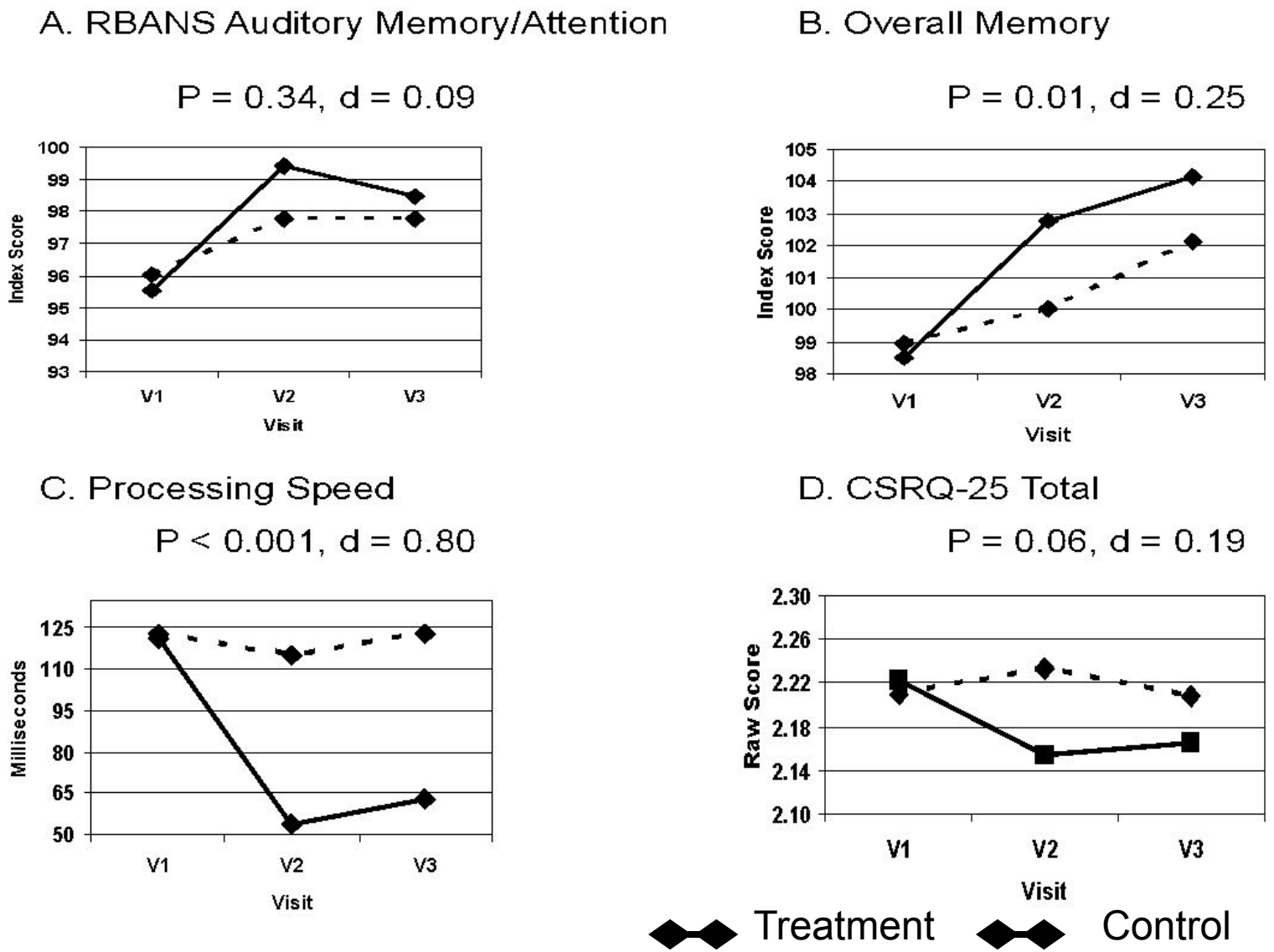
- Cognitive Interventions
  - Cognitive Training
  - Compensatory Training
- Education/Planning
- Mood Management
- Physical Exercise

Cognitive Rehabilitation

- 2 Modes:
  - Restore or improve the cognitive function itself (restitution)
  - Train to adapt to the cognitive difficulty (compensation)


I am at a whole new level of thinking
don't think I have ever been happier.
-Merry West
sidered myself to be a safe driver, but it is
ow that I can respond to these incidences
PEOPLE SKILLS
NAVIGATION
brainHQ
from Posit Science
Create Account
or
Get Started
I HAVE AN ACCOUNT

Improvement in Memory with Plasticity-Based Adaptive Cognitive Training: Results of the 3-Month Follow-Up *Zelinski, Spina, Yaffe, Ruff, Kennison, Mahncke, Smith,* JAGS, 2011



State of the Science in 2019: Four Recent Meta-Analyses

Shao 2015 (N=12) "Computer-Based Cognitive Programs for Improvement of Memory, Processing Speed and Executive Function during Age-Related Cognitive Decline: A Meta-Analysis"	**"**CCP should be recommended as a complementary and alternative therapy for age-related cognitive decline, especially in memory performance and processing speed."
Lampit 2014 (N=52) "Computerized Cognitive Training in Cog Healthy Older Adults: A Systematic Review and Meta-Analysis of Effect Modifiers"	"CCT is modestly effective at improving cognitive performance in healthy older adults, but efficacy varies across cognitive domains and is largely determined by design choices."
Mewborn 2017 (N=97, CCT & non-CCT) "Cognitive Interventions for Cognitively Healthy, Mildly Impaired, and Mixed Samples of Older Adults: A Systematic Review and Meta-Analysis of RCTs"	"Results indicated that cognitive interventions produce a small, but significant, improvement in the cognitive functioning of older adults . Effects were larger for directly trained outcomes but were also significant for non-trained outcomes."
Edwards 2018 (N=17, speed training) "Systematic review and meta-analyses of useful field of view cognitive training"	**"**Training transfers to real-world tasks, including those that are vital to older adults' maintained independence, with significant, lasting effects."

