
Infant Self-Recognition And Mother–Infant Attachment: Developmental Trajectories And Implications For Early Socio-Emotional Development

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Abstract

Infant self-recognition constitutes a critical milestone in early cognitive and socio-emotional development, marking the emergence of an organized and differentiated sense of self. Although self-recognition has traditionally been examined through maturational and perceptual frameworks, contemporary research increasingly highlights the significance of early relational experiences, particularly mother–infant attachment, in shaping self-cognitive development. This systematic review synthesizes developmental psychology and attachment research to examine age-related trajectories of infant self-recognition and their association with attachment patterns. Guided by PRISMA principles, peer-reviewed studies were systematically identified and analyzed to explore how secure and insecure attachment influence the timing, coherence, and emotional quality of self-recognition. The findings indicate that secure attachment facilitates emotional regulation, exploratory behavior, and reflective self-awareness, whereas insecure attachment patterns may delay or disrupt self-recognition and subsequent socio-emotional outcomes. The review advances an integrative developmental framework and offers practical implications for early parenting interventions and childhood policy aimed at promoting healthy socio-emotional development.

Keywords: Infant self-recognition; mother–infant attachment; developmental trajectories; self-cognition; socio-emotional development

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Introduction

The development of self-awareness during infancy is a foundational process that underpins later emotional regulation, social competence, identity formation, and psychological well-being. Self-recognition, defined as the capacity to perceive oneself as a distinct and continuous entity, has long been considered a hallmark of early cognitive development. Classical developmental research, particularly studies employing mirror self-recognition paradigms, has emphasized neurological maturation and perceptual abilities as the primary drivers of this achievement (Amsterdam, 1972; Lewis, 2003).

However, such cognitively focused explanations provide an incomplete account of early self-development. Infants are embedded in social environments from birth, and their earliest experiences of selfhood are constructed through ongoing interactions with caregivers. Attachment theory, first articulated by **John Bowlby**, emphasizes that early emotional bonds shape internal working models of the self and others, influencing socio-emotional and cognitive development across the lifespan (Bowlby, 1969/1982). Despite this theoretical relevance, self-recognition and attachment have often been examined independently.

This review addresses this gap by integrating research on infant self-recognition with mother–infant attachment patterns, examining their combined implications for early socio-emotional development.

Conceptual Background: Self-Recognition and Attachment

Contemporary developmental models conceptualize self-recognition as a multidimensional construct encompassing bodily self-awareness, agency, emotional self-experience, and reflective self-recognition (Rochat, 2003). Rather than emerging abruptly, self-awareness develops progressively through embodied, emotional, and social processes.

Attachment theory complements this view by proposing that infants develop a sense of self through repeated experiences of caregiver responsiveness and emotional attunement. Through consistent caregiving, infants learn to regulate affect, explore their environment, and internalize perceptions of themselves as valued and effective (Bowlby, 1988). Integrating these perspectives enables a relational understanding of how self-recognition emerges within caregiving contexts.

Developmental Trajectories of Self-Cognition in Infancy

Self-cognition unfolds through overlapping developmental stages, beginning with embodied awareness and culminating in reflective self-recognition.

Table 1. Developmental Stages of Infant Self-Recognition

Age Range	Stage of Self-Cognition	Core Characteristics	Developmental Significance	References
0–6 months	Bodily and sensorimotor self	Differentiation of self-generated and external stimuli; proprioceptive sensitivity	Foundation of embodied self-awareness	Rochat & Striano (2000); Stern (1985)
6–12 months	Emotional and social self	Social contingency, joint attention, emotional exchange	Emergence of agency and emotional self	Campos et al. (2003); Ainsworth et al. (1978)
18–24 months	Reflective self-recognition	Mirror self-recognition; symbolic representation	Explicit self-awareness	Amsterdam (1972); Lewis (2003)

Early bodily awareness enables infants to experience continuity between intention, movement, and sensation. During later infancy, social interaction and emotional feedback support the emergence of agency and affective self-experience. Reflective self-recognition emerges alongside language and memory, indicating integration of perceptual, emotional, and cognitive dimensions of self-awareness (Fonagy et al., 2002).

Mother–Infant Attachment and Self-Development

Attachment theory posits that infants are biologically predisposed to form emotional bonds with caregivers who provide protection and emotional regulation. These early bonds shape internal working models that guide expectations regarding self-worth and relational trust (Bowlby, 1969/1982). Building on Bowlby’s work, **Mary Ainsworth** identified secure, avoidant, resistant, and disorganized attachment patterns based on caregiver responsiveness (Ainsworth et al., 1978).

