

Parenting Styles, ACEs, & Neurobiological Effects on Attachment Styles for High-Functioning ASD Children

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ABSTRACT: Autism Spectrum Disorder (ASD) affects 1 in 36 children in the U.S. This disorder causes symptoms such as having trouble making social connections with others, and this ability is important in making secure attachment styles with caregivers. This study examines parenting styles, adverse childhood experiences (ACE), and neurobiological processing to find their impacts on children aged 7-11's ability to form secure attachment styles. How do parenting styles, adverse childhood experiences, and neurobiological differences for middle-childhood children with High-Functioning ASD affect the creation of a secure attachment style? It is found in this paper that authoritarian, permissive, uninvolved, and inconsistent parenting styles, a high number of ACEs, and neurobiological abnormalities can cause children with ASD to have difficulty forming secure attachment styles with their caregivers.

KEYWORDS: Clinical and Developmental Psychology, Neuroscience, Autism, Attachment, Parenting, Adverse Childhood Experiences.

■ Introduction

People with Autism Spectrum Disorder (ASD) frequently exhibit symptoms listed in the Diagnostic and Statistical Manual of Mental Disorders (DSM-5) published in 2013, a manual developed by the American Psychiatric Association and used by medical professionals to diagnose mental disorders. Autism Spectrum Disorder shows they are as follows: 1) Having trouble interacting and communicating with others, 2) limited passions and habitual actions, and 3) symptoms that impair their capacity to perform in their job, education, and other spheres of life.¹ ASD is a spectrum disorder because it appears in different severity and symptoms. DSM-4, which was published in 1994, did not categorize all autism disorders into one called ASD. Otherwise, there were five forms of autism, and one of them was Asperger's Syndrome. Asperger Syndrome | Autism Speaks, n.d. proves It was a milder version of Autism Disorder, and now it would be categorized as Level 1 ASD or High-Functioning ASD using the DSM-5.² Attachment Theory sparked from attachment behavior, which is the tendency for infants to want to be in close proximity to their primary caregivers. According to the Attachment Theory developed by Bowlby *et al.*, this bond will influence the child's emotional and social development, and whether this is formed will impact the child's future in their ability to form healthy interpersonal relationships.³ Mary Ainsworth conducted the "Strange Situation" experiment in the 1970s, an observational study to assess attachment styles. The infants were left alone in a room, left with a stranger in a room, and then reunited with the caregiver. This experiment found children with four types of attachment styles: securely attached children, insecure-avoidant children, insecure-ambivalent children, and

disorganized children. Secure attachment is when the child shows distress when the caregiver leaves and happiness when returned. Insecure-avoidant children showed little reaction to whether the caregivers left or returned. The insecure-ambivalent children showed high distress when the caregivers left and were not easily soothed after their return. The disorganized children showed odd behaviors such as approaching the caregiver but then stopping or wanting comfort but also showing fear towards the caregiver (Table 1) found by Salter Ainsworth, 1984.⁴

Table 1: Convergence and divergence between reactions of different attachment styles in children for the Strange Situation experiment.

Subtypes	Characteristics Shown When Caregiver Leaves	Characteristics Shown When Caregiver Returns	Convergence	Divergence
Secure	Distress	Seek proximity, happiness when received	Similar to disorganized, showing need for proximity	Stop showing distress when caregiver returns
Insecure-avoidant	Little reaction	Little reaction	N/A	Not bothered by existence of caregiver
Insecure-ambivalent	High distress	Externalized behaviors, not	Shows distress when caregiver	Continue showing distress when

These attachment styles are directly related to attachment representations, which is the way that individuals develop and form emotional relationships and how it affects their sense of self and others found by Winnie Lau & Candida C. Peterson, n.d.⁵ Gallitto & Leth-Steensen shows that many adults with Asperger Syndrome have an insecure avoidant attachment style, and ones with autistic traits have less emotional closeness with their romantic partners in a non-clinical setting with a positive relationship between autistic traits and attachment

avoidance.⁶ Although there are several pieces of research on preschool children with ASD and the effects of different attachment styles on their future interpersonal relationships, there are a few research gaps that this paper aims to fill, as stated in papers by McCarthy, R.M. Pasco Fearon & Roisman, and Aber & Allen.⁷⁻⁹ There is little research on the effect of late childhood attachment representation, the impact of adverse childhood experiences, the impact of parental influences, and the neurobiological and sensory processing effects on attachment styles of children with ASD through research by Giannotti & de Falco, 2021.¹⁰ Therefore, the research question is produced: How do parenting styles, adverse childhood experiences, and neurobiological differences for middle-childhood children with High-Functioning ASD affect the creation of a secure attachment style?

