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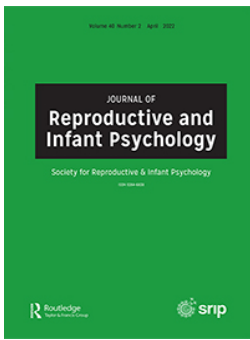
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Maternal perception of infant's intersubjectivity: a questionnaire

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ABSTRACT

Introduction: Intersubjectivity is a fundamental dimension of the mother–infant relationship.

Objective: Design of a questionnaire to assess maternal perception of the infant's intersubjectivity.

Design: After running a focus group with mothers of infants within their first year of life, items related to maternal perception of the infant's intersubjectivity were generated. These items were applied to a sample of 125 mothers and the results were submitted to principal components analysis.

Results: Principal components analysis (forced extraction to 3 factors, KMO = .752, Bartlett = 976.202, $p = .000$; explained variance = 42.12%) identified 22 items grouped in three factors: a) F1, 'Interactive Competence' ($\alpha = .817$); b) F2, 'Emotional States' ($\alpha = .749$), and c) F3, 'Initiative' ($\alpha = .647$). Positive and significant correlations were observed among all MPIIQ factors ($p \leq .01$). Maternal perception of infant's intersubjectivity varied according to the number of gestational weeks at birth ($T = -1.15$, $p \leq .05$) and according to the infant's age ($F = 7.834$, $p \leq .001$). Mothers of preterm infants reported lower perception of infant's intersubjectivity whereas mothers of older infants reported higher perception of infant's intersubjectivity.

Conclusion: The Maternal Perception of Infant's Intersubjectivity Questionnaire (MPIIQ) seems to be a sensitive instrument, able to discriminate different levels of maternal perception about the infant's intersubjective competences.

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Intersubjectivity; maternal perception; emotional states; initiative; mother–infant relationship

Trevarthen and Aitken (2001, p. 18) stated that '... human intersubjectivity is conceived as a process that makes it possible for subjects to detect and change each other's mind and behaviour, by purposeful, narrative expressions of emotion, intention and interest'. As follows, Trevarthen's framework is especially suited for the study of intersubjectivity during the first steps of human development.

In the context of mother–infant relationship, intersubjectivity is a matter of major clinical and empirical interest. Maternal perception of the infant's participation in the mother–infant relationship is a relevant contribute to the development of this important experience. In the field of mother–infant dyads, intersubjectivity results from the abilities

of both the mother and the infant to pick up signals from each other and to infer on the partner's emotional states in the context of their relationship (Murray, 1991; Trevarthen, 1974, 1980, 1984, 1986, 2001, 2002; Trevarthen & Aitken, 2001).

Intersubjectivity is established through a set of processes in the context of mother–infant interactions, beginning with imitation (Beebe et al., 2003; Stern, 1998; Trevarthen, 1984, 1986, 2001, 2002, 2003; Trevarthen & Aitken, 2001), followed by coordination (Fogel et al., 2002), synchronisation and proto-conversations (Trevarthen, 2002), reciprocity (Trevarthen, 2003), and also affective attunement (Beebe et al., 2003; Stern, 1998). Intersubjectivity is essential to the development of infant's purposeful consciousness and ability to cooperate with other persons' actions and interests, as well as to the capability to learn from them (Nagy, 2008; Trevarthen, 1974, 1980, 1984, 1986, 2001, 2002; Trevarthen & Aitken, 2001). Infant's intersubjectivity was pointed out as being of major importance for mental health, suggesting the relevance to investigate this dimension in the context of mother–infant relationships (Trevarthen & Aitken, 2001).

