

Eye-Tracking Biomarkers for Objective ADHD Diagnosis: Responses to Frustration in Adults

Introduction

ADHD is a neurodevelopmental disorder affecting a significant proportion of children, 30-60% of whom retain the diagnosis into adulthood. Classically defined by attention deficits, excessive activity, and impulsivity, ADHD is also increasingly linked to **emotional dysregulation**, including elevated **frustration intolerance**.

Eye-tracking studies indicate **specific eye movement patterns** as potential **biomarkers of ADHD**. Research on **pupillometry** in an emotional context is also evolving.

Considering the significance of emotional dysregulation in ADHD, particularly heightened intolerance to frustration among individuals with this disorder, it becomes justified to **investigate the impact of frustration on specific visual biomarkers**.

Existing research suggests the possibility of **developing more objective diagnostic methods**. Further evidence in this area could contribute to the creation of diagnostic tools, reducing the subjectivity in clinical evaluations. This could support clinicians in more accurately identifying the disorder.

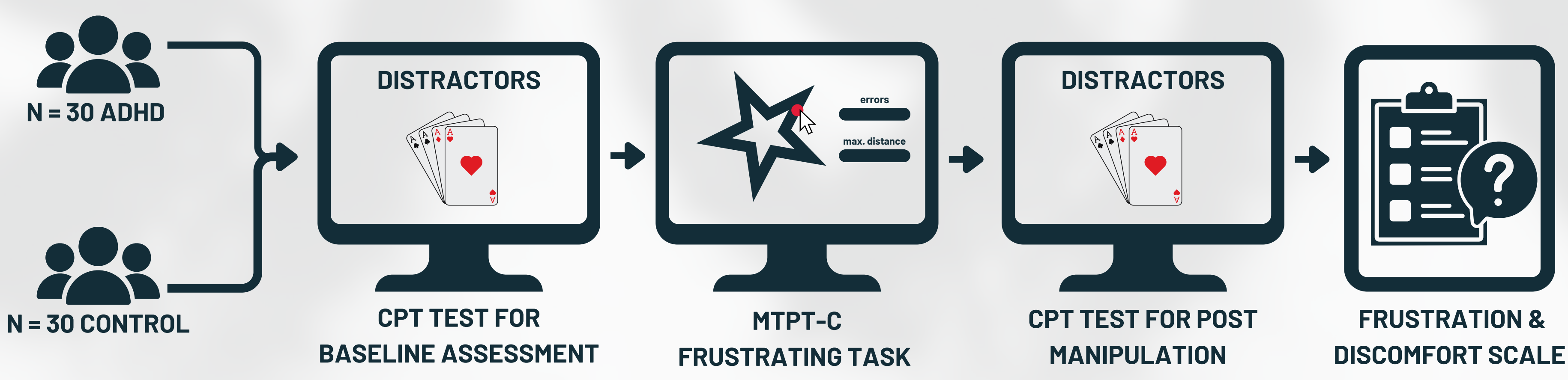
Hypotheses

The aim of this study is to test the hypothesis stating that **H1:** frustration will result in a greater change in eye-tracking parameters in individuals with ADHD compared to baseline measurements and to a control group, and that **H2:** frustration will lead to greater pupil dilation amplitude compared to baseline measurements and a control group.

Method

The study will use a 2x2 between-groups design with **60 participants:** individuals with **ADHD** and a **control group**, each split into **frustration** and **no-frustration** conditions. Frustration will be induced through a computer task with reversed controls (**MTPT-C**), while the control condition will use the same task without added difficulty. Eye-tracking data, including pupillometry and eye movement parameters, will be recorded throughout. Participants will complete a **10-minute AX-CPT** task before and after the manipulation to measure baseline and post-manipulation **attention and pupillary reactivity**, with the Frustration Discomfort Scale administered afterward to confirm the manipulation.