■ Research Group

As children enter elementary school, they are exposed more to the outside world as they make friends and speak to others who do not have the same background. A typical child during the concrete development stage should be able to develop self-reliance, responsibility, cognition, and emotional regulation found by Brumariu & Kerns, Bosmans, G. & Kerns, K. A., and Brumariu & Kerns.¹¹⁻¹³ This creates a fundamental difference in their attachment styles. Ainsworth reports they go from proximity as an infant to availability during middle childhood.¹⁴ It is vital for children this age that their parents are available to act as a haven for them, and they do not need to be near their primary caregivers to be securely attached. According to Piaget's developmental theory, they are in the Concrete Operational stage (age 7-11 years old). The children at this stage should be able to develop cognitive skills related to "understanding, comprehending, analyzing, synthesizing, evaluating, and differentiating between two objects." As stated in Rachana Maurya & Khan.¹⁵ Kids with ASD have trouble with these skills, such as conservation of liquid and number, classification, and spatial reasoning. Moreover, they also have trouble forming secure attachments with their parents/caregivers due to their lack of social abilities. Williams shows that 47-53% of children with autism are securely attached, compared to 65% of ones without ASD.¹⁶ They possess difficulties with social performance, such as eye contact, repetitive behaviors, and the impaired ability to relate to others, as proved by the HEALIS AUTISM CENTRE.¹⁷ Children should become more socio-centric and focused on others at this stage. Autism Diagnostic Criteria.¹⁸ says this tends to be more difficult for children with ASD because there is an impairment in forming social bonds.

■ Parental Impacts on Attachment Styles:

Lanjekar *et al.* prove it is commonly known that parenting styles have a large impact on the development of a child.¹⁹ These parenting styles are often associated with cultural influences, but it is not always. The cultural influences, for example in Asian culture, Confucianism is a common religion. In Confucianism, children are obligated to perform "Xiao," which is reciprocating the care that the parents give to the child. This heavily influences the parenting style, which changes the attachment style the child forms. However, there is no direct

influence of culture on attachment styles. Culture influences parenting styles, which then influences attachment styles. There are four types of parenting styles: Authoritative, authoritarian, permissive, and uninvolved. Authoritarian parenting is often telling the child to listen just because the parent "said so," and the child needs to obey the parents' strict rules. Permissive parenting is giving space for the child to explore on his/her own, giving limited rules. Uninvolved parenting is fulfilling the child's basic needs but not being involved in any way otherwise. Authoritative parenting is the parenting style that is considered the most effective for establishing a secure attachment with the child. Appropriate amounts of rules are established, and disciplinary methods are taken instead of merely punishment without reason, as stated in Sanvictores & Mendez.²⁰ Lastly, not included above, there is also inconsistent parenting, which includes a combination of the above, with different parenting styles performed by the caregiver or multiple caregivers. Through reviewing studies on parenting styles for children with ASD in different cultures, it is found by O'Nions *et al.*, that in the United Kingdom, the most used parenting styles include Accommodation, Reinforcement Approaches, and Reducing Uncertainty.²¹ Accommodation is the action of the parents changing their behavior or the environment that the child is in to reduce the child's distress. For example, the parent can hold the child in place when the child is externalizing behaviors. This is influenced by child behavior, often because the child is rigid in socialization. Using rewards to encourage positive behavior is called Reinforcement Approaches, and this is not influenced by child behavior. For example, the parent can give the child a piece of candy after the child uses his/her words to communicate with the parent. The parenting style/strategy of Reducing Uncertainty is producing consistency in the parents' actions and allowing the child to feel secure. This is influenced by the child's behavior. These three parenting strategies can be categorized into authoritative parenting styles. On the other hand, in American and Asian cultures, poor child executive functioning leads to authoritarian and permissive parenting, so authoritarian parenting is often used. In a study conducted in the United States, a questionnaire study showed more parenting stress and a greater use of permissive parenting compared to typically developing children. Hutchison *et al.* state, "Authoritarian and permissive parenting styles were associated with poorer child executive functioning."²² Through reviewing three studies conducted in Asia (Indonesia, Hong Kong, and Taiwan), it is found that the authoritarian parenting style is the most used in these countries. In Indonesia, 101 families with children with ASD were surveyed in the study by Yulina Eva Riany *et al.*, and they reported greater use of authoritarian parenting compared to families without children with developmental delays.²³ In Hong Kong, forty-five parents were surveyed and interviewed by Kathleen Tait *et al.* about their experience with their children with ASD, and it was found that they often feel embarrassed about their children having developmental delays and ASD. Hutchison *et al.* prove that parental stress leads to more authoritarian parenting, therefore. Hong Kong parents are also more likely to perform authoritarian parenting