A primary intersubjectivity is present at birth, as the infant possesses means to communicate with the parent/caregiver (Beebe et al., 2003; Stern, 1998). The infant sends signals to the mother, but the ability to share affective states is still rudimentary (Trevarthen, 1986, 2002; Trevarthen & Aitken, 2001). Over the first 6 months, changes in levels of emotional communication, self-awareness and engagement with objects are strongly marked by developments in the infant's body and brain (Trevarthen & Aitken, 2001). Intimate proto-conversations with the mother, the father or other caregivers arouse by the first 6 weeks of the infant's life, after the beginning of primary intersubjectivity with imitation. At 3 months, infants become more playful, responding to rhythmic provocations of expressive movements required by games with caregivers. At this time, the infant shows an increased interest in objects that can be manipulated. This interest is evidenced with improved visual tracking. After 4 months, infants start to pointing and waving, or making humorous sound expressions, which probably consist in the imitation of conventional mannerisms (Kokkinaki & Vasdekis, 2015). Also, caregivers are more likely to take turns during infant's speech-like vocalisations, i.e. protophones (precursors of speech; Yoo et al., 2018). Empirical observations of infant-mother dyads show that between two and 6 months of age, the probability of emotional matching, synchrony and attunement changes dramatically (T. S. Kokkinaki et al., 2017). Surprisingly, the probability of emotional non-matching is higher than the probability of emotional matching, according to the authors' results on the development of infants' attention and play attitude. Still, at 6 months of age, differences between same-gender and cross-gender infant-parent dyads can be observed (T. Kokkinaki et al., 2020), where mothers favour girls in infant attention speech and favour boys in infant emotion/attention thematic sequences (internal state, emotion), while fathers favour systematically the temporal structure of their speech to both boys and girls.

Moreover, during playfully games that emerge in parent–infant interactions, like peekaboo game (Nomikou et al., 2017), infants as young as 4 months of age engage in the game taking up turns; furthermore, at 6 months, the infants' participation seems to increase significantly. Infant participation at both four and 6 months of age in the peekaboo game can be predicted by the way mothers structured the game at 4 months (Nomikou et al., 2017). Playfully games or shared pleasurable moments

(Puura et al., 2019) can be found in seven-month-old infants, more specifically infants of depressive mothers. At 7 months, longer periods of shared pleasure are related to lower levels of maternal depressive symptoms, to a better maternal structuring of the communication with the infant, and also to infants' higher involvement (Puura et al., 2019). During the first 3 months of life, parental turn-taking is more probable during infant speech-like vocalisations (i.e. protophones, precursors of speech) while parental overlapping is more likely to be observed during infants' cries (Yoo et al., 2018).

Secondary intersubjectivity begins at 6 months and is fully established at 9 months, and implies a qualitative leap in shared communication (Trevarthen, 2003; Trevarthen & Aitken, 2001). Communicative and affective attunement evolves, and a more complex intersubjectivity in the dyad is possible (Beebe et al., 2003; Stern, 1998). At this point, a sharing of affective states and human experiences between the two partners of the dyad is supposed to happen. At 9 months, positive expressions during mother–infant interactions are no longer exclusively initiated by the mother, once the infant also holds that ability (Cohn & Tronick, 1987). In other words, infants start to take initiative in mother–infant interactions.

The absence of intersubjective communication in the mother–infant interaction interferes with the development of socio-emotional competences associated to neuro-developmental disorders, including autism, ADHD and specific language impairments (Trevarthen & Aitken, 2001). For example, due to preterm birth and early separation between the infant and the mother, early mother–infant interactions may be compromised. The immature behavioural repertoire of the preterm baby possibly takes the mother to develop a weak repertoire in domains like vocalisation and handling (Trevarthen & Aitken, 2001). When compared with term infants, preterms spend less time in eye contact with their mothers and show more negative expressions (Malatesta et al., 1986), less vocalisations (Crnic et al., 1983), and they are delayed in the development of both looking and expressive behaviours (Van Beek et al., 1994). Differences can be found, also, in the mothers of preterm infants, that is, they display less imitation of their infant's facial expressions, less contingent responsiveness and attention to their infant's negative emotions (Malatesta et al., 1986).