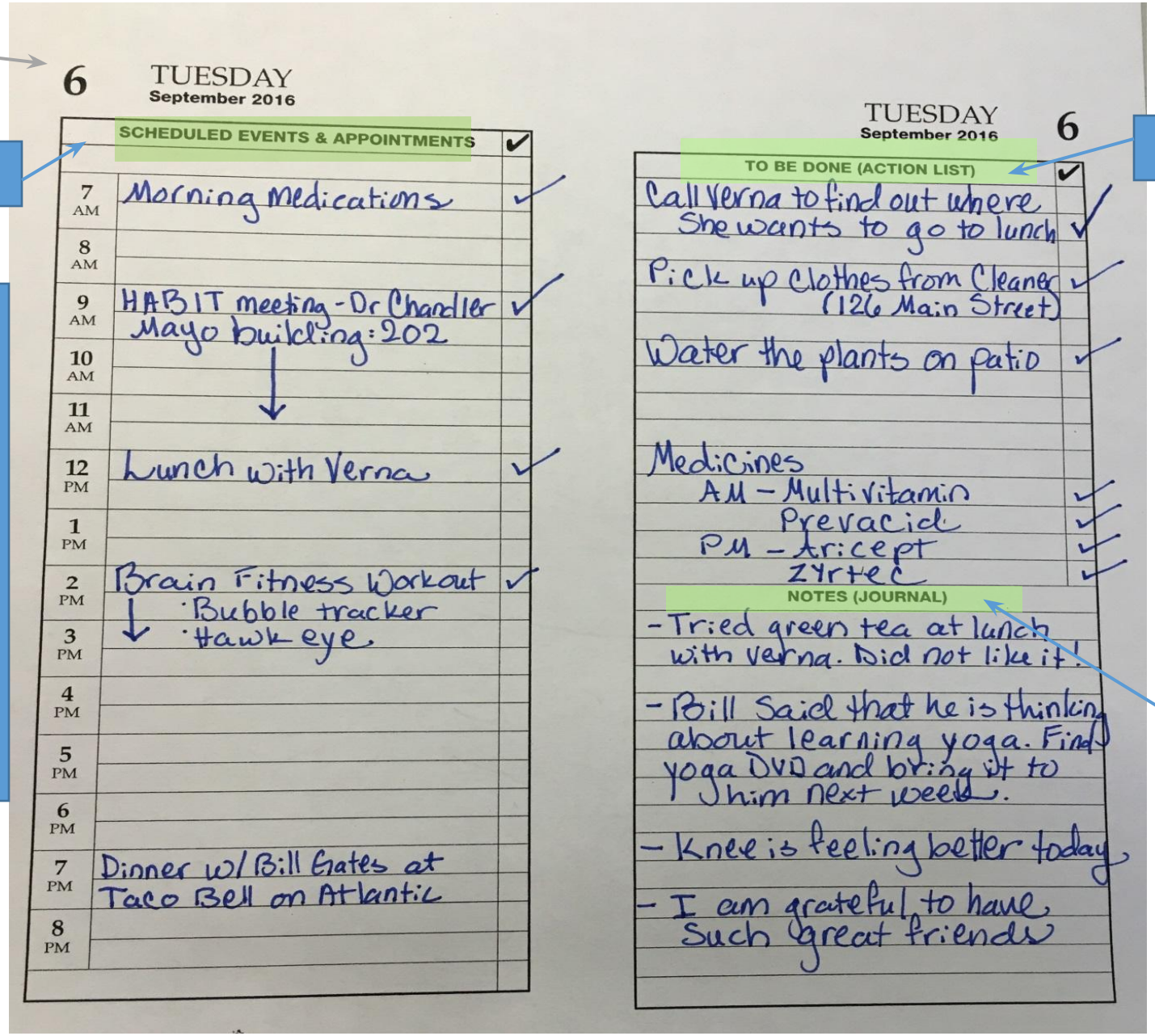
Memory Support System (MSS)

Sohlberg and Mateer, 1988; Greenaway et al, 2008

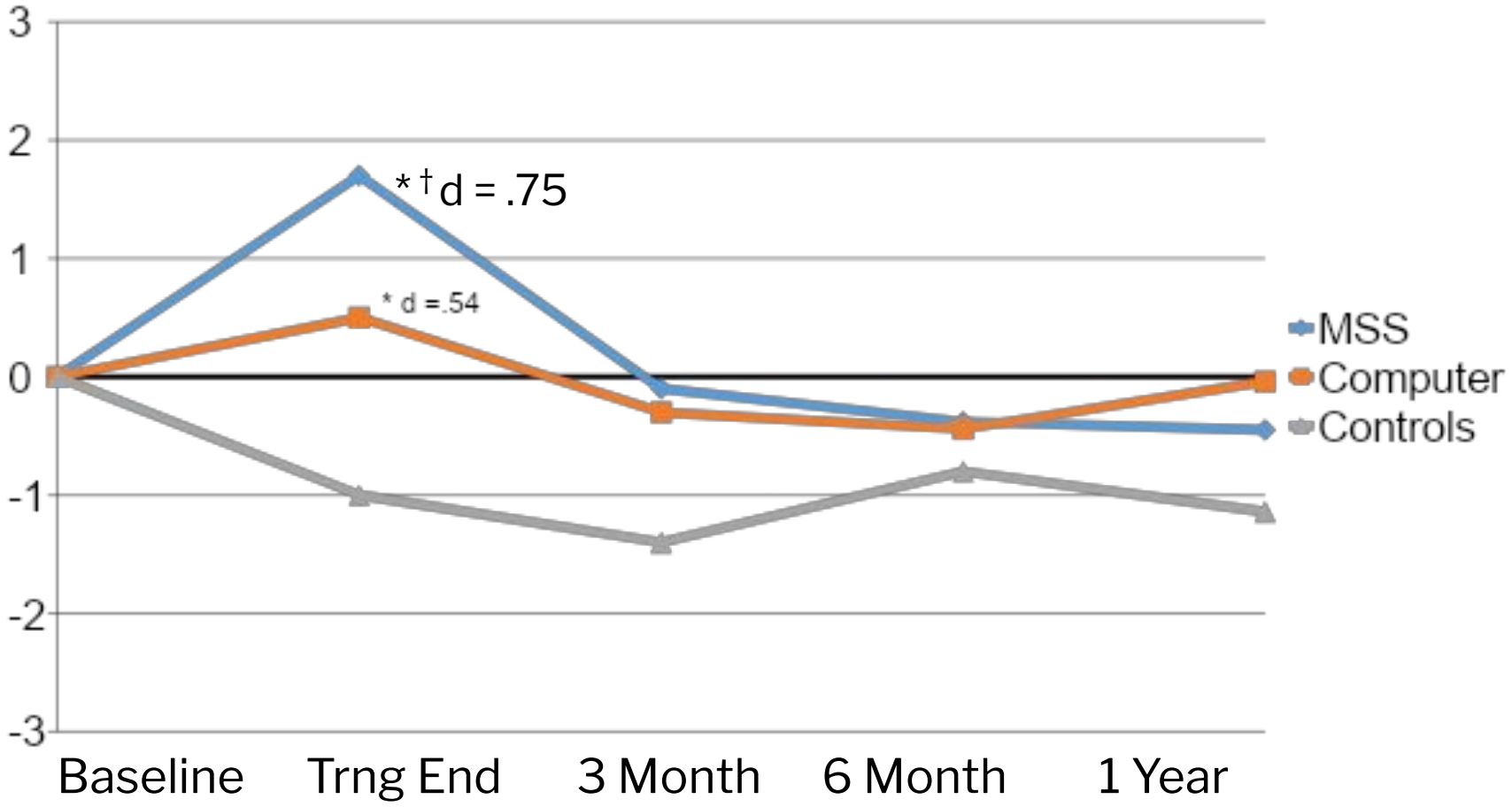
- Training to use a calendar/note taking system to compensate for memory loss

Three sections!

It might be helpful to highlight these sections while training.

