# Mealtime interactions: the role of sensitive parental feeding behavior in the first years of life

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# 4




# Chapter 4

## Maternal sensitivity during mealtime and free play: Differences and explanatory factors

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## Abstract

Mealtime is a parent-toddler interaction that occurs multiple times a day. This study examined whether observed maternal sensitivity differed between a mealtime and free-play setting, aiming to explain differences between the two situations by studying moderating effects of children's eating behavior. The sample consisted of 103 first-time mothers and their 18-month-old children. Maternal sensitivity was assessed by coding videotaped interactions of free-play sessions and mealtimes, using the Ainsworth Sensitivity Scale (range 1-9). Additionally, child eating behavior during the meal was coded, and also assessed through the Child Eating Behavior Questionnaire - Toddlers. First, a small but significant amount of stability was found between sensitivity during mealtime and sensitivity during play ($r$ = .24). Second, mothers were more sensitive during free play (Mean=7.11) than during mealtime (Mean=6.52). Third, observed child eating behavior was related to maternal sensitivity during mealtime, with more food enjoyment being associated with higher levels of sensitivity, and more challenging child behavior with lower levels of sensitivity. Finally, when children showed a high degree of challenging behavior during the meal, there was more discrepancy between sensitivity during mealtime and free play. Our results highlight the importance of taking context into account when observing parental sensitivity.

## Introduction

Parental sensitivity, or the ability to perceive a child's signals, to interpret these signals correctly, and to respond to them promptly and adequately, is an important indicator of the quality of parent-child interaction (Ainsworth et al., 1974). Parental sensitivity has been shown to be related to positive child outcomes in several domains (Bakermans-Kranenburg et al., 2003; De Wolff & Van IJzendoorn, 1997; Kochanska, 2002; Van IJzendoorn, Vereijken, Bakermans-Kranenburg, & Riksen-Walraven, 2004), and interventions that increase parental sensitivity improve parent-child attachment (Bakermans-Kranenburg et al., 2003; Juffer et al., 2017). However, the expression and degree of parental sensitivity can be situation-dependent (Branger, Emmen, Woudstra, Alink, & Mesman, 2019; Costanzo & Woody, 1985; Joosen, Mesman, Bakermans-Kranenburg, & van IJzendoorn, 2012; Seifer, Sameroff, Anagnostopolou, & Elias, 1992). Indeed, parents appear to vary more in their level of sensitivity across different situations (e.g., free play vs. caregiving situations) than across time within the same situation (Bornstein, et al., 2006; Branger et al., 2019; Braungart-Rieker et al., 2014; Endendijk et al., 2019; Mills-Koonce et al., 2007).



There is one specific parenting situation that has received surprisingly little attention throughout the literature on parental sensitivity, and this concerns mealtime interactions. Although the related but narrower construct of responsive feeding behavior, which involves responding sensitively to a child's hunger and satiety cues during a meal, has frequently been studied within the field of child nutrition (Black & Aboud, 2011; DiSantis et al., 2011; Hurley et al., 2011), parental sensitivity to all child signals during mealtime has not. Moreover, in the general parenting field, mealtimes have rarely been studied in comparison to other parenting situations. One study with 2-30 month-old African American children examined maternal nurturance during mealtime and free play, which included for example enthusiasm, initiative towards the child, and verbalization. This behavior was found to correlate moderately between mealtime and free play (Black et al., 1996).

Mealtime is an important part of daily parent-child interaction and can be quite challenging for parents. Indeed, earlier studies show that 25-40% of parents report feeding problems with their infants and toddlers (Mitchell et al., 2013; Reau et al., 1996). Therefore, it is plausible that levels of parental sensitivity are lower during mealtime than during other parenting situations. Because the few studies that have examined parental sensitivity during mealtime found lower sensitivity to be associated with overweight in (pre)school-aged children (Camfferman, 2017; Rhee et al., 2016), it is important to know whether such lower levels of sensitivity are already present at an earlier age, and what factors might contribute to lowered sensitivity in this specific context. The present study aims to examine differences in observed maternal sensitivity towards 18-month-

old children during mealtime and free play, to explain possible differences between the two situations by examining child eating behavior, and to examine the relation between maternal sensitivity during mealtime and child eating behavior.

