Preprints.org

Review

Not peer-reviewed version

Attachment in Adolescence: Old Patterns and New Challenges

Varvara Salavou and Georgios Giannakopoulos *

Posted Date: 17 September 2024

doi: 10.20944/preprints202409.1181.v1

Keywords: adolescent attachment; affect regulation; developmental psychopathology; intergenerational transmission; reflective functioning

Preprints.org is a free multidiscipline platform providing preprint service that is dedicated to making early versions of research outputs permanently available and citable. Preprints posted at Preprints.org appear in Web of Science, Crossref, Google Scholar, Scilit, Europe PMC.

Copyright: This is an open access article distributed under the Creative Commons Attribution License which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

Preprints.org (www.preprints.org) | NOT PEER-REVIEWED | Posted: 17 September 2024 doi:10.20944/preprints202409.1181.v1

Disclaimer/Publisher's Note: The statements, opinions, and data contained in all publications are solely those of the individual author(s) and contributor(s) and not of MDPI and/or the editor(s). MDPI and/or the editor(s) disclaim responsibility for any injury to people or property resulting from any ideas, methods, instructions, or products referred to in the content.

Review

Attachment in Adolescence: Old Patterns and New Challenges

Varvara Salavou and Georgios Giannakopoulos *

Department of Child Psychiatry, School of Medicine, National and Kapodistrian University of Athens, Aghia Sophia Children's Hospital, Athens, Greece

* Correspondence: ggiannak@uoa.gr

Abstract: This narrative review provides an in-depth analysis of attachment during adolescence, emphasizing how early attachment experiences shape emotional, social, and psychological development. Drawing from the foundational work of Bowlby and Ainsworth, it revisits attachment theories and explores how the attachment system evolves as adolescents seek greater autonomy while maintaining bonds with caregivers. The review discusses the prevalence and developmental consequences of attachment-related disorders, such as reactive attachment disorder and disinhibited social engagement disorder, particularly in relation to adverse caregiving environments. Key themes include the intergenerational transmission of attachment, where parental reflective functioning and early caregiving behaviors influence attachment security across generations. The evolving role of fathers, peer relationships, and romantic bonds in adolescence are explored as significant factors shaping attachment patterns during this developmental period. Methodological considerations highlight the value of qualitative approaches, including interviews and observational methods, for capturing the complexity of adolescent attachment dynamics. Additionally, the review addresses the processes that contribute to both continuity and change in attachment classifications over time, emphasizing the impact of life events, parental behaviors, and developmental transitions. The implications of attachment for developmental psychopathology, particularly in relation to emotional regulation and psychosocial functioning, are discussed. Finally, the review calls for further interdisciplinary research to deepen understanding of attachment mechanisms, using advanced technologies and culturally sensitive approaches to improve mental health and developmental outcomes across the lifespan.

Keywords: adolescent attachment; affect regulation; developmental psychopathology; intergenerational transmission; reflective functioning

1. Introduction

John Bowlby [1,2] defined attachment as an innate biological predisposition in children to seek comfort from their caregivers, particularly in situations of fear or distress. The child and caregiver form an attachment system, which serves as a secure base that provides emotional safety during times of stress and encourages exploration of the world. The accessibility and responsiveness of the caregiver play a crucial role in the security of this attachment.

Attachment is central to a child's socio-emotional development, as it represents the first experience of human intimacy [3]. Through selective processing and integration of information gathered from relational experiences, the child internalizes representations of the self, the caregiver, and their relationship. Over time, these representations become part of the child's internal model of self and others [4].

Mary Ainsworth's Strange Situation Procedure (SSP) [5,6] demonstrated the importance of a caregiver's sensitive responsiveness to the child's attachment-seeking behaviors. This assessment classified attachment into secure and insecure patterns by observing how infants regulated their emotions in the presence, absence, and return of their caregiver, as well as during interactions with a

© 2024 by the author(s). Distributed under a Creative Commons CC BY license.

Preprints.org (www.preprints.org) | NOT PEER-REVIEWED | Posted: 17 September 2024 doi:10.20944/preprints202409.1181.v1

stranger. Confidence in the caregiver's consistent accessibility and responsiveness was identified as key to secure attachment. Later, Mary Main identified disorganized attachment, which occurs when a child lacks a coherent strategy to cope with stress, often described as a "fright without solution" [7].

A review of 285 studies involving over 20,000 parent-child dyads in more than 20 countries revealed that globally, 51.6% of infants were securely attached, 14.7% showed anxious-avoidant attachment, 10.2% had anxious-resistant attachment, and 23.5% exhibited disorganized attachment [8]. These studies found no significant differences in attachment patterns between mothers and fathers, or between different child ages and sexes. However, disorganized attachment was more prevalent in populations at socio-demographic risk, in cases of child maltreatment, in families where the parent had a mental health disorder, and among children in foster care or adopted from institutional settings.

Main's Adult Attachment Interview (AAI) [9,10] remains a widely used tool for assessing adult attachment by evaluating the coherence of individuals' narratives about their early caregiving experiences and their reflections on how these experiences have shaped their adult personality [11]. The AAI classifies individuals as secure-autonomous, insecure-avoidant, insecure-preoccupied, or unresolved with respect to trauma or loss.