styles.^{24,25} In Taiwan, 151 children were recruited, and results show the ones with more behavioral problems received less affection and more overprotection and authoritarian control from their parents than the children without ASD, as found by Susan Shur-Fen Gau *et al.*²⁶ These parenting styles have different impacts on children with ASD. For one, Chao states authoritarian parenting styles cause children to externalize behaviors.²⁷ That means that the children are displaying more bad behavior, for example, aggression, rule-breaking, etc. They also display lower emotional regulation and the ability to adapt to stress. This impacts their future interpersonal relationships because they tend to be more shy, socially inept, and unable to make their own decisions, as proved by Sanvictores and Mendez.²⁸ Permissive parenting also has the same impact, with children exhibiting externalized behaviors. They have some self-esteem and decent social skills, but they can be impulsive, demanding, selfish, and lack self-regulation. Inconsistent parenting creates a disorganized-insecure attachment style for children, especially children with ASD. Feuerman argues they tend to become more untrusting and show more inconsistent behaviors.²⁹

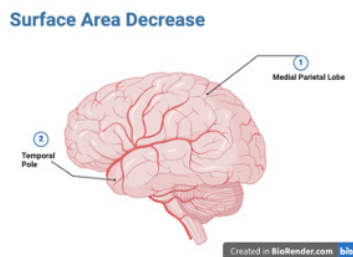


Figure 1: Brain regions with reduced surface area are associated with inconsistent parenting.

Inconsistent parenting style also alters brain development, as longitudinal magnetic resonance imaging by Whittle showed a decrease in surface area in medial parietal and temporal pole regions and reduced cortical thinning in medial parietal regions (see Figure 1).³⁰ This affects the development of neural circuits that subserve sensorimotor and social functioning in children.

Therefore, it makes creating secure attachment difficult for children with ASD because it harms the ability to function socially, including with parents.

Adverse Childhood Experiences (ACE) Impacts on Forming Secure Attachment Styles:

Adverse Childhood Experiences include “experiencing violence, abuse, or neglect, witnessing violence in the home or community, witnessing violence in the home or community, having a family member attempt or die by suicide, or growing up in a household with substance use problems, mental health problems, instability due to parental separation, or instability”, stated in About Adverse Childhood Experiences | Adverse Childhood Experiences (ACEs) | CDC.³¹ ACEs are more prone for children with ASD, as outlined by CDC.³² This is because they are more likely to be bullied at school because of their difference, which adds stress for parents and causes parents to react impulsively under pressure. A meta-analysis of

40 studies of 5,619,584 participants by Hartley *et al.* found an overall average Odds Ratio (“an OR > 1 means greater odds of association with the exposure and outcome” as stated by Smith 2018) of 2.11 of the relationship between a diagnosis of autism and ACEs.^{33,34} Hoover & Kaufman show that children with ASD get bullied by peers at a rate 3-4 times compared to children without autism.³⁵ This hurts the academic and mental health of ASD children. Moreover, ACEs like parental divorce and income insufficiency occur often for children with ASD because of the large amount of money that needs to go towards therapy. Hoover & Kaufman say this often causes comorbid psychiatric and mental health problems for these children.³⁵ Through reviewing three articles on the effects of ACE, it is found that they cause large amounts of externalized behavioral problems. The age of the children studied ranged from 3-18, with the majority in elementary school. One study done in 4 southwestern United States elementary schools showed that the “number of ACEs was able to predict 100% of the variance in social-emotional competencies and 98% of [the] variance in behavioral problems.” Moreover, the amount of ACEs also negatively correlates with social-emotional competencies and positively correlates with the number of behavioral problems that are reported by parents as found by Ray in 2020.³⁶ Another study done by Choi *et al.* for children aged 3-16 who are seeking primary care and mental healthcare services in Chicago, Illinois did a 28-item version of the Traumatic Events Screen Inventory and the results showed an OR of 2.93 for emotional abuse or neglect, 3.89 for natural disaster, 2.95 for forced separation from a parent or caregiver, 2.43 for incarceration of a family member, 2.84 for physical attack, and 2.35 for community violence.³⁷ However, after adjusting for the overall ACE level, only 1 item remained statistically significant: forced separation from a parent or caregiver (OR of 2.44). A study done on 845 children from primary to high school found a higher emotional intelligence correlated with higher well-being and resilience, and “a negative correlation between experiencing difficult situations, students’ well-being, and the level of resilience they reported.” Then a T-test was done to find which factors influenced well-being and resilience the most. The results showed violence from family and colleagues and parental divorce had the largest impact on well-being, while family violence, famine, and violence from colleagues had the largest impact on resilience. These effects of ASD are important because it was originally difficult for children with ASD to form secure attachments, as shown earlier in this paper. More research shows that although they show a range of attachment behaviors that are similar to children without ASD, “they displayed impairments in the use of the caregiver as a secure base and co-regulating agent”, supported by Keenan *et al.*³⁸ This is because they have impairments in forming social bonds, specifically having trouble making eye contact, turn-taking, conversation, joint attention, and other aspects of interpersonal relatedness. This heavily impacts the attachment style because these social bonds are essential for secure attachment. On top of this difficulty for children with autism to form secure attachment styles, ACEs further complicate the process because ACEs decrease social-emotional

