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Parental sensitivity to toddler's need for autonomy: An empirical study on mother-toddler and father-toddler interactions during feeding and play

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ABSTRACT

During the second year of life, children's need for autonomy grows, and their behaviors become increasingly complex. Parental sensitivity to children's different cues is important in supporting adaptive psycho-emotional development. The present study assumes that mothers and fathers may respond with varying levels of sensitivity to the child's different cues, with particular attention to requests for greater autonomy. The study also examines the possible role played by interactive contexts (ie., play and feeding) and children's and parents' individual factors. The sample comprised N = 91 families with children aged between 12 and 24 months. Mother-toddler and father-toddler interactions were assessed during feeding and play. Parents completed questionnaires assessing children's temperament, psychopathological risk, and parenting stress.

Results: showed that toddlers' demands for autonomy were the most frequent cues in both play and feeding contexts, both with mothers and fathers. Furthermore, parents were more sensitive to toddlers' requests for cooperation than their requests for autonomy, in both interactive contexts. Moreover, mothers and fathers showed higher sensitivity to toddlers' demands for greater autonomy in the play context rather than in the feeding context. Mothers were more sensitive than fathers to toddlers' cues of resistance to parents' actions and to toddlers' requests for cooperation. Results showed differences and specificities in mother-toddler and father-toddler interactions in the two interactive contexts, showing associations between child negative emotionality, parental psychopathological risk and parenting stress, and maternal and paternal sensitivity to toddlers' demands for greater autonomy during play and feeding, respectively. These results confirm the initial hypotheses regarding parental sensitivity and its differential expression according to child cues. Implications are discussed.

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1. Introduction

During the second year of life, children develop new skills (motor, cognitive, linguistic, etc.), their behaviors become increasingly complex, assuming new meanings (Sroufe & Rutter, 1984), and they develop the ability to represent others as having different mental states from their own. These developments require a sensitive interlocutor (Atkinson et al., 2000). Parental sensitivity is defined as the ability to accurately interpret the child's cues and respond appropriately (Ainsworth et al., 1974). In particular, parental sensitive responses that favor child development are adaptive, synchronous and reciprocate the child's initiatives (Carlson et al., 1995; Sroufe et al., 2000). Research has emphasised that parental sensitivity may differ based on individual variables, such as parental psychopathology (Cooke et al., 2022), parenting stress (Trumello et al., 2022), and child temperament (Samdan et al., 2020). In addition, studies on attachment have found different levels of sensitivity to infant distressed vs. non-distressed cues (Leerkes et al., 2012; McElwain & Booth-LaForce, 2006). In the present study, we focused on different child cues and requests, assuming that parents may respond with varying levels of sensitivity to each of them.

Among the major changes that occur in the second year of life, the push towards autonomy, a development widely studied in the context of play within Self-determination theory (Deci & Ryan, 1980, 2000; Matte-Gagné et al., 2013; Whipple et al., 2011), is particularly important. These studies consider autonomy a fundamental child need, and regard support for autonomy to be the most important aspect of parenting for the development of child independence (Joussemet et al., 2008); moreover, they have consistently found correlations between parental autonomy support and the development of child problem-solving skills and executive functions (Meuwissen & Carlson, 2015). Relatedly, parents' scaffolding of child behavior has been seen as a central component of autonomy support, whereby the child is helped, or facilitated, to use their skills to successfully complete a task (Bernier et al., 2010). While the drive towards autonomy is greater in this age group than in other ages, it should also be borne in mind that different interactive contexts (e.g., play and feeding) could prompt certain needs of the child (such as a request for greater autonomy). The present study aimed to investigate more closely parental sensitivity to toddlers' requests for greater autonomy, differentiating it from parental sensitivity to other child cues (such as the request for reassurance, cooperation etc.), in two interactive contexts: feeding and play.

1.1. Feeding and play interactions

While most observational research examining the support for child autonomy has been conducted in *play* contexts, other kinds of interaction may be as much, if not more relevant to its development, including feeding interactions. Like play, feeding represents a fundamental daily experience in the development of the dyadic relationship (Chatoor et al., 2018; Roggero et al., 2023; Stern, 1996; van Dijk et al., 2022), and many researchers have highlighted the importance of being able to observe parent-child interactions in both these contexts (Feldman et al., 2004; Lieberman & Slade, 2000; Stern, 1985; Trevarthen & Aitken, 2001). Thus, in the course of daily mutual exchanges, including feeding and play activities, children develop both their regulatory skills and sense of self (Ammaniti & Gallese, 2014; Fogel, 1995; Zimmerman et al., 2019).

Despite the similar frequency, and the fundamental, common, characteristics of play and feeding, the nature of these activities and what they require from parents may differ. During free play, parents and children can interact with each other with the only objective being the pleasure of sharing (Stern, 1985). In this context, child initiatives and bids for autonomy may be exercised without posing challenges to the parent's own agenda, and the parent-child dyad can simply share the pleasure of the interaction itself. During feeding, by contrast, there are other goals; thus, parents and children co-construct their own dyadic rhythm, gradually shifting from reciprocal regulation to autonomous nutrition and greater self-regulation on the part of the child. Interactions in the context of nutrition in the early years of life represent, therefore, not only an organizer of biological rhythms, but also a key opportunity for the early development of the autonomous self (Ammaniti et al., 2010; Feldman, 2007; Stern, 1985). Parental sensitivity to the natural push towards autonomy is fundamental in this developmental phase. Nevertheless, during feeding, parents may be confronted with autonomous child behaviors that are more challenging to manage than in the context of free play. This may occur, for example, when the child enjoys manipulating food in what might be perceived as a 'messy' way, or is not motivated to consume food that parents have prepared and consider important for the child's nutritional needs. Negotiating the child's bids for autonomy and supporting their emotional need to develop an independent self during feeding may, therefore, be more difficult for parents to handle in a sensitive, reciprocal fashion than during free play.