A review of more than 200 studies and over 10,000 AAIs conducted over 25 years found that 58% of adults were securely attached, 23% were dismissing of attachment, and 19% were preoccupied. Additionally, 18% were unresolved in relation to trauma or loss [12]. No gender differences were detected between avoidant and preoccupied classifications, and attachment classification was found to be independent of language or country of origin. However, clinical populations showed higher rates of insecure and unresolved attachment compared to non-clinical groups.

2. Attachment and Attachment Disorders

Since the early 20th century, numerous studies have identified two primary attachment disorders: reactive attachment disorder (RAD) and disinhibited social engagement disorder (DSED). Both are linked to various types of adverse caregiving environments [13,14]. However, much remains to be learned about the vulnerability factors and underlying mechanisms of inadequate care that contribute to these disorders, as well as the neurobiological factors associated with each [14].

Zeanah and Smyke [13] emphasized the importance of recognizing relationship-specific psychopathology, which extends beyond the within-child perspective outlined by official psychiatric classification systems. An alternative classification for attachment disorders distinguishes between disorders of nonattachment, which may manifest as either emotional withdrawal or indiscriminate sociability; secure base distortions, which are relationship-specific maladaptive patterns such as self-endangerment, clinging, hypercompliance, or role reversal; and disrupted attachment disorders, which involve a sudden loss of the attachment figure, leading to behaviors like protest, despair, and detachment [15].

3. The Impact of Attachment Classification on Child Development

Attachment classification has been found to have a significant impact on various aspects of child development. In a review by Ainsworth [6], factors such as cooperation, aggression, competence, persistence in problem-solving, adjustment, peer relations, and resilience were all linked to the quality of early parent-child attachment. Additionally, maternal stress, a history of behavioral problems, and maternal sensitivity were identified as important influences on attachment security in infants.

Nearly two decades later, a meta-analysis by Bakermans-Kranenburg et al. [12] confirmed the causal role of parental sensitivity in attachment security. Interventions aimed at enhancing parental sensitivity were shown to increase attachment security in infants.

On the other hand, research by Lyons-Ruth [16–18] highlighted the importance of early mother-infant interactions in shaping a child's ability to regulate emotions, particularly in stressful situations, even at the physiological level. Disruptive affective communication processes observed between 12

Preprints.org (www.preprints.org) | NOT PEER-REVIEWED | Posted: 17 September 2024 doi:10.20944/preprints202409.1181.v1

to 18 months of age were linked to infant disorganized attachment and maternal unresolved trauma or loss, in both low- and high-risk families [17,18]. Lyons-Ruth [19] identified five specific aspects of mother-infant interaction that contributed to this disruption: (a) affective errors, (b) disorientations, (c) negative-intrusive behavior, (d) role confusion, and (e) withdrawal.

Maternal withdrawal, in particular, was found to play a key role in setting developmental trajectories that could lead to dissociative, borderline, and conduct disorders in late adolescence. Interestingly, other factors such as single parenthood, poverty, and a mother's prior psychopathology were not predictive of dissociative symptoms in adulthood [18].

In two more recent longitudinal studies, O'Connor et al. [20] examined the quality of parent-child interactions in both clinical and at-risk community samples, assessing these interactions at ages 3, 7, and 12. The studies found moderate stability in these interactions over time and revealed a strong influence of early caregiving on attachment representations in adolescence. Parental sensitivity emerged as a key predictor of attachment security in adolescence, though this effect was particularly strong in the at-risk community sample.

The link between attachment and caregiving experiences is evident, particularly in relation to mental health outcomes later in life. While maltreatment and neglect have been consistently associated with attachment disorders [14], Granqvist et al. [21] clarified that disorganized attachment is not a static trait of the child, does not reliably indicate child maltreatment, and is not always a predictor of future pathology. Instead, disorganized attachment has been associated with parental behaviors that are frightening, dissociative, or unresolved, especially in cases involving parental trauma or socio-economic risks. Granqvist and colleagues also emphasized the importance of attachment-based interventions and reparative relational experiences in breaking intergenerational cycles of abuse.

4. Attachment and Developmental Psychopathology

Attachment can be understood within a vulnerability model, where both protective and risk factors shape future child and adolescent development, rather than being a direct cause of psychopathology [22,23].

In her longitudinal studies, Lyons-Ruth [19] found that disorganized attachment behaviors in infancy are important precursors to later dissociative symptoms. Lyons-Ruth [18] later reported that early emotional exchanges between parent and infant had significant predictive power over a 20-year period, independent of demographic factors or a history of abuse.

In a longitudinal study with a medium-risk sample, Sroufe [22] explained that both secure and insecure attachment in infancy could lead to behavioral problems later in development, especially when combined with other risk factors. He also found that disorganized attachment in infancy could predict dissociative symptoms in middle adolescence and early adulthood. Self-injurious behavior in early adulthood, often associated with borderline personality features, was found to be independently related to a history of disorganized attachment, maltreatment, and dissociation.

Other studies have linked insecure attachment with both internalizing and externalizing behaviors [22,24–28]. Allen et al. [25] found that previously hospitalized adolescents who had experienced severe psychopathology were more likely to have insecure attachment and unresolved trauma, suggesting a link between attachment organization and developmental psychopathology.

Insecure attachment has been shown to influence a wide range of psychosocial outcomes. Kobak [29] warned of the risks of overlooking attachment disruptions during psychiatric assessments, particularly when symptoms of psychopathology are more apparent. These disruptions, particularly when related to a caregiver's availability, can be critical to understanding the underlying dynamics of developmental psychopathology.