Having a meal with your child might be a lot more challenging than interacting in different situations, like (watching them) play, evoking different expectations and behavior in both parent and child. During a meal, parents often have certain goals related to the child's food intake, as well as routines and rules they expect their child to follow. Such goals and expectations may easily lead to conflict situations where the child's behavior differs from the parents' wishes. To date, only a few studies have been published that assessed parental sensitivity during mealtime, and even fewer compared sensitive parenting during mealtime to other parenting situations. One study with 4-month-old children compared maternal sensitivity during feeding to a bathing session, and indeed observed less responsive and more negative maternal behavior during feeding than during bathing (Seifer et al., 1992). The study of Black and colleagues on maternal nurturance only examined the association between mealtime and play, rather than the difference between the two situations (Black et al., 1996). Other studies comparing parental sensitivity across different settings did not include mealtimes, and all focused on babies in the first six months of life (Branger et al., 2019; Joosen et al., 2012; Maas, Vreeswijk, & Van Bakel, 2013). Studies conducted in toddlerhood are still lacking, as well as studies comparing mealtime to free play.

Because of their clear (health-related) goals, mealtimes may evoke more conflict situations between parent and child than play situations, thereby making it more challenging to show sensitive responses. Moreover, the way children behave during mealtime (i.e. child eating behavior) might either further complicate or simplify the situation for a parent. Indeed, many studies have emphasized the transactional nature of parent-child interactions in general, whereby the actions of each party are dependent on the perceptions and actions of the other (e.g. Crnic & Greenberg, 1985; Sameroff, 2009). This transactional pattern is also very relevant for mealtimes, as from the second year of life onwards, parents often start experiencing more difficulties with their child during mealtimes due to the growing need for autonomy in most children, as well as the emergence of picky or fussy eating behavior (Dovey et al., 2008). Picky or fussy eating behavior occurs in many children between 1 and 6 years of age. It often peaks during toddlerhood, when the food neophobia phase, or the unwillingness to try new foods that is considered an integral part of fussy eating behavior, emerges (Dovey et al., 2008; Taylor et al., 2015). In contrast to parents of children who eagerly and easily respond to food and generally enjoy eating, parents of so-called "fussy eaters" have more conflicts with their children during mealtimes and use more pressure or coercion to increase their child's food intake (Galloway et al., 2005; Jacobi et al., 2003; Mascola et al., 2010; Ventura & Birch, 2008).

Although there are many studies on the relation between challenging child eating behavior like fussiness and *in*sensitive feeding behavior like pressuring, few studies have examined its relation with parental sensitivity. One study showed a non-significant trend concerning a negative association between maternal sensitivity at 10 months and challenges around child eating at 10 months and 2 years (Hagekull, Bohlin, & Rydell, 1997). Another study showed a reciprocal relation between maternal sensitivity and challenges around child eating, with a negative association between maternal sensitivity at 3 months and challenges around child eating at 18 months, as well as between child problems with milk feeding at 3 months and maternal sensitivity at 3 and 18 months (Bilgin & Wolke, 2017). These studies suggest that more challenges around child eating are indeed related to lower levels of maternal sensitivity, possibly in a reciprocal way. However, these two studies assessed maternal sensitivity during play sessions rather than mealtimes. Studies assessing challenges around child eating and their relation to maternal sensitivity during mealtimes are still lacking. Because the onset of fussy food-related behavior often lies in early toddlerhood, it is important to study the relation between parental sensitivity and child eating behavior in this age group. Moreover, it is likely that child eating behavior not only directly relates to the level of parental sensitivity during a meal, but it may also explain differences between mealtime sensitivity and play sensitivity. After all, it is plausible that mothers of children who show more challenging behavior during mealtime respond less sensitively during mealtimes than during free play, thereby increasing the discrepancy in sensitivity between the two situations.



