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Introduction

- Over 20% of children and adolescents suffer from at least one mental health condition
 - Common conditions include anxiety disorders, depressive disorders, and attention-deficit hyperactivity disorder (ADHD)
- Considerable limits on the accessibility, availability, and scalability of current evidence-based treatments
- Gamified digital mental health interventions (DMHI) may be able to help meet the increasing demand
- For children and adolescents, gamified DMHI can increase engagement relative to traditional therapies

Objectives

- To examine the therapeutic effects of video-game based (i.e., “gamified”) DMHIs for common pediatric mental health conditions (e.g., anxiety, depression, ADHD)

Materials and Methods

- A systematic search was performed for randomized controlled trials using a gamified DMHI to reduce anxiety severity, depressive severity, and/or attention-deficit hyperactivity disorder (ADHD) severity
 - In young people under the age of 18 years old.
 - Conducted for articles published over the period of January 1, 1990 through April 7, 2023
- Articles were excluded if:
 - No control condition,
 - Did not utilize a digital game for their intervention,
 - Did not provide sufficient data to calculate effect sizes
 - Not available in English
- A Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) compliant systematic review characterized the extant literature using articles that met all inclusion criteria
- A meta-analysis was performed to examine the therapeutic effects of the gamified DMHI for common pediatric mental health conditions.

