



Journal Website

Article history:

Received 24 May 2026

Revised 04 September 2026

Accepted 11 September 2026

Initial Publication 14 September 2026

Final Publication 01 November 2027

International Journal of Education and Cognitive Sciences

Volume 8, Issue 6, pp 1-10



E-ISSN: 3041-8828

From Prelinguistic Interaction to Language-Mediated Mentalization: A Narrative Review

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Article Info

Article type:

Review Article

How to cite this article:

Entezari, S., & Khodabakhsh Pirkalani, R. (2027). From Prelinguistic Interaction to Language-Mediated Mentalization: A Narrative Review. *International Journal of Education and Cognitive Sciences*, 8(6), 1-10.

<https://doi.org/10.61838/kman.ijecs.471>



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ABSTRACT

Purpose: This narrative review examined how prelinguistic interactions contribute to the foundations of mentalization and how language subsequently extends this capacity.

Methods and Materials: Theoretical and empirical literature published between 2018 and 2026 was identified through Scopus and Google Scholar using keywords related to mentalization, joint attention, prelinguistic interactions, caregiver sensitivity, and language. Relevant seminal theoretical sources were also included, and the selected literature was narratively synthesized.

Findings: Prelinguistic communication, particularly joint attention, gesture, vocalization, and affective coordination, provides an interpersonal foundation for understanding others' behavior as meaningful and intentional. Caregiver responsiveness may further support the regulation and organization of internal experience. Language expands these foundations by providing representational structures for distinguishing mental content from external reality and for comparing perspectives. Linguistic diversity may increase sensitivity to differences in others' communicative perspectives, although second-language processing may also increase unnecessary mental-state attribution.

Conclusion: Mentalization development may be better understood as a progressive expansion and reorganization of ways of engaging with mental states rather than a linear shift from nonverbal to verbal social cognition. Embodied-interpersonal, linguistic, and sociocultural processes appear to make interconnected contributions to this development.

Keywords: *mentalization, joint attention, prelinguistic interactions, caregiver sensitivity, language.*

1. Introduction

Mentalization refers to the capacity to understand one's own and others' behavior in terms of underlying mental states, including beliefs, emotions, intentions, and desires (Fonagy et al., 2002). Its developmental foundations can be traced to early social exchanges in which infants become increasingly sensitive to others' actions, attention, and affective signals. Before language emerges, eye contact, gestures, vocalizations, and joint attention provide opportunities for coordinating experience with others and constitute an important foundation for social cognition (Tomasello, 2003, 2010).

The development of mentalization is closely embedded in early interpersonal interactions, particularly caregivers' responses to infants' signals (Fonagy et al., 2002). Its psychological significance extends beyond understanding why people behave as they do: by relating behavior to underlying mental states, individuals can consider what they or others may be thinking, feeling, wanting, or intending rather than relying solely on immediate interpretations of observable behavior (Fonagy et al., 2002; Luyten et al., 2020). Mentalization is commonly conceptualized along four bipolar dimensions—automatic (implicit)—controlled (explicit), self—other, internal—external, and cognitive— affective—with adaptive mentalizing requiring flexible balance across these dimensions according to the situation and interpersonal context (Luyten et al., 2020). Under stress or intense affect, this flexibility may be disrupted, leading to more rigid interpretations of oneself and others and impairing the understanding of mental states such as emotions (Entezari & Robatmili, 2024; Fonagy et al., 2002; Hagelquist & Rasmussen, 2024). Accordingly, impairments in mentalization have been implicated in a wide range of psychological difficulties (Allen, 2024; Entezari & Khodabakhsh Pirkalani, 2026; Luyten et al., 2020), making the development of flexible mentalizing relevant to both social cognition and psychological adaptation.

This multidimensional account raises an important developmental question: how does early, largely implicit and interaction-based sensitivity to others develop into an increasingly explicit and representational understanding of mental states? Language appears central to this process by providing resources through which internal goals, intentions, and experiences can be expressed, interpreted, and differentiated from those of others (Durrleman, 2020; Khodabakhsh Pirkalani & Shakeri, 2023). Vygotsky (1962) further emphasized the role of internalized socially

developed language in higher psychological processes, suggesting that language may do more than communicate already-formed mental content: it may provide representational resources through which mental experience can be organized and reflected upon.