The aim of the present study is to examine differences in maternal sensitive behavior between a mealtime and free-play situation when the child is 18 months old, as well as study child eating behavior as a potential explanation for such differences. First, based on earlier studies on sensitivity between contexts, we expect maternal sensitivity during mealtime and free play to be moderately positively correlated. Second, we hypothesize that less maternal sensitivity will be observed during mealtime than during free play. Third, we expect to find a positive association between positive child eating behavior (enjoyment of food) and maternal sensitivity at mealtime, and a negative association between challenging child eating behavior (food fussiness) and maternal sensitivity at mealtime. Finally, we hypothesize that child eating behavior moderates the difference in maternal sensitivity between mealtimes and free play, with higher levels of child food fussiness and lower levels of enjoyment of food related to lower levels of sensitivity during mealtimes compared to free play.

# Method

## Participants

The present study is part of a large longitudinal randomized controlled trial called Baby's First Bites, in which the effects of two different interventions (one focusing on vegetable exposure, the other on sensitive feeding) are evaluated separately and combined in order to enhance vegetable intake in infants and toddlers (Van der Veek et al., 2019). The overarching study included 246 mothers and their infant at baseline (4-6 months), and 213 at age 18 months. Because the sensitive feeding intervention was effective in enhancing maternal sensitive feeding behavior at age 18 months (Van Vliet et al., 2022), including these participants in the present study might bias the findings concerning differences between sensitivity during mealtime and sensitivity during free play. Therefore, in the present study the mothers who received an intervention focusing on sensitive feeding were excluded, resulting in a sample of 105 first-time mothers and their infant at 18 months. Families who received an intervention focusing on repeated exposure to vegetables were included, because this intervention was not expected to influence maternal sensitivity. Study condition was included as a covariate to ensure that the intervention on vegetable exposure was not a factor in the results. For two dyads no observational data were collected, resulting in a total sample of 103 dyads included in the present study. Mean age of the mothers was 32.5 years ($SD$ = 4.7; comparable to first-time mothers in the general Dutch population), mean age of the children (48% boys) was 18.5 months ($SD$ = 0.6). 86% of the mothers had a Dutch ethnic background, and 92% of the mothers lived together with a partner, who was the child's biological father for 98% of these families. With respect to highest achieved educational level, 39% of the mothers had a lower educational level (finished high school or vocational school), 41% finished a degree comparable to a bachelor's degree and 20% obtained a master's degree.

## Procedure

The present study was conducted according to guidelines laid down in the Declaration of Helsinki, with written informed consent obtained before any data was collected. All procedures involving the participants in this study were approved by the Ethics Review Board of the Institute of Education and Child Studies, Leiden University (ECPW-2015/116), as well as by the Medical Research Ethics Committee of Wageningen University and Research (NL54422.081.15). For the present study, data collected during the post-test of the RCT at 18 months of age was used. Participants for the RCT were recruited from the general population in the four Dutch provinces nearby the two participating universities. Information about the RCT was sent to potential participants by email, using email addresses obtained from Nutricia Early Life Nutrition (a company focussing on nutrition during the first years of life) and WIJ Special Media (a company focusing on pregnancy and the first years of life in general). In addition, only within the vicinity of Wageningen,

brochures were handed out at youth health care centres. The following inclusion criteria had to be met for the overarching RCT: first-time mothers; healthy term infants (37-42 weeks of gestation); planning to start complementary feeding at child age of 4-6 months; sufficient knowledge of the Dutch language; willing to start complementary feeding with commercially available vegetable/fruit purées; willing to be videotaped. Mothers with major psychiatric diagnoses were excluded, as well as twins or children with medical problems that could influence their ability to eat. Further details about how participants were recruited can be found in the study protocol (Van der Veek et al., 2019). Interventions tested in the overarching RCT started when infants were between 4-6 months old, and contained five sessions divided over the course of approximately 1 year. After the final session had taken place when the infants were around 16 months old, the post-test measurement took place around 18 months. Prior to this home visit, all mothers filled out online questionnaires. During the home visit, among other tasks, a family meal was videotaped. The family was asked to prepare a warm meal that they would normally choose to cook on that particular week day, and that was already familiar to the child. In addition, the family was instructed to behave like they would usually do. As soon as the camera was installed, the researcher left the room and returned when the meal was finished. Afterwards, an 8-minute free-play observation was conducted. For this free-play interaction, mother and child received a set of four standardized age-appropriate toys (a car slide, a puzzle, a book, and wooden fruits that could be cut in half), and mothers again were instructed to behave as they would normally do. After the home visit, mothers received a gift voucher of €25 and the child received a small present.



