ASSOCIATION BETWEEN PARENT ADVERSE EXPERIENCES AND CHILD EXECUTIVE FUNCTION

by

ANTHONY MACIAS

A THESIS

Presented to the Department of Psychology
and the Robert D. Clark Honors College
in partial fulfillment of the requirements for the degree of
Bachelor of or Science

June 2023

An Abstract of the Thesis of

Anthony Macias for the degree of Bachelor of Science
in the Department of Psychology to be taken June 2023

Title: Association Between Parent Adverse Experiences and Child Executive Function

Approved: *Shannon Peake, PhD*
Primary Thesis Advisor

Children with impairments in the development of executive function (EF) face an increased risk of developmental disorders, including autism and attention-deficit hyperactivity disorder, compared to typically developing children. Understanding the factors influencing child executive function (EF) is crucial for early intervention strategies. Recent studies highlight the role of parent-child interaction as a significant factor in shaping child EF. However, the impact of parent adverse childhood experiences (ACEs) on the parent-child intersection and subsequent effects on child EF remains a crucial area of investigation. Adverse events and toxic stress in childhood have been associated with higher incidence of mental illness and physical health problems in individuals, as well as potential negative implications in future generations. This study sought to further examine the relationship between parent ACEs and child EF, specifically child working memory, cognitive flexibility, and inhibitory control. Participants of this study were primary caregivers (n = 151) and children (n = 166) recruited from an early intervention services program with suspected or diagnosed developmental delay. ACEs levels were notably high in parents of the children being assessed, however linear regressions of each of the child executive functioning tasks on parent ACEs scores were non-significant, even when controlling for both child and parent variables (e.g. child age, parent socioeconomic status). This study does not indicate that extra parenting support needs to be given to those parents with high ACEs. Rather, intervention programs should explore other possible associations to effectively support children's development of executive function.

Acknowledgements

I want to thank the entire SNAP lab for the opportunity to re-use past data to design a new research study and be a part of meaningful research under a current study. I want to thank Shannon Peake, Ph.D., for his countless hours guiding me through the entire process of designing and conducting a psychological experiment. I also want to thank Trond Jacobsen, Ph.D., and Jack Buck, MS, for serving on my thesis committee and providing me with assistance and expertise. Finally, I want to thank my friends and family, whose unwavering love supported me from start to finish.

Table of Contents

List of Figures

Introduction

Executive Function (EF) is a blanket term that incorporates multiple processes responsible for purposeful, goal-directed behavior that develop through childhood and adolescence (Anderson, 2002). These processes support important life skills such as anticipation, goal selection, self-regulation, mental flexibility, development of attention, and utilization of feedback. They are helpful in success in education and social settings as they enable a child to engage in recalling information (e.g. class rules), resisting interfering stimuli, and inhibiting the tendency to react negatively to provocation in a social environment (Bernier et al., 2015; Clark, 2010). Collectively, EF processes are critical for healthy development of cognitive function, behavior, emotional control, and social interaction.

Key components of EF include skills such as inhibitory control, cognitive flexibility, and working memory. Inhibitory control is defined as the ability to deliberately withhold responses that are dominant, automatic, or prepotent and to resist distractions (Diamond, 2006, as cited in Valcan, 2018). One example of an inhibitory control task is verbally-regulated inhibition (e.g. a Simon Says game) used by Reed et al. (1984), where a child must alternate between tasks involving following instruction (activation trials) and ignoring instructions (inhibition trials). An adapted version of the task developed specifically for use with children is called Bear/Dragon, in which a child is told to follow the instructions of one stuffed animal (bear) and inhibit the instructions of a second stuffed animal (dragon). Cognitive flexibility is defined as one's capacity to shift between response sets, learn from mistakes, devise alternative strategies, and process multiple sources of information concurrently (Anderson, 2002). Low cognitive flexibility is associated with perseverative behavior and continuing to make the same mistake or break the same rule (Anderson, 2002). One way to test cognitive flexibility is the Dimensional Change Card Sort (DCCS) task, in which a child is given cards with pictures that vary in shape and color and told to sort the cards on one dimension (color) then change and sort the cards on the second dimension (shape; Carlson et al., 2004). The task measures how many mistakes children make after being told to switch the sorting rule. Working memory can be defined as the ability to obtain and mentally manipulate information (Diamond, 2006, as cited in Valcan, 2018). One task used to measure working memory is Spin the Pots, in which a child must find the stickers hidden under all but two boxes on a rotating tray (Hughes & Ensor, 2005). The task measures a child's ability to develop a strategy and update information after each response to recall which boxes had already been uncovered. Although there are mixed views in the literature of whether EF should be measured as a unitary or multidimensional factor, this study will focus on assessing EF using three factors: cognitive flexibility, working memory, and inhibitory control (Valcan et al., 2018). Child EF tasks are valuable measures because ages of 3-5 are important years for the development of executive function (Garon et. al 2008). Garon proposes development of the attention system and its connection to other brain areas as a reason for the improvement during this age.