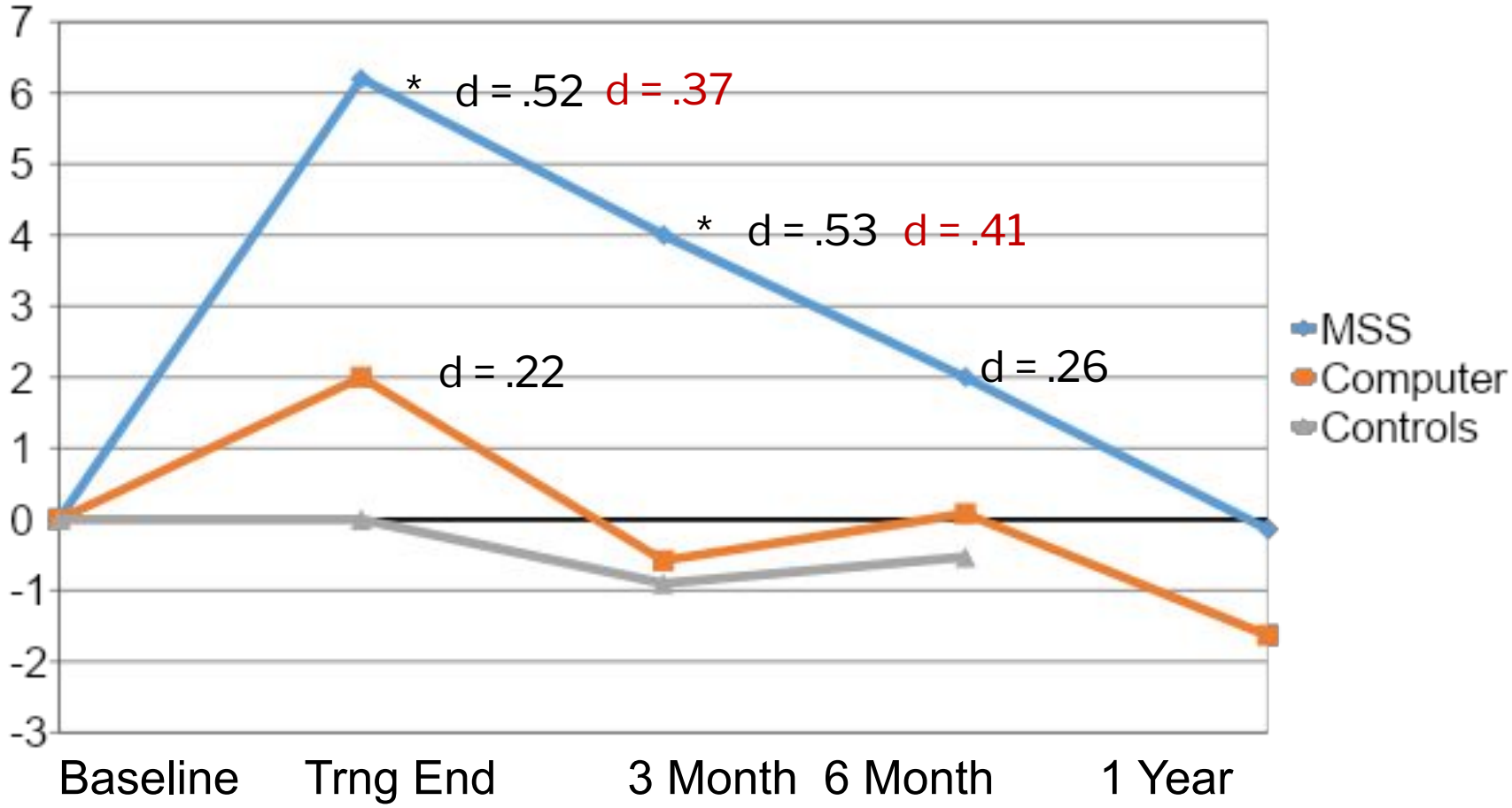


Activities of Daily Living



*Within subject change * p < .05 for both computer and MSS Between subject change † p = .01 for MSS compared to controls Effect sizes are compared to controls*

Self-Efficacy

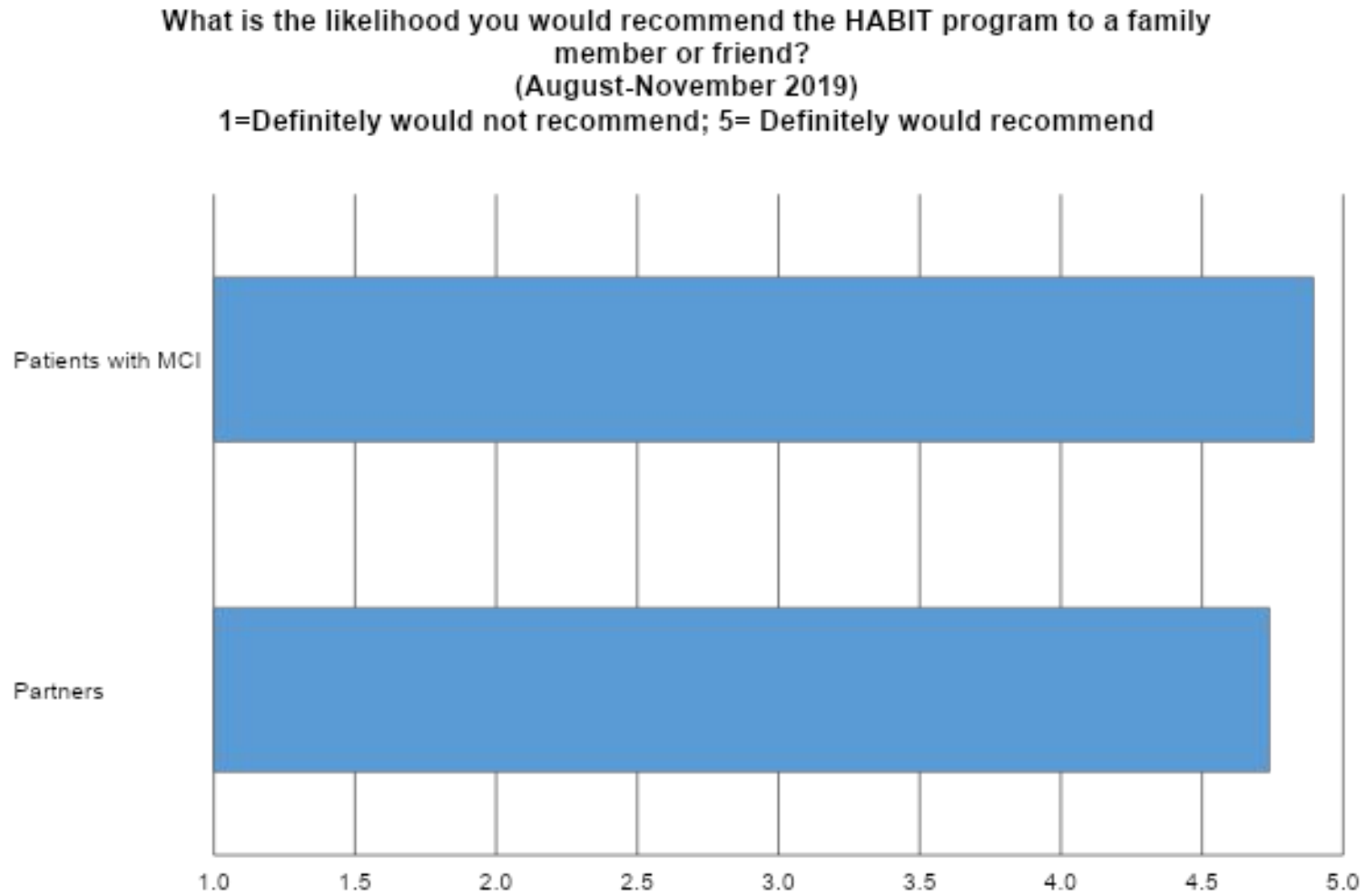


*Within subject change * p < .05*
Effect sizes are compared to controls

HABIT Healthy Action to Benefit Independence & Thinking® Program

- 50 hours (5 components, 1 hour each day x 10 days)
  - Individualized calendar training (compensation training)
  - Computer lab: (cognitive training)
  - Physical activity (Yoga)
  - Separate support groups for participant and partners
  - Wellness education
- Program partner required