In an alternative framework, Tomasello and colleagues (Tomasello et al., 2005) proposed shared intentionality as the major difference while comparing human to other species' cognitive phenomena. As they state, specific skills like the ability to engage in collaborative activities while sharing goals and intentions are developing during the first year of human life. This appeals to the existence of a powerful basic motivation to share psychologically important experiences with others as well as human specific forms of representation to achieve these goals.

Intersubjectivity is an important indicator of the mother–infant relationship effectiveness, and provides the necessary experiences for the infant to acquire relevant developmental competences. Thus, an instrument dedicated to assess maternal perception of the infant's participation in mother–infant intersubjectivity can be a relevant tool for both clinicians and researchers. From this point on we will refer to the infant's participation in the intersubjectivity experience as infant intersubjectivity.

Methods

Initial design of the Maternal Perception of Infant's Intersubjectivity Questionnaire (MPIIQ)

A 15 minutes video was recorded with interactions between a mother and her 3 months old female infant (bathing, feeding and free play). This video was then presented to 18 mothers (9 in a focus group and 9 in individual semi-structured interviews) whose babies were aged 3–9 months ($M = 5.56$, $SD = 2.75$). Mothers of the focus group were recruited in a Private Institution of Social Solidarity in northern Portugal, after the approval of the institution's ethical board (details may be found at Sousa, 2016). Mothers selected for individual interviews were recruited by personal contacts and by the 'Facebook' contact of the 'Douglas Association of Portugal' which aims to support pregnant women and newly mothers.

All mothers were Portuguese (age, $M = 32.61$, $SD = 4.16$; education, $M = 13.61$, $SD = 4.07$), 66.66% were employed, 88.89% lived with the infant's father (marital relationship length, $M = 8.54$ years, $SD = 4.13$), and the average number of children per mother was 1.5 ($SD = .62$). Pregnancy was desired (100%) and sometimes planned (46.47%). After the video has been displayed, mothers at the focus group and mothers at the individual interviews were questioned about their competences to decode messages exhibited by the infant in the video.

Preliminary version of the MPIIQ

Contents obtained in group and individual sessions were independently appreciated by the two first authors. Categories were created relative to maternal competence to decode the infant's messages involved in: 1) the infant's crying, 2) the infant's smile and laugh, 3) the infant's look and facial expressions, 4) the infant taking objects into his mouth, 5) the infant throwing objects away, 6) the infant turning his face away from the mother, 7) the infant's grunts, 8) the infant's avoidance of the mother's look, 9) the infant following objects displaced by the mother's hand, 10) the infant paying attention to the mothers' play and 11) the infant's reactions to the mother's voice. Categories were also created relative to maternal believes on: a) the infant's attempts to talk, b) the infant's cooperation with the mother, c) the infant's demands for the maternal help, d) the infant's pleasure, e) the infant's relaxation, f) the infant's expressions about his own needs (to sleep, to be fed, etc.), g) the infant's aggressiveness, h) the infant's interest about starting an interaction, i) the infant's invitation for the mother to play with him, j) the infant's communication about suffering or discomfort, k) the infant's communication about happiness, l) the infant's communication about sadness, m) the infant being distracted by stimuli outside the relationship with the mother and n) the infant's motivation to explore his environment.

Based in these categories, 76 items were generated consisting of statements related to maternal perceptions of the infant intersubjectivity. Answers were recorded in 5 points Likert scales ranging from 'I totally disagree' to 'I totally agree'. The resulting 76 items were submitted to 62 mothers having infants aged 3–9 months. These mothers were recruited at the aforementioned institution and in a cultural association working at both metropolitan areas of Porto and Lisbon. After the approval by the board of the institutions,

participants were informed about the goals and procedures of the investigation and were asked to sign informed consent forms. Participants were between 23 and 40 years old ($M = 33.21$, $SD = 3.85$), almost all were Portuguese (96.8%) and 85.5% said to be living with the infant's father. The average number of children per mother was 1.39 ($SD = .58$) and the medium of pregnancies was 1.54 ($SD = .79$).