While EF skills are critical components of success, lack of development of executive processes may lead to poor outcomes for children. EF impairments have been associated with developmental disorders such as autism and attention-deficit hyperactivity (Willcut et al., 2005). Deficits in children may be associated with poor impulse control, difficulties monitoring or regulating performance, planning and organizing problems, and poor reasoning ability (Anderson, 2002). Children with low levels of executive function may present as apathetic, unmotivated, and unresponsive. Along with this, low inhibitory control has been found to be related to aggressive behavior in preschool children (Raaijamakers, 2008). Although a sizable amount of research confirms the relationship between EF and developmental disorders in children, the challenge is not identifying deficient executive function, but identifying the contributing factors as this will influence intervention and treatment plans.

One of the factors that can affect child EF is parent interaction. Valcan et al. (2018) conducted a quantitative meta-analysis of 42 studies to clarify the different parent behaviors associated with child EF. It was found that positive parental behaviors (warmth, sensitivity, responsiveness, affect, positive regard, support, and physical proximity) predicted higher EF scores in children, while negative parental behaviors (control, intrusiveness, negative regard, negative affect and detachment) predicted lower EF scores. Bernier et al. (2015) found that children who were more securely attached to their parent during toddlerhood scored better on EF tasks in kindergarten and presented fewer executive deficits to their teachers. Parent behavior has been shown to correlate with child EF, suggesting that the actions of parents may enhance or diminish the development of these higher-order cognitive processes (e.g. Bernier et al. 2010; Blair et al. 2014).

A key influence on parenting is Adverse Childhood Experiences (ACE), which can be defined as abuse and household dysfunction during childhood (Felitti et al., 1998). Felitti found a link between exposure to childhood abuse and household dysfunction and several risk factors that can lead to early death in adulthood. Adverse events and toxic stress in childhood have also been associated with both mental illness and physical health problems in individuals, as well as health problems in future generations (Boullier, 2018). Bailey et al. (2012) found that parents who had experienced emotional maltreatment (emotional abuse, neglect, and lack of supervision) and witnessed family violence were associated with signs of hostility (e.g. expressed impatience, frustration) during parent-child interactions. In addition, mothers in moderate-to-high-stress, low-support groups had poorer reproductive and physical health and reported their children had poorer developmental outcomes than mothers in low-stress, high-support groups (Racine, 2018).

Parent ACE scores have been found to influence children's risk of poor behavioral outcomes (Schickedanz et al., 2018). Maternal ACEs was associated with missed well-child visits, which can lead to behavior outcomes going undiagnosed and/or untreated (Eismann et al., 2019). Additionally, maternal exposure to ACEs was related to higher levels of children's withdrawn and aggressive behavior which can have negative effects on children's social development (Stepleton, 2018).