The literature that has investigated mother-child and father-child interactions during feeding and play is fragmented. Several studies have emphasized differences in mother-child interactions in the two different contexts, focusing on both clinical samples with mothers or children with feeding difficulties (Chatoor et al., 2018; Feldman et al., 2004; Keren et al., 2001; Stein et al., 1994), and normative samples (Fadda & Lucarelli, 2017; van Vliet et al., 2022). Regarding studies with clinical samples, for example, Stein et al. (1994) found that mothers with eating disorder showed greater intrusiveness than non-clinical controls in both a feeding interaction and during a structured play task where they were invited to help infants play with a hammer ball game. While the study by Stein and coll. (1994) focused on maternal psychopathology, Keren and colleagues (2001) compared mother-child interactions during play and feeding in a child clinical sample at high risk of onset of psychopathology. In this study, unlike that of Stein and coll. (1994), play was 'free' play, rather than observed during a structured task. Keren et al. found that feeding elicited more negative interactions than free play, and they noted that the feeding context was a "potentially more intrusive setting" (Keren et al., 2001). Indeed, in this last study, the two interactive contexts were very different, and the push towards autonomy elicited during feeding may have been much greater than that in the free play observation. Hence, it is possible that the two contexts (feeding and free play) could stimulate different needs in the child and that the parent's responses to these needs could also differ.

With regard to normative samples, Fadda and Lucarelli (2017) tested associations between mother-child interactions during

mealtime and play and the child's subsequent social skills. However, this study did not compare the two contexts and does not explore differences and similarities between them. By contrast, van Vliet and colleagues (2022) observed greater maternal sensitivity during interactions with their children during free play than during mealtime, highlighting the importance of taking context into account when observing parental sensitivity.

Compared to research on mother-child interactions, fewer studies have explored father-child interactions in play and feeding contexts (Chatoor et al., 2022; Jacobvitz et al., 2022), but without observing mother-child interactions. Furthermore, these studies have not explored the differences between these interactive contexts.

Overall, the studies that have investigated mother-child and father-child interactions in the two contexts are scarce. Given that mothers spend more time in caregiving contexts such as feeding during the early years of the child's life, while fathers are more involved in play contexts, Bernier et al. (2023) and Hertz et al. (2019) observed mother-child interactions during feeding and father-child interactions during play. Specifically, Hertz et al. (2019) found that only father-child interactions predicted children's executive functions, and accordingly they highlight the importance of the paternal role. However, the question is raised whether the two different contexts may have introduced a bias to these conclusions. Indeed, in a study of a group of children with nonorganic-based feeding disorder and a control group, Atzaba-Poria et al. (2010) observed mother-child and father-child interactions in both feeding and play, and found no relation between parental sensitivity in the two different contexts. Further studies are therefore needed to understand the differences between these interactive contexts, including whether they elicit different child cues and different parental responses to them.

1.2. Risk factors for lower sensitivity in the interaction

The second year of life represents critical phase when the risk of conflicts between the child and parent increase, as well as in the level of child emotional dysregulation (DeMartini et al., 2021; Maag et al., 2021; Sander, 1976). It is, therefore, important to investigate factors that promote or else hinder a good quality of parental care, and consequently healthy child development. The transactional model of development argues that the characteristics of the child and the parents influence each other (Sameroff, 2009). With regard to child factors, starting from Wolff's work (1963), numerous studies have shown that the child's temperament can affect the parent (Kiff et al., 2011). Indeed, Rode and Kiel (2016) found that child temperament was associated with post-partum depression, and Kim et al. (2017) found that it can interact with parenting quality in the first year of life, predicting child attachment. The temperamental characteristic of 'negative emotionality' has received particular research attention and it has been consistently found that high levels of negative emotionality are associated with low parental sensitivity (Kivijärvi et al., 2005; Lahtela et al., 2023; Pauli-Pott et al., 2000) and parenting stress (Potapova et al., 2014). The child's "negative emotionality" is thus associated with lower parent-child interactive quality, but several authors have highlighted that this relationship is often mediated by how the parent experiences the child's temperament and any perceived parental stress (Fang et al., 2022; Tharner et al., 2012).

Interestingly, several studies have found the interaction between parental mental state and child negative emotionality influence parental sensitivity, including both parental stress (Bernier et al., 2021; Paulussen-Hoogeboom et al., 2008) and maternal depression (Pauli-Pott et al., 2000). Indeed, the presence of parental psychopathology and parenting stress have themselves been found to have important effects on the child's adaptive functioning (Glover, 2014; Porreca et al., 2018; Senehi & Brophy-Herb, 2020). If on the one hand, the role of maternal anxious and depressive symptoms has been widely documented (Bernard et al., 2018; Cimino et al., 2020; Glasheen et al., 2010; Reck et al., 2018), on the other hand research has also shown the role played by paternal psychopathological risk and parenting stress, which can further aggravate children's emotional-behavioral functioning (Lamb, 2010). Specifically, Sethna et al. (2018) found that fathers with post-partum depression were less active and playful, and showed more abrupt gestures in their interaction with the child, than fathers of a normative, non-depressed sample.