Results

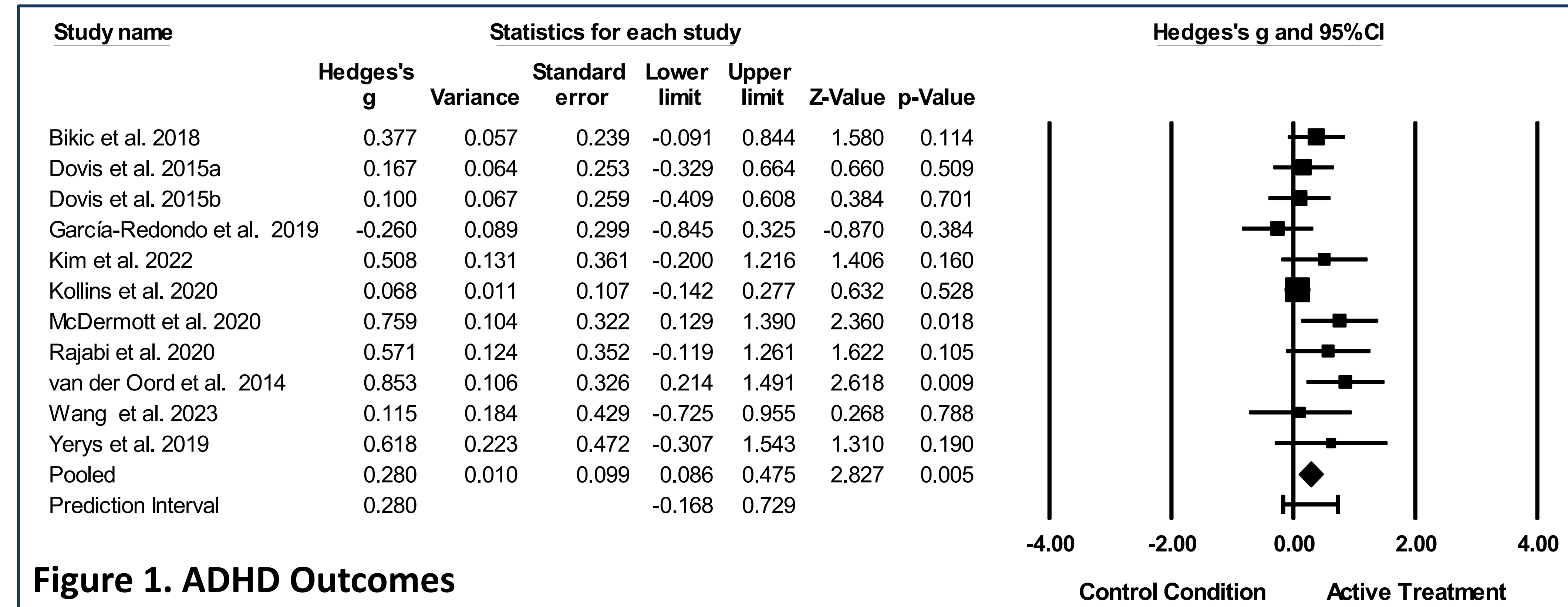


Figure 1. ADHD Outcomes

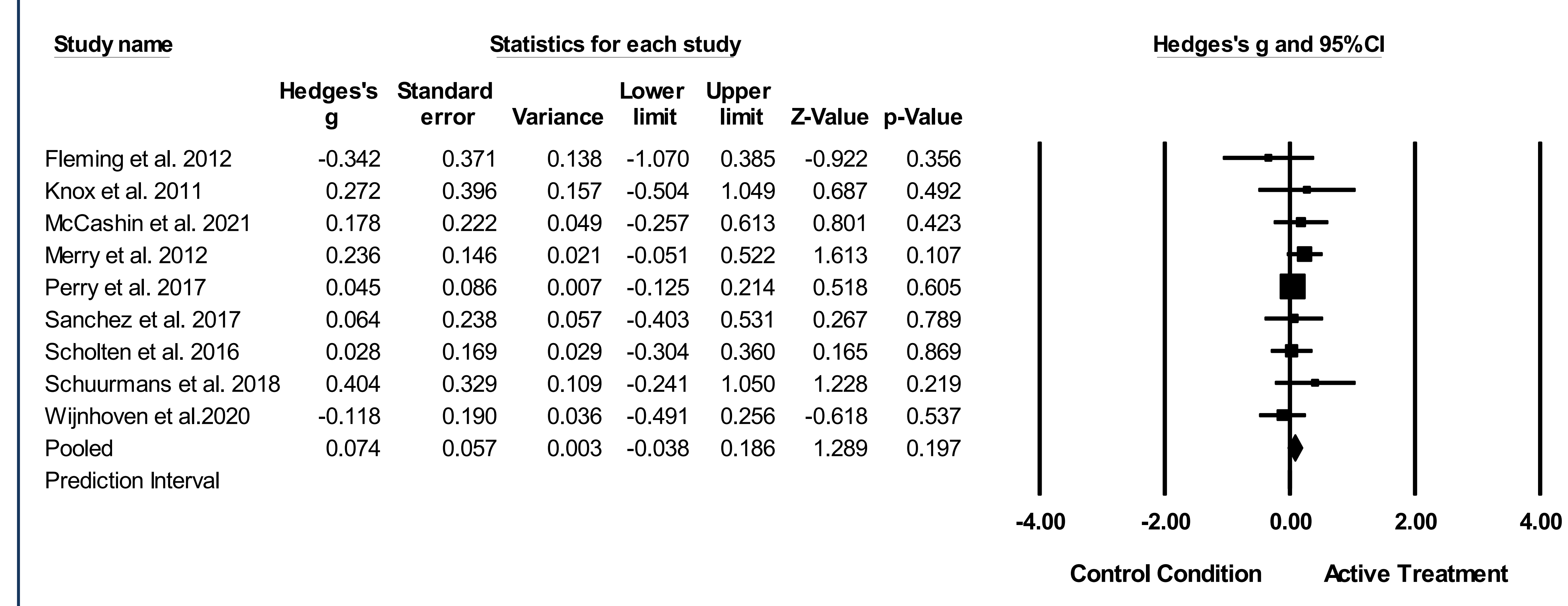


Figure 2. Anxiety Outcomes

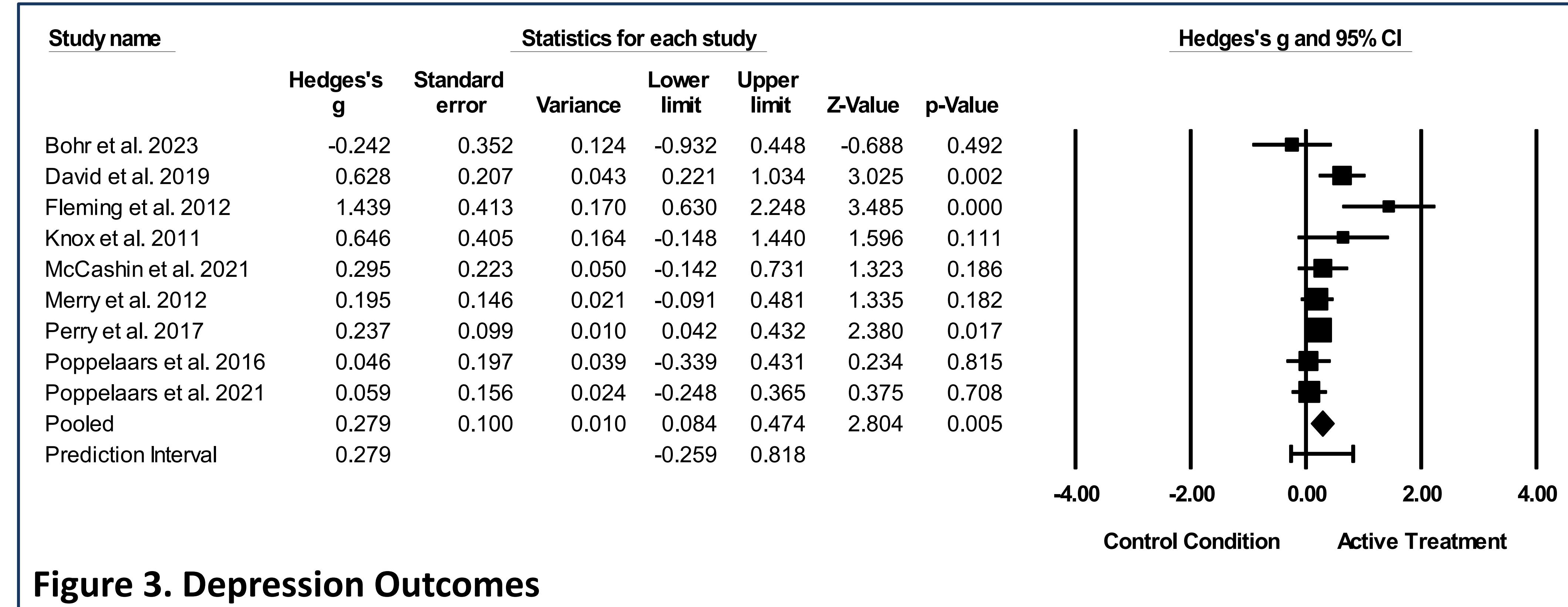


Figure 3. Depression Outcomes

Our findings suggest that Gamified Digital Mental Health Interventions have a modest therapeutic effect for treating ADHD (g=0.280, p=0.005) and Depression (g=0.279, p=0.005) in children and adolescents.

Conclusion

- Our findings assist clinicians and other stakeholders as they make recommendations to patients and parents regarding the efficacy of using gamified DMHIs to treat mental health
- For each of the conditions being treated, there was significant heterogeneity of therapeutic effects between different studies and their corresponding gamified interventions.
- Gamified DMHIs can play a critical role in developing and implementing stepped models of care that increase the accessibility and availability of evidence-based treatments

References

Bethell, C. D., Garner, A. S., Gombojav, N., Blackwell, C., Heller, L., & Mendelson, T. (2022). Social and Relational Health Risks and Common Mental Health Problems Among US Children: The Mitigating Role of Family Resilience and Connection to Promote Positive Socioemotional and School-Related Outcomes. *Child and Adolescent Psychiatric Clinics of North America*, 31(1), 45–70.

Hallfors, B., Hill, C., Waite, P., Partridge, K., Freeman, D., & Creswell, C. (2021). Annual Research Review: Immersive virtual reality and digital applied gaming interventions for the treatment of mental health problems in children and young people: the need for rigorous treatment development and clinical evaluation. *Journal of Child Psychology and Psychiatry, and Allied Disciplines*, 62(5), 584–605.

Hollis, C., Falconer, C. J., Martin, J. L., Whittington, C., Stockton, S., Glazebrook, C., & Davies, E. B. (2017). Annual Research Review: Digital health interventions for children and young people with mental health problems – a systematic and meta-review. *Journal of Child Psychology and Psychiatry*, 58(4), 474–503.