While evidence exists that early life adversity affects parent executive function skills, less is known about what impact ACEs in parents has on their children's EF (Johnson, 2021). It has been found that parents with an ACE score of four or more (out of nine possible) adverse experiences had children who were at twice the risk for attention-deficit/hyperactivity disorder (ADHD) and four times the risk of emotional disturbance (Schickedanz et al., 2018). Furthermore, Treat (2019) examined how ACEs and harsh parenting affected child working memory, cognitive flexibility, and inhibitory control. They found that children of parents with high ACE scores had lower working memory scores. While the study does support a relationship between parent ACE and child EF, limitations were noted by the authors. The study had a small sample size which could have led to some error in analysis (e.g. false positive or false negative). Thus, additional research is needed on how past parent adverse experiences may influence child EF. This study will examine the association between parent ACE and child EF, specifically child working memory, cognitive flexibility, and inhibitory control in families whose child was being screened for or had a diagnosis of a developmental delay. It is hypothesized that higher parents' ACE scores will be associated with lower EF tasks scores in their children.

Methods

Participants

175 families with children enrolled in Early Childhood CARES in Eugene participated in this study (Salisbury et al., 2022). Eligible individuals were parents 18 years or older that spoke English and had a child between 2.5 and 6 years old with a suspected or diagnosed developmental delay or disorder. Parents were required to have full or partial custody of the child, as it was necessary they spend significant time with him/her. Children who participated (n = 166) included a higher number of male (n = 124, 74.7%) compared to female (n = 42, 25.3%) children. Ages for the children ranged from 28 to 70 months (M = 47.70, SD = 10.48). Primary caregivers were mainly female (n = 151, 91%) ages 20 to 63* years old (M = 33.58, SD = 7.07). The sample predominantly included children and caregivers of Euro-American/ Caucasian/White race ethnicity (n = 135, 77.1% children and n = 121, 69.1% caregivers) followed by mixed race/ethnicity (n = 17, 9.2% children, n = 34, 16.9% caregivers) with all other race/ethnic categories representing less than 10% of the sample. Primary caregiver education was reported using a continuous 14-point scale with responses ranging from 4: partial high school to 14: graduate degree. The median level of education was a partial college degree with at least 1 year. Gross annual household income was reported using a continuous 12-point scale from less than $4,999 to more than $100,000 (median = $30,000–$39,000).

* Parents were also foster and grandparents

Procedure

All families provided written informed consent approved by the University of Oregon Institutional Review Board. Families participated in an initial 90-minute assessment prior to intervention (see Salisbury et al., 2022 for details of the intervention). The assessment took place at the University of Oregon and data for both the parent and child tasks were collected (all measures described below). Families received $50 as compensation for completing the assessment plus a stipend for transportation.

Materials

Parenting Measures

Parent ACE scores were measured using the original ACEs survey (Felitti et al., 1998). The ACE test is designed to measure adverse experiences and household dysfunction using a 10-item scale (e.g. "Did you live with anyone who was a problem drinker, alcoholic or used street drugs?"). Item responses ("yes" = 1, "no" = 0) were summed to produce an adversity score. Parent education level was measured using an ordinal variable in which parents were initially asked "Which letter represents the highest grade you completed in school?" and chose a letter ranging from A (below 6^{th} grade) to N (graduate degree). Parent socioeconomic status was measured as an ordinal variable using the Hollingshead code for Primary Caregivers.

Child Measures

Three tasks were used to measure each of the three EF factors being studied.

The **Bear/Dragon Task** is designed to measure inhibitory control, which is a factor of EF that involves a child performing and suppressing different actions (Reed et al., 1984). In

Bear/Dragon, children were presented with a “nice bear” whose instructions they had to follow (e.g. “touch your nose”) and a “mean dragon” whose instructions they had to ignore (see Figure 1). Inhibitory control was scored using a 4-point scale on 5 inhibition (dragon) trials (0 = full commanded movement; 1 = partial commanded movement; 2 = flinch or wrong movement; 3 = no movement).

Figure 1: Bear/Dragon Task

Bear Game: *“This is the good bear. He says, ‘Touch your nose.’”*

Dragon Game *“Now let's practice with the naughty dragon. In this game, we won't do what the dragon asks us to do because he's not so nice.”*

Dimensional Change Card Sort (DCCS) is a measure of cognitive flexibility (Carlson et al., 2004). Children were instructed to sort a series of cards first by shape and then by color to observe how they reacted to classifying objects then needing to reclassify (see Figure 2). This assessed the child’s ability to control prepotent responses.