## Measures

### *Maternal sensitivity*

To rate maternal sensitivity towards all expressed child behavior during mealtime and free play, the Ainsworth sensitivity scale was used (Ainsworth et al., 1974). This scale is a general rating scale of parental sensitivity which can be used to code sensitivity during any type of parent-child interaction (Ainsworth et al., 1974). As such, we applied it in the same way to code both mealtime and free play. Mothers were scored on the original 9-point scale, ranging from highly insensitive (1) to highly sensitive (9). The highly sensitive mother (9) "virtually always responds sensitively, with any lapses being small and extremely rare", while the highly insensitive mother (1) "responds insensitively almost all of the time, with sensitive responses being extremely rare or absent, gearing almost exclusively to his/her own wishes, moods, and activity" (Ainsworth et al., 1974). Examples of maternal insensitive behavior are not responding to infant signals of distress (serious lapses), or not responding to infant vocalizations or interest in surroundings (mild lapses). Regarding mealtimes, feeding interactions were taped and coded from the beginning of the feed (first spoon offer of the meal) until the end (final spoon offer of the meal) to measure, among other maternal and child behaviors, maternal sensitivity. In case the

child was offered dessert after the meal, this was not coded. With respect to free play, coding started as soon as the mother received a bag with age-appropriate toys, and ended after 8 minutes. Regarding mealtimes as well as free play, after intensive training, a reliability set of 30 videos was coded by all coders (4 coders for mealtimes, 3 other coders for free play). The training resulted in intercoder reliabilities (intraclass correlations (ICC), single rater, absolute agreement) of >.70 for all scales between all individual coders, which is considered good reliability (Cortina, 1993). Intercoder reliability ranged from .73-.87 for mealtimes, and .81-.88 for free play. Coders were not familiar with the family they were coding and were not aware of which condition the family was enrolled in in the overarching RCT.

***Child eating behavior***

**Observation.** Child eating behavior was observed by the same four coders who scored maternal sensitivity during the meal. Two types of child behavior were coded, namely Enjoyment of food, and Challenging behavior. The Enjoyment of food scale was designed by the authors, and was rated on a 3-point scale ranging from 1 (= no enjoyment/neutral attitude towards the food) to 3 (a high amount of enjoyment towards the food). Scores of 2 were given to children who for example enjoyed part of the mealtime or part of the food on the plate. Examples of food enjoyment that were coded were the child saying "yummy" or "mmmm", or the child eating in an eager and enthusiastic way (e.g. opening the mouth widely in response to the food throughout the meal, or eagerly self-feeding). Intercoder reliability ranged from ICC = .83-.89. The Challenging behavior scale was based on a similar scale as designed by Camfferman and colleagues (Camfferman, 2017), and included all kinds of child behavior that could be *perceived* as challenging by the mother. Challenging behavior was scored on a 5-point scale ranging from 1 (no/negligible challenging behavior) to 5 (prominent challenging behavior). Examples of challenging behavior during the meal concern mild/innocent child behaviors such as unintentionally dropping something on the floor, making funny noises or messy eating, or more pronounced child behaviors, such as crying, intentionally throwing with food or cutlery or temper-tantrums. Intercoder reliability ranged from ICC = .79-.85.

**Mother-report.** Mother-reported child eating behavior was assessed with the Child Eating Behavior Questionnaire-Toddler (CEBQ-T, based on the widely used instrument CEBQ (Wardle et al., 2001)). The CEBQ-T has the same content as the CEBQ, but with some small adaptations to make the instrument more applicable for toddlers. The CEBQ-T assesses several aspects of eating behavior, including two scales used in the present study: Enjoyment of food, and Food fussiness. Mothers reported on a 5-point Likert scale (from "1 = never" to "5 = always") how frequently they observed eating behavior characteristics on a typical day. Enjoyment of food captures an infant's perceived liking of food in general and the extent of pleasure experienced while feeding (e.g. "My child enjoys feeding time").