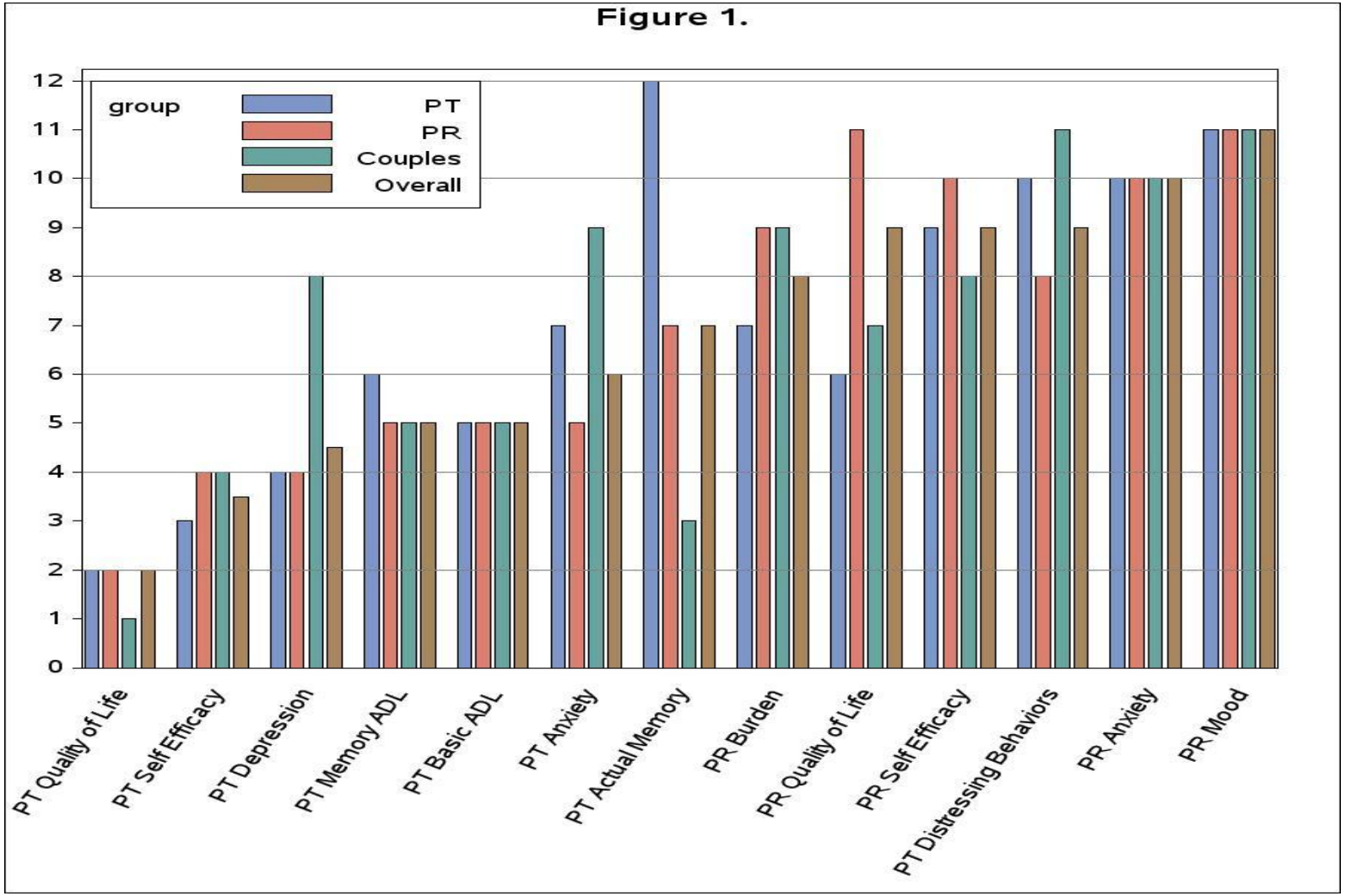
Would they Recommend HABIT?

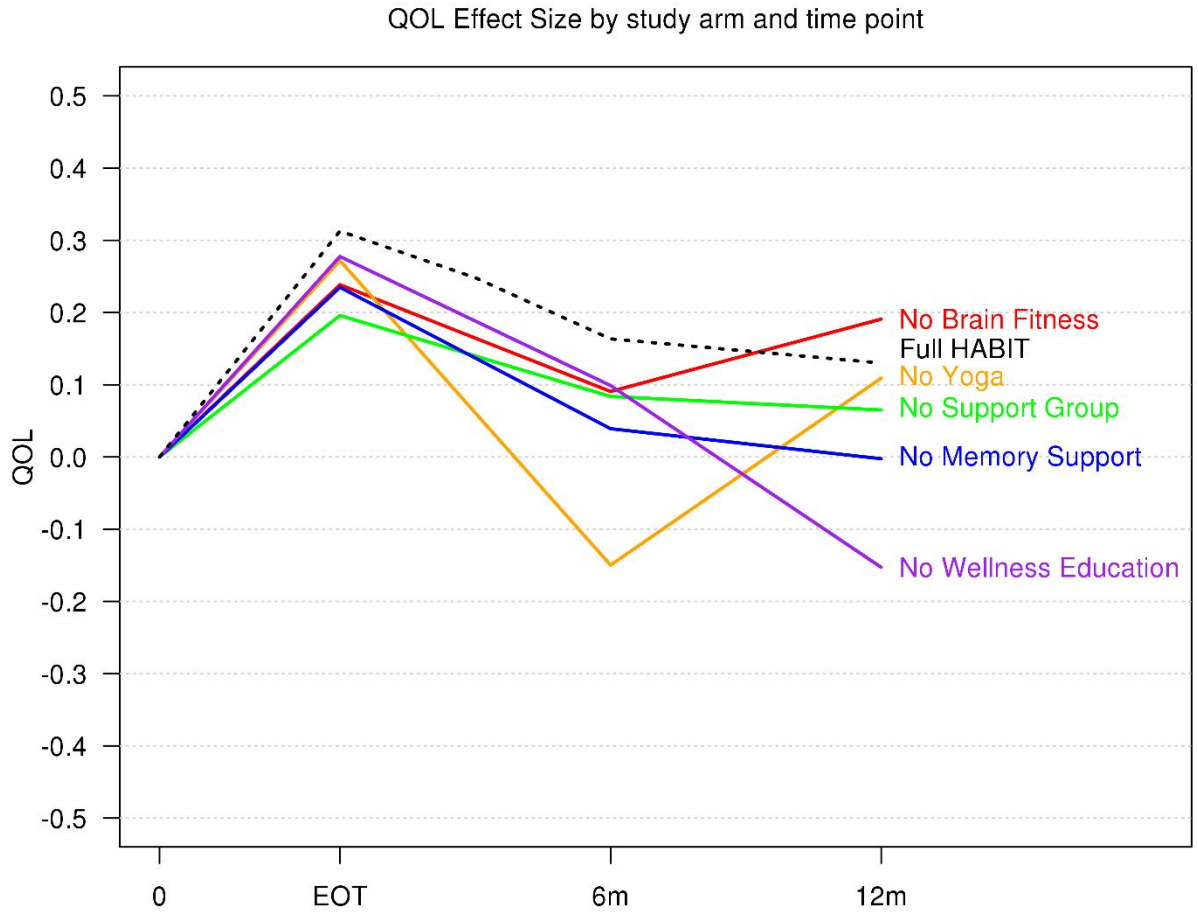


Comparative effectiveness of behavioral interventions to prevent or delay dementia