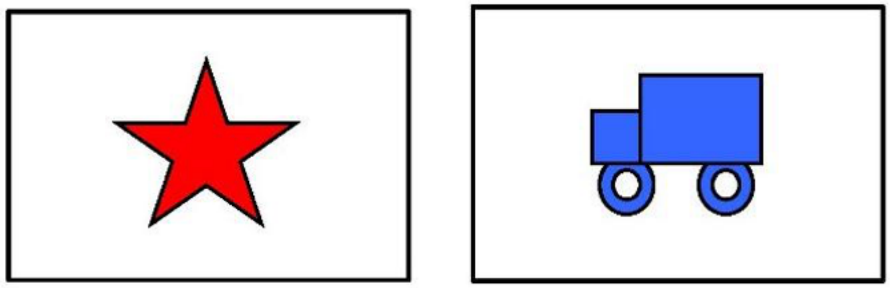

Figure 2: Dimensional Change Card Sort Task

Shape Game: *"If it is a star, then put it here, but if it is a truck, put it here."*

Color Game: *"If it is a blue one, then put it here, but if it is a red one, put it here."*

Spin the Pots involves using visually distinct boxes on a rotating tray (2.5 years: 8 boxes; 3 years: 9 boxes; 3.5 years: 10 boxes; 4 years: 11 boxes) to measure working memory (Hughes & Ensor, 2005). Children watched researchers place stickers under all but two boxes and then place a cloth on top and spin the tray. Each trial began when the tray stopped spinning and the cloth was pulled off. Children were then instructed to select a box and if they found a sticker, they could keep it. Each time a box was chosen, researchers placed the cloth back on and spun the tray again. The task was completed once the children found all the stickers or reached the maximum number of trials (2.5-years: 12 trials; 3 years: 14 trials; 3.5 years: 16 trials; 4 years: 18 trials). Spin the pots is a working memory task designed to assess children's ability to generate a strategy to monitor and update information. Additionally, child age was measured as a continuous variable.

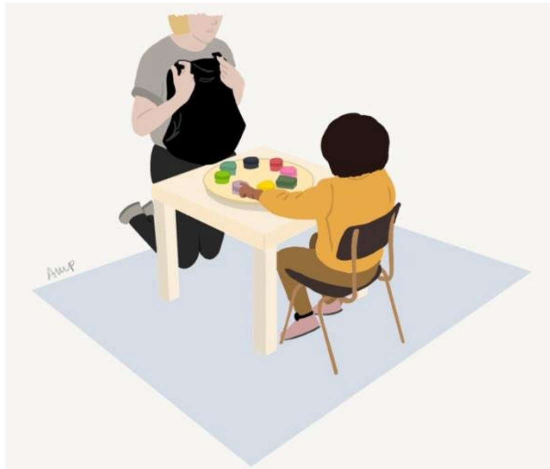

Figure 3: Spin the Pots Task

Trial 1: Researchers placed stickers under all but two distinct boxes, then placed a cloth over the boxes and spun the tray. The child was then instructed to pick one box and search for a sticker.

Trial 2: Researchers placed the cloth back over the boxes and spun the tray again.

Analysis

All analyses were conducted in Jamovi (jamovi, 2022). The hypothesis was analyzed using linear regressions of two ordinal variables. Each of the child executive functioning task scores (Bear Dragon, DCCS*, Spin the Pots) were individually regressed on parent ACE scores.

After the initial linear regressions, separate linear regressions were conducted controlling for both child and parent variables. Each set of executive functioning task scores were individually regressed on parent ACE scores controlling for child age, parent education level, and parent socioeconomic status.