In sum, the individual characteristics of the child and the parents can have an effect on parental sensitivity in responding to the child's cues. Especially from the second year of life, children send different signals to parents, request for greater autonomy, for reassurance, for cooperation etc.; and parents might respond with different levels of sensitivity to the child's different cues: for example, a parent might be more sensitive to the child's requests for reassurance and cooperation, that involve child's demand for the parent's presence; on the other hand, the growing need for autonomy, characteristic of this age group compared to other periods during childhood, means that the child could show choices, interests and times, that may be different from those of the parent. Parental autonomy support has been construed as the readiness of the parent to assume the child's perspective and to facilitate self-initiated expression and action (Ryan & Solky, 1996), but several studies have highlighted that parents with psychopathological risk could have difficulties in assuming the child's perspective, finding it difficult to be sensitive to the child's cues when they are related to autonomy needs (Andreadakis et al., 2020; Ryan et al., 2006). Individual risk factors may interact in reducing parental sensitivity in responding to different child cues (Ballarotto et al., 2021). A child expressing more negative emotionality might cause the parent to have difficulty "reading" the child's needs (Kiff et al., 2011), especially when those needs highlight difference and separateness from the parent; high levels of a child's negative emotionality might be associated with high parental stress (Paulussen-Hoogeboom et al., 2008) and psychopathological symptoms such as anxiety and depression (Torpey et al., 2013), which in turn might make it difficult to read those signals from the child.

1.3. The present study

The present study aimed to establish whether maternal and paternal sensitivity may differ according to specific child cues, and in particular their requests for autonomy; we also aimed to establish whether sensitivity differed according to interaction context (play,

feeding) where child cues may be differentially expressed. Finally, in line with [Leerkes et al. \(2012\)](#), given that parental sensitivity may be a relational construct, we examined the influences of characteristics of the child and the parents.

Specifically, the present study aimed to assess the quality of mother-toddler and father-toddler interactions during feeding and play, in the second year of life. In accordance with the theoretical framework of Developmental Psychopathology ([Bifulco et al., 2002](#); [Davies & Cicchetti, 2004](#)) and with the transactional model of development ([Sameroff, 2009](#)), we aimed to assess any differences in parental sensitivity, considering the parents' psychological profiles and parenting stress, and child negative emotionality.

We hypothesized that:

a) toddlers' autonomy-seeking cues (such as requests for greater autonomy and attempts to resist to parent's behavior) would be greater than the requests for help, cooperation and reassurance, and they will be greater in the feeding context rather than in the play context, with both parents;

b) parents would show less sensitivity to the child's autonomy-seeking cues rather than to the requests for help, cooperation and reassurance, both in the context of play and feeding;

c) the feeding context would be characterized by less sensitivity (both in mothers and fathers) towards the child's requests for greater autonomy compared to the context of play;

d) maternal, paternal and child characteristics would be associated with parental sensitivity to the child's cues. Specifically, higher maternal and paternal psychopathological risk, child negative emotionality and greater parental stress due to their perception of a difficult child would be associated with less parental sensitivity to child's requests for greater autonomy.

2. Method

2.1. Procedure

In collaboration with both public and private kindergartens in Central Italy, families with children aged between 12 and 24 months were contacted by researchers, who organized an information day with the kindergartens' directors. The selection criteria for the sample were the children's age ranged from 12 to 24 months, the absence of physical or mental disorders in parents and/or children, that both parents take care of the feeding of the child in the absence of their partner, that families lived together for at least 2 years and that parents were biological parents of the child. Two meetings were held (one with the kindergarten educators and one with the parents), in which the procedures and aims of the study were explained in detail. During the meeting, the parents completed a socio-demographic questionnaire, and families who agreed to participate in the study signed an informed consent in which the steps of the study were detailed. In accordance with the Helsinki Declaration, the study was approved before its start by the Ethics Committee of the Department of Dynamic and Clinical Psychology of the University of Rome "La Sapienza" (n. 58/2017).

The mother-toddler and father-toddler interactions were assessed during feeding and play (on two different days) by psychologists who were specifically trained in the use of the observational tool (described below). For the order of administration between mothers and fathers, and between feeding and play, a randomized procedure considering the child's sex was employed.

Parents were asked to interact with their children during a main meal, recreating their usual situation, offering the child the food he/she was used to consuming daily. Parent and child were seated at a low, child-level table together, with eye-to-eye contact being possible. Parents were asked to provide two types of food (e.g. pasta/rice; meat/vegetables) along with a drink. The feeding interactions were recorded in full, but were considered for coding for 10 min.

For parent-child interactions in the play context, the video recording was similarly about 10 min. The mothers and fathers (separately) were asked to interact with their child normally with a toy at the same table as had been used for feeding; the toy was a book of stories described through puzzles. This game was chosen because it had a difficulty level that might require some parental support (as in feeding). Thus, the child could play with the game by himself or herself but needed the parents' help in order to be able to use the game fully (i.e., build the puzzles). These characteristics of parent-child interactions (interaction duration for coding, interaction at the table, and the use of a game with a certain level of difficulty) allow us to control some variables that could interfere with the comparison between the two interactive contexts. Eliminating these potential biases enables us to compare the two interactive situations in order to better understand potential differences.

Parents filled out separately the questionnaires described below.

2.2. Sample

For the purposes of this study, through stratified sampling method, based on child sex, $N = 112$ families with children aged 12–24 months were contacted, of which $N = 12$ decided not to participate in the research, while $N = 3$ families in which the children had physical or psychological disabilities were excluded from the sample; furthermore, $N = 6$ families in which the parents reported current or previous psychological disorders (post-partum maternal depression, alcoholism, anxiety and depression) were excluded from the sample. Therefore, the final sample of the present research was composed of $N = 91$ families with children aged between 12 and 24 months (47 males and 44 females), with an average age of 15.03 months ($sd = 2.43$). 52.6% of the children were firstborn, and 71.05% had been breastfed during the first year of life. The average age of the mothers was 32.54 ($sd = 5.46$) and that of the fathers was 34.68 ($sd = 6.3$). Moreover, 94.74% of couples were married and all families belonged to average socio-economic status (with an average income of 25,000–30,000 Euros per year). Furthermore, 100% of the parents lived together and 89.47% of the families had double incomes. All the parents belonged to the Caucasian race.

2.3. Measures

2.3.1. Assessment of parent-toddler interactions

In order to assess the mother-toddler and father-toddler interactive quality, taking into account the child's different cues, an observational tool was applied to video recording: *Coding Schedule for Toddler-Parent Interaction* (Unpublished manual; see Ballarotto et al., 2021).