5. Intergenerational Transmission of Attachment

The correspondence between adult attachment classifications, as measured by the Adult Attachment Interview (AAI), and infant attachment classifications, as measured by the Strange Situation Procedure (SSP), has been well-established. In one of the first studies to examine this, Main

Preprints.org (www.preprints.org) | NOT PEER-REVIEWED | Posted: 17 September 2024 doi:10.20944/preprints202409.1181.v1

[9] found significant alignment between the attachment classifications of parents and their infants. Strong evidence of this intergenerational transmission of attachment was later demonstrated in the London Parent-Child Project, where a mother's mental state during pregnancy could predict the attachment pattern of her infant 75% of the time, as assessed by the SSP at one year of age [30,31].

More recent studies, such as that of Shah et al. [32], suggest a more nuanced view of this transmission, showing a tendency for insecure patterns to invert between generations. For example, mothers classified as insecure-avoidant tended to have infants with insecure-preoccupied attachment patterns, and vice versa.

A meta-analysis by Van IJzendoorn [33], which included 18 samples with a combined sample size of 854, showed a strong effect size (1.06) for the secure-insecure match between parent and infant attachment classifications. In 13 samples where the three-way classifications were used, the correspondence rate was 70%. Notably, the correlation between fathers and their infants was consistently weaker than between mothers and infants, reflecting an infant's ability to form distinct attachment representations with each parent during the first 18 months [31].

In contrast, studies examining the relationship between mother and adolescent attachment security found a much lower correlation, with a correspondence rate of only .2 [34]. This suggests that attachment patterns may shift during adolescence, potentially due to changes in the parent-child relationship or broader developmental factors.

Verhage et al. [35] stressed the importance of understanding attachment in the context of changing societal dynamics, such as increased paternal involvement in caregiving over recent decades. These changes highlight the need for further research into the specific mechanisms of attachment transmission in a way that reflects the modern family structure.

While maternal sensitivity has long been identified as a key mediator in the transmission of attachment, explaining about 25% of the variance [36], other factors are now being explored. Differential susceptibility, where temperamentally difficult children may affect caregiving behaviors, and broader parenting practices such as autonomy support, limit setting, parental warmth, synchrony and repair of mismatches, are also important contributors to the transmission process [36].

In the most recent meta-analysis on this topic, Verhage et al. [35] confirmed the intergenerational transmission of attachment but with a lower effect size than the 1995 meta-analysis. This change was attributed to factors such as at-risk samples, the age of the children, and the gender of the parent. These findings suggest a non-linear model of attachment transmission, where some children may be more resilient to negative influences from their environment, and where societal changes play a significant role.

Parental reflective functioning—the ability of a parent to reflect on their own and their child's mental states—has emerged as a particularly important factor in the intergenerational transmission of attachment. Studies have shown that a parent's reflective capacity is the strongest predictor of attachment security in infants [37,38]. In some cases, maternal reflective functioning, rather than attachment security, has been shown to predict a child's reflective functioning [39].

6. Processes Linked with Stability and Change in Attachment Classification

John Bowlby [1] proposed that internal working models of the self and others are established in infancy and remain relatively stable throughout development. However, he also acknowledged that these models need ongoing updates as the child's social, cognitive, and communicative abilities grow [4]. Without these updates, there is a risk of psychopathology.

Mary Ainsworth [6,40] observed that attachment provides a core of continuity despite developmental changes. She encouraged researchers to investigate the factors that promote or disrupt this continuity through intensive and longitudinal studies. Ainsworth identified several internal factors that contribute to stability in attachment, such as habitual behaviors, representational models of the self and caregivers, and defensive processes. However, she also noted that children are sensitive to significant changes in maternal behavior and life events that occur later in development.

Recent research has focused heavily on the processes that contribute to both continuities and discontinuities in attachment security over time. Sroufe [22] developed an organizational perspective

Preprints.org (www.preprints.org) | NOT PEER-REVIEWED | Posted: 17 September 2024 doi:10.20944/preprints202409.1181.v1

on development, highlighting the dynamic interaction between past experiences and present challenges. According to Sroufe [22], prior history shapes new experiences, but these new experiences can also transform established patterns of adaptation. His research emphasized the transactional nature of development, showing that attachment experiences throughout childhood and adolescence are influenced by factors such as peer relationships, emotional regulation, and social competence. As Sroufe [22] aptly stated, "Who you are depends on both who you were and the challenges faced in the present."

Findings from twin studies support the idea of stability in attachment, indicating that around 40% of attachment security is heritable, while the shared environment has a negligible influence [41]. Ammaniti et al. [42] also found significant stability in attachment security between late childhood and early adolescence in a small sample, though measurement limitations were noted due to the young age of the children [43].

Other research has demonstrated that environmental factors can influence changes in attachment classification, particularly during adolescence. Hamilton [44] and Allen et al. [45] both found that attachment security in infancy was a predictor of adolescent security, but they also observed that stressful life events, such as parental divorce, death, or foster care placement, contributed to shifts in attachment classification. This finding was later supported by Weinfield et al. [46], especially in high-risk samples.

Temperament also plays a role in the stability of attachment. Weinfield et al. [46] found that children with difficult temperaments are more likely to experience disruptions in security, as mothers may struggle to maintain sensitivity in their interactions. Maltreatment has been shown to maintain insecurity over time, though more research is needed to determine how the type and timing of maltreatment impact attachment continuity.