Results were submitted to a principal components analysis that yielded 20 components explaining 86.47% of the total variance. It was decided to retain items with factor loadings higher than .5 at the first 13 components once that from the 14th component on the explained variance became too low. The resulting 43 items were reanalysed with several component analyses allowing to identify 4 major components able to explain 55.81% of the total variance.

All the 22 items of the final set had anti-image values higher than .5. While the first six factors explained 68.97% of the variance, after varimax rotation it seemed that the first four factors were the only ones that could be used once that the two latter factors could not attract enough items: F1- 24, 25, 27, 31, 33, 47, 50 and 75; F2- 9, 26, 37, 51, 56, 59 and 67; F3- 29, 46, 48 and 69; F4- 58, 68 and 72. At this moment, 4 items presented factor loadings lower than .5: 27 (.499), 51 (.494), 58 (.470) and 67 (.489).

Analysing the content of the items, it was possible to designate the factors' psychological meaning: F1 – infant's use of emotional states and bodily movements to communicate with the mother, F2 – infant's ability to share emotional states, F3 – infant's communication of pleasure and F4 – infant's communication of distress. The internal consistency values were: F1- $\alpha = .85$; F2- $\alpha = .85$; F3- $\alpha = .76$ and F4- $\alpha = .51$.

As F4 had only 3 items (58, 68 and 72), we decided to create 3 more items about infant's communication of distress. The association of the previous 22 items with these new 3 originated a new version with 25 items which analysis required a new sample of 125 mothers.

The 25 items version of the MPIIQ

The new version of the MPIIQ with 25 items was submitted to participants ($N = 125$) recruited at the institution already mentioned and also in hospitals of Porto town and surroundings. Selection was made according to the following inclusion criteria: 1) mothers of infants with 2–9 months of age; 2) mothers using consultations of primary health care services or nurseries; 3) mothers of infants born at term without health risks; 4) infants without developmental problems; 5) infants without hospital admissions; 6) mothers without mental disorders; 7) mothers not using psychopharmacological medication and 8) mothers without addictive behaviours.

Mothers, fathers and infants' sociodemographic data are presented in [Table 1](#). The vast majority of participants was Portuguese (94%). While 16% of the mothers experienced one spontaneous abortion, only 2.4% reported a voluntary abortion. About delivery, 37.50% had a vaginal delivery and 62.50% a caesarean delivery. Relative to the infants, 80% had no medical interventions, and 75% were exclusively breastfed.

Table 1. Mothers, fathers and infants' sociodemographic data (N = 125).

Variables	M	SD	Min.	Max.
Mother age	32.98	4.32	20	45
Mother education (NSYE*)	14.96	3.37	6	20
Number of pregnancies	1.64	.92	1	6
Number of children alive	1.40	.57	1	4
Father age	34.41	4.73	26	46
Father education (NSYE*)	13.43	3.74	4	19
Infant age (months)	5.7	2.13	2	9
Weight at birth (Kg)	3205.48 g	489.34 g	2225.00 g	4280.00 g
Height at birth (cm)	48.94	2.46	43	59
Apgar at the 1 st minute	8.53	1.42	2	10
Apgar at the 5 th minute	9.57	1.57	5	10
Gestational age at birth (weeks)	38.6	1.25	35	42
	n	%		
Mothers' marital status				
Living without a marital partner	26	20.8		
Living with a marital partner	96	76.8		

*NSYE- Number of successful years of education

Results

Principal components analysis for the 25 items version of the MPIIQ

Mothers' responses to the 25 items of the MPIIQ were submitted to a principal components analysis with forced extraction to 4 factors (KMO = .680; Bartlett's test of sphericity, $\chi^2 = 829.456$; $p = .000$). The 4 factors together explained 49.99% of the total statistical variance. At this stage, the fourth factor was not able to capture any items with enough factorial loadings and a further extraction forced to 3 factors was performed. Conditions for factorial analysis appeared to be good (KMO = .752; Bartlett's test of sphericity, $p = .000$) and all items scored above .5 in anti-image analysis. The 3 factors together explained 42.12% of the total variance. After using different rotation methods, the best option was varimax rotation. Table 2 displays the results of the principal components analysis.

