

designating the ability to understand one's own and others' mental states: reflective function of the self and mentalization [15-18]. Specifically, Fonagy and colleagues coined the expression "emotional mirroring"[18,19]. The authors suggested that the child is instinctively led to express changes in his/her internal states, while the mother is instinctively led to mirror (and mark) these internal states.

Maternal mirroring of the child's affective expressions plays a fundamental role in establishing a conscious representation of the emotion that will lead the child to understand the emotion itself. Starting from the end of the first year of life, thanks to mirroring, the child will become progressively more sensitive to her own internal states, thus being able to identify and mentally represent own emotional dispositional states [19,20]. In this perspective emotional mirroring influences the development of mentalization which is closely linked to the reflexive function referring to a complex of psychological processes underlying the ability to mentalize [15,19].

More in details, the reflexive functions can be described as "the mental function" organizing one's own and others' behaviors in terms of mental states; it concerns the mental representations relating to beliefs, emotions and desires, and contributing to the ability of predicting what is going next during social interactions [15].

Parents who are unable to reflect comprehensively on the internal experience of their children and do not know how to respond properly, tend to deny the child as a central psychological structure essential for building a vital sense of self. Therefore, the parental reflexive function determines the development of mental structures that are decisive for the regulation of the self and affects.

This implies that the quality of the affective states, their recognition and the child's self-regulatory reactions are influenced by the characteristics of the affective and reflective communication of his parents [19]. In the present study, we aimed at specifically investigating the relationships between the development of children's joint attention skills and the mentalization abilities of their mothers). We expected to find that better maternal reflexive functions could favor a more rapid and effective expression of early precursors to ToM in children under 2 years of age. In this regard, we focused on two main precursors to ToM, *i.e.*, IJA and RJA, and aimed at relating them with maternal Reflexive Functions (RF).

Materials and Methods

Participants

A sample of 60 children aged between 15 and 20 months was recruited for the study. The exclusion criteria were as follows: a) Nosographically defined psychiatric disorders in parents; b) Mothers over 35 years of age; c) Disadvantaged socio-cultural class in parents; d) Age over 20 months in children; e) Nosographically defined psychiatric and neurodevelopmental disorders in children.

The sample consisting of 60 children had the following characteristics: mean age 17 months (SD=1.41; 44 males and 16 females). The data were collected at the Developmental Psychology Clinic of FINDS (Italian Foundation for Neuroscience and Neurodevelopment Disorders) in collaboration with the Pediatric Neonatology of the Civil Hospital of Caserta, the Developmental Neuropsychology Laboratory and Clinic of Child and Adolescent Neuropsychiatry of the University of Campania Luigi Vanvitelli.

Measures

All children were administered the Early Social Communication Scales-Live (ESCS-L) [21] for measuring IJA and RJA. We subsequently assessed mothers' RF through the administration of the Reflective Functioning Questionnaire (RFQ) [22].

Early Social Communication Scales-Live (ESCS-L)

An *in vivo* observation tool designed to provide a time-efficient quantitative assessment of non-verbal social communication skills: specifically, the ESCS measures Joint Attention Initiative (IJA) and Joint Attention Response (RJA), a critical precursor to the development of social skills and ToM, and the initiative and response to social interaction and demand behaviors, which fall within the global score of the above scale, which we considered for this study.

Reflective Functioning Questionnaire (RFQ)

A self-administered questionnaire for parents aimed at evaluating mentalization, it presents two subscales evaluating the certainty (RFQ_C) and the uncertainty (RFQ_U) on the mental states of oneself and others.

Higher scores on these subscales indicate two distinct RF deficits, respectively, hypomentalization and hypermentalization. Hypomentalizing reflects concrete thinking and poor understanding of mental states of oneself and others, while hypermentalizing describes the person's tendency to interpret events in terms of mental states even when in the absence of empirical support.

Results

Pearson correlations were conducted between the two subscales of the ESCS and the two subscales of the RFQ. We labeled the subscales as follows: RFQ_C the certainty subscale and RFQ_U the uncertainty subscale, ESCS_IJA the JA initiative subscale and ESCS_RJA the JA response subscale. The significance was accepted at the 5% level ($\alpha < 0.05$). Data analyses were performed using SPSS 26.0 [23].

Results showed a significant negative correlation between the RFQ_C and IJA ($r = -0.852$; $p < 0.05$). A significant positive correlation between RFQ_C and RJA ($r = 0.497$; $p < 0.05$) was also found. Furthermore, results showed a significant positive correlation between RFQ_U and IJA ($r = 0.395$; $p < 0.05$).

Finally, results showed a significant negative correlation between RFQ_U and RJA ($r=-0.871$; $p<0.05$) (Table 1).

RFQ_C			RFQ_U		
	r	p		r	p
ESCS_IJA	-0.852	<0.05*	ESCS_IJA	0.395	<0.05*
ESCS_RJA	0.497	<0.05*	ESCS_RJA	-0.871	<0.05*

Table 1. Correlation between RFQ and ESCS subscales. RFQ_C (RF Certainty Subscale); RFQ_U (RF Uncertainty Subscale); ESCS_IJA (Initiating Joint Attention); ESCS_RJA (Responding to JA).