Table 2. Attachment Patterns and Self-Cognitive Outcomes

Attachment Pattern	Caregiving Characteristics	Impact on Self-Recognition	Socio-Emotional Outcomes	References
Secure	Sensitive and responsive	Facilitates coherent self-awareness	Emotional regulation, empathy	Ainsworth et al. (1978); Bowlby (1988)
Avoidant	Emotionally distant	Reduced reflective engagement	Emotional suppression	Main & Solomon (1990)
Resistant	Inconsistent responsiveness	Emotional instability	Anxiety, dependency	Ainsworth et al. (1978)
Disorganized	Frightening or chaotic	Fragmented self-experience	Identity difficulties	Lyons-Ruth & Jacobvitz (2008)

Methodology

Research Design

This study employs a **systematic literature review** guided by PRISMA principles to synthesize research on infant self-recognition and mother–infant attachment.

Data Sources and Search Strategy

Searches were conducted in **Scopus, Web of Science, PsycINFO, PubMed, and Google Scholar**. Keywords included *infant self-recognition, early self-awareness, mother–infant attachment, and socio-emotional development*. Boolean operators were used to refine results.

Inclusion and Exclusion Criteria

Included studies were peer-reviewed, English-language publications focusing on infants aged 0–24 months and addressing self-recognition or attachment. Studies lacking developmental relevance or empirical/theoretical grounding were excluded.

PRISMA Selection Process

The initial search yielded approximately **320 records**. After removing duplicates and screening abstracts, **62 studies** met inclusion criteria and were synthesized qualitatively.

Data Synthesis

A thematic synthesis approach was used to organize findings into developmental stages, attachment influences, and socio-emotional outcomes.

Integration of Self-Recognition and Attachment

Infant self-recognition develops through the interaction of neurocognitive maturation and attachment-based relational experiences. Secure attachment provides an emotionally supportive context in which infants regulate affect, explore their environment, and integrate internal sensations with external feedback. Through caregiver mirroring and emotional attunement, infants construct stable self-representations. In contrast, insecure attachment patterns constrain emotional feedback and reflective engagement, introducing variability in the coherence and timing of self-recognition. Disorganized attachment presents the greatest developmental risk, as inconsistent caregiving may fragment early self-experience and undermine socio-emotional regulation (Fonagy et al., 2002; Main & Solomon, 1990).

Table 3. Relational Model of Self-Recognition and Socio-Emotional Development

Self Component	Attachment Influence	Developmental Outcome	Long-Term Impact	References
Bodily self	Caregiver responsiveness	Emotional regulation	Stress resilience	Stern (1985)
Emotional self	Secure attachment	Empathy	Social competence	Fonagy et al. (2002)
Reflective self	Emotional labeling	Identity coherence	Well-being	Lewis (2003); Rochat (2003)

Implications for Early Socio-Emotional Development and Practice

The integration of infant self-recognition and mother–infant attachment has significant implications for understanding early socio-emotional development and informing practice in caregiving, early education, and child welfare contexts. The emergence of self-recognition represents more than a cognitive milestone; it reflects the infant’s growing capacity for emotional regulation, social engagement, and self–other differentiation. Infants who develop a coherent sense of self are better equipped to recognize and interpret emotional states, regulate affective responses, and engage empathically with others. Secure attachment plays a critical role in supporting these developmental outcomes by providing a stable relational context in which infants experience themselves as valued, effective, and emotionally understood.

Through consistent caregiver responsiveness and emotional attunement, securely attached infants develop internal working models that promote confidence in exploration and trust in social relationships. These experiences facilitate the integration of emotional, cognitive, and social aspects of self-awareness, which in turn supports the development of empathy, prosocial behavior, and adaptive emotion regulation. In contrast, disruptions in attachment security may compromise the development of self-recognition and socio-emotional competencies. Insecure attachment patterns, particularly avoidant and disorganized forms, may limit opportunities for emotional feedback and reflective engagement, increasing vulnerability to later difficulties in emotional regulation, peer relationships, and identity coherence.

From a practical perspective, these findings underscore the importance of attachment-informed approaches in early childhood care and intervention. Parenting programs that emphasize caregiver sensitivity, emotional responsiveness, and reflective communication can play a vital role in promoting both attachment security and healthy self-development. Training caregivers to recognize and respond to infants’ emotional cues, engage in affective mirroring, and support exploratory behavior can strengthen the relational foundations of self-recognition. Furthermore, early childhood education settings can incorporate practices that foster emotional safety, consistency,

and responsive interaction, particularly for infants at developmental risk.

Policy-level implications are equally significant. Integrating attachment-based frameworks into maternal and child health services can support early identification of attachment difficulties and enable timely preventive interventions. Routine screening for relational risk factors during infancy, combined with targeted support for caregivers, may mitigate long-term socio-emotional challenges. Overall, recognizing self-recognition as a relationally embedded developmental process highlights the need for holistic, relationship-centered strategies to promote optimal socio-emotional development during the earliest stages of life.