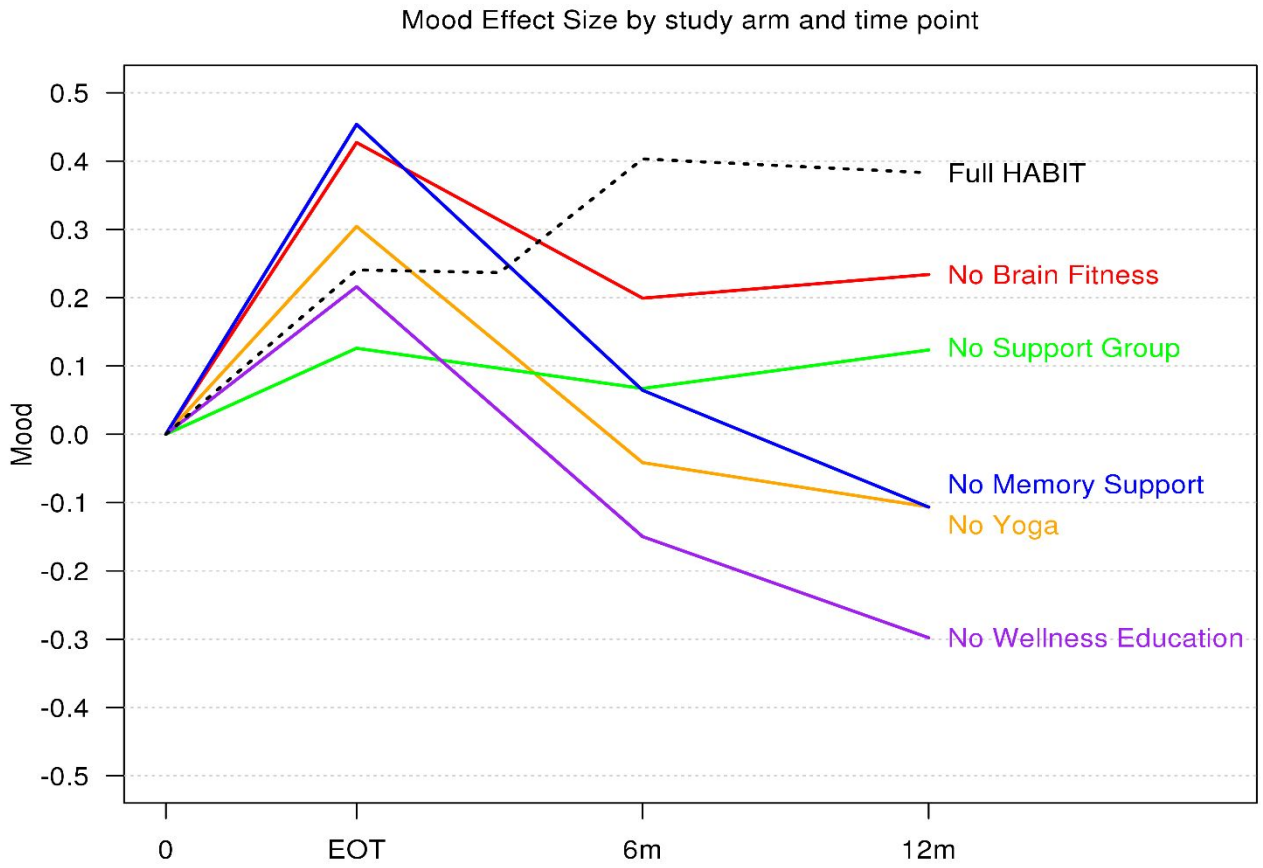
Smith, G., Chandler, M., Locke, D. E., Fields, J., Phatak, V., Crook, J., ... & Hughes, C. A. (2017). Behavioral Interventions to Prevent or Delay Dementia: Protocol for a Randomized Comparative Effectiveness Study. *JMIR research protocols*, *6*(11).

Rankings of Priority of HABIT Outcomes

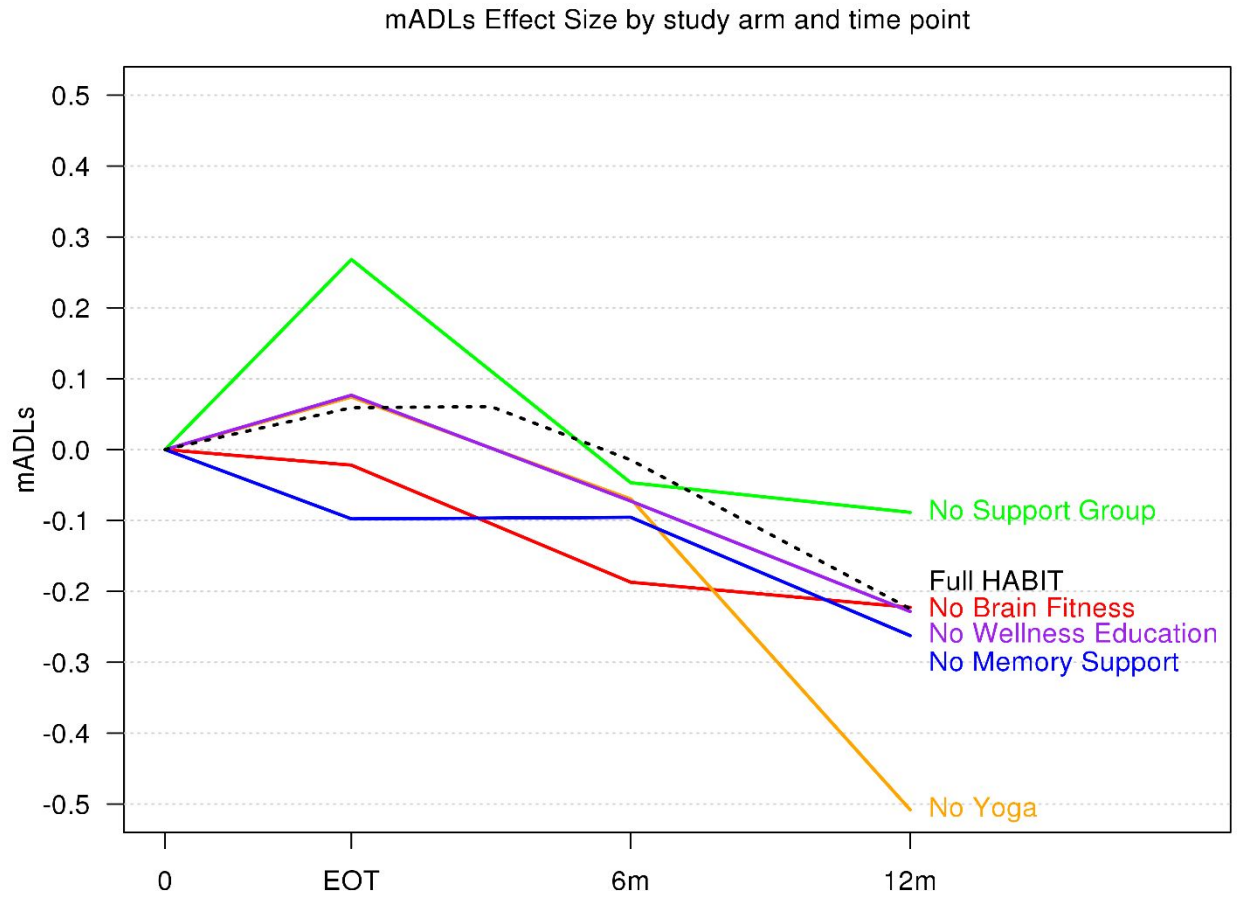




- All groups improved by end of treatment ($p < .05$)
- Wellness education was significantly more important to QOL than BF at 12 months ($p = .02$, Effect Size = .34)