Food fussiness measures a child's tendency to be highly selective in the foods he or she is willing to eat, as well as the tendency to refuse to try new food items (e.g. "My child decides that he/she does not like a food, even without tasting it"). Regarding the original CEBQ, earlier studies found adequate two-week test-retest reliability (correlation coefficients ranging from .52 to .87 (Wardle et al., 2001)) as well as construct validity (Carnell & Wardle, 2007). In the present study, the internal consistency for the Enjoyment and Fussiness scales of the CEBQ-T were $\alpha = .85$ and $\alpha = .90$, respectively.

## Statistical analysis

Analyses were performed using SPSS version 25. In every analysis, condition (1 = vegetable intervention, 2 = control) was added as a covariate, to control for possible effects of the intervention with exposure to vegetables. To test whether a positive correlation was present between free play and mealtime (Hypothesis 1), Pearson's partial correlations (controlling for study condition) were performed. In order to test whether less maternal sensitivity would be observed during mealtimes than during free play (Hypothesis 2), mean level differences were assessed by means of repeated measures ANOVA. Next to condition, breastfeeding duration and child BMI-z score (i.e. a standardized indicator of child weight) were considered relevant covariates, but because no relations were found with any of the core variables, breastfeeding and child BMI-z were not included as covariates. Cohen's *d* effect size was obtained and reported regarding the mean difference between situations (Cohen, 1992). Values of .20, .50 and .80 were considered a small, moderate and large effect, respectively (Cohen, 1992).

To test whether (observed and mother-reported) enjoyment of food and maternal sensitivity were positively related, and whether mother-reported food fussiness/observed challenging child behavior and maternal sensitivity were negatively related (Hypothesis 3), a multiple regression analysis was performed. Child sex, age, maternal age, maternal education, breastfeeding duration, maternal BMI and child BMI-z were explored as potential covariates by means of Pearson's correlations. Because mother-reported child fussiness significantly correlated with child age and maternal age and because observed food enjoyment marginally significantly correlated with child BMI-z, analyses were performed correcting for condition, child age, child BMI-z and maternal age, by entering them together in the first block. In the second block, the four child eating behavior predictors were entered together with the covariates. If applicable, the final regression model only consisted of predictors significantly adding variance to the model.

Finally, to test whether child eating behavior moderated the difference between maternal sensitivity during free play and during mealtimes (Hypothesis 4), another repeated measures ANOVA analysis was performed, by examining the interaction between "setting" (mealtime or free play) and the moderators mother-reported enjoyment, mother-reported

fussiness, observed enjoyment, and observed challenging behavior during the meal, which were all tested simultaneously. Regarding covariates, the same approach was taken as for Hypothesis 1, so only condition was included as a covariate.

## Results

Descriptive statistics of core variables and correlations among core variables are depicted in Table 1 and Table 2, respectively. Six mothers who were observed during mealtime and free play did not fill out online questionnaires, resulting in a missing score on mother-reported child behavior. Outliers (*SD* ± 3.29 around the mean) were detected for all variables except observed child eating behavior. However, because none of the assumptions of repeated measures ANOVA or multiple regression analysis were violated and these outliers contain valuable information, they were included in the analyses.

**Table 1. Descriptive statistics of maternal sensitivity and child eating behavior.**

| **Variable** | | | |
|---|---|---|---|
| | N | M (*SD*) | Range |
| Maternal sensitivity – Free play | 103 | 7.11 (*1.30*) | 1-9 |
| Maternal sensitivity – Mealtime | 103 | 6.52 (*1.74*) | 1-9 |
| Mother-report – child food enjoyment | 97 | 4.11 (*0.61*) | 1.75-5 |
| Mother-report – child food fussiness | 97 | 2.49 (*0.52*) | 1-4.33 |
| Observed child food enjoyment | 103 | 1.98 (*0.78*) | 1-3 |
| Observed child challenging behavior | 103 | 2.26 (*1.13*) | 1-5 |

**Table 2. Pearson's correlations of maternal sensitivity and child eating behavior.**

| **Variable** | 1. | 2. | 3. | 4. | 5. | 6. |
|---|---|---|---|---|---|---|
| 1. Maternal sensitivity – Free play | - | | | | | |
| 2. Maternal sensitivity – Mealtime | .24* | - | | | | |
| 3. Mother-report – Enjoyment of food | .09 | .15 | - | | | |
| 4. Mother-report – Food fussiness | -.06 | -.19 | -.69** | - | | |
| 5. Observation – Enjoyment of food | .29** | .46** | .30** | -.20 | - | |
| 6. Observation – Challenging child behavior | -.09 | -.41** | -.19 | .30** | -.37** | - |

*Correlation is significant at the 0.05 level (2-tailed).
**Correlation is significant at the 0.01 level (2-tailed).