Through this coding scheme, the frequency of child's cues and the parents' responses to them are observed. Specifically, the tool assesses the following child cues: demand for autonomy (AUT); resistance to parent's actions (RES); need for reassurance (REASS); need for cooperation (COOP) (see Table 1 for definitions):

During coding, the coder noted each child cue, evaluating its intensity based on the time of the cue. Each type of signal (AUT, RES, REASS, or COOP) was then given a rating on a Likert scale with 4 points from 0 to 3 on the basis of both the cue's frequency and intensity. For example, a score of 0 is assigned when no specific child signals are observed; a score of 1 is assigned when the child sends 1 or 2 well-defined signals to the parent with low intensity. On the other hand, a score of 2 is given when the child sends several well-defined signals with higher intensity. Finally, a score of 3 is assigned when the child sends multiple well-defined signals to the parent, and the intensity of the signals is higher. Then, the coder rated the parent's sensitivity in responding to the child's specific cue, with a rating being given for each signal type, on a 5-point Likert scale from 1 (very insensitive) to 5 (very sensitive) (i.e. prompt and appropriate responses were considered sensitive as opposed to ill-timed and inappropriate responses or lack of them which were rated as insensitive). Thus, parental sensitivity was rated in response to each kind of child cue, i.e., the child's demand for autonomy (S-AUT), resistance to parent's actions (S-RES), need for reassurance (S-REASS), and need for cooperation (S-COOP).

The video recordings were coded on the two sets of scales above by two trained coders. Coding was done independently and blindly to the characteristics of the sample. The coders had no information on the age or clinical condition of the toddlers. In case of discordance of more than two points of the Likert scales, the sequences were revised by resolving the discrepancies with a shared agreement or with the intervention of a third observer.

Reliability calculated on 20% of the video recordings and based only on the independent evaluations of the two coders showed intraclass correlations ranging from .77 to .96 for all dimensions (child cues and parental sensitivity to them).

This observational tool was used in a recent study (Ballarotto et al., 2021), in which it was used to assess underweight and normal weight children's signals and maternal sensitivity during mother-child feeding interactions. The results showed that underweight children showed less demand for autonomy and request for cooperation than normal weight children, and mothers of underweight children were less sensitive to toddler's and demands for autonomy compared to mothers of normal weight children. Furthermore, high toddler dysregulation was associated with lower maternal sensitivity to child's resistance to mother's actions.

2.3.2. Assessment of parental psychological profiles

Mothers and fathers filled out *Symptom Checklist-90 item-Revised* (SCL-90-R; Derogatis, 1994), a self-report questionnaire composed of 90 items, for the assessment of the parental psychological profile. The items of the SCL-90-R are evaluated on a 5-point Likert scale, from 0 (not at all) to 4 (very much), asking participants to report how much they suffered in the previous week. Higher scores indicate greater difficulty and more psychological symptoms. The questionnaire provides a Global Severity Index (GSI), a measure of individual psychopathological risk, calculated as the mean score reported by a subject on the items (the GSI score can thus range from 0 to 4). The Prunas and colleagues' study (2012) showed satisfactory internal consistency of the Italian version of the SCL-90-R in adolescents and adults (coefficient $\alpha = .70 - .96$) with a clinical cut-off of ≥ 1 in the GSI, indicating psychopathological risk (Prunas et al., 2012). In the present study, Cronbach's α for the GSI was .97 for mothers, and .96 for fathers.

Table 1

Description of child's different cues observed through the *Coding Schedule for Toddler-Parent Interaction*.

Child's cues	Description
Demand for autonomy (AUT)	Verbal and non-verbal signals indicating autonomy, or the need for greater autonomy. In the feeding context, for example, the child could indicate the objects that can be used alone (bread, teaspoon, glass), expressing it verbally (e.g. making a request), trying to take the spoon, trying to reach for the glass, manipulating part of the food (e.g. bread, pasta, etc.) by himself, taking the plate from which the parent is handing him the food or the teaspoon, or choosing the food to eat. During play, the child may signal his/her need for autonomy by indicating the toy that want to use, expressing it verbally, changing the game (leaving the puzzle or another game and choosing a new toy), or taking a toy from the parent's hands to manipulate it alone.
Resistance to parent's actions (RES)	This category includes behaviors such as avoiding parent's gaze, physically moving away from the parent, pushing away the spoon, the plate or other objects used by the parent to interact with the child, turning his or her head away, covering his mouth (during feeding interactions), crying or verbally making a request to interrupt the interaction.
Need for reassurance (REASS)	In situations of distress, the child could signal the need for reassurance from the parent, e.g. by reaching out to the parent, looking for body contact, extending the arms to his parent, crying.
Need for cooperation (COOP)	During interactions, the child may request parent's cooperation, either to share an activity with him/her (e.g. showing a piece of food or the spoon, offering her the food or the teaspoon, holding out a toy to the parent to share it with him/her) or to ask for help (e.g. showing or pointing out the empty glass to the mother, opening her mouth to be fed, pointing out to the parent a piece of the puzzle that he or she cannot place, asking it verbally). Indeed, both situations of interaction (feeding and play) are situations where, for the complete execution of the task, it is necessary for the parent to help to the child.

2.3.3. Assessment of child temperament

The *Italian Questionnaires of Temperament* (QUIT; Axia, 2002) are report-form questionnaires validated on an Italian sample designed to assess the child's temperament from the first month to 11 years of age, within 4 age groups: from 1 to 12 months, 12–36 months, 3–6 years and 7–11 years. In the present study, the version for children aged 12–36 months was used, and the *Negative emotionality* main dimension was assessed (6 items; e.g., cries strongly even when in the mother's arms). The questionnaire for the age of 12–36 months showed good internal coherence and a high degree of agreement between mothers and fathers (Axia, 2002). The validation study also showed satisfactory internal consistency, with Cronbach's alpha values between .69 and .83. After verifying the absence of differences between mothers' and fathers' scores through a univariate analysis of variance ($p > .05$), in accordance with the QUIT Manual (Axia, 2002), the average scores for maternal and paternal perceptions were used in subsequent analyses. In the present study, Cronbach's α for the *Negative Emotionality* dimension was .84.