All selected items had factorial loadings greater than .471. Items 8, 9 and 23 were eliminated. As a result, we have a factorial solution with 22 items. Factor 1 consists of items 1, 6, 7, 14, 15, 18, 22 and 24 (for example, item 14: 'Sometimes I get the feeling that my baby already expresses his will and his desires'). Factor 2 includes items 2, 3, 4, 10, 11, 16, 19 and 20 (for example, item 2: 'When my baby wants to fuss, he waves his arms or starts crying'). Factor 3 comprises items 5, 12, 13, 17, 21 and 25 (for example, item 13: 'My baby does not like being alone anymore and does everything to get my attention').

According to the contents of the items, Factor 1 was related to 'maternal perception about the infant's competence at the interaction with the mother' (Interactive Competence). Factor 2 referred to 'maternal perception of infants' behaviours that express emotional states' (Emotional States). Finally, Factor 3 was related to 'maternal perceptions about the infants' competence to express their own initiatives' (Initiative). The internal consistency analysis yielded the following values: Factor 1 (Interactive Competence), $\alpha = .817$; Factor 2 (Emotional States), $\alpha = .749$ and Factor 3 (Initiative), $\alpha = .647$. Using all items as a 'Total Scale' we found a good internal consistency value ($\alpha = .816$). This way, we have a MPIIQ with 22 items, 3 factors and a Total Scale.

Table 2. Principal components analysis for the 25 items of the MPIIQ with extraction forced to 3 factors, varimax rotation and Kaiser normalisation (N = 125).

Items	Components		
	1	2	3
1	.746	.237	-.039
2	.222	.594	-.126
3	-.059	.548	.067
4	-.003	.508	.282
5	.049	.476	.503
6	.624	-.046	.025
7	.782	-.022	-.023
8	.299	.197	.066
9	.418	.234	.323
10	-.062	.744	-.065
11	.075	.496	-.048
12	.058	-.182	.675
13	-.026	.125	.600
14	.550	.250	.386
15	.624	-.004	.285
16	.076	.590	.202
17	.420	.012	.471
18	.739	.060	-.068
19	.341	.531	-.008
20	.282	.560	.230
21	.114	.445	.605
22	.619	.174	.200
23	.315	.299	.216
24	.669	.027	.205
25	.226	.005	.483

Table 3. Correlations among the factors and the total scale of the MPIIQ (N = 125).

	Emotional States	Initiative	Total Scale
Interactive Competence	.296**	.424**	.675**
Emotional States		.365**	.807**
Initiative			.772**

MPIIQ- Maternal Perception of the Infant's Intersubjectivity Questionnaire; ** $p < .001$

Correlations among factors of the MPIIQ

Pearson correlations revealed that the three factors of the MPIIQ and the Total Scale are positively correlated with each other. Table 3 displays the correlation coefficients and the significance levels.

MPIIQ sensitivity to mothers' and infants' sociodemographic dimensions

Multivariate and univariate analyses were conducted to understand the relationship between MPIIQ measurements, on one side, and sociodemographic variables, on the other side (Table 4). Comparing mothers of infants younger than 5 months old with mothers of infants with 5 or more months of age, two significant differences were found ($F = 7.83$, $df = 3$, $p \leq .001$): Emotional States ($F = 7.77$, $df = 1$, $p \leq .01$) and Initiative ($F = 5.46$, $df = 1$, $p \leq .05$). Mothers of infants older than 5 months tend to show lower scores in Emotional States when compared with mothers of infants

Table 4. Univariate and multivariate analyses of MPIIQ subscales and total scale according to mothers' age, education, spontaneous abortion, delivery type, number of children alive, infant's gestational age at birth age, weight at birth and gender.