Recent evidence supports associations between linguistic skills and experiences and mentalizing abilities (Clarke et al., 2023; Durrleman, 2020; Tiv et al., 2022). However, the processes involved in mentalization development have often been examined within distinct lines of research, limiting an integrated understanding of how multiple developmental and contextual factors contribute across development. Bringing these findings together may provide a more comprehensive developmental account and help inform more targeted educational, preventive, and clinical approaches (Karterud, 2024; Luyten et al., 2020), particularly given evidence that processes such as caregiver responsiveness, communication, and mental-state language are amenable to intervention (Conrad et al., 2024; Durrleman, 2020).

Accordingly, this narrative review integrates evidence across the transition from prelinguistic interaction to language-mediated mentalization, examining how early interpersonal processes and language, alongside other developmental and contextual factors, contribute to the emergence and expansion of the capacity to understand mental states.

2. Methods and Materials

This study employed a narrative review approach to examine the developmental roles of prelinguistic interaction and language in mentalization. A narrative approach was considered appropriate for integrating and interpreting theoretical and empirical literature across related but distinct areas of research, including early social interaction, caregiver responsiveness, language development, and social cognition (Greenhalgh et al., 2018).

Relevant literature published between 2018 and 2026 was identified through searches of Scopus and Google Scholar using the keywords “mentalization,” “joint attention,” “prelinguistic interactions,” “caregiver sensitivity,” and “language.” Seminal theoretical sources were also included when relevant to the developmental focus of the review.

Sources were initially screened by title and abstract, followed by full-text examination of studies directly relevant to mentalization, language, and early child interactions; duplicate and unrelated sources were excluded. The selected

literature was then analyzed and synthesized around three interrelated developmental processes: early prelinguistic communication, caregiver responsiveness to children's communicative and affective signals, and the role of language in representing and interpreting mental states. Evidence concerning multilingual experience was additionally considered to examine the potential contribution of linguistic diversity to mentalizing abilities.

3. Findings and Results

1. Prelinguistic Interactions as a Foundation for Mentalization

Before children can verbally represent mental states, they participate in social interactions through gaze, gestures, vocalizations, and other nonverbal signals (McCathren et al., 2000). These behaviors gradually acquire communicative functions as children use them to respond to events, maintain adults' attention, and influence interaction (Crais & Ogletree, 2016). Early vocal development also becomes increasingly organized over time, contributing to the transition from prelinguistic vocalizations toward more stable speech forms (Smith et al., 1995).

By approximately 12 months, three major communicative functions become evident: social interaction, behavior regulation, and joint attention (Bruner, 1981). Joint attention is particularly relevant to mentalization because children coordinate attention with another person toward a third object or event. Following others' gaze and pointing, and using referential pointing, increasingly expose children to others' orientation toward the external world (Kristen et al., 2011; Tomasello, 2010). Within early social interactions, children also become sensitive to others' desires (Repacholi & Gopnik, 1997), while joint-attention abilities predict the subsequent emergence of mental-state language (Kristen et al., 2011). Gesture and joint attention thus provide an interpersonal context for socialization and language development (Cameron-Faulkner, 2020).

Empirical findings further indicate that early communicative behaviors operate within coordinated systems. Infants at high risk for autism display fewer communicative behaviors and weaker coordination between joint attention and vocalization (Heymann et al., 2018). Between 9 and 15 months, social-interaction gestures have been associated with receptive language and behavior-regulation gestures with expressive language, whereas joint-attention gestures were not significantly related to language ability in one sample (Stewart et al., 2021). These findings

suggest that associations between particular prelinguistic behaviors and language may vary across communicative functions and developmental contexts.

Prelinguistic communication also involves affective and symbolic forms of coordination. Children's laughter becomes increasingly coordinated and responsive within mother-child interactions between 12 and 36 months (Mazzocconi & Ginzburg, 2022), illustrating how affective signals can acquire interpersonal communicative functions. Pretend play provides another illustration of the transition toward symbolic representation. In a case study of a child with Global Developmental Delay, therapeutic pretend play provided a context in which emotional experiences could be expressed and organized symbolically (Donner, 2021). Although findings from a single case cannot be generalized developmentally, they illustrate how nonverbal and symbolic interaction may provide a medium for representing experience before or alongside more elaborate verbal expression.