### Observed maternal sensitivity during mealtime and free play

Corrected for study condition, a small to moderate significant positive partial correlation was found between maternal sensitivity during mealtime and maternal sensitivity during free play, $r = .24$, $p = .02$, confirming Hypothesis 1. The partial correlation was equal to

the uncorrected correlation. With respect to Hypothesis 2, corrected for condition, mean-level differences tested by means of repeated measures ANOVA revealed that observed maternal sensitivity was lower during mealtimes ($M$ = 6.52; $SD$ = 1.74) than during free play ($M$ = 7.11; $SD$ = 1.30), $F$ = 8.29, $p$ = .01, $d$ = 0.38, confirming our hypothesis.

## Relation between child eating behavior and maternal sensitivity during mealtimes

Regarding Hypothesis 3, results of the multiple regression analysis are depicted in Table 3. Statistical assumptions like homoscedasticity and absence of multicollinearity were checked, and no problems were revealed. The first block, containing covariates, did not significantly contribute to the prediction of maternal sensitivity during mealtimes ($F$ = .165, $p$ = .96), explaining 1% of the variance. The second block, adding the four predictors concerning child eating behavior, explained 34% of the variance in maternal sensitivity during mealtimes, on top of covariates ($F$ = 4.98, $p$ < .001; Table 3). When examining individual predictors, only the two observed child eating behavior measures significantly contributed to the model. Observed child enjoyment of food was positively related to maternal sensitivity during the meal, $\beta$ = .423, $t$ = 4.07, $p$ < .001, and observed challenging child behavior was negatively related to maternal sensitivity during the meal, $\beta$ = -.261, $t$ = -2.49, $p$ = .02. Examining the final model in which only the significant observed predictors were included, revealed that observed child eating behavior accounted for 29% of the variance (Table 3).

**Table 3. MRA of child eating behaviors predicting maternal sensitivity during the meal.**

| | Model 1 | | | Model 2 | | | Model 3 | | |
|---|---|---|---|---|---|---|---|---|---|
| | *B* | *SE B* | *B* | *B* | *SE B* | *β* | *B* | *SE B* | *β* |
| **Covariates** | | | | | | | | | |
| Condition | -.03 | .13 | -.03 | -.04 | .11 | -.04 | | | |
| Child age | .12 | .32 | .04 | -.04 | .28 | -.01 | | | |
| Maternal age | .03 | .04 | .08 | .06 | .04 | .17 | | | |
| Child BMI-z | .06 | .18 | .04 | -.06 | .16 | -.04 | | | |
| **Core predictors** | | | | | | | | | |
| Mother-reported food enjoyment | | | | .23 | .40 | .08 | | | |
| Mother-reported food fussiness | | | | .01 | .47 | .01 | | | |
| Observed food enjoyment | | | | .91 | .22 | .42** | .80 | .20 | .36** |
| Observed challenging behavior | | | | -.40 | .16 | -.26* | -.43 | .14 | -.28** |
| *Adjusted $R^2$ change* | | .01 | | | .34** | | | .29** | |
| *F for change in $R^2$* | | .17 | | | 9.73** | | | 19.53** | |

*Note:* Model 3 is a parsimonious model, testing only significant main predictors
*$p$ < .05. **$p$ < .01.

### Moderating effects of child eating behavior

The moderation hypotheses were partly supported. Observed challenging child behavior during mealtime significantly moderated the difference between observed maternal sensitivity during mealtime and free play, $F = 5.42$, $p = .022$, $\eta^2 = .06$. Aiken and West's (Aiken & West, 1991) method for plotting interactions with continuous data was used to illustrate the differences between children with low levels of challenging behavior (−1 SD) and those with high levels of challenging behavior (+1 SD; Figure 1). As depicted in Figure 1, when children showed a high amount of challenging behavior during the meal, there was more discrepancy between sensitivity during mealtime and during free play. However, when the levels of challenging behavior were lower, differences between maternal sensitivity during mealtime and free play were much smaller. Observed enjoyment of food, mother-reported enjoyment of food and mother-reported food fussiness did not significantly moderate the difference between maternal sensitivity during mealtime and free play.