* For DCCS, both total color separated, and total shape separated were analyzed

Results

Children (*N* = 111) correctly found a mean of 10.1 (*SD* = 3.10) stickers out of 16 total trials on the Spin the Pots task. Individual child scores ranged from 4 to 16. The mean score on the five inhibitory control trials in the Bear-Dragon task was 8.6 (*SD* = 6.82). Scores ranged from 0 to 15 where 15 indicated correct answers on all 5 inhibitory control trials. These results were slightly higher than those found by Reed et al. (1984) who found a mean score of 6.5 (*SD* = 4.04) on the same task. This might be expected given that the average age of children in the current sample (*M* = 47. 7 months) was higher than that of the children assessed by Reed and colleagues (*M* = 44.6). The mean score on the Dimensional Change Card Sort task was 5.4 (*SD* = 1.21) for the shape separation trials and 3.1 (*SD* = 2.62) for the color separation trials. Of the children who completed the first block of trials (*N* = 139), most (84.9%) passed the block by correctly answering on 5 of the 6 trials. Of the children who completed the second block of trials (*N* = 117) where the sorting rule was switched, only 42.7% of children passed the block with scores of 5 correct responses or higher. This is lower than the results of Zelazo (2006) who found that 3-year-old children typically fail to pass the post-switch block of trials whereas the majority of 4- and 5-year-old children pass.

The current study assessed the ACE score of 155 parents and found that 38.7% had ACE scores of 4 or higher, which is notably higher than that found in the original ACE study in which only 6.2% of adult participants had scores of 4 or higher (see Figure 4). Linear regressions of each of the child executive functioning tasks on parent ACE were non-significant. Parent ACE scores were not a significant predictor of inhibitory control using Bear Dragon task scores ($r = 0.03$, $p = 0.77$). Parent ACE scores were not a significant predictor of cognitive flexibility using Dimensional Card Sort task scores for total shape separated ($r = 0.03$,

$p = 0.71$) and total color separated ($r = 0.03$, $p = 0.75$). Parent ACE scores were not a significant predictor of working memory using Spin the Pots task scores ($r = 0.006$, $p = 0.95$). No significant changes in the relationships were found after controlling for child age, parent education, or parent socioeconomic status (i.e., Hollingshead code for Primary Caregiver).

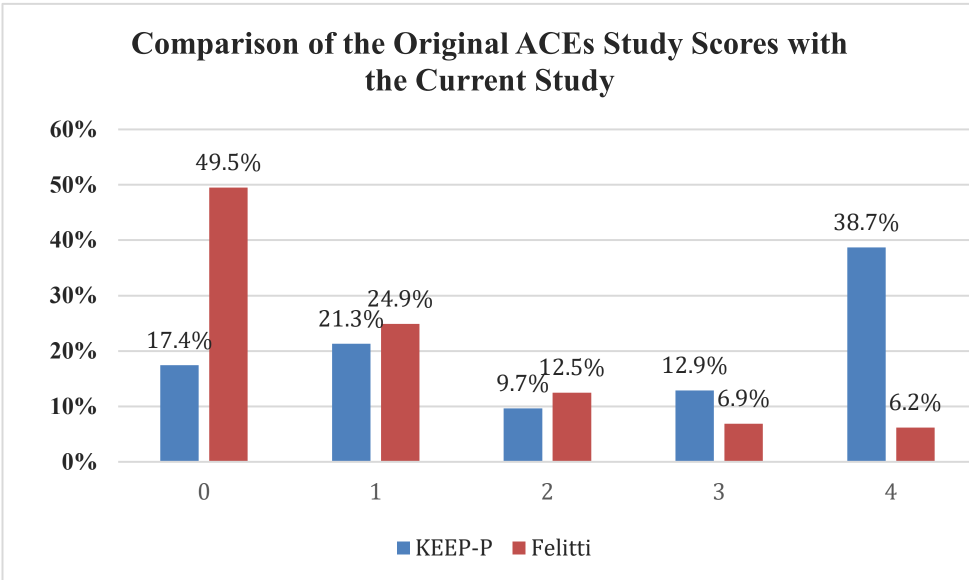

Figure 4: Bar Graph Comparing the ACE Score Percentages of the Original ACEs Study with the Current Study

Discussion

This study examined the relationship between parent's adverse childhood experiences and their child's executive function skills, specifically inhibitory control, cognitive flexibility, and working memory. It was found that there was no significant association between parent ACE scores and child EF, even when controlling for child age, parent education, and parent socioeconomic status. Children whose parents themselves experienced moderate to high levels of adverse events did not have lower scores on EF measures. Two interpretations may explain the results for this sample.

