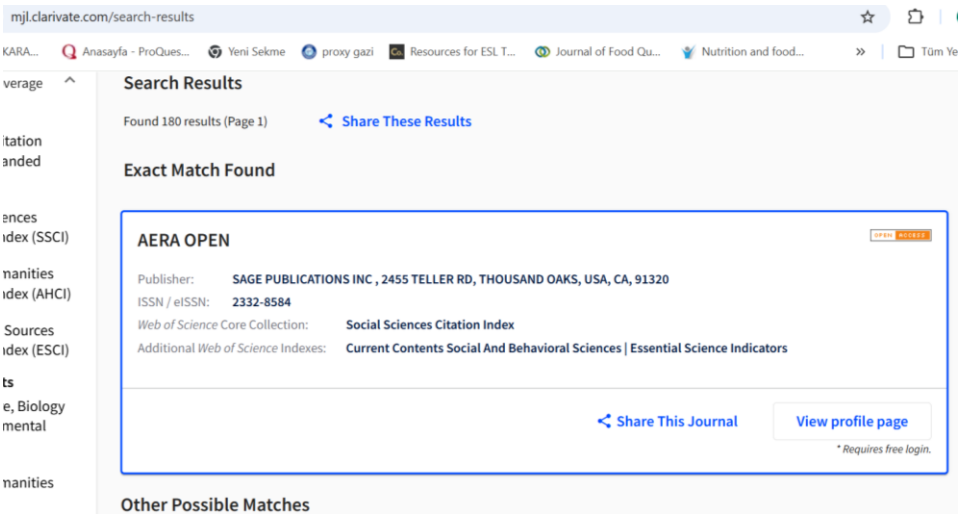
Effect of play-based educational programme on behavioral self-regulation skills of 48-60 month-old children

Link: https://journals.sagepub.com/doi/pdf/10.1177/23328584251362714





AERA Open
January-December 2025, Vol. 11, No. 1, pp. 1–17
DOI: 10.1177/23328584251362714
Article reuse guidelines: sagepub.com/journals-permissions
© The Author(s) 2025. https://journals.sagepub.com/home/ero

Investigating Nature-based Preschoolers Gains in Early Literacy and Select Executive Function Skills

Arianna E. Pikus
Teaching, Learning, and Culture, Texas A&M University

Lori E. Skibbe
Human Development and Family Studies, Michigan State University

Rachel A. Larimore
Samara Early Learning

David Sobel
Antioch University New England

that working memory can be improved through specialized training (Green et al., 2012; St Clair-Thompson et al., 2010); others argue that previous studies have been too narrow and haven't shown working memory training transferable to other tasks (Gade et al., 2017; Shipstead et al., 2012). It is possible that results reflect the particular aspects of executive function studied, as working memory may not be as malleable as previously thought (Rapport et al., 2013). If this is the case, then school setting might have less of an effect on the development of working memory when compared to other aspects of executive function, such as inhibitory control that is developing rapidly (Kochanska et al., 2001).

Unlike other areas of executive function, children in the nature-based program did not develop as many skills related to their behavioral self-regulation, which often involves integrating skills related to working memory, cognitive flexibility, and inhibitory control. This finding conflicts with other work in this area which finds preschool as a time of rapid growth in this area (McClelland et al., 2015), but can possibly be explained in several ways. It is possible that the structure of the nature-based program did not provide sufficient opportunities for children to develop behavioral regulation. Anecdotal evidence from the classroom observations they support their inhibitory control, independence, and self-direction (Kenworthy et al., 2014). Lists like this were not observed being utilized at the nature-based preschool, possibly due to limitations with the outdoor environment (e.g., materials needed to post a list outdoors are more extensive than in an indoor classroom).

These results were surprising as most research shows that unstructured play supports children's behavioral self-regulation (Colliver et al., 2022; Savina, 2014; Sezgin & Demiriz, 2019). For example, a recent longitudinal study found that the amount of time children engaged in unstructured active play significantly predicted their behavioral self-regulation skills two years later (Colliver et al., 2022). While the current study found less growth in behavioral self-regulation for children who attended the nature-based preschool, it is possible that the benefits of unstructured play on self-regulation take longer to manifest and future work should examine the longitudinal impact of more time in nature for children. It is also possible that moving forward, nature-based preschools should take a "both/and" approach where there is a mix of unstructured nature play and structured instructional time. Recent empirical evidence has shown that children who attend nature preschool programs which take a more blended

Boekaerts, P. R. Pintrich, & M. Zeidner (Eds.), *Handbook of self-regulation* (pp. 631–649). Academic Press.

Schutte, A. R., Torquati, J. C., & Beattie, H. L. (2017). Impact of urban nature on executive functioning in early and middle childhood. *Environment and Behavior*, *49*(1), 3–30. https://doi.org/10.1177/0013916515603095

Schweinhart, L. J., & Hohmann, C. F. (1992). The high/scope K–3 curriculum: A new approach. *Principal*, *71*(5), 16–18.

Sezgin, E., & Demiriz, S. (2019). Effect of play-based educational programme on behavioral self-regulation skills of 48–60 month-old children. *Early Child Development and Care*, *189*(7), 1100–1113. https://doi.org/10.1080/03004430.2017.1369972

Shipstead, Z., Hicks, K. L., & Engle, R. W. (2012). Cogmed working memory training: Does the evidence support the claims? *Journal of Applied Research in Memory and Cognition*, *1*(3), 185–193. https://doi.org/10.1016/j.jarmac.2012.06.003

Skibbe, L. E., Montroy, J. J., Bowles, R. P., & Morrison, F. J. (2019). Self-regulation and the development of literacy and language achievement from preschool through second grade. *Early Childhood Research Quarterly*, *46*, 240–251. https://doi.org/10.1016/j.ecresq.2018.02.005

Sobel, D. (2014). Learning to walk between the raindrops: The value of nature preschools and forest kindergartens. *Children Youth and Environments*, *24*(2), 228–238. https://doi.org/10.1353/cye.2014.0035

D., Wallner-Allen, K., Fox, N. A., Beaumont, J. L., Mungas, D., Nowinski, C. J., Richler, J., Deocampo, J. A., Anderson, J. E., Manly, J. J., Borosh, B., . . . Fox, N. A. (2013). Cognition assessment using the NIH Toolbox. *Neurology*, *80*(11 Supplement 3), S54–S64. https://doi.org/10.1212/wnl.0b013e3182872ded

Wells, N. (2000). At home with nature: Effects of "greenness" on children's cognitive functioning. *Environment and Behavior*, *32*(6), 775–795. https://doi.org/10.1177/00139160021972793

Wells, N. M., & Evans, G. W. (2003). Nearby nature: A buffer of life stress among rural children. *Environment and Behavior*, *35*(3), 311–330. https://doi.org/10.1177/0013916503035003001

White, J. (Ed.). (2011). *Outdoor provision in the early years*. Sage.

Wiebe, S. A., Sheffield, T. D., & Espy, K. A. (2012). Separating the fish from the sharks: A longitudinal study of preschool response inhibition. *Child Development*, *83*(4), 1245–1261. https://doi.org/10.1177/0013916503035003001

Wiggins, D. G. (2007). Pre-K music and the emergent reader: Promoting literacy in a music-enhanced environment. *Early Childhood Education Journal*, *35*(1), 55–64. https://doi.org/10.1007/s10643-007-0167–6

Zelazo, P. D., Blair, C. B., & Willoughby, M. T. (2016). *Executive function: Implications for education (NCER 2017–2000)*. National Center for Education Research.

Zelazo, P. D., Muller, U., Frye, D., Marcovitch, S., Argitis, G.,