MODERATE AND FAR TRANSFER EFFECTS OF WORKING MEMORY TRAINING IN THOSE WITH ALCOHOL USE DISORDERS: A PRELIMINARY ANALYSIS

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INTRODUCTION

- Alcohol use disorders (AUDs) are associated with reduced executive working memory capacity (eWMC), poor inhibitory control (Finn, 2002).
- The role of these functions in AUDs and a wide range of other clinical problems has driven recent inquiries into the development of procedures to improve eWMC and related executive functions (Au et al., 2015; Chein & Morrison, 2010; Rabipour & Raz, 2012).
- Studies suggest such approaches may even improve symptoms related to low eWMC, such as poor attentional control in ADHD (Klingberg et al., 2005; 2002).
- WM training studies have been hindered by a lack of appropriate control groups, questionable training models, and narrow/inappropriate outcome measures.
- Recent work from our group suggests working memory training leads to improved scores on measures of eWMC similar to those trained on (near-transfer) in those with AUDs (Gunn, Gerst, Redick, Finn, in prep).
- Evidence of transfer to other executive functions (far-transfer) is sparse and inconsistent (Shipstead, Redick, & Engle, 2012)

Current Study: We sought to further examine transfer effects within a previously successful methodologically rigorous and adaptive WM training protocol (Gunn et al., in prep; Harrison et al, 2013) in those with AUDs. The present study examines whether WM training leads to improvements on other measures of executive functioning (moderate & far-transfer).

METHODS

Methods & Procedure
- This study implements a WM training program for individuals with AUDs that utilizes two adaptive complex dual-span WM tasks for active training (AT) and two Visual Search (VS) tasks for control training (Harrison et al., 2013).
- Participants completed comprehensive baseline and follow-up assessments of eWMC, and 15 training sessions.

Materials
- SSAGA-IV interview (Semi-Structured Assessment for the Genetics of Alcoholism: COGA, 2005) to assess group criteria
- Active WM Training: Operation Span (OSpan) and Symmetry Span (SSpan) tasks
- Visual Search (Control) Training: Visual Search Letters and Hands (Harrison et al., 2013)

RESULTS

Baseline Comparisons
- Separate ANOVAs found no differences of baseline transfer measures between groups or conditions.

Moderate Transfer
- Linear mixed models revealed significant transfer in one moderate transfer measures, RSS, at follow-up 1 (B=6.15; 95%CI=[1.46, 10.84]; p<0.01).
- This effect was no longer significant at follow-up 2.

Both training programs:
- 15 total training sessions
- Adaptive
- Monetary Incentives
- Increasing span as improve

Far Transfer
- Linear mixed models revealed significant transfer in one far transfer measure (Spatial Stroop) at follow-up 1 (B=0.07; 95%CI=[0.02, 0.12]; p<0.005).
- This effect was no longer significant at follow-up 2.

Far Transfer Effect: Spatial Stroop
- Moderate Transfer Effect: Running Spatial Span

CONCLUSION

- Results suggest individuals with AUDs improve on tasks designed to improve eWMC and that these effects transferred to moderate (RSS) and far (spatial stroop) transfer measures.
- These results support our hypothesis that those who completed the active WM training also showed improved eWMC and attentional control.
- Future studies should examine predictors of far transfer effects, such as individual cognitive, personality, and symptom level variables.

References