Adolescence, in particular, is a phase of life where attachment may undergo significant changes. Allen et al. [45] identified several stressors that could affect attachment during this period, including developmental tasks such as the pursuit of autonomy, familial interactions, intrapsychic stressors like depression, and environmental factors such as financial hardship. The authors found that attachment organization stabilizes by middle adolescence, with the adolescent's capacity for emotional regulation and autonomy predicting future attachment security.

Overall, while attachment can remain stable over time, significant life events, environmental stressors, and family dynamics can lead to changes in attachment classification, especially during periods of developmental transition like adolescence. These shifts underscore the adaptive and context-sensitive nature of attachment.

7. Attachment in Adolescence

Adolescence represents a critical period of development, where attachment undergoes significant changes as individuals navigate new emotional, cognitive, and social challenges. This stage is often referred to as the "second individuation process" [47] or a "normative crisis situation" [48], during which a mental picture of the self, including a fixed sexual identity, is formed [49]. The turbulence of this period, marked by hormonal, emotional, and cognitive transformations, heightens vulnerability while simultaneously fostering increased autonomy from parents and deeper connections with peers and romantic partners.

Allen and Tan [50] describe three primary areas of transformation in adolescence: attachment relationships with caregivers, intra-psychic processes, and peer relationships. Unlike in infancy, where attachment is primarily centered around the caregiver, the adolescent must balance attachment needs with the growing desire for exploration and independence. Adolescents gradually shift from relying heavily on caregivers for emotional regulation to seeking autonomy in meeting their attachment needs. Although peer and romantic relationships often gain importance during this phase, attachment to mothers typically remains paramount [51].

Adolescence involves a renegotiation of the attachment bond with caregivers, where adolescents seek more independence while still requiring support from their parents. Allen et al. [52] identified four markers that significantly explain the variance in adolescent attachment security: maternal

Preprints.org (www.preprints.org) | NOT PEER-REVIEWED | Posted: 17 September 2024 doi:10.20944/preprints202409.1181.v1

supportiveness, maternal attunement, adolescent de-idealization, and dyadic relatedness. Support from mothers, especially during conflict, was found to be particularly influential in fostering attachment security. Furthermore, the degree of concordance between adolescents' and parents' perceptions of their relationship could predict the adolescent's attachment security.

Current parent-adolescent interactions often have a stronger influence on attachment than past internal working models [20,29,52,53]. However, early sensitive caregiving in childhood has enduring effects on attachment in adolescence, even independent of the current quality of the parent-child relationship [20]. Adolescents with secure attachment representations are more likely to elicit sensitive parenting due to their positive and constructive interaction styles. In contrast, adolescents with insecure attachment patterns may struggle to negotiate autonomy and may be overwhelmed by emotions during disagreements with parents [20,50].

Affect regulation strategies play a vital role in adolescent development, with the ability to manage emotions strongly linked to psychosocial functioning, autonomy, and long-term psychological adjustment [25,53,54]. Adolescents may seek emotional support from peers and romantic partners as they develop their meta-cognitive capacities to process emotions, particularly during critical moments [50,55]. While adolescents often turn to peers for support, parent-adolescent interactions continue to have a strong impact on attachment security and emotional development.

Attachment during adolescence is not static but rather an adaptive quality that responds to changes in relationships and the broader social context. Factors such as parental availability, responsiveness, and the adolescent's evolving need for autonomy and affect regulation shape the attachment process throughout this period. The ability to balance autonomy with relatedness, as well as to navigate conflicts with parents while maintaining emotional security, are key components of secure attachment during this developmental stage.

8. Measuring Attachment in Adolescence

Measuring attachment during adolescence presents unique challenges, as this developmental phase involves significant cognitive, emotional, and social changes. Mary Ainsworth [56] highlighted the importance of understanding these changes, stating that much more research is needed to comprehend the normative shifts that occur during adolescence. Attachment processes may be influenced by hormonal, neurophysiological, and cognitive changes as well as by socioemotional experiences.

In early studies, the Adult Attachment Interview (AAI) was adapted to assess attachment in adolescents, mainly focusing on late adolescence [27]. The AAI continues to be a robust qualitative tool for capturing adolescents' attachment to caregivers, with studies utilizing it across a wide age range [25,52]. Additionally, conflict resolution tasks with parents and friends, as well as self-report measures, have been used to assess attachment and emotional regulation strategies in adolescents [34,51].

More recently, new qualitative measures have been developed to address gaps in adolescent attachment research. The Child Attachment Interview (CAI) and the Friends and Family Interview (FFI) are designed to assess attachment representations in children and adolescents aged 9 to 16 years [57,58]. Both interviews emphasize reflective functioning and mentalization, crucial skills that develop during adolescence and are linked to attachment security [59]. These tools fill a gap by addressing the difficulty of assessing attachment during adolescence, especially given the limitations of earlier measures focused on pre-verbal and pre-symbolic internal working models, which are more appropriate for younger children.

Jewell et al. [60] reviewed attachment measures in middle childhood and adolescence and found that while the CAI demonstrated strong psychometric properties, its inter-rater reliability was not fully adequate. The FFI, though often used in studies with adopted children to capture the integration of past and present attachment representations, was less effective at detecting disorganization compared to other measures.

