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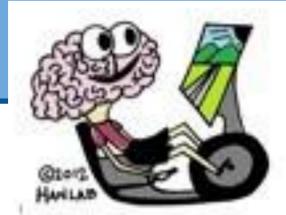
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# Remote administered in-home interactive Physical and Cognitive Exercise Study (iPACES v2.8) for youth on the Autism Spectrum: A feasibility pilot



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## Introduction

- Autism spectrum disorder, or ASD, is a neurodevelopmental disorder that affects 1 in 68 youth (Center for Disease Control, 2014).
- Research shows that exercise can be beneficial for youth diagnosed with autism in that it decreases depression and the frequency of repetitive behaviors and improves social interaction and communication (Bremer et al., 2016; Spratt et al., 2018; Zhao & Chen, 2018)
- In a study involving twelve youth with autism, it was found that physical activity along with an active mental task can lead to increased cognitive executive functioning and a decrease in behavioral symptoms associated with autism (Anderson-Hanley et al., 2011).
- We aim to explore the long-term benefits of the iPaces system for youth diagnosed with ASD and the feasibility of remote study

## Methods

### Participants

- 1 case study
- Age = 10-21 years

### Procedure

- Participant will be asked to complete surveys on exercise history, mood and emotions, and ASD symptoms
- Pre-intervention cognitive assessments of executive function and attention by remotely administering tests via Zoom
  - Stroop Test
  - Color Trails
  - Digits Span (Forward and Backward)
- Three-month exergaming intervention achieved through in-home use of an under-the-table peddler to pedal and control a bike in the iPACES game
  - Moderate exergame three to four times a week for 30-45 minutes over the course of three months
  - Participants will log hours spent exergaming
- Post-intervention assessments utilizing alternative versions of the same assessments.



<https://ce.nationalregister.org/wp-content/uploads/2020/04/Risk-Management-for-Teleneuropsychology.pdf>

## Remote Adaptations

- Administering Cognitive Assessments via Zoom
  - Stroop Test is administered via screen sharing. The size of stimuli is controlled for providing the participant an iPad and controlling size of screen-shared
  - Color Trails is mailed to participant's place of residence. Camera is situated as to show administer the page so the task can be timed.
  - Digits Span is administered via zoom and can be administered as originally intended. If audio cuts out that item will be cut and an alternate version is at hand.
- In-home placement of iPaces System
  - Pedaler, iPad, and smartwatch is delivered to participant's house by mail (due to COVID-19 guidelines)
  - iPaces and Zoom application is installed on iPad prior to delivery
  - An exercise log will be available for them to fill out remotely

## Conclusions

- The feasibility of remote administration of questionnaires and cognitive tasks is still being explored. Standardization of methods and more research is required.
- Remote implantation of the iPaces system comes with complications that require knowledge of both the administer's and the participant's technology

## References

- Anderson-Hanley, C., Tureck, K., & Schneiderman, R. (2011). Autism and exergaming: effects on repetitive behaviors and cognition. *Psychology Research and Behavior Management*, 4, 129-137. <<http://dx.doi.org/10.2147/PRBM.S24016>>
- Bremer, E., Crozier, M., & Lloyd, M. (2016). A systematic review of the behavioural outcomes following exercise interventions for children and youth with autism spectrum disorder. *Autism*, 20(8), 899-915. <https://doi.org/10.1177/1362361315616002>
- Centers for Disease Control and Prevention. (2010). Autism Spectrum Disorder (ASD). Retrieved from <https://www.cdc.gov/ncbddd/autism/>
- Spratt, E., Mercer, M. A., Grimes, A., Papa, C., Norton, J., Serpe, A., Mueller, M., Eckert, M., Harris, K., Blackmon, L., Durant, J., & Newton, J. (2018). Translating benefits of exercise on depression for youth with autism spectrum disorder and neurodevelopmental disorders. *Journal of psychology and psychiatry*, 2, 109.
- Zhao, Mengxian, and Shihui Chen. "The Effects of Structured Physical Activity Program on Social Interaction and Communication for Children with Autism." *BioMed Research International*, vol. 2018, Hindawi Limited, 2018, pp. 1-13, doi:10.1155/2018/1825046.
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