**Intermittent Theta Burst Stimulation of the Dorsal Attention Network**

**Cerebellar Node Improves Selective and Sustained Attention**

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### Introduction

- Dorsal attention network (DAN) is a core cortical network supporting selective & sustained attention
- Transcranial magnetic stimulation (TMS) of select cortical nodes of DAN can impact attention\(^1\)
- Little known about how whole-network modulation of DAN impacts attention
- TMS of the cerebellum can upregulate whole-network DAN functional connectivity\(^2\)
- Using this cerebellar network TMS approach, we hypothesized increasing DAN functional connectivity would improve selective and sustained attention

### Method

1. **Gradual onset continuous performance task (gradCPT):**
   - Stimulation Targets: 1) midline cerebellar node of the DAN and 2) right cerebellar node of the default mode network (DMN) as control
   - Targets identified using resting functional connectivity with cortical network seeds in each individual subject
   - Brainstim stereotactic localization system used for targeting

2. **Attentional Blink:**
   - **Stimulation Targets:**
     - N7 L 3 B
     - T1 T2

#### GradCPT Results

- **Commission Errors in-the-zone**
  - DAN: \(t(13) = 2.28, p = .04\)
  - Interaction: \(F(1, 13) = 6.86, p = .02\)

#### Attentional Blink Results

- **Second Target Errors**

### Conclusions

- Temporarily increasing functional connectivity in the DAN via cerebellar stimulation can enhance selective and sustained attention

### References


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**Cerebellar DMN Site**

**Cerebellar DAN Site**