Overall, advancements in measuring attachment during adolescence continue to enhance our understanding of attachment dynamics. These tools provide more nuanced insights into how

Preprints.org (www.preprints.org) | NOT PEER-REVIEWED | Posted: 17 September 2024 doi:10.20944/preprints202409.1181.v1

adolescents navigate emotional regulation and relational challenges, emphasizing the need for reflective functioning and mentalization as part of attachment assessments.

9. Discussion

The review of attachment theories and studies underscores the complex interplay between attachment behaviors and developmental outcomes from infancy through adolescence. While significant progress has been made in understanding the many dimensions and implications of attachment, several gaps remain that require further exploration to enhance both the theoretical and practical applications in this field.

One of the most notable gaps lies in the overreliance on quantitative measures, which may overlook the nuanced and subjective experiences of attachment relationships. Current research often relies heavily on these measures, but the integration of qualitative approaches—such as interviews and narrative assessments for both adolescents and parents—could provide deeper insights into the dynamics of attachment. These methods can capture complex elements such as affect regulation, reflective functioning, social competence, and self-esteem, offering a more comprehensive understanding of how these factors contribute to emotional and behavioral outcomes [43,59].

Moreover, the traditional focus on Bowlby's concept of internal working models, while foundational, may benefit from being expanded to include constructs such as affect regulation and reflective functioning. These concepts are critical for understanding how individuals manage their emotions and navigate relationships. Research has already shown that parental mentalization—particularly a parent's ability to reflect on their own and their child's mental states—plays a key role in attachment security in infants [37,38]. However, further exploration of reflective functioning in adolescence is needed, as this is a developmental period when peer relationships and self-regulation take on greater significance [55]. Such a shift would offer a more dynamic view of attachment and its role in psychological and social development.

Another area in need of attention is the role of maternal sensitivity in attachment development. While maternal sensitivity and active, supportive engagement during conflict have been shown to shape secure attachment in adolescence [52], the exploration of a broader range of maternal behaviors is necessary. Behaviors such as warmth, limit-setting, and emotional attunement may interact in complex ways to foster attachment security [36]. Lyons-Ruth [18] has argued that attachment research should evolve to focus on intersubjective exchanges rather than just physical proximity or protection, emphasizing positive engagement, and relational processes that regulate affect.

The role of fathers in attachment has also been historically underexplored. Although early findings suggested that maternal attachment was a stronger predictor of infant attachment security [30], more recent studies have shown the importance of paternal involvement, particularly in facilitating exploration and autonomy [35]. Fathers' involvement in caregiving and emotional support plays a significant role in attachment outcomes, especially during adolescence, when peer and romantic relationships become central to the individual's attachment hierarchy [45,61]. Findings such as those by Grossman et al. [62], which suggest that fathers' play sensitivity may be a better predictor of long-term attachment representation than early security with the father, point to the need for more research in this area. This research should investigate the unique contributions fathers make to attachment development during adolescence and how these contributions differ from maternal roles.

Unresolved trauma and loss in parents can profoundly impact attachment security in their children. While much research has focused on infants, there is a growing need to understand how these issues affect adolescents and how they may influence attachment trajectories over time. Therapeutic interventions aimed at enhancing parental reflective functioning and affect regulation could mitigate these adverse effects, potentially breaking cycles of attachment insecurity that span generations.

In addition to addressing these research gaps, attachment studies must increasingly incorporate multidisciplinary approaches. The integration of insights from psychology, neuroscience, and the social sciences can provide a more holistic understanding of attachment. For instance, neuroimaging

Preprints.org (www.preprints.org) | NOT PEER-REVIEWED | Posted: 17 September 2024 doi:10.20944/preprints202409.1181.v1

and biofeedback technologies offer new opportunities to measure emotional and physiological responses in real-time, adding precision to attachment assessments. Such innovations could complement traditional methods and lead to a more comprehensive understanding of attachment dynamics.

Cultural sensitivity also remains an essential area for future research. Expanding attachment studies across diverse cultural contexts can help distinguish universal from culture-specific attachment behaviors. Such an approach would support the development of culturally sensitive measures, interventions, and support systems, thereby improving the applicability of attachment theory in various social and cultural environments.

Finally, attachment research holds significant policy implications. Findings in this field can inform policies related to child welfare, education, and mental health services. Evidence-based policies that promote environments conducive to secure attachment will ultimately enhance developmental outcomes for children and adolescents. Policymakers must consider how parental attachment behaviors, early caregiving experiences, and broader social factors influence mental health and well-being across the lifespan.

In conclusion, addressing the existing gaps and embracing interdisciplinary approaches will be crucial in advancing attachment research. By incorporating qualitative measures, exploring the broader range of caregiving behaviors, understanding the evolving role of fathers, and leveraging technological advancements, future research can deepen our understanding of attachment and its profound impact on human development.

10. Conclusions

This review highlights the significant strides made in understanding attachment theory and its role in developmental outcomes, yet it also underscores the need for continued research to fill existing gaps. The foundational work of Bowlby and Ainsworth, alongside the evolving insights of contemporary researchers, has established that attachment plays a critical role in shaping the emotional, social, and psychological well-being of individuals from infancy through adolescence.