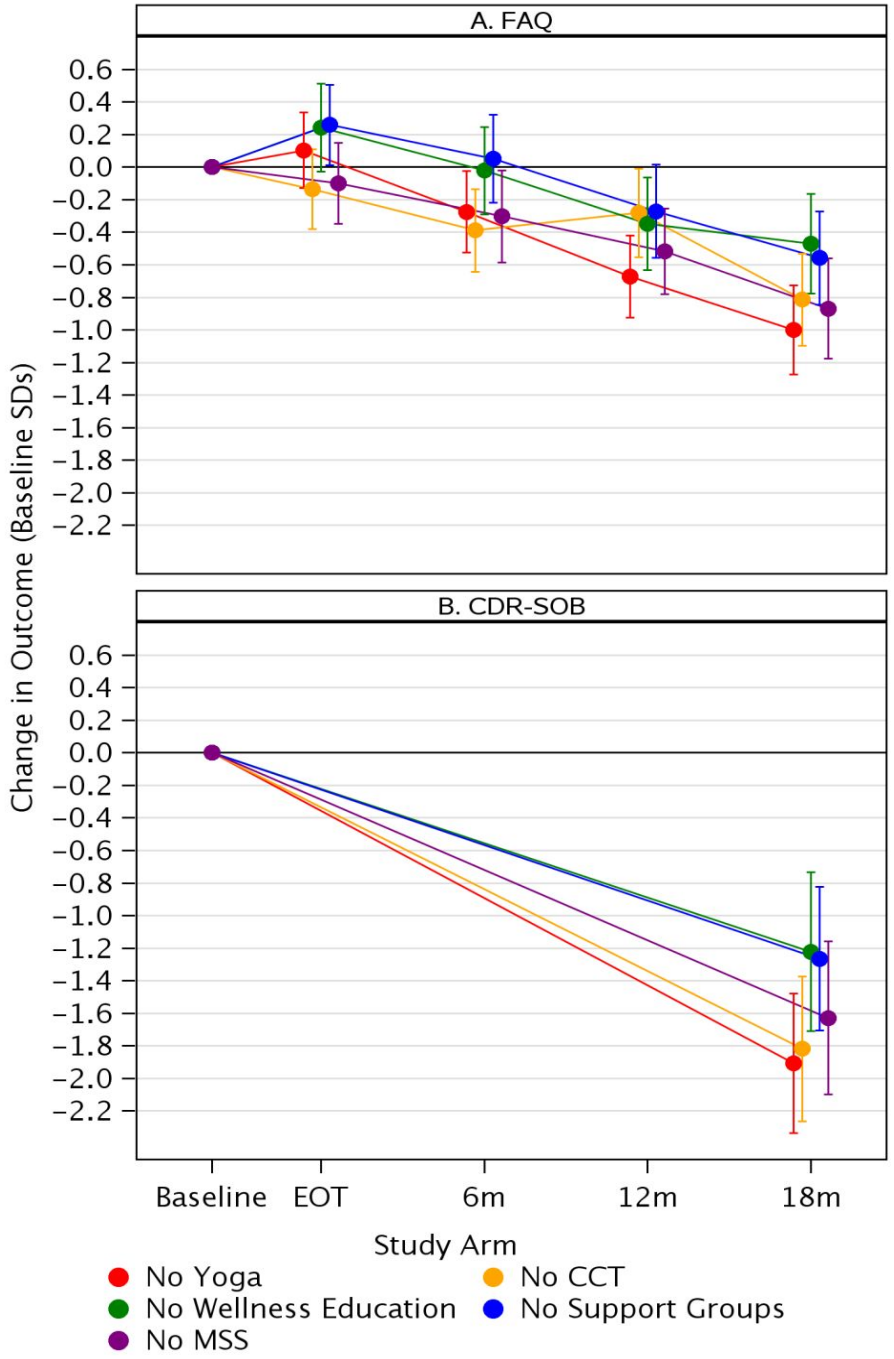


- Arms with no BF, no MSS training, and no yoga had significant improvement by end of treatment ($p < .05$)
- At 12-months wellness education (effect size = 0.53, $p = .001$), yoga (effect size = 0.34, $p = .035$), and MSS calendar training (effect size = 0.34, $p = .04$) all had significantly more positive impact on mood than BF.