2.3.4. Assessment of parental stress

The *Parenting Stress Index-Short Form* (PSI-SF; Abidin, 1990; Italian validation – Guarino et al., 2008) is a self-report screening questionnaire used to assess parental stress due to parental behavior, child's characteristics and their interactions. The PSI-SF was created to be used by parents of children aged between 1 month and 12 years to assess stress in the parenting system. The short form of the questionnaire (used in this study) is composed of 36 items evaluated on a scale of 1 (strongly agree) to 5 (strongly disagree). In the present study, we aimed to investigate how the way of experiencing the child's temperament (whether more or less stressful) may impact the quality of the interaction with the child. Therefore, the *Difficult child* main domain of PSI-SF was assessed. It was composed of 12 items (e.g., to build a system in sleep or eating for my son (daughter) was much harder than I expected) and focused on fundamental characteristics of the child's behavior, which make them easy or difficult to manage and often originate in their temperament. The Italian validation study showed satisfactory internal consistency, with Cronbach's alpha values between .78 and .93 (Guarino et al., 2008). In the present study, Cronbach's α for the *Difficult child* domain was .71 for mothers, and .73 for fathers.

2.4. Data analysis

The assumption of normality of the variables was ascertained before carrying out the analyses. To verify the frequencies of the toddlers' different cues in the play and feeding contexts, descriptive analysis (frequencies, averages, and standard deviations) and a multivariate analyses of variance (MANOVA) were conducted. Dependent variables were the frequencies of toddlers' different cues, while independent variables were "parent" and "interactive context".

Furthermore, in order to determine the presence of possible differences between mothers and fathers in the two interactive contexts (feeding and play), a MANOVA was carried out. Dependent variables were parental sensitivity to toddlers' different cues, while independent variables were "parent" and "interactive context".

Finally, after verifying the correlations between the variables using the Pearson correlation coefficient (r), regression analyses were conducted to determine the presence of associations between child negative emotionality, parental psychopathological risk, and parental stress due to their perception of a difficult child, and the quality of play and feeding interactions. All analyses were performed using SPSS software, Version 27.

3. Results

3.1. Assessment of toddlers' different cues in mother-toddler and father-toddler play and feeding interactions

Descriptive analyses were conducted on the child's cues. Table 2 shows frequencies and average scores of different child's cues, regardless of context and parent. Toddlers' requests for autonomy were the most frequent cues.

To address our core questions, a MANOVA was first conducted to determine possible differences between the child's different cues based on the independent variables "parent", "interactive context" and "parent X interactive context". The results showed that there was a significant difference in the child's signals based on the independent variables "parent" ($\Lambda = .92$; $F(4, 357) = 7.36$; $p < .001$), and "interactive context" ($\Lambda = .86$; $F(4, 357) = 13.94$; $p < .001$). Descriptive statistics of frequency ratings of child different cues with mother and father in both contexts are shown in Table 3.

As regards the variable "parent" examining effects on child behavior of mothers vs. fathers, the analysis of the univariate effects

Table 2

Frequencies on Likert scores and average scores of different child's cues.

	Frequencies				Average score	Standard deviations
	0	1	2	3		
AUT	14 (3.8%)	65 (17.9%)	97 (26.6%)	188 (51.6%)	2.26	0.88
RES	122 (33.5%)	92 (25.3%)	70 (19.2%)	80 (22.0%)	1.3	1.15
REASS	307 (84.3%)	40 (11.0%)	14 (3.8%)	3 (0.8%)	0.21	0.54
COOP	180 (49.5%)	75 (20.6%)	82 (22.5%)	27 (7.4%)	0.88	1.00

Note. AUT= toddler's demand for greater autonomy; RES= toddler's cues of resistance to parent's actions; REASS= toddler's request for reassurance; COOP= toddler's request of cooperation.

Table 3

Descriptive statistics of frequency ratings of child different cues with mother and father in both contexts.

	Feeding			Play			Total		
	Mother	Father	Total	Mother	Father	Total	Mother	Father	Total
AUT	2.04 (.95)	2.21 (.86)	2.13 (.92)	2.40 (.84)	2.40 (.83)	2.40 (.83)	2.22 (.92)	2.30 (.85)	2.26 (.88)
RES	1.43 (1.21)	1.75 (1.18)	1.59 (1.20)	.85 (.96)	1.16 (1.05)	1.01 (1.02)	1.14 (1.13)	1.46 (1.15)	1.30 (1.15)
REASS	.53 (.87)	.12 (.33)	.32 (.69)	.12 (.33)	.08 (.27)	.10 (.30)	.32 (.69)	.10 (.30)	.21 (.54)
COOP	.86 (.89)	.77 (.94)	.81 (.91)	.97 (1.09)	.92 (1.08)	.95 (1.08)	.91 (.99)	.85 (1.01)	.88 (1.00)

Note. AUT= toddler's demand for greater autonomy; RES= toddler's cues of resistance to parent's actions; REASS= toddler's request for reassurance; COOP= toddler's request of cooperation.

showed that children showed less resistance to their mother's actions ($F(1360) = 7.56$; $p = .006$) and more requests for reassurance from their mother ($F(1360) = 17.60$; $p < .001$).

As regards the variable "interactive context", examining effects of feeding vs. play, the analysis of the univariate effects showed that children demanded greater autonomy during play ($F(1360) = 8.59$; $p = .004$). By contrast, during feeding, they showed more resistance to the parent's actions ($F(1360) = 25.26$; $p < .001$) and more requests for reassurance ($F(1360) = 17.6$; $p < .001$).