The first interpretation is that parent-child interactions may not influence child EF development. This means that no direct, significant association was found that would conclude an effect on child EF due to interactions with their parent. The association between parent and child behavior often has multiple, interactive facets, and it is critical to study all the factors at play in order to educate intervention. It is often assumed that low inhibitory control in the parent is associated with low inhibitory control in the child through means of social learning, which is a form of parent-child interaction (Bandura, 1965). Another assumption that has been studied is that parents with high ACE scores may have other issues. This is due to adverse childhood experiences being associated with adult health risk behaviors, health status, and disease, all of which can significantly impact the quality of life and in turn parent-child interactions (Felitti et al., 1998). One possible explanation for this interpretation is that the current sample of children were recruited based on being screened for developmental delay (Salisbury et al., 2022). It may be the case that a sample of children with typical cognitive development would have produced different results. Another possible explanation for what is influencing child EF is genetics. Longitudinal studies comparing monozygotic and dizygotic Japanese twins have found that genetic factors emerged in children by 60 months that mediated both EF and math ability in school (Fujisawa, 2019) (Fujisawa, 2017). It may be that the factors that significantly affect *development* of child EF are more genetic, whereas EF *stability* is more influenced by one's environment (e.g., parent-child interaction). Even though past literature suggests a relationship between parental behavior and child executive function, there are still inconsistencies, and further exploration is required.

The second interpretation is that adult ACEs may have not been associated with parent-child interactions in this sample. This means that parent ACE scores may not be indicative of how parents interact with their children. The level of parent ACE scores in this study suggests that if these scores truly were an indicator of parent-child interaction, then some association should have been established. According to Felliti, ACE scores of 4 or higher are associated with increased health-risk behaviors (e.g., alcoholism), social problems, and early death. As highlighted in the results of this study, the parent ACE scores in this sample were notably higher than those found in the original ACEs study (Felitti et al., 1998). A possible explanation for the lack of association found between ACE and parent-child interaction is that parents who have experienced more traumatic events during childhood or adolescence may be more protective or committed to being good parents. Parents who have dealt with abuse (e.g., physical, sexual, psychological) or household dysfunction (e.g., substance abuse, mental illness) may be more inclined to focus on their child's development to ensure they do not endure the same experiences. Another explanation is that parents with *low* ACE scores might not necessarily be more interactive parents focused on their child's development. It is assumed that parents who have low ACE scores are in turn better suited for healthy parent-child interactions. This study suggests that these scores may not be the best indicator of this relationship.

Some limitations should be mentioned regarding the current study. As stated above, this sample consisted of children being screened for developmental delay. Since there was no control sample of developmentally typical children, there is no sample to compare results and ensure the tasks were fit for the subject group. Another limitation was that the nature of the EF tasks used to assess children precluded standard reliability tests as they require individual test items to compute (Cronbach, 1951). A test for reliability is helpful to ensure that each task was internally consistent and stable in measuring what it is intended to measure.

Conclusion

This study found that parent ACEs were not significantly associated with their children's EF in this sample. While the results were not significant, it's important to consider the contribution of these findings. This study does not support the idea that extra parenting support is necessary for those who have experienced high levels of adverse experiences during childhood. Additionally, parent trauma-informed intervention has been highlighted as a potential mediator in the relationship between parent ACE and child EF (Cook, 2019). This study suggests that intervention programs should explore other possible associations to effectively support children's development of executive function. For example, intervention may focus on parent behavior as a key influence on child EF. Parent behavior has been found to be associated with their child's externalizing behaviors (i.e., hyperactivity and aggression), which is a sign of low inhibitory control (Cooke, 2019). Understanding where to direct intervention and further research is critical because resources are scarce and the least advantaged should be targeted. Furthermore, these findings help inform future directions in studying the relationship between parent ACE and child EF. When conducting a study on parent ACEs, future studies should include a genetic analysis as well as a measurement of parent-child interaction. This would ensure a better understanding of which variable is affecting child EF. Another future direction is to use child EF tasks that have a reliable method of analysis to confirm that each task is truly grasping a measure of child EF. Finally, in order to ensure that developmental delay does not significantly impact the association between parent ACE and child EF, future studies should control for this by using at least one developmental delay sample and one typically developing sample. It is clear that the relationship between parent behavior and child cognitive processes is complex and multi-faceted.