Discussion

Results showed a significant negative correlation between the RFQ_C and IJA indicating that as mothers' certainty about mental states increases, children's IJA behaviors decrease. Certainty represents the parents' ability to understand their own and their child's mental states, implying hypermentalizing when this tendency is excessive. Hypermentalizing thus reflects the parents' inability to scaffold the child's anxieties and fears because they are excessively certain that they can understand their child's mental states. Moreover, results showed a significant positive correlation between RFQ_C and RJA indicating that as mothers' certainty about mental states increases, children's RJA behaviors increase. Uncertainty reflects concrete thinking and poor understanding of the mental states of oneself and others and represents the extreme difficulty in developing complex models of the mind of self and others.

This ability corresponds to hypomentalizing preventing adequate RF in mothers due to their concrete and inflexible way of mentalizing, which in turn makes them unable to consider the complexity in understanding their own or their baby's mind states. Furthermore, results showed a significant positive correlation between RFQ_U and IJA indicating that as the uncertainty of mothers about mental states increases, children's IJA behaviors increase. Finally, results showed a significant negative correlation between RFQ_U and RJA indicating that as the uncertainty about mental states on the part of parent's increases, children's RJA behaviors decrease.

As recalled above, mentalizing refers to the ability of perceiving oneself and others in terms of mental states (desires, emotions, beliefs and needs) and interpreting one's own and others' behavior as a consequence of the latter [15,19]. This ability develops in the context of the attachment relationships between caregiver and infant, favoring the development of the ability to understand one's own and other people's mental states and development of the structure of a cohesive, coherent and flexible self. Fonagy et al. [19] demonstrated that, in the face of adverse life experiences, a good reflective functioning represents a protective factor against possible maladaptive outcomes. Specifically, mentalizing would allow both children and adults to perceive and name different emotions throughout challenging life experiences [24,25].

Emotional mirroring have two main characteristics: it needs to be "contingent" with respect to the expressive manifestations of the emotional state [15], and needs to be "marked", in order to allow a change in the person's representational quality of internal states. Infants perceive and express their every experience through the body, so the presence of adequate parental care, congruent affective mirroring, the containment function and the establishment of a secure attachment become fundamental for the birth of the psychological self and the acquisition of the emotional self-regulation [15,19]. Reaching this goal allows the person to understand and predict others' behaviors and to reflect on own internal states. Failure in acquiring mentalization can in fact lead to an experience made up of incomprehensible emotional experiences, difficult to manage and with marked difficulties in controlling the impulsive responses that would dominate the more reflective ones. Based on Fonagy [15], the determining factor is the mother's ability to mentally contain the child and to respond to her behaviors [26-29]. Indeed, the first relational environment is fundamental, since the security of mother's attachment is a predictor of the child's reflective capacity [15].

Repeated dysfunctional interactions between child and caregiver can give rise to marked difficulties in the ability to tolerate and regulate emotions independently and to acquire mentalizing skills. The present results showing that a hypomentalizing was related to high IJA and less RJA, suggest that the child is molded on a caregiver who accepts all his attempts at IJA while it seems less attentive to what is the joint initiative initiated by the caregiver. On the other hand, hypermentalizing, describing mothers who appear more confident in the interpretation of the emotional and mental states of the other, imply a reduced ability to follow the IJA attempts of their own child. In this case the child shows less IJA but appears more alert and responsive in response to the attempts initiated by the caregiver himself.

Hence, we can confirm the key interaction between parental reflexive functions and child's JA's abilities. Some authors found that children's JA abilities play a fundamental role in the successive social development [30-33]. Other authors have also found that the lack of RF seems to be strongly linked to the child's difficulties in building a reflective self, thus being more prone to develop avoidance and aggression [34]. Therefore, mentalizing and JA can be conceived as developmental acquisitions allowing the child to respond not only to the behavior of others, but also to his own representation of own feelings, beliefs and expectations. By attributing mental states, the child makes the behavior of others meaningful and predictable and will be able to respond in a flexible and adaptive way to complex interpersonal exchanges.

Conclusion

Results showed a significant correlation between mothers' mentalization capacity (ToM) and the development of key communicative markers, such as JA. These findings suggest that the reflective capacity of mothers plays an important role in providing assistance and comfort to the child. In particular, a hypomentalizing educational style might imply higher child's

JA initiatives and a lower maternal JA response; conversely, a hypermentalizing style might imply lower child's initiative JA and a greater maternal JA response. Thus, the present findings would highlight the importance of interventions focused on improving parents' mentalizing skills, and in particular of RF, especially in the context of atypical neurodevelopmental conditions as Autism Spectrum Disorders. Future studies are warranted to confirm the present results on larger samples and to test the development of the correspondence between maternal mentalization and child's mentalization in a longitudinal perspective.

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