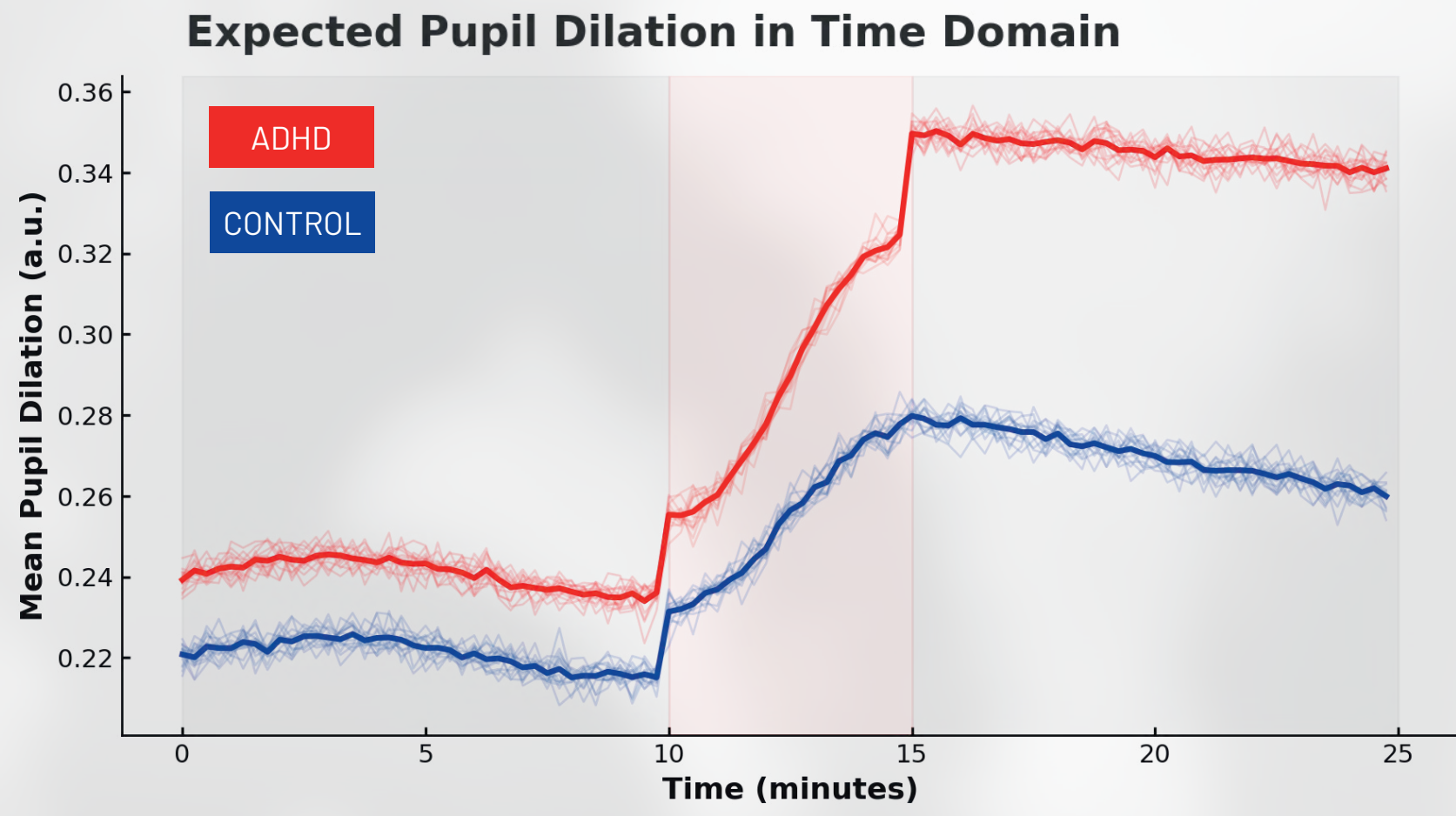
Eye-tracking study plan



Measured variables

The study will assess oculomotor and pupillometric parameters selected based on findings from existing studies. Key variables will include **pupil dilation amplitude** - reflecting fluctuations in pupil size linked to attentional control and emotional response; **saccade frequency** - indicating inhibitory control demands; **saccade latency**, capturing the speed of response initiation. These measures will be compared between ADHD and control groups to identify potential biomarkers.

Expected results



Misc.



Full version



References



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