competencies, increase levels of cortisol (the body's primary stress hormone), and decrease the child's overall well-being, found by Coan.³⁹

Neurobiology Processing Effects on Secure Attachment:

Children with ASD have structural abnormalities in the brain compared to children without ASD, and this can severely impact the formation of secure attachment. A child with ASD's brainstem, cerebellum, and limbic system, including the amygdala and the cortex, have abnormalities. Specifically, the amygdala shows abnormal developmental patterns, including the frontal and prefrontal lobes responsible for executive functions and social cognition. These abnormalities are linked to social isolation. The structural MRI shows consistent findings of early brain overgrowth, specifically in white matter and the amygdala during a child with ASD's first few years as proved by Parici *et al.*⁴⁰ When comparing the structural abnormalities of the brain of a child with ASD to the parts of the brain that need to be activated for secure attachment, it is found that there are many overlaps. For example, secure attachment needs the anterior cingulate cortex, the prefrontal cortex, and the hippocampus. These three parts of the brain are all included in the limbic system, which a child with ASD has abnormalities in, as shown. Moreover, the striatum and amygdala are activated in secure attachment, as found by Vrticka *et al.*, and "Securely attached children showed greater activation in the frontal, limbic and basal ganglia area which included the dorsolateral prefrontal cortex, amygdala, cingulate cortex and striatum, compared to other children who had lower quality of attachment", as stated by Choi.^{41,42} The amygdala overgrowth that was found in ASD children causes an insecure attachment style because it is associated with higher attachment-related anxiety.

Conclusion and Discussion

In conclusion, results show that culture acts as a factor in influencing the parenting styles of families with children with ASD, and the U.K. and Western cultures show more authoritative parenting styles while Asian cultures or families with children who show more externalized bad behaviors use authoritarian or permissive parenting styles. This causes children to exhibit more externalized behaviors, which proves this to be a malicious cycle. The inconsistent type of parenting also decreases social functioning. This all proves that authoritarian, permissive, and inconsistent types of parenting cause children to have more trouble in creating secure attachments with their caregivers because social functioning is needed to make secure attachment styles. Next, adverse childhood experiences are more common for children with ASD, and it causes them to also have decreased amounts of social-emotional competencies. This further complicates the process of the children forming secure attachment styles with their caregivers, due to the same reason as above. Children with ASD also have neurobiological differences with children without ASD, for example. Structural abnormalities in the limbic system, especially the amygdala. They experience more stress, causing them to have trouble forming secure attachments. The frontal and prefrontal cortex have abnormalities, explaining the social difficulties that they experience. With these factors combined, it should

be able to explain how the children tend to grow up to be more socially inept or unable to self-regulate, either because of their challenges to form secure attachment with their caregivers or because of their biological differences. For future studies, it is important to consider that the results of empirical studies may not be accurate because of the confounding variables that might influence the results. For this study, the same applies because the three factors compared in this study cannot control variables that were done in the studies that were analyzed. For example, when researching the neurobiological differences, the parental influences cannot be controlled in the studies that were analyzed. Moreover, there is a need for more longitudinal studies to find the actual impacts of parenting styles, adverse childhood experiences, and neurobiological differences on the attachment styles/representations of children with ASD. The existing cross-sectional studies may not successfully show the precise impact the three factors that the children with ASD experience during their childhood have on their future. There can only be a prediction of what impacts the experiences and neurobiological factors have. A large number of longitudinal studies with the same results can reveal the true relationship between the factors and the attachment representations, which can impact their quality of life due to the number of healthy relationships that can be built.

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