The expression of early communication is also shaped by sociocultural context. Stewart et al. (2022) found differences in gesture functions across ethnic groups and more frequent gesture use in structured environments. Particular gestures should therefore not be treated as culturally invariant indicators of development.

Finally, intentional understanding is not entirely dependent on language. In a nonverbal task, individuals with autism spectrum disorders showed greater difficulty with intentions attribution than controls, despite no group difference in purely causal inferences (Le Donne et al., 2023). This distinction suggests that sensitivity to intentional relations cannot be reduced to linguistic competence.

2. Caregiver Responsiveness to Prelinguistic Signals: From Interpersonal Coordination to the Organization of Internal Experience

The developmental significance of prelinguistic signals depends partly on how caregivers respond to them. During early face-to-face interactions, infants and caregivers exchange affective signals through gaze, facial expression, vocalization, and bodily movement, providing a context in which early affective representations can develop (Beebe et al., 1997; Tronick, 1989). When caregiver responses are sufficiently rapid and predictable, repeated interactions allow children to anticipate caregivers' behavior and increasingly regulate their own responses (Fonagy et al., 2002).

A central mechanism in this process is marked mirroring. By reflecting the infant's affect in a marked and modulated

form, caregivers provide an external representation of the child's internal state, allowing affective experiences to become increasingly differentiated, symbolized, and regulated (Fonagy & Allison, 2012). At this pre-symbolic stage, children do not yet explicitly represent caregivers' mental states but increasingly anticipate interpersonal responses and adjust their behavior accordingly (Fonagy et al., 2002). Caregiver responsiveness may therefore help establish regulatory and representational conditions for later mentalization.

This process also occurs through bodily interaction. Pre-verbal children participate in shared meaning through movement, affective exchange, and communicative rhythms, while adults' interpretations of their nonverbal signals contribute to interpersonal meaning-making (Våpenstad & Bakkenget, 2021). Intersubjectivity—the capacity to understand one another through shared actions and emotions—thus provides a way of conceptualizing how shared meaning can emerge before predominantly linguistic communication (Ammaniti & Gallese, 2014).

Research on parental embodied mentalizing (PEM) further illustrates this embodied dimension. PEM reflects parents' capacity to understand children's mental experience through nonverbal bodily interaction (Shai & Belsky, 2017). Shai et al. (2022) found that PEM in infancy significantly predicted language development 12 months later and marginally predicted cognitive development, explaining unique variance beyond several parental, child, and demographic factors. These findings suggest that the mentalizing quality of caregiving involves not only sensitivity but also interpreting and responding to bodily behavior in relation to the child's possible internal experience.

Caregiver responsiveness, however, occurs within broader socioeconomic and cultural contexts. Moreno et al. (2021) found no significant socioeconomic differences in joint attention among 24-month-old Colombian children, whereas higher socioeconomic status was associated with better social interaction and lower socioeconomic status with better behavior regulation than in the high-SES group. This pattern suggests that different communicative functions may vary in their sensitivity to socioeconomic and cultural context. Astor et al. (2022) found similar trajectories of gaze following among Bhutanese and Swedish infants, but maternal postpartum depression was associated with gaze following only in the Swedish sample; the authors discussed protective factors within Bhutan's more interdependent

family context as one possible explanation for this difference.

Neural and intervention findings further extend this picture. Communicative signals such as eye contact, gestures, and directed speech can enhance infants' attention and associated neural processing (Bánki et al., 2024). In the context of Paediatric Autism Communication Therapy (PACT), Conrad et al. (2024) also reported parents' perceptions of changes in their interactions and relationships with their autistic children following participation in the intervention. Together, these findings illustrate that responsiveness to communicative signals can be examined at multiple levels, from neural processing to embodied interaction and parent-child relational experience.

3. Language as a Representational and Reflective Tool for Mentalization

If prelinguistic interaction and caregiver responsiveness provide an interpersonal foundation for mentalization, language introduces an important developmental change: mental states can increasingly be represented and reflected upon. This transition is evident during the preschool years, when explicit false-belief understanding typically develops around 4–5 years of age but may be delayed in children with autism spectrum disorders and developmental language disorder (Durrleman, 2020). These capacities continue to develop alongside increasing social complexity through adolescence and early adulthood (Desatnik et al., 2023).