	Interactive Competence	Emotional States	Initiative	F	Total Scale	
	M (SD)	M (SD)	M (SD)		M (SD)	T
Mothers' age						
< 30 (n = 26)	38.54 (1.53)	32.89 (4.23)	25.69 (3.16)	.747	97.12 (6.62)	.33*
≥ 30 (n = 86)	38.05 (3.01)	33.50 (4.76)	24.94 (3.5)		96.49 (8.87)	
Mothers' education (NSYE)						
< 12 (n = 9)	38.44 (1.42)	32.11 (4.29)	26.56 (3.21)	1.121	97.11 (6.79)	.91
≥ 12 (n = 101)	38.25 (2.63)	33.43 (4.69)	25.05 (3.59)		96.72 (8.42)	
N° of children alive						
1 (n = 70)	38.14 (2.79)	33.16 (4.70)	25.09 (3.73)	.062	96.39 (8.80)	.68
≥ 2 (n = 41)	38.17 (2.71)	33.54 (4.52)	25.24 (3.49)		96.95 (7.79)	
Spontaneous abortion						
Yes (n = 20)	37.95 (3.24)	32.45 (4.47)	23.25 (4.69)	2.577	97.28 (8.10)	.80
No (n = 89)	38.26 (2.65)	33.41 (4.67)	25.62 (3.25)		93.65 (9.69)	
Delivery type						
Vaginal (n = 42)	37.79 (3.39)	32.14 (4.71)	24.57 (3.67)	1.674	94.50 (9.09)	.68
Caesarean (n = 70)	38.40 (2.27)	34.06 (4.44)	25.47 (3.57)		97.93 (7.71)	
Infants' age in months						
≤ 4 (n = 52)	38.17 (2.73)	34.60 (4.12)	24.25 (3.61)	7.834**	97.02 (7.84)	.65
≥ 5 (n = 60)	38.13 (2.77)	32.23 (4.76)	25.82 (3.48)		96.18 (8.79)	
Gestational weeks at birth						
≤ 37 (n = 19)	38.00 (3.22)	32.90 (4.74)	23.74 (5.00)	1.252	94.63 (10.56)	-1.15*
≥ 38 (n = 93)	38.20 (2.66)		25.42 (3.23)		97.05 (7.87)	
Weight at birth						
< 2500 gr (n = 6)	39.00 (.89)	35.33 (4.32)	26.00 (3.74)	.458	100.33 (8.33)	.08
≥ 2500gr (n = 106)	38.12 (2.81)	33.23 (4.63)	25.09 (3.62)		96.43 (8.38)	
Infants' gender						
Girl (n = 13)	38.23 (2.09)	33.30 (3.45)	26.08 (2.99)	.026	97.62 (6.13)	.16
Boy (n = 18)	38.11 (3.03)	33.00 (4.03)	26.11 (2.97)		97.22 (6.99)	

MPIIQ- Maternal Perception of Infant's Intersubjectivity Questionnaire; TS- Total Scale; * $p \leq .05$; ** $p \leq .001$
 NSYE- Number of successful years of education

younger than 5 months. In regard to Initiative, mothers of infants younger than 5 months old showed lower scores than mothers of infants older than 5 months. A nearly significant difference was found when mothers with spontaneous abortions and mothers without spontaneous abortions were compared for MPIIQ subscales ($F = 2.577$, $df = 3$, $p = .058$). Among MPIIQ subscales, Initiative is the most sensitive one ($F = 7.28$, $df = 1$, $p \leq .01$) meaning that mothers with an history of spontaneous abortion present lower scores in Initiative than mothers with no spontaneous abortions.