The results of this study will inform intervention and allow both parental figures and clinicians to have a greater impact on children.

Bibliography

Anderson, P. (2002). Assessment and Development of Executive Function (EF) During Childhood. *Child Neuropsychology*, *8*(2), 71. https://doi.org/10.1076/chin.8.2.71.8724

Bailey, H. N., DeOliveira, C. A., Wolfe, V. V., Evans, E. M., & Hartwick, C. (2012). The impact of childhood maltreatment history on parenting: A comparison of maltreatment types and assessment methods. Child Abuse & Neglect, 36(3), 236-246. https://doi.org/10.1016/j.chiabu.2011.11.005

Bandura, A., & Walters, R. H. (1977). *Social learning theory* (Vol. 1). Prentice Hall: Englewood cliffs.

Bernier, A., Beauchamp, M. H., Carlson, S. M., & Lalonde, G. (2015). A secure base from which to regulate: Attachment security in toddlerhood as a predictor of executive functioning at school entry. *Developmental Psychology, 51*(9), 1177–1189. https://doi.org/10.1037/dev0000032

Bernier, A., Carlson, S. M., & Whipple, N. (2010). From External Regulation to Self-Regulation: Early Parenting Precursors of Young Children's Executive Functioning. *Child Development*, *81*(1), 326–339. https://doi.org/10.1111/j.1467-8624.2009.01397.x

Blair, C., Raver, C. C., Berry, D. J., & Family Life Project Investigators. (2014). Two approaches to estimating the effect of parenting on the development of executive function in early childhood. *Developmental Psychology, 50*(2), 554–565. https://doi.org/10.1037/a0033647

Boullier, M., & Blair, M. (2018). Adverse childhood experiences. Pediatrics and Child Health, 28(3), 132-137. https://doi.org/10.1016/j.paed.2017.12.008

Carlson, S., Mandell, D., & Williams, L. (2004). Executive function and theory of mind: Stability and prediction from ages 2 to 3. *Developmental Psychology., 40*, 1105–1122.

Clark, C. A. C., Pritchard, V. E., & Woodward, L. J. (2010). Preschool executive functioning abilities predict early mathematics achievement. Developmental Psychology, 46(5), 1176–1191. https://doi.org/10.1037/a0019672

Cooke, J. C., et. al. (2019). Maternal adverse childhood experiences, attachment style, and mental health: Pathways of transmission to child behavior problems. Child Abuse & Neglect, 93, 27-37. https://doi.org/10.1016/j.chiabu.2019.04.011

Cronbach, L. J. (1951). Coefficient alpha and the internal structure of tests. psychometrika, 16(3), 299 -334. https://link.springer.com/article/10.1007/bf02310555

Eismann, E. A., Folger, A. T., Stephenson, N. B., Brownrigg, M. E., Shapiro, R. A., Macaluso, M., & Gillespie, R. J. (2019). Parental Adverse Childhood Experiences and Pediatric Healthcare Use by 2 Years of Age. *The Journal of Pediatrics*, *211*, 146–151. https://doi.org/10.1016/j.jpeds.2019.04.025

Felitti, V. J., Anda, R. F., Nordenberg, D., Williamson, D. F., Spitz, A. M., Edwards, V., Koss, M. P., & Marks, J. S. (1998). Relationship of Childhood Abuse and Household Dysfunction to Many of the Leading Causes of Death in Adults: The Adverse Childhood Experiences (ACE) Study. American Journal of Preventive Medicine, 14(4), 245-258. https://doi.org/10.1016/S0749-3797(98)00017-8

