

## Introduction

### Theoretical Framework

- Small tactile movements release dopamine and norepinephrine which increase attention (Schechter, 2017).
- Fidgeting may redirect flow of thoughts in a way that promotes calmness and reduces anxiety (Karlesky, 2016).
- Fidgeting is a natural adjustment when an activity cannot sustain attention (Rotz, 2021).
- People alter their environments to achieve the proper level of stimulation (Ibister, 2017).

### Previous Research

- Higher intensity movement corresponds to more correct trials in attention tasks for children with ADHD (Hartano, 2016).
- Adults reported having fidgets at their desks improved focus and concentration, were calming and handy in moments of stress, and reported deriving pleasure from engaging with their chosen fidgets (Karlesky, 2016).
- Children undergoing dental anesthesia had reduced HR and self reported anxiety when given fidgets as compared to those given kaleidoscopes, VR headsets, or control groups (Aditya, 2021).

## Method

- 51 adult North Carolina residents ages 18-64 were recruited via flyer postings, social media, and the SONA participant database.
- Participants completed a 15-minute enrollment appointment where they were consented and completed the enrollment survey which included an index finger ring sizing, demographic data, shipping and contact information, the Depression Anxiety and Stress Scale (DASS-21), and blinded random assignment
- Rings were sent out to participants who were instructed to wear them for 1 week and complete self-report measures for anxiety, stress, and attention each day as well as how much they engaged with their rings. All items were measured on a 7-point likert scale.
- Day 0 baseline survey was completed Sunday November 13th.
- Day 7 post-test data was collected on Sunday November 20th. Participants were instructed to guess which group they had been assigned to and to provide feedback.
- It was hypothesized that wearing the experimental rings would result in decreased anxiety and stress scores and increased attention scores at post-test compared to baseline values..

## Results

### Group Differences

- No significant differences in DASS-21 scores between experimental and control groups.
- No significant differences in fidgeting behavior was found between control (M= 4.06, SD = 1.40) and experimental (M = 4.06, SD = 1.40) groups,  $t(46) = 0.014$ ,  $p = 0.989$ ,  $d = 0.004$ .

### Primary Outcomes

- A repeated measures ANOVA revealed a significant effect for time,  $F(1, 42) = 5.086$ ,  $p = 0.029$ ,  $\eta_p^2 = 0.108$ , but not for condition  $F(1, 42) = 1.868$ ,  $p = 0.179$ ,  $\eta_p^2 = 0.043$ , however, the time by condition interaction was significant,  $F(1, 42) = 4.308$ ,  $p = .044$ , with a medium effect size of  $\eta_p^2 = 0.93$ .
- Post hoc t-tests indicated significant reduction in anxiety between pre and post-tests for experimental group,  $t(20) = 2.75$ ,  $p = 0.012$ ,  $d = 0.60$ , but not control group,  $t(22) = 0.143$ ,  $p = 0.888$ ,  $d = 0.030$ .
- Post hoc tests showed no differences at pre-test,  $t(48) = 0.514$ ,  $p = 0.610$ ,  $d = 0.145$ , but a significant difference between control and experimental groups at post-test,  $t(42) = 2.403$ ,  $p = 0.021$ ,  $d = 0.725$ . The experimental group evidenced lower anxiety scores at post-test than control group.
- No significant time by condition effects were found for stress or attention.