These preliminary analyses showed that toddlers' requests for reassurance were observed in only a small number of observations, both in feeding and play interactions; accordingly, neither these cues, nor parental sensitivity in responding to them are considered in the subsequent statistical analysis.

3.2. Assessment of mother-toddler and father-toddler interactions during feeding and play

In order to determine whether parental sensitivity differed according to the different toddler cues and needs, ANOVAs were carried out separately for mothers and fathers in the two interactive contexts. The results showed the presence of differences in parents' sensitivity to the toddlers' different cues in both contexts (feeding and play) (see Table 4).

Bonferroni's post hoc test showed that during play maternal sensitivity to children's requests for cooperation was significantly higher than sensitivity to all other cues ($p < .001$); during feeding, sensitivity to requests for cooperation was higher than that to toddlers' cues of resistance to parent's actions ($p = .003$) and to demands for greater autonomy ($p < .001$).

As regards fathers, their sensitivity to the toddlers' cues concerning cooperation was significantly higher than sensitivity to cues of resistance to parent's actions ($p < .001$) and demands for greater autonomy ($p = .002$) during play interactions; furthermore, during feeding, fathers' sensitivity to requests for cooperation was higher than that to toddlers' resistances to parent's actions ($p = .007$) and to demands for greater autonomy ($p = .012$).

Subsequently, in order to investigate the presence of possible differences between mothers and fathers in the two interactive contexts (feeding and play), a MANOVA was carried out. Dependent variables were the scales from the *Coding Schedule for Toddler-Parent Interaction*, while independent variables were "interactive context" and "parent". The results showed that there was a significant difference in the parental sensitivity to child cues based on the independent variables "interactive context" ($\Lambda = .93$; $F(3, 113) = 2.95$; $p = .036$), and "parent" ($\Lambda = .86$; $F(3, 113) = 6.05$; $p = .001$) (see Table 5).

The analysis of the univariate effects showed that in the play vs. feeding context, parents were more sensitive to children's demands for greater autonomy ($F(1115) = 7.71$; $p = .006$). As regard the variable "parent", the analysis of the univariate effects showed that mothers were more sensitive than fathers to toddlers' cues of resistance to parent's actions ($F(1115) = 5.92$; $p = .017$) and to toddlers' cues for cooperation ($F(1115) = 11.44$; $p = .001$).

3.3. Assessment of the relationships between parents' and toddlers' individual variables and their interactive quality

In order to determine the presence of associations between variables, a correlation analysis was carried out using Pearson's coefficient. Based on the results of the correlation analyses (see Table S1 in the Supplement), multiple regression analyses were conducted to examine the predictive effect of the GSI, the Difficult Child PSI-SF subscale, the Negative emotionality QUIT subscale on the parental sensitivity to toddler's cues of resistance to parent's actions and to toddler requests for greater autonomy, during play and feeding. Results are showed in Table 6.

As shown in Table 6, the results indicated that during mother-toddler play interactions, higher maternal perceptions of Difficult

Table 4

Average scores, standard deviations and F of mothers' and fathers' sensitivity to the toddlers' different cues during feeding and play.

	S-AUT	S-RES	S-COOP	F	P
Mother-toddler interactions during play	3.38 (1.14) ^b	3.33 (1.10) ^b	4.87 (.50) ^a	38.34	< 0.001
Mother-toddler interactions during feeding	3.17 (1.01) ^b	3.49 (1.08) ^b	4.13 (.89) ^a	13.77	< 0.001
Father-toddler interactions during play	3.34 (1.32) ^b	3.14 (1.11) ^b	4.07 (.69) ^a	9.30	< 0.001
Father-toddler interactions during feeding	3.04 (1.11) ^b	2.97 (1.15) ^b	3.67 (1.33) ^a	5.45	0.005

Note. S-AUT= parental sensitivity to toddler's demand for greater autonomy; S-RES= parental sensitivity to toddler's cues of resistance to parent's actions; S-COOP= parental sensitivity to toddler's request of cooperation.

Table 5

Descriptive statistics of frequency ratings of mothers' and fathers' sensitivity to the toddlers' different cues during feeding and play.

	Feeding			Play			Total		
	Mother	Father	Total	Mother	Father	Total	Mother	Father	Total
S-AUT	3.08 (1.12)	3.26 (.78)	3.51 (.89)	3.64 (1.15)	3.78 (.94)	3.74 (.99)	3.23 (1.15)	3.51 (.89)	3.39 (1.02)
S-RES	3.87 (.99)	3.17 (.75)	3.53 (.94)	3.79 (.89)	3.53 (1.22)	3.61 (1.12)	3.85 (.96)	3.34 (1.01)	3.56 (1.01)
S-COOP	4.26 (.83)	4.14 (1.11)	4.21 (.97)	4.97 (.34)	3.97 (.74)	4.28 (.78)	4.46 (.78)	4.06 (.95)	4.24 (.90)

Note. S-AUT= parental sensitivity to toddler's demand for greater autonomy; S-RES= parental sensitivity to toddler's cues of resistance to parent's actions; S-COOP= parental sensitivity to toddler's request of cooperation.

Table 6

Multiple linear regression analyses between child negative emotionality, parental psychopathological risk, and parental stress due to their perception of a difficult child, and the quality parental sensitivity during play and feeding interactions.