One key conclusion is that attachment is not a static construct; rather, it evolves in response to ongoing relational experiences, particularly during periods of developmental transition like adolescence. Adolescence marks a crucial period where attachment dynamics with caregivers, peers, and romantic partners shift, and the adolescent's capacity for affect regulation, autonomy, and relatedness becomes more prominent. The renegotiation of attachment bonds during this stage can have lasting implications for mental health and overall adjustment.

The intergenerational transmission of attachment further emphasizes how early caregiving experiences and parental reflective functioning influence attachment security across generations. Secure attachment is not only a product of early childhood experiences but also of ongoing interactions and relational experiences throughout development. This dynamic nature of attachment calls for a broader understanding that includes both protective and risk factors over the course of an individual's life.

Furthermore, the review has demonstrated the importance of expanding our understanding of attachment beyond traditional caregiver-child relationships. The evolving role of fathers, the impact of unresolved trauma in parents, and the significance of peer and romantic relationships in adolescence are all areas that demand more attention. These factors interact with the individual's attachment system in complex ways and shape long-term developmental outcomes.

While attachment security has been linked to numerous positive outcomes, such as resilience, social competence, and psychological well-being, insecure attachment—particularly when coupled with other risk factors—can predispose individuals to a range of developmental psychopathologies. Studies have shown that disorganized attachment, often associated with frightening or dissociative parental behaviors, can lead to dissociative symptoms and self-injurious behavior in later life. Understanding these pathways is essential for developing targeted interventions that can disrupt maladaptive cycles of attachment and promote secure relationships.

Preprints.org (www.preprints.org) | NOT PEER-REVIEWED | Posted: 17 September 2024 doi:10.20944/preprints202409.1181.v1

In conclusion, while attachment theory provides a robust framework for understanding human development, it is clear that attachment is a complex and adaptive process influenced by a wide range of factors. Future research should continue to explore the nuances of this process, incorporating interdisciplinary perspectives, advanced technologies, and cultural sensitivity to deepen our understanding of attachment and its far-reaching impact on mental health and development. Through these efforts, we can continue to improve outcomes for children and adolescents, supporting them in forming secure, healthy relationships that foster lifelong well-being.

Funding: This research received no external funding

Institutional Review Board Statement: Not applicable

Informed Consent Statement: Not applicable

Data Availability Statement: No new data were created or analyzed in this study. Data sharing is not applicable to this article

Conflicts of Interest: The authors declare no conflicts of interest

References

1. Bowlby J: **Attachment and Loss**, vol. I: Attachment. New York: Basic Books; 1969.
2. Bowlby J: **Attachment and Loss**, vol. II: Separation, Anxiety and Anger. New York: Basic Books; 1973.
3. Sroufe LA, Carlson EA, Levy AK, Egeland B: **Implications of attachment theory for developmental psychopathology**. *Dev Psychopathol* 1999, **11**(1):1-13.
4. Bretherton I, Munholland K: **The internal working model construct in light of contemporary neuroimaging research**. In: *Handbook of attachment Theory, research and applications*. 3rd edn. Edited by Cassidy J, Shaver P. New York ; London: The Guilford Press; 2016.
5. Ainsworth M, Blehar M, Waters E, Wall S: **Patterns of Attachment. A Psychological Study of the Strange Situation**, 1st edn. New York: Psychology Press; 2015.
6. Ainsworth MD: Patterns of infant-mother attachments: antecedents and effects on development. *Bull N Y Acad Med* 1985, 61(9):771-791.
7. Hesse E, Main M: Frightened, threatening, and dissociative parental behavior in low-risk samples: Description, discussion, and interpretations. *Development and Psychopathology* 2006, 18(2):309-343.
8. Madigan S, Fearon RMP, van Ijzendoorn MH, Duschinsky R, Schuengel C, Bakermans-Kranenburg MJ, Ly A, Cooke JE, Deneault AA, Oosterman M *et al.*: **The First 20,000 Strange Situation Procedures: A Meta-Analytic Review**. *Psychological Bulletin* 2023, **149**(1-2):99-132.
9. Main M, Kaplan N, Cassidy J: **Security in infancy, childhood, and adulthood: A move to the level of representation**. *Monographs of The Society for Research in Child Development* 1985, **50**:66-104.
10. George C, Main M, Kaplan N: **Adult Attachment Interview (AAI) [Database record]**. In.: APA PsycTests; 1985.
11. Hesse E, Main M: Disorganized infant, child, and adult attachment: Collapse in behavioral and attentional strategies. *Journal of the American Psychoanalytic Association* 2000, 48(4):1097-1127.
12. Bakermans-Kranenburg MJ, Van Ijzendoorn MH, Juffer F: **Less is More: Meta-Analyses of Sensitivity and Attachment Interventions in Early Childhood**. *Psychological Bulletin* 2003, **129**(2):195-215.
13. Zeanah CH, Smyke AT: **Attachment disorders in family and social context**. *Infant Mental Health Journal* 2008, **29**(3):219-233.
14. Zeanah CH, Gleason MM: Annual research review: Attachment disorders in early childhood—Clinical presentation, causes, correlates, and treatment. *Journal of Child Psychology and Psychiatry and Allied Disciplines* 2015, 56(3):207-222.
15. Zeanah CH, Boris NW, Lieberman AF: **Attachment Disorders of Infancy**. In: *Handbook of Developmental Psychopathology.* edn. Edited by Sameroff AJ, Lewis M, Miller SM. Boston, MA: Springer; 2000.
16. Lyons-Ruth K: The two-person construction of defenses: Disorganized attachment strategies, unintegrated mental states, and hostile/ helpless relational processes. *Journal of Infant, Child, and Adolescent Psychotherapy* 2002, 2(4):107-119.
17. Lyons-Ruth K: The interface between attachment and intersubjectivity: Perspective from the longitudinal study of disorganized attachment. *Psychoanalytic Inquiry* 2006, 26(4):595-616.
18. Lyons-Ruth K: Contributions of the mother-infant relationship to dissociative, borderline, and conduct symptoms in young adulthood. *Infant Mental Health Journal* 2008, 29(3):203-218.
19. Lyons-Ruth K: Dissociation and the parent-infant dialogue: A longitudinal perspective from attachment research. *Journal of the American Psychoanalytic Association* 2003, 51(3):883-911.