Fujisawa, K. K., Todo, N., & Ando, J. (2019). Changes in genetic and environmental influences on cognitive ability, executive function, and preacademic skills in Japanese preschool age twins. *Developmental Psychology, 55*(1), 38–52. https://doi.org/10.1037/dev0000627

Fujisawa, K. K., Todo, N., & Ando, J. (2017). Genetic and Environmental Influences on the Development and Stability of Executive Functions in Children of Preschool Age: A Longitudinal Study of Japanese Twins. Infant and Child Development, 26(3). https://doi.org/10.1002/icd.1994

Garon, N., Bryson, S. E., & Smith, I. M. (2008). Executive function in preschoolers: A review using an integrative framework. *Psychological Bulletin, 134*(1), 31–60. https://doi.org/10.1037/0033-2909.134.1.31

Hughes, C., & Ensor, R. (2005). Executive function and theory of mind in 2 year olds: A family affair? *Developmental Neuropsychology*, *28*, 645–668.

Johnson, D., et al. (2021). Associations of Early-Life Threat and Deprivation With Executive Functioning in Childhood and Adolescence: A Systematic Review and Meta-analysis. JAMA Pediatr, 175(11). doi:10.1001/jamapediatrics.2021.2511

Raaijmakers, M.A.J., Smidts, D.P., Sergeant, J.A. et al. (2008). Executive Functions in Preschool Children with Aggressive Behavior: Impairments in Inhibitory Control. J Abnorm Child Psychol 36, 1097–1107. https://doi.org/10.1007/s10802-008-9235-7

Racine, N., Madigan, S., Plamondon, A., Hetherington, E., McDonald, S., & Tough, S. (2018). Maternal Psychosocial Risk Profiles in Pregnancy: Associations With Postpartum Maternal Health and Child Outcomes. Clinical Psychological Science, 6(6), 783–796. https://doi.org/10.1177/2167702618788863

Reed, M., Pien, D., & Rothbart, M. (1984). Inhibitory self-control in pre- school children. *Merrill-Palmer Quarterly, 30*, 131–147.

Salisbury, M. R., Roos, L. E., Horn, S. R., Peake, S. J., & Fisher, P. A. (2022). The effectiveness of KEEP for families of children with developmental delays: Integrating FIND video coaching into parent management training—oregon model: A randomized trial. Prev Sci, 23, 1029–1040. https://doi.org/10.1007/s11121-022-01344-w

Schickedanz, A., Halfon, N., Sastry, N., & Chung, P. J. (2018). Parents' Adverse Childhood Experiences and Their Children's Behavioral Health Problems. *Pediatrics*, *142*(2), e20180023. https://doi.org/10.1542/peds.2018-0023

Stepleton, K., Bosk, E. A., Duron, J. F., Greenfield, B., Ocasio, K, & MacKenzie, M. J. (2018). Exploring associations between maternal adverse childhood experiences and child behavior. Children and Youth Services Review, 95, 80-87. https://doi.org/10.1016/j.childyouth.2018.10.027.

The jamovi project (2022). *jamovi*. (Version 1.6) [Computer Software]. Retrieved from https://www.jamovi.org

Treat, A. E., Morris, A. S., Williamson, J. H., Laurin, D. (2019). Adverse childhood experiences, parenting, and child executive function. Early child development and care, 189(6), 926-937.

Valcan, D. S., Davis, H., & Pino-Pasternak, D. (2018). Parental Behaviours Predicting Early Childhood Executive Functions: a Meta-Analysis. *Educational Psychology Review*, *30*(3), 607–649. https://doi.org/10.1007/s10648-017-9411-9

Willcutt, E. G., Doyle, A. E., Nigg, J. T., Faraone, S. V., & Pennington, B. F. (2005). Validity of the Executive Function Theory of Attention-Deficit/Hyperactivity Disorder: A Meta-Analytic Review. *Biological Psychiatry*, *57*(11), 1336–1346. https://doi.org/10.1016/j.biopsych.2005.02.006