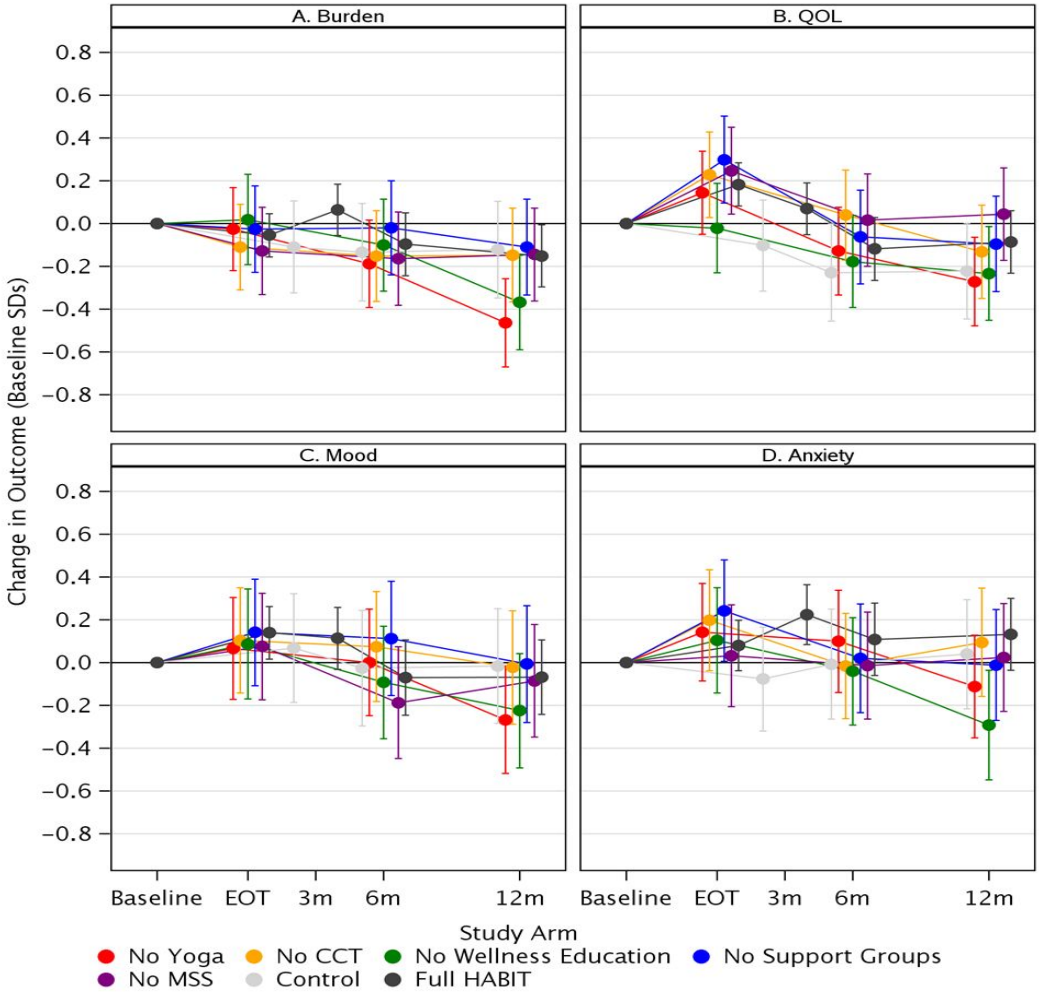


- Only no support group had significant improvement by EOT ($p < .05$)
- All groups had significantly worse mADLS by 12 mos except no support group
- Lack of yoga was particularly detrimental to mADLS by 12 mos

Functional activities questionnaire and CDR Sum of boxes at 18m



12-month Partner Outcomes

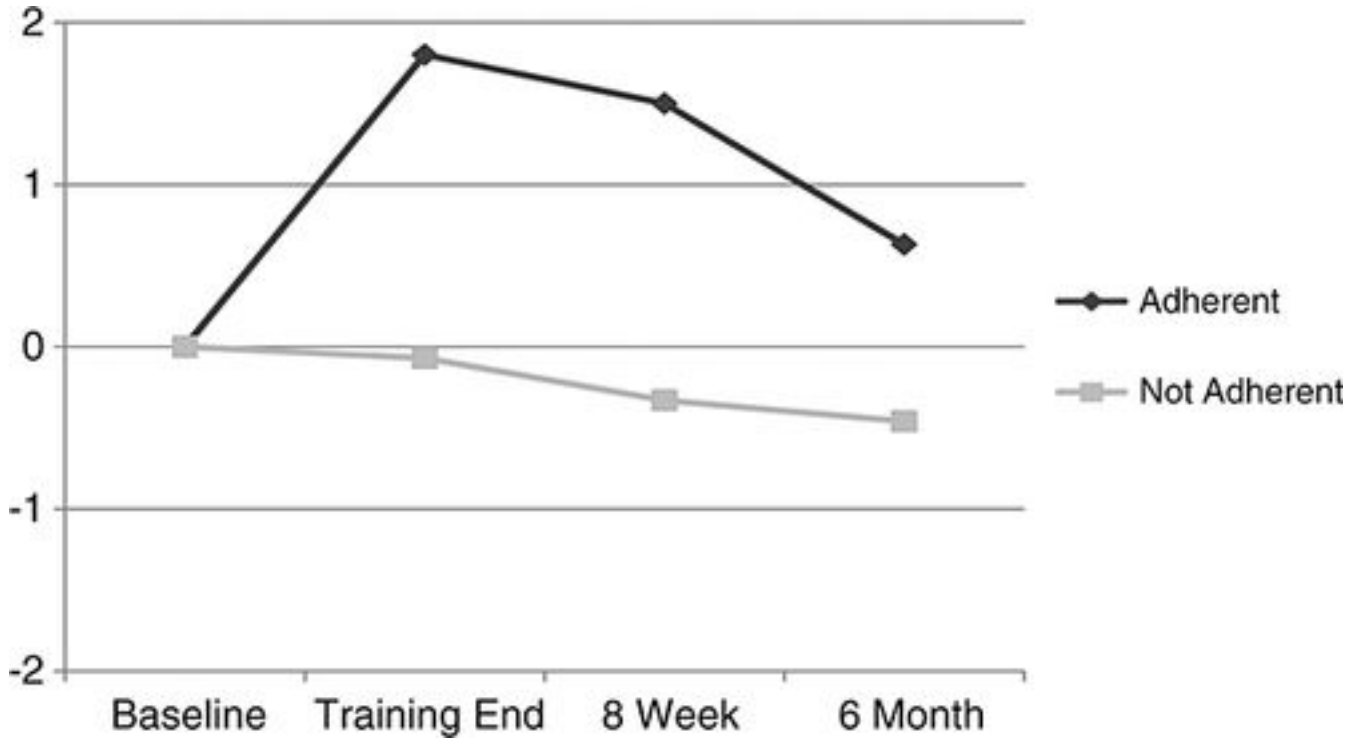


- Absence of wellness associated with more anxiety (P=.007; Effect Size = -.42)
- Absence of yoga associated with more burden (P=.014; Effect Size = -.31)

Adherence Challenges

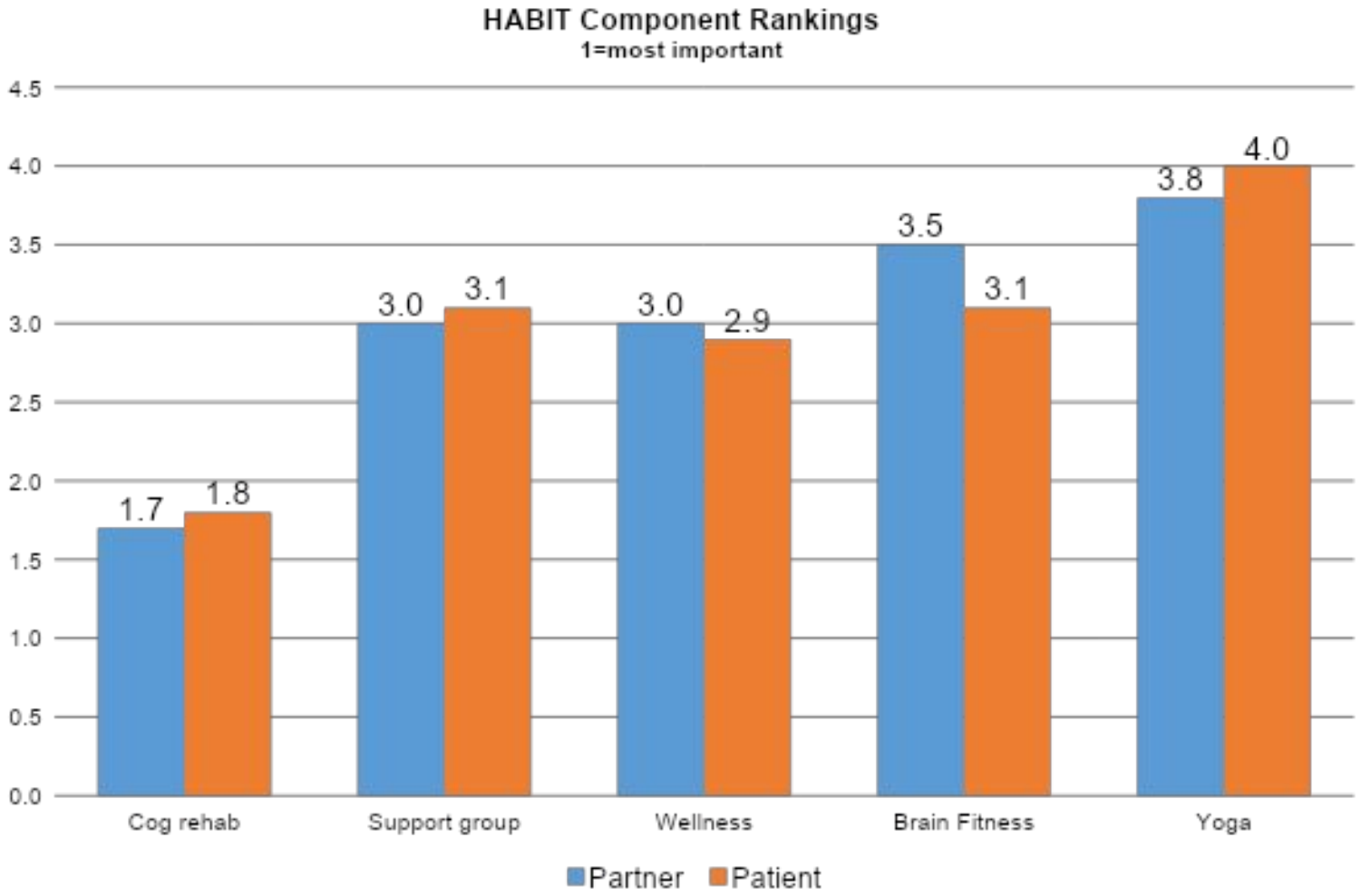
Intervention	12 month adherence Full / Partial / Not
Physical Exercise	65 / 21 / 14
Cognitive Activity	35 / 40 / 25
Memory Compensation	17 / 53 / 30
Patient Support Group	20 / 25 / 55
Partner Support Group	22 / 27 / 51