Preprints.org (www.preprints.org) | NOT PEER-REVIEWED | Posted: 17 September 2024 doi:10.20944/preprints202409.1181.v1

20. O'Connor TG, Woolgar M, Humayun S, Briskman JA, Scott S: **Early caregiving predicts attachment representations in adolescence: findings from two longitudinal studies**. *Journal of Child Psychology and Psychiatry and Allied Disciplines* 2019, **60**(9):944-952.
21. Granqvist P, Sroufe LA, Dozier M, Hesse E, Steele M, van Ijzendoorn M, Solomon J, Schuengel C, Fearon P, Bakermans-Kranenburg M *et al.*: **Disorganized attachment in infancy: a review of the phenomenon and its implications for clinicians and policy-makers**. *Attachment and Human Development* 2017, **19**(6):534-558.
22. Sroufe LA: Attachment and development: A prospective, longitudinal study from birth to adulthood. *Attachment and Human Development* 2005, 7(4):349-367.
23. Malik S, Joychan S, Zajac J, Sinisgalli S, Namerow L: Using an attachment-informed framework in the clinical care of children and adolescents: A review of attachment theory and its impact on developmental psychopathology. *Psychiatric Annals* 2021, 51(7):300-315.
24. Allen JP, Borman-Spurrell E, Hauser ST: Attachment theory as a framework for understanding sequelae of severe adolescent psychopathology: An 11-year follow-up study. *Journal of Consulting and Clinical Psychology* 1996, 64(2):254-263.
25. Allen JP, Moore C, Kuperminc G, Bell K: **Attachment and Adolescent Psychosocial Functioning**. *Child Development* 1998, **69**(5):1406-1419.
26. Allen JP, Marsh P, McFarland C, McElhaney KB, Land DJ, Jodl KM, Peck S: **Attachment and autonomy as predictors of the development of social skills and delinquency during midadolescence**. *Journal of Consulting and Clinical Psychology* 2002, **70**(1):56-66.
27. Kobak RR, Sceery A: Attachment in late adolescence: working models, affect regulation, and representations of self and others. *Child development* 1988, 59(1):135-146.
28. Allen JP, Porter M, McFarland C, McElhaney KB, Marsh P: The relation of attachment security to adolescents' paternal and peer relationships, depression, and externalizing behavior. *Child Development* 2007, 78(4):1222-1239.
29. Kobak R: **Attachment disruptions, reparative processes and psychopathology. Theoretical and clinical implications**. In: *Handbook of attachment Theory, research and applications* 3rd edn. Edited by Cassidy J, Shaver PR. New York: The Guilford Press; 2016.
30. Fonagy P, Steele H, Steele M: Maternal Representations of Attachment during Pregnancy Predict the Organization of Infant-Mother Attachment at One Year of Age. *Child Development* 1991, 62(5):891-905.
31. Steele H, Steele M, Fonagy P: Associations among Attachment Classifications of Mothers, Fathers, and Their Infants. *Child Development* 1996, 67(2):541-555.
32. Shah PE, Fonagy P, Strathearn L: **Is attachment transmitted across generations? the plot thickens**. *Clinical Child Psychology and Psychiatry* 2010, **15**(3):329-345.
33. Van Ijzendoorn MH: Adult attachment representations, parental responsiveness, and infant attachment: A meta-analysis on the predictive validity of the adult attachment interview. *Psychological Bulletin* 1995, 117(3):387-403.
34. Allen JP, Manning N: **From safety to affect regulation: attachment from the vantage point of adolescence**. *New directions for child and adolescent development* 2007(117):23-39.
35. Verhage ML, Schuengel C, Madigan S, Pasco Fearon RM, Oosterman M, Cassibba R, Bakermans-Kranenburg MJ, Van Ijzendoorn MH: **Narrowing the transmission gap: A synthesis of three decades of research on intergenerational transmission of attachment**. *Psychological Bulletin* 2016, **142**(4):337-366.
36. van Ijzendoorn MH, Bakermans-Kranenburg MJ: **Bridges across the intergenerational transmission of attachment gap**. *Current Opinion in Psychology* 2019, **25**:31-36.
37. Slade A, Grienenberger J, Bernbach E, Levy D, Locker A: **Maternal reflective functioning, attachment, and the transmission gap: A preliminary study**. *Attachment and Human Development* 2005, **7**(3):283-298.
38. Steele H, Steele M: **On the Origins of Reflective Functioning**. In: *Mentalization.* 1st edn. Edited by Busch FN. New York: Routledge; 2008.
39. Rosso AM, Airaldi C: **Intergenerational transmission of reflective functioning**. *Frontiers in Psychology* 2016, **7**(DEC).
40. Ainsworth MS: **Infant-mother attachment**. *American Psychologist* 1979, **34**(10):932-937.
41. Fearon P, Shmueli-Goetz Y, Viding E, Fonagy P, Plomin R: **Genetic and environmental influences on adolescent attachment**. *Journal of Child Psychology and Psychiatry and Allied Disciplines* 2014, **55**(9):1033-1041.
42. Ammaniti M, Van Ijzendoorn MH, Speranza AM, Tambelli R: Internal working models of attachment during late childhood and early adolescence: An exploration of stability and change. *Attachment and Human Development* 2000, 2(3):328-346.
43. Schmueli-Goetz Y: **The Child Attachment Interview**. In: *The Routledge Handbook of Attachment: Assessment.* edn. Edited by Farnlield S, Holmes P. New York: Routledge; 2014.
44. Hamilton CE: Continuity and discontinuity of attachment from infancy through adolescence. *Child Development* 2000, 71(3):690-694.