One important contribution of language is its capacity to represent relations among propositions and perspectives. Complement clauses such as “John thinks that Mary is at home” allow a mental representation to be embedded within a proposition while remaining distinguishable from external reality. Evidence reviewed by Durrleman (2020) indicates a close relationship between mastery of complement syntax and false-belief understanding, including findings from children with autism spectrum disorders and developmental language disorder. Training in complement structures has also been associated with improvements in false-belief performance, suggesting that syntax may provide a representational resource for reasoning about mental states.

Language can also support mentalization by making perspectives available for explicit comparison. In Joint Attention to Mental Content (JAM), interlocutors direct one another's attention not only toward external objects but toward propositions, reasons, and perspectives that can be jointly considered (O'Madagain & Tomasello, 2021). In this sense, language does not replace the interpersonal structure

established through early joint attention; it expands what can become the object of shared attention.

The contribution of language to mental-state understanding is not limited to syntax. Linguistic and pragmatic cues can also guide inferences about speakers' beliefs and intentions. For example, Japanese children's use of the connective *datte* ("but-because") has been examined as a linguistic cue in reasoning about a speaker's belief (Matsui et al., 2005). Likewise, conversational experience appears relevant to more advanced forms of Theory of Mind: O'Reilly et al. (2014) found differences in false-belief and sarcasm understanding among deaf native signers, deaf late signers, and hearing participants, with findings highlighting the extended importance of conversational interaction for Theory of Mind development.

Importantly, explicit verbalization is not always necessary for mentalizing. Jensen et al. (2021) described how bodily interaction, including respiratory marking and marked mirroring, can support explicit mentalizing without words in psychotherapy. This observation suggests continuity between embodied-interpersonal and linguistic forms of mentalization rather than a simple replacement of one by the other.

Language may nevertheless influence how readily and in what ways mental states are attributed. Understanding nonliteral language provides one illustration of this interaction: Zajęzkowska and Abbot-Smith (2020) found that cognitive flexibility contributed uniquely to children's irony interpretation even when structural language and mentalizing abilities were taken into account. More broadly, Westra and Nagel (2021) emphasized the role of social and linguistic practices in shaping mind-reading. Together, these findings suggest that language-mediated social understanding depends not only on mental-state representation but also on the flexible coordination of linguistic, cognitive, and contextual information.

This point is also relevant in socially complex contexts. Payne et al. (2025) found across three experiments that mental-state language used to introduce out-group members increased participants' tendency to take each out-group member's distinctive mind into account. Thus, mental-state language can shape how readily people individuate and mentalize socially distant others, illustrating that linguistic framing may influence the deployment of mentalizing in social interaction.

Clinical findings further support an association between language and mentalization. Clarke et al. (2023) found that adolescents experiencing mental illness showed poorer

vocabulary and reflective functioning, alongside lower interpersonal trust and greater attachment difficulties, than non-clinical adolescents. These findings suggest that language and mentalizing difficulties may coexist within broader patterns of interpersonal and psychological vulnerability.

4. Linguistic Diversity and the Flexibility of Mentalization

If language provides a medium for representing and comparing mental states, experience with linguistic diversity may further shape how flexibly individuals attend to others' perspectives. Research on bilingualism provides some support for this possibility, although the evidence does not indicate a uniform bilingual advantage. A meta-analysis by Schroeder (2018) found a small overall bilingual advantage in children's Theory of Mind performance, suggesting a modest association between bilingual experience and mental-state understanding.

Importantly, such effects may not depend solely on speaking more than one language. Fan et al. (2015) found that both bilingual children and monolingual children regularly exposed to other languages performed better than monolingual children without such exposure on a perspective-taking communication task. Because multilingual exposure alone was associated with this advantage, the authors proposed that navigating linguistically diverse social environments may increase children's sensitivity to others' communicative perspectives. This finding is consistent with accounts emphasizing the social-pragmatic, rather than exclusively executive, consequences of multilingual experience (Antonioni, 2019).