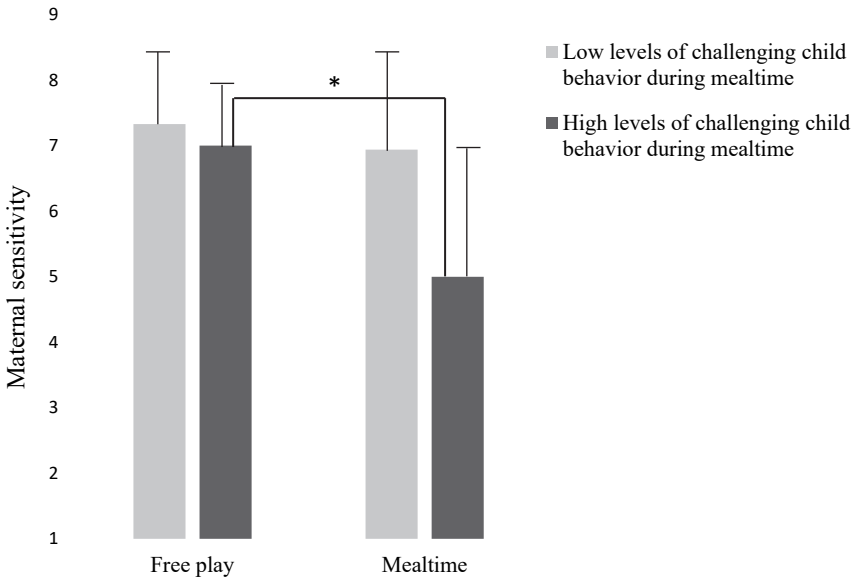


**Figure 1. Moderating effect of observed challenging child behavior during mealtime.**

## Discussion

The present study examined maternal sensitivity towards their 18-month-old children during mealtime and free play. First, a small to moderate significant association was found between sensitive behavior during mealtime and free play, indicating a limited level of stability of maternal behavior between the two situations. Second, mothers showed more sensitive behavior towards their child during free play than during mealtime. Third,

observed but not mother-reported child behavior during the meal was related to maternal sensitive responses during mealtime, with more food enjoyment being associated with higher levels of sensitivity, and more challenging child behavior with lower levels of sensitivity. Finally, when children showed a high amount of challenging behavior during the meal, there was more discrepancy between sensitivity during mealtime and free play, which implies that challenging child behavior might impair sensitive responses during mealtime.

Maternal sensitivity was positively related across contexts, which is in line with the findings of Black and colleagues who studied the related construct 'maternal nurturance' across mealtime and play (Black et al., 1996), as well as with other studies examining maternal sensitivity in different settings (Branger et al., 2019; Braungart-Rieker et al., 2014; Mills-Koonce et al., 2007). However, in relation to the majority of comparisons made in other studies, the correlation was relatively low. This low degree of stability suggests that mealtime to a certain extent elicits different maternal behavior compared to free play. In addition, also in line with our expectation, maternal sensitivity was found to be lower during mealtime than during free play. As argued earlier, an explanation for this discrepancy might be that mealtimes are generally more demanding situations for parents compared to free play, which might be because they feel more is 'at stake' (wanting the child to eat healthily), because they feel obliged to feed their child in a certain way, based on beliefs and influences through their surroundings and culture, or because they are being confronted with more challenging child behavior. In our study, we found the way children behaved during the meal to be associated with maternal sensitivity during that same meal. Mothers responded more sensitively to children who showed more food enjoyment, and less sensitively to children who showed higher levels of challenging behavior during the meal. This is in line with other studies that found more difficulties around child eating to be related to more *in*sensitive feeding practices, although none of these studies used observational data to measure either eating behavior or parental feeding behavior (Galloway et al., 2005; Jacobi et al., 2003; Jansen et al., 2017; Mascola et al., 2010).