Preprints.org (www.preprints.org) | NOT PEER-REVIEWED | Posted: 17 September 2024 doi:10.20944/preprints202409.1181.v1

45. Allen JP, McElhaney KB, Kuperminc GP, Jodl KM: **Stability and change in attachment security across adolescence**. *Child Development* 2004, **75**(6):1792-1805.
46. Weinfield NS, Whaley GJL, Egeland B: Continuity, discontinuity, and coherence in attachment from infancy to late adolescence: Sequelae of organization and disorganization. *Attachment and Human Development* 2004, 6(1):73-97.
47. Blos P: **The second individuation process of adolescence**. *The Psychoanalytic study of the child* 1967, **22**:162-186.
48. Tonnesmann M: **Adolescent re-enactment, trauma and reconstruction**. *Journal of Child Psychotherapy* 1980, **6**(1):23-44.
49. Laufer M: **Developmental breakdown in adolescence. Problems of understanding and helping**. In: *Adolescent Breakdown and Beyond.* edn. Edited by Laufer M. London: Routledge; 1997.
50. Allen JP, Tan J: **The multiple facets of attachment in adolescence**. In: *Handbook of attachment Theory, research and applications* 3rd edn. Edited by Cassidy J, Shaver PR. New York: The Guilford Press; 2016.
51. Rosenthal NL, Kobak R: Assessing adolescents' attachment hierarchies: Differences across developmental periods and associations with individual adaptation. *Journal of Research on Adolescence* 2010, 20(3):678-706.
52. Allen JP, McElhaney KB, Land DJ, Kuperminc GP, Moore CW, O'Beirne-Kelly H, Kilmer SL: **A Secure Base in Adolescence: Markers of Attachment Security in the Mother-Adolescent Relationship**. *Child Development* 2003, **74**(1):292-307.
53. Scott S, Briskman J, Woolgar M, Humayun S, O'Connor TG: **Attachment in adolescence: Overlap with parenting and unique prediction of behavioural adjustment**. *Journal of Child Psychology and Psychiatry and Allied Disciplines* 2011, **52**(10):1052-1062.
54. Delgado E, Serna C, Martínez I, Cruise E: **Parental Attachment and Peer Relationships in Adolescence: A Systematic Review**. *International Journal of Environmental Research and Public Health* 2022, **19**(3).
55. Allen JP, Miga EM: **Attachment in adolescence: A move to the level of emotion regulation**. *Journal of Social and Personal Relationships* 2010, **27**(2):181-190.
56. Ainsworth MDS: **Attachments Beyond Infancy**. *American Psychologist* 1989, **44**(4):709-716.
57. Target M, Fonagy P, Shmueli-Goetz Y: Attachment representations in school-age children: The development of the Child Attachment Interview (CAI). *Journal of Child Psychotherapy* 2003, 29(2):171-186.
58. Steele H, Steele M: **The construct of coherence as an indicator of attachment security in middle childhood**. In: *Attachment in Middle Childhood.* edn. Edited by Kerns K, Richardson R. New York: Guildford Press; 2005.
59. Kriss A, Steele H, Steele M: Measuring attachment and reflective functioning in early adolescence: An introduction to the friends and family interview. *Research in Psychotherapy: Psychopathology, Process and Outcome* 2012, 15(2):87-95.
60. Jewell T, Gardner T, Susi K, Watchorn K, Coopey E, Simic M, Fonagy P, Eisler I: **Attachment measures in middle childhood and adolescence: A systematic review of measurement properties**. *Clinical Psychology Review* 2019, **68**:71-82.
61. Zimmermann P: Attachment representations and characteristics of friendship relations during adolescence. *Journal of Experimental Child Psychology* 2004, 88(1):83-101.
62. Grossmann K, Grossmann KE, Fremmer-Bombik E, Kindler H, Scheuerer-Englisch H, Zimmermann P: The uniqueness of the child-father attachment relationship: Fathers' sensitive and challenging play as a pivotal variable in a 16-year longitudinal study. *Social Development* 2002, 11(3):301-337.

Disclaimer/Publisher's Note: The statements, opinions and data contained in all publications are solely those of the individual author(s) and contributor(s) and not of MDPI and/or the editor(s). MDPI and/or the editor(s) disclaim responsibility for any injury to people or property resulting from any ideas, methods, instructions or products referred to in the content.