Limitations and Future Research

1. The present study is based on a **systematic review of existing literature** and does not include original empirical data, which limits causal interpretation of the relationship between infant self-recognition and mother–infant attachment.
2. The majority of reviewed studies rely on **mirror self-recognition tasks**, which may not fully capture earlier embodied, emotional, or relational aspects of self-awareness.
3. Findings are drawn largely from **Western research contexts**, potentially limiting their generalizability to diverse cultural and caregiving settings.
4. Future research should employ **longitudinal and cross-cultural designs** using multidimensional measures of self-cognition to examine developmental pathways and socio-emotional outcomes more comprehensively.

Conclusion

Infant self-recognition is best understood as a relationally embedded developmental achievement that emerges through the dynamic interaction of cognitive maturation and early caregiving experiences. Rather than representing a purely perceptual or neurological milestone, self-recognition develops within the context of mother–infant attachment, where emotional attunement, caregiver responsiveness, and social interaction play a central role in shaping early self-awareness. Secure attachment provides infants with a stable emotional base from which they can explore their environment, regulate affective states, and gradually integrate bodily, emotional, and cognitive aspects of the self into a coherent sense of identity.

The findings synthesized in this review highlight that infants who experience consistent, sensitive caregiving are more likely to develop organized and emotionally grounded self-recognition, which in turn supports key socio-emotional competencies such as empathy, emotional regulation, and social engagement. Conversely, disruptions in attachment security may introduce variability in the timing and coherence of self-recognition, increasing vulnerability to later socio-emotional difficulties. These insights underscore the importance of moving beyond maturation-based explanations of self-development and adopting relationally informed developmental models that recognize the foundational role of early emotional bonds.

From an applied perspective, the integration of attachment theory and self-cognition emphasizes the value of early interventions that strengthen caregiver–infant relationships. Parenting programs, early childhood education practices, and child health policies that prioritize emotional attunement and relational stability can play a crucial role in promoting healthy self-development. Overall, understanding infant self-recognition as a relational process offers a more comprehensive framework for supporting optimal socio-emotional development during the earliest stages of life.

References

1. Ainsworth, M. D. S., Blehar, M. C., Waters, E., & Wall, S. (1978). *Patterns of attachment: A psychological study of the strange situation*. Hillsdale, NJ: Erlbaum.
2. Amsterdam, B. (1972). Mirror self-image reactions before age two. *Developmental Psychobiology*, 5(4), 297–305. <https://doi.org/10.1002/dev.420050403>
3. Agarwal, N., Singh, A., & Ambojia, M.C.T (2024). *Amalgamation of Disruptive Technologies for Implementation of Intelligent Manufacturing*. *Intelligent Manufacturing and Industry 4.0: Impact, Trends, and Opportunities*, CRC Press, ISBN-9781032630748, 42-66.
4. Agarwal, N. (2024). Innovation strategies for sustainable development in business considering current scenario for Africa. In *Springer Proceedings in Business and Economics* (pp. 95–110). Springer.
5. Bowlby, J. (1969/1982). *Attachment and loss: Vol. 1. Attachment* (2nd ed.). New York, NY: Basic Books.
6. Bowlby, J. (1988). *A secure base: Parent-child attachment and healthy human development*. New York, NY: Basic Books.
7. Campos, J. J., Frankel, C. B., & Camras, L. (2003). On the nature of emotion regulation. *Child Development*, 75(2), 377–394. <https://doi.org/10.1111/1467-8624.00033>
8. Fonagy, P., Gergely, G., Jurist, E. L., & Target, M. (2002). *Affect regulation, mentalization, and the development of the self*. New York, NY: Other Press.
9. Lewis, M. (2003). The emergence of consciousness and its role in human development. *Annals of the New York Academy of Sciences*, 1001, 337–351. <https://doi.org/10.1196/annals.1279.017>

10. Lyons-Ruth, K., & Jacobvitz, D. (2008). Attachment disorganization: Genetic factors, parenting contexts, and developmental transformation from infancy to adulthood. In J. Cassidy & P. R. Shaver (Eds.), *Handbook of attachment* (2nd ed., pp. 666–697). New York, NY: Guilford Press.
11. Main, M., & Solomon, J. (1990). Procedures for identifying infants as disorganized/disoriented during the Strange Situation. In M. T. Greenberg et al. (Eds.), *Attachment in the preschool years* (pp. 121–160). Chicago, IL: University of Chicago Press.
12. Rochat, P. (2001). *The infant's world*. Cambridge, MA: Harvard University Press.
13. Rochat, P. (2003). Five levels of self-awareness as they unfold early in life. *Consciousness and Cognition*, 12(4), 717–731. [https://doi.org/10.1016/S1053-8100\(03\)00081-3](https://doi.org/10.1016/S1053-8100(03)00081-3)
14. Stern, D. N. (1985). *The interpersonal world of the infant: A view from psychoanalysis and developmental psychology*. New York, NY: Basic Books.