Mothers									
	Play S-RES			S-AUT		Feeding S-RES		S-AUT	
	Beta	t		Beta	t	Beta	t	Beta	t
NE	-.15	-.87		-.37	-5.39 **	-.20	-1.45	-.20	-1.56
GSI	.10	.69		-.25	-3.95 **	-.01	-.04	-.12	-.97
DC	-.42	-2.51 *		-.43	-5.93 **	-.26	-1.82	-.16	-1.20
R ²	.25			.73		.16		.15	
Fathers									
	Play S-RES			S-AUT		Feeding S-RES		S-AUT	
	Beta	t		Beta	t	Beta	t	Beta	t
NE	-.13	-.87		-.11	-1.05	-.13	-1.05	-.30	-3.96 **
GSI	-.02	-.12		-.52	-4.06 **	-.42	-2.75 *	-.21	-2.35 *
DC	-.35	-2.00 *		.06	.51	-.02	-.14	-.49	-6.22 **
R ²	.21			.31		.27		.71	

Note. S-RES= parental sensitivity to toddler's cues of resistance to parent's actions; S-AUT= parental sensitivity to toddler's demand for greater autonomy; NE = Negative Emotionality; GSI = Global Severity Index; DC = Difficult Child.

Bold coefficients are significant ($p < .05$). * $p < .01$; ** $p < .001$

Child were associated with lower maternal sensitivity to toddler's cues of resistance to parent's actions (S-RES). Maternal perceptions of Difficult Child were the only significant predictor of S-RES, accounting for 25% of the variance. With regard to predictors associated with maternal sensitivity to toddler requests for greater autonomy (S-AUT) during mother-toddler play interactions the regression model revealed that greater toddler Negative Emotionality, higher maternal GSI scores, and higher maternal perceptions of Difficult Child were significantly associated with lower S-AUT. This model accounted for 73% of the variance. Regarding mother-toddler feeding interactions, no significant predictors among the variables tested were found for maternal sensitivity to toddler's cues of resistance to parent's actions or toddler requests for greater autonomy.

In terms of father-child interaction quality during play, the findings showed that lower paternal sensitivity to toddler's cues of resistance to parent's actions (S-RES) was significantly associated with higher paternal perceptions of Difficult Child. This model accounted for 21% of the variance. Furthermore, lower paternal sensitivity to toddler requests for greater autonomy (S-AUT) during play was associated with higher paternal GSI scores, accounting for 31% of the variance. As for father-toddler feeding interactions, lower paternal sensitivity to toddler's cues of resistance to parent's actions (S-RES) was also associated with higher paternal GSI scores, accounting for 27% of the variance. Additionally, lower paternal sensitivity to toddler requests for greater autonomy (S-AUT) during feeding was associated with greater toddler Negative Emotionality, higher paternal GSI scores, and higher paternal perceptions of Difficult Child. This model accounted for 71% of the variance.

4. Discussion

The aim of this study was to assess differences in maternal and paternal sensitivity to toddlers' different cues (such as demands for greater autonomy, resistances to parent's actions, requests to cooperate etc.) and the possible associations with factors such as parental psychological profiles, parental stress and the child's negative emotionality, both in play and feeding interactive contexts.

The first hypothesis of the present study was that toddlers' autonomy-seeking cues (such as requests for greater autonomy and attempts to resist to parent's behavior) would be greater than the requests for cooperation and reassurance, and they will be greater in the feeding context rather than in the play context, with both parents. We found that toddler's requests for autonomy were the most frequent cues, regardless of the interactive context, highlighting the importance of the need for autonomy in a phase that several authors have suggested to be the root of subjectivity (Woods & Pretorius, 2011). In fact, several studies highlight the universality of this need (Andreadakis et al., 2019; Chirkov & Ryan, 2001; Marbell & Grolnick, 2013), that refers to feeling that actions stem from the sense of self (Ryan et al., 2006). Furthermore, we found differences between the child's different cues with mother and father in

feeding and play contexts: thus, children demanded greater autonomy in relation to both parents more during play than they did in feeding. Moreover, in the feeding context, children made more cues of resistance to parent's actions and more requests for reassurance than they did during play. Consistent with Keren et al.'s statement, toddlers' increased resistance to parent's actions during feeding suggest that the feeding context is a "potentially more intrusive setting" (Keren et al., 2001). Interestingly, findings showed that toddlers made more requests for reassurance and showed less resistance to parent's actions in relation to mothers compared to fathers.

The second hypothesis of the present study was that the parental sensitivity was not a unitary construct but differed according to toddler cues; it was assumed that in this specific age group, parents might show less sensitivity to child requests for greater autonomy and for the attempts to resist to parent's behavior in comparison to requests for help, cooperation and reassurance, both in the context of play and feeding. The results confirmed this hypothesis, showing that mothers and fathers were more sensitive to the toddler's requests for cooperation than their requests for autonomy and resistance to the parent's actions, in both interactive contexts. In fact, we have assumed that toddlers' requests for cooperation could elicit more parental sensitive behaviors than toddler's bids for autonomy, which instead may increase aversive pressure on parents. In line with our hypothesis, we found that parental sensitivity differs according to child cues. Such differences are likely to be related to the specific child age group, characterized by a change in the roles of the dyad and the child's growing sense of self (Ammaniti & Gallese, 2014; Sroufe & Rutter, 1984; Stern, 1985), thereby requiring further investigation in different age groups.

The third hypothesis of the present study was that the feeding context would be characterized by less parental sensitivity towards the toddler's requests for greater autonomy than in the play context. In fact, we assumed that during feeding, child bids for autonomy may pose challenges to the parent's own agenda, while during play interactions the parent-child dyad shares the pleasure of the interaction itself. Results were in line with this prediction, showing that in play vs. feeding interactions both mothers and fathers showed higher levels of sensitivity to toddlers' demands for greater autonomy. These findings are consistent with those of Feldman and coll. (2004) and Keren and coll. (2001), who found parent-child interactions in the feeding context were of a lower interactive quality than during play.