Whereas observed maternal sensitivity during mealtime was associated with *observed* child eating behavior, it was not associated with *mother-reported* child eating behavior. The observation of eating behavior concerned one specific situation, while the mother-report concerned the way the parent would generally describe the child's eating behavior. Moreover, the mother's perspective in general might deviate from the observers' perspective. Another explanation might be that parents adapt their behavior to the situation they are currently dealing with, rather than to more generally perceived characteristics of their child's eating behavior. Studies that did find significant associations with mother-reported child eating problems, solely studied *in*sensitive feeding practices

such as pressure to eat (Galloway et al., 2005; Jansen et al., 2017; Mascola et al., 2010). However, we did find a marginally significant association between mother-reported fussiness and sensitivity during mealtime ($p$ = .07). An explanation for not finding larger associations similar to those in studies involving pressure to eat might be that pressuring a child to eat is more directly related to fussy child behavior than parental sensitivity, which incorporates broader parenting behavior than pressure to eat. Finally, it is possible that at least part of the relation between observed child behavior and observed maternal sensitivity can be explained by so-called *observer bias*. Parent and child behavior were coded by the same person and always in the same order (parent behavior first when watching the video for the first time; followed by child behavior when watching the video for the second time). Therefore we cannot rule out the possibility that the parental behavior the coder observed may have influenced the way the behavior of the child was coded, potentially somewhat inflating the relation.

In line with the finding described above, only observed challenging child behavior during the meal moderated the difference between maternal sensitivity during mealtime and free play, and mother-reported child eating behavior (i.e., perceived food enjoyment and food fussiness in general) did not. However, in contrast to observed challenging behavior, child enjoyment during the meal did not explain the difference in maternal sensitivity during mealtime and free play. This might be explained by the fact that observed food enjoyment was not only positively associated with sensitivity during mealtime, but also with sensitivity during free play. This in turn suggests that expressed enjoyment during the meal may more readily reflect the child's general affect or character in terms of expressiveness and joy, while challenging child behavior was more specific to the mealtime situation. Future studies may include more context-specific as well as general moderators (e.g., child temperament) when explaining differences in parental sensitivity across contexts. In addition, it would be relevant to learn more about the implications of the discrepancy in sensitive behavior during mealtime and free play for child development. Future studies might aim to replicate this finding, as well as investigate associations with several child outcomes. For example, it would be relevant to see how sensitivity during mealtimes in early childhood relates to a child's emotional development, compared to sensitivity during free play or other contexts, to learn more about the relative importance of sensitive behavior during several specific parenting situations. Moreover, previous studies show that inconsistent parenting is associated with psychological problems in children (Dwairy, 2009; Halgunseth, Perkins, Lippold, & Nix 2013; Kassing, Lochman, & Glenn, 2018). However, these studies often concern adolescents rather than young children, parental discipline styles rather than sensitive behavior, and inconsistency between parents rather than within parents across contexts. Therefore, it would be highly relevant to study the impact of inconsistent sensitive behavior towards young children across situations. Suggestions made above could contribute to theories on parent-

child interaction, child feeding, or to clinical recommendations related either to typical development or to concerns about feeding problems.

Finally, it should be noted that it is likely that the relation between child eating behavior and parental behavior is bidirectional. Parents may adapt their responses to expressed child behavior, and children may adapt their behavior to parental sensitive responding. In our study, challenging child behavior during the meal moderated the difference in sensitivity during mealtime and free play. This relation can also be interpreted in a bidirectional way. For example, if maternal behavior is highly discrepant between two situations, this might cause children to perceive the situation where the mother is less sensitive as unsafe or unpleasant, which in turn might cause the child to show more difficult behavior throughout that specific interaction. However, the direction of effects assumed in this paper, in which challenging child behavior during the meal might have decreased maternal sensitivity, is also highly plausible and supported by previous studies. Indeed, earlier studies have demonstrated that parents adapt their behaviors depending on variable child characteristics such as mood or behavior (Hudson, Doyle, & Gar, 2009; Lee & Bates, 1985; Russell, 1997). With respect to feeding, a recent longitudinal study performing prospective analyses showed that parents adapted their feeding behavior in response to child food fussiness (Jansen et al., 2017). To inform health care professionals and to better support families, future studies of parent-child interactions should continue to unravel the issue of "who influences whom".



Although the present