Figure 1

Experimental and Control Rings



Figure 2

Significant Impacts of Time by Condition on Anxiety

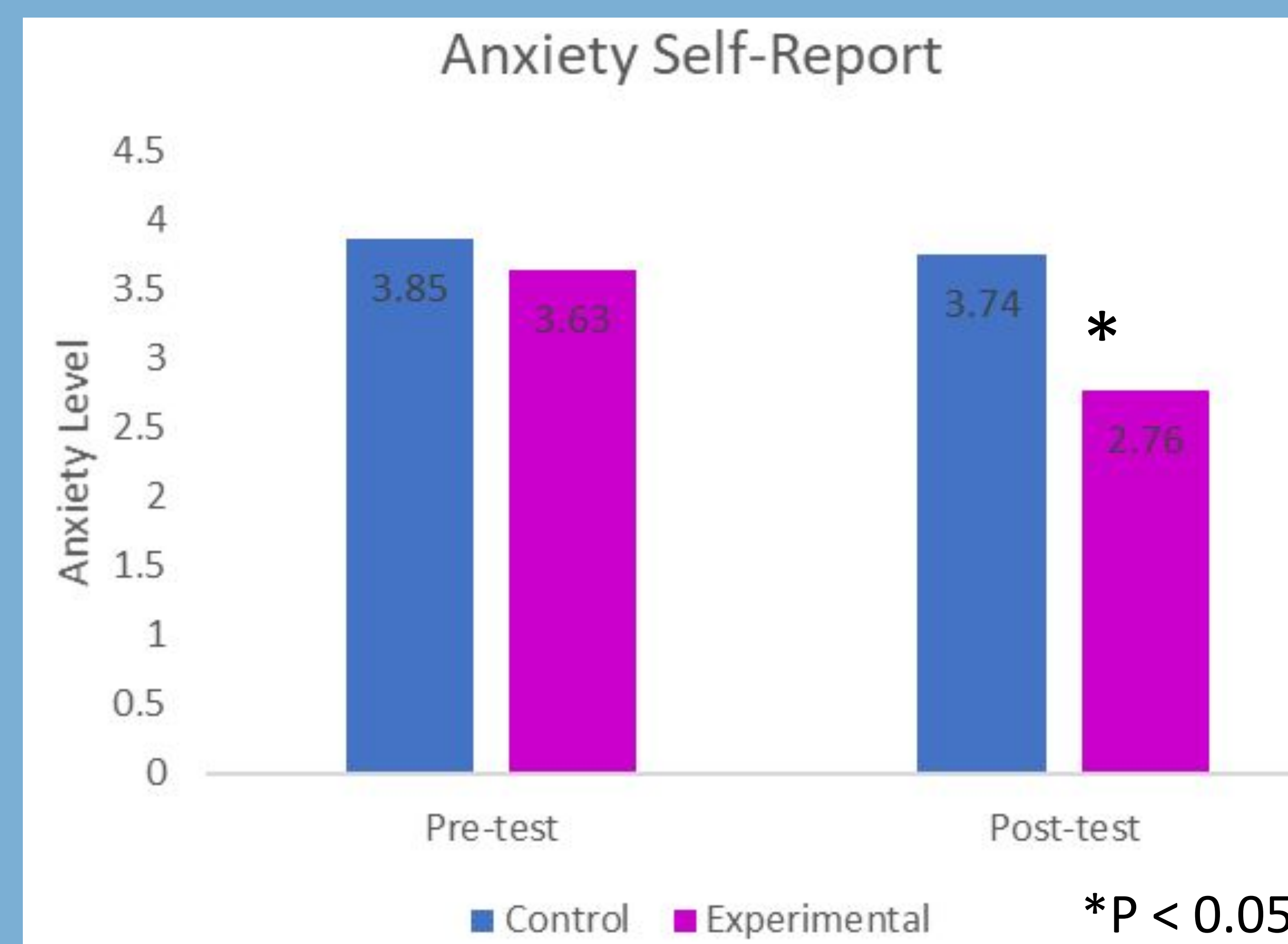


Table 1

Pre-test and Post-test Values for Interest Measures

Variable	Pre-test M (SD)	Post-test M (SD)
<b>Anxiety</b>		
Control	3.85 (1.54)	3.74 (1.45)
Experimental	3.63 (1.50)	2.76 (1.22)
<b>Stress</b>		
Control	4.23 (1.58)	3.61 (1.34)
Experimental	3.92 (1.44)	2.72 (1.19)
<b>Attention</b>		
Control	3.23 (1.07)	3.35 (1.03)
Experimental	3.04 (1.04)	3.52 (1.21)

## Descriptives

Table 1

Sociodemographic Data

Characteristic	Full Sample (N = 51)
<b>Age</b>	M = 30.73 (SD = 13.71)
<b>Gender</b>	
Male	13.7% (n = 7)
Female	82.4% (n = 42)
Non-Binary	2% (n = 1)
Non-Binary Female	2% (n = 1)
<b>Race/Ethnicity</b>	
Asian	7.8% (n = 4)
Black or African American	5.9% (n = 3)
White	66.7% (n = 34)
Multi-Racial	17.6% (n = 9)
Other	2% (n = 1)

Table 2

DASS-21 Subscales

Scale	Control (N = 26)	Experimental (N = 25)
<b>DASS-21 Subscales</b>		
Depression	M = 14.08 (SD = 10.55)	M = 9.79 (SD = 7.97)
Anxiety	M = 14 (SD = 8.85)	M = 9.28 (SD = 8.08)
Stress	M = 17.85 (SD = 7.96)	M = 17.36 (SD = 8.58)

## Discussion

### Key findings

- CONQUERing had a significant effect on anxiety reduction over and above the act of fidgeting. Fidgeting behavior was equal across control and experimental groups.
- Potential benefit of sensory integration (spinning and clicking sounds), and intentional movement as a grounding technique.

### Limitations and Future Directions

- Study only followed participants for one week with no long term follow-up.
- Some participants reported discomfort with their rings which could be confounding.
- Future research could look into how fidget rings impact anxiety long-term
- Future research could look into potential benefits for clinical anxiety and how fidget rings may augment CBT or ERP treatments for anxiety disorders.

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