Second-language processing may also alter the use of pragmatic information. Foucart et al. (2015) found that late bilinguals showed heightened sensitivity to pragmatic information and relied on speaker-related indexical properties under increased semantic demands. Such findings suggest that processing meaning in a less dominant language may change the relative weight assigned to linguistic and contextual information during interpretation.

However, greater sensitivity to perspective does not necessarily imply greater accuracy in mental-state inference. Tiv et al. (2021) examined how language experience and language entropy relate to mentalizing judgments and found that second-language readers were more likely than first-language readers to attribute mentalizing processes to logical inferences. This pattern suggests that operating in a less dominant language may sometimes increase unnecessary

mental-state attribution rather than simply improving mentalizing ability.

The sociolinguistic organization of an individual's environment may also matter. Tiv et al. (2022) found that mentalizing was related to features of individuals' social networks, including the extent to which they occupied bridging positions between otherwise less-connected people, both across their overall social network and within language-specific networks. These findings suggest that mentalizing may be shaped not only by whether an individual is bilingual, but also by how they are positioned within social networks involving different linguistic contexts.

4. Discussion and Conclusion

The reviewed evidence points to continuity between prelinguistic and language-mediated forms of mentalization. Early interpersonal coordination, caregiver responsiveness, linguistic representation, and sociolinguistic experience appear to contribute at different stages to how mental states are understood and represented.

Before language, infants already participate in interpersonal exchanges that require sensitivity to others' attention, affect, and behavior. Through joint attention, affective coordination, and sensitivity to intentional actions, infants begin to experience others' behavior as connected to what they attend to, how they feel, and what they are trying to achieve (Kristen et al., 2011; Le Donne et al., 2023; Mazzocconi & Ginzburg, 2022; Tomasello, 2010). Joint attention provides a clear example: by following another person's gaze or pointing, the child encounters the fact that another person's attention can be directed toward a particular aspect of the world. Repeated experiences of this kind may gradually help children move beyond responding to observable behavior toward recognizing the attention, affect, and goals that may underlie it, providing a foundation for their later explicit representation as mental states.

Caregiver responsiveness may contribute a further developmental step by helping internal experience become increasingly differentiated and representable. Contingent responding and marked mirroring allow affect that is initially experienced bodily to be reflected back within an interpersonal exchange, potentially facilitating its differentiation and regulation (Fonagy & Allison, 2012; Fonagy et al., 2002). Parental embodied mentalizing similarly suggests that caregivers can engage with children's possible internal experience through bodily interaction before extensive linguistic representation is available, with

early PEM predicting subsequent language development (Shai & Belsky, 2017; Shai et al., 2022). Caregiver-child interaction may therefore help children move from experiencing affect primarily at a bodily level toward increasingly differentiating and, later, representing their internal states.

Language adds a further representational possibility: mental states can increasingly be treated as representations that may differ from external reality and from the perspectives of others. Complement syntax is particularly important in this respect because it allows a person's belief to be represented separately from reality. For example, a child can understand that someone believes something to be true while also recognizing that this belief does not correspond to what is actually the case. The association between complement syntax and false-belief understanding further supports this representational role of language (Durrleman, 2020). Language also extends joint attention from external objects to propositions, reasons, beliefs, and perspectives that can themselves become objects of shared reflection (O'Madagain & Tomasello, 2021). Language therefore does more than provide labels for mental states. It allows children to distinguish between different representations of the same situation—for example, between what they know, what another person believes, and what is actually the case—and to reflect on these differences.

This representational expansion nevertheless remains integrated with earlier embodied forms of mentalizing. Evidence that explicit mentalizing can be supported through marked bodily interaction in psychotherapy illustrates that verbal reflection need not operate independently of bodily and interpersonal processes (Jensen et al., 2021). This continuity is consistent with multidimensional accounts in which adaptive mentalizing depends on flexible movement between implicit and explicit, cognitive and affective, self- and other-oriented, and internally and externally focused processing (Karterud, 2024; Luyten et al., 2020). Linguistic representation can therefore be understood as expanding the range of ways in which mental states can be processed rather than establishing a separate, purely verbal system.