For the data of the Total Scale T-tests were used. A significant difference was found when comparing mothers younger than 30 years old and mothers with 30 or more years of age ($F = 4.29$, $df = 110$, $t = .33$, $p \leq .05$). Mothers older than 30 or more years of age showed lower scores than mothers less than 30 years old. Finally, considering gestational age at birth, mothers of infants born with 37 or less gestational weeks present a significant difference when compared with mothers of infants born with 38 or more gestational weeks ($F = 4.45$, $df = 110$, $t = -1.15$, $p \leq .01$) meaning that mothers of infants with earlier births present lower scores on the Total Scale than mothers of infants born with 38 or more gestational weeks.

Discussion

The study aim was to design a questionnaire to assess maternal perception of the infant's intersubjectivity a fundamental dimension of the mother–infant relationship. Importantly, intersubjectivity is associated with the emergence and development of an active self-and-other awareness in infancy. A questionnaire to assess the maternal perception of the infant's participation in mother–infant intersubjectivity (MPIIQ) was designed and psychometrics proprieties were assessed.

Mothers of infants in their first year of life answered to the questionnaire. Principal components analysis identified 22 items grouped in three factors, explaining 42.1% of variance: a) F1, 'Interactive Competence'; b) F2, 'Emotional States', and c) F3, 'Initiative'. Interactive Competence assesses maternal perception about the infant's competence to interact with the mother. Emotional States assesses maternal perception about the infant's behaviours that express emotional states. Initiative assesses maternal perception about the infant's competence to express his own initiative. Positive and significant correlations were observed among all MPIIQ factors. The questionnaire presented a good internal consistency ($\alpha = .816$) as well did the sub-scales Interactive Competence ($\alpha = .817$) and Emotional States ($\alpha = .749$), while Initiative presented a lower alpha ($\alpha = .647$).

The questionnaire was sensitive to expected differences in the maternal perception of the infant's intersubjectivity, according to the infant's gestational age at birth and age at the assessment time. According to previous studies, maternal perception of infant's intersubjectivity varied according to the number of gestational weeks at birth (Crnic et al., 1983; Malatesta et al., 1986; Van Beek et al., 1994) and according to the infant's age (Kokkinaki & Vasdekis, 2015; Nomikou et al., 2017; Puura et al., 2019; T. S. Kokkinaki et al., 2017; Yoo et al., 2018). Older mothers (≥ 30 years old) reported lower perception of the infants' participation in the intersubjectivity experience than younger mothers (< 30 years old). Mothers of infants born with 37 or fewer gestational weeks reported a lower perception of the infants' participation in the intersubjectivity experience than mothers of infants born with 38 or more gestational weeks. Similarly, mothers of older infants (≥ 5 months) reported lower levels of perception about infants' expressing their Emotional States and higher levels of perception about infants' Initiative than mothers of younger infants (≤ 5 months).

The above-mentioned differences should be interpreted with caution. There is still no knowledge about what can be an optimal level of the scores obtained by the MPIIQ. For example, the difference between mothers of younger and mothers of older infants relative to Emotional States and to Initiative may simply reflect how hard it is to decode the infants' messages in the first few months of life; and, how it is much easier to decode those messages during the second half of the infants' first year of life.

Also, important for the interpretation of results obtained with the MPIIQ is the question of the respondents' cultural context. It is possible that some cultures overvalue the psychological meaning of infants' behaviour during childhood while other cultures influence maternal perceptions in a different way. Psychosocial factors should always be present in the judgment of the researcher applying the MPIIQ.

The proposed questionnaire showed good psychometric proprieties and is now available to research and clinical practice. Although intersubjectivity is usually assessed in a behavioural perspective and in the research context, a questionnaire can be more

appropriate to assess maternal perception of the infant's intersubjectivity in specific research fields and in the clinical context. For example, the questionnaire can be used to identify difficulties to perceive infant's intersubjectivity and help parents to achieve intersubjectivity in the context of their relationship with the infant.

Disclosure statement

No potential conflict of interest was reported by the author(s).

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