We found significant differences in interactive quality between mothers and fathers in both feeding and play interactions, with mothers being more sensitive to toddlers' cues of resistance to the parent's actions and to toddlers' cues for cooperation than fathers. On the other hand, the previous result showed toddlers showed fewer cues of resistance to the parent's actions to mothers than to fathers. We assumed these two sets of results could be related to each other and reflect the possibility that father-toddler interactions are characterized by more conflict than mother-toddler interactions.

In order to better understand this result, we investigated the associations between parents' and toddlers' individual variables and interaction quality. Specifically, the fourth hypothesis of this study was higher maternal and paternal psychopathological risk and greater parental stress due to their perception of a difficult child, and child negative emotionality would be associated with less parental sensitivity to child's requests for greater autonomy.

After verifying the correlations between the variables, regression models were conducted. The results showed differences and specificities in mother-toddler and father-toddler interactions in the two interactive contexts. Specifically, paternal sensitivity to children's demand for greater autonomy during feeding was negatively associated with paternal psychopathological risk, parenting stress due to the perception of a difficult child, and children's negative emotionality, showing that this model accounted the 71% of variance of paternal sensitivity to children's demand for greater autonomy. Similarly, maternal sensitivity to children's demand for greater autonomy during play was negatively associated with maternal psychopathological risk, parenting stress due to the perception of a difficult child, and children negative emotionality, showing that this model accounted the 73% of variance of maternal sensitivity to children's demand for greater autonomy. This result is very interesting, and it may reflect the fact that mothers, could overcome any symptoms during feeding better than fathers because they were more familiar with the feeding situation; indeed, for mothers, who are often the primary caregivers during feeding in the first year of life, it may be less complex to understand some toddlers' demands for greater autonomy during feeding, unlike fathers. Although we know that the 71.05% of sample children had been breastfed during the first year of life, we do not have data on who was primarily responsible for feeding the child in the first year of life (mother, father, others). Further studies taking these data into account are needed in order to confirm our hypothesis.

In line with the literature (Feldman, 2003; Vallotton et al., 2016) and our study hypotheses, we see that individual characteristics of the child and of the parents were associated with the quality of the parent-child interaction, albeit in somewhat different ways. Consistent with the literature, we assumed that parental sensitivity may impact on mothers and fathers differently, including the parents' psychological profile and child temperament (Cerniglia et al., 2014), but it is also possible that the degree of childcare involvement (Atzaba-Poria et al., 2010; Fuertes et al., 2016), child sex (Schoppe-Sullivan et al., 2006), and marital adjustment (Young et al., 2017) could be influential. These variables were not investigated in the present study and further studies should investigate these relationships.

While several studies have shown an association between greater parental stress and poorer interactive quality with their child (Lutz et al., 2012; Spinelli et al., 2013), the associations we found with child temperamental features raises questions about the possible influence of biological and epigenetic factors (Cerniglia et al., 2021; Cimino et al., 2018; Cimino et al., 2019). As suggested by the studies of Anacker et al. (2014) and Harper (2005), we can hypothesize that child's genetic temperamental factors may be modified by increased parental stress, which does not help the child to achieve a well-regulated, calm state. In fact, a recent study (Shewark et al., 2021) found that although children's negative emotionality was genetically associated with the biological parents, adoptive parents' sensitivity to the child's cues could modulate its expression.

Overall, the results confirm the initial hypotheses regarding parental sensitivity and its differentiation based on the child's cues. Despite this, it should be noted that toddlers' requests for cooperation were not associated with either parental psychopathological risk, parenting stress, or toddlers' negative emotionality. This may be because toddler's requests for cooperation are positive behaviors

that could not elicit any aversive pressure on parents. Indeed, in a positive context, effects of child temperament, parental psychopathology and stress may be less likely to emerge. The current study sample was a normative one at relatively low socio-economic risk, where variation was limited, and it is therefore notable that, despite limited variation, significant differences in parental behavior occurred according to their psychological symptoms and stress. Indeed, much research identifying influences on parental sensitivity have studied parent-child interactions in clinical settings (Cimino et al., 2018) or in populations with a psychopathological risk (Cerezo et al., 2008; Tambelli et al., 2022; Tambelli et al., 2015), where more extreme variation may occur. Further studies on these latter populations could contribute significantly to the understanding of the differences in parental sensitivity to different toddler cues. In addition, the small sample size must also be considered, and further studies are needed. Finally, the use of self-report and report-form tools limits the reliability of the results, although widely validated questionnaires were used and disseminated in the literature.

Despite these limitations, the present study has several strengths. No other studies in the available literature have evaluated maternal and paternal sensitivity to toddlers' different cues in play and feeding contexts. Additionally, the use of observational tools allowed the understanding of complex family dynamics in two daily contexts that researchers indicated as two fundamental daily experiences in the development of the dyadic relationship, highlighting the importance of being able to observe parent-child interactions in both these contexts (Feldman et al., 2004; Lieberman & Slade, 2000; Stern, 1985; Trevarthen & Aitken, 2001).

It is considered important to be able to deepen this research with a longitudinal study, which should consider the stability and changes in specific patterns of interaction between mothers, fathers and children over time. In fact, it is believed that interactive parent-child difficulties can fit within specific patterns, whose better understanding is necessary in order to establish appropriate prevention and treatment programs.

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Data availability statement

Due to the sensitive nature of the questions asked in this study, survey respondents were assured raw data would remain confidential and would not be shared. Data not available / The data that has been used is confidential.

CRediT authorship contribution statement

Ballarotto Giulia: Conceptualization, Methodology, Data curation, Writing – original draft preparation, Writing – review & editing. **Murray Lynne:** Conceptualization, Methodology, Writing – review & editing. **Bozicevic Laura:** Methodology, Writing – review & editing. **Marzilli Eleonora:** Methodology, Data curation. **Cerniglia Luca:** Writing – review & editing. **Cimino Silvia:** Supervision, Writing – review & editing. **Tambelli Renata:** Supervision, Writing – review & editing.

Data availability

Data will be made available on request.

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