Linguistic diversity may provide repeated opportunities to notice that others do not necessarily share the same linguistic knowledge or communicative perspective. In linguistically diverse environments, individuals cannot always assume that others share the same linguistic knowledge or access to meaning and may therefore need to monitor what others understand and adjust communication accordingly. This interpretation is consistent with evidence

that multilingual exposure can enhance sensitivity to communicative perspectives even without active bilingualism (Fan et al., 2015). At the same time, findings that second-language processing may increase unnecessary mental-state attribution (Tiv et al., 2021) caution against equating greater orientation toward others' perspectives with more accurate mentalizing. Linguistic diversity may therefore make individuals more attentive to differences in perspective without necessarily making their inferences about others' mental states more accurate (Fan et al., 2015; Tiv et al., 2021).

The effects of language on mentalization are also socially situated. In social interactions, people may sometimes perceive members of other groups primarily in terms of their group membership rather than as individuals with distinctive beliefs, feelings, intentions, and perspectives. In such cases, assumptions about the group may guide how an individual's behavior is interpreted (Payne et al., 2025). For example, when another group is perceived as rival or threatening, an ambiguous action by one of its members may be more readily interpreted as hostile or harmful, leaving less room to consider the particular beliefs, feelings, or intentions that might explain that person's behavior. Mental-state language may help shift attention from social category to individual mind by making the person's internal perspective more salient. Consistent with this possibility, mental-state descriptions have been shown to increase attention to the distinctive minds of out-group members. This suggests that language may counteract reliance on group-based assumptions by directing attention toward the individual perspective behind a person's behavior.

The interpersonal foundations of mentalization should also be understood within the socioeconomic and cultural environments in which early interactions take place. Socioeconomic conditions may shape the kinds of communicative experiences that are more available or necessary in children's everyday lives. For example, environments that provide caregivers with more time and resources for reciprocal interaction may offer children more opportunities to initiate and sustain social exchanges, whereas environments characterized by greater practical constraints may place more emphasis on communication used to regulate others' actions or obtain immediate needs. Such differences may help explain why socioeconomic advantage is not uniformly associated with better performance across all communicative functions (Moreno et al., 2021). Cultural practices may similarly shape the meaning and use of nonverbal signals. Variations in gesture

across sociocultural groups suggest that the same observable behavior may serve different communicative functions depending on the interactional context in which it develops (Stewart et al., 2022). Culture may also influence how relational resources are organized around the child (Astor et al., 2022). One possible interpretation is that, in more interdependent family contexts, relational resources may be distributed across a broader network of caregivers and family members, potentially reducing the child's dependence on the availability and responsiveness of any single caregiver.

Taken together, these findings support a developmental account in which mentalization emerges through the continuing interaction of embodied-interpersonal, representational-linguistic, and sociocultural processes. Rather than replacing earlier capacities, later developments add new ways of differentiating, representing, and reflecting on mental states. At the same time, socioeconomic and cultural contexts shape the meanings and relational resources through which these capacities develop and are expressed. Mentalization development may therefore be understood as a gradual expansion and integration of increasingly differentiated ways of understanding one's own and others' mental states, embedded within the relational and sociocultural environments in which this understanding develops.

This review was limited to literature identified through Scopus and Google Scholar, and relevant studies indexed elsewhere may have been missed. In addition, heterogeneity in participants, linguistic backgrounds, developmental characteristics, and research methods limits direct comparison across studies. Finally, the proposed developmental account integrates findings from distinct bodies of literature and should not be interpreted as evidence of a fixed or causal developmental pathway.

Future longitudinal research should directly examine how prelinguistic interaction, caregiver responsiveness, language development, and mentalization influence one another across development. Cross-cultural and multilingual studies could further clarify how sociocultural and linguistic diversity shapes the flexibility and accuracy of mental-state inference. Intervention studies, particularly in populations with social-communicative difficulties such as autism spectrum disorders, could also examine whether strengthening joint attention, caregiver responsiveness, and mental-state language supports later mentalizing abilities.

Authors' Contributions

All authors significantly contributed to this study.

Declaration

In order to correct and improve the academic writing of our paper, we have used the language model ChatGPT.

Transparency Statement

Data are available for research purposes upon reasonable request to the corresponding author.

Acknowledgments

None.

Declaration of Interest

The authors report no conflict of interest.

Funding

According to the authors, this article has no financial support.

Ethical Considerations

Not applicable.

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