The memory support system for mild cognitive impairment: randomized trial of a cognitive rehabilitation intervention



Greenway, Duncan and Smith (2012). International Journal of Geriatric Psychiatry, Volume: 28, Issue: 4, Pages: 402-409, DOI: (10.1002/gps.3838)

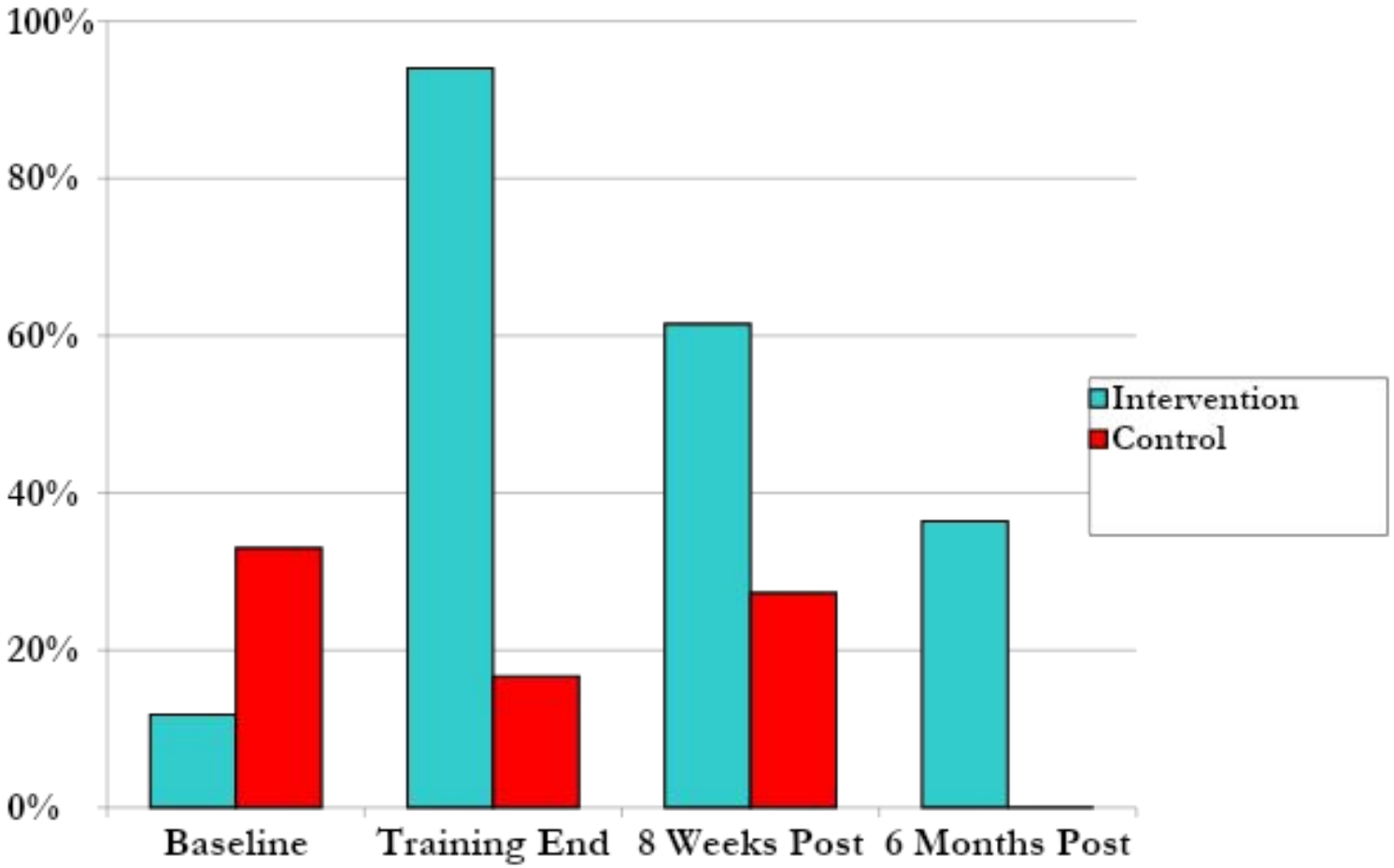
Ranking of importance of the components



HABIT future directions

- Additional outcome analysis:
  - Cognitive outcomes (cogstate, DRS)
  - Functional measures (Ecog, CDR, FAQ)
  - Physical measures (SPPB)
  - fMRI measures (Drs. Smith & Chandler ongoing trial)
- Effects sizes are modest. Would this improve with improved adherence post-HABIT?
- HABIT Registry
- Expansion to other sites
- Consider inclusion of other outcome targets (e.g., aggressive blood pressure control given NAS report)
- Consider inclusion of additional interventions
  - Smart phone MSS
  - Aerobic exercise options
- Cultural and linguistic adaptations
- Adaptations for SES
- Evaluate if the impact varies across etiology (AD vs. non-AD)
- Evaluation of brain basis for outcomes

Making the Recommendation Isn't Enough



Greenaway et al., Int J Geriatr Psychiatry, 2012

SUMMARY

- Computerized training can improve aspects of cognition, not really memory
- Memory compensation training can have positive effects on function
- Both are probably best deployed in the context of multi-component life-style interventions that also include wellness education and physical exercise
- Most people require a program to launch these behaviors, they are hard to start and hard to maintain on your own.

Thank you to the HABIT-PCORI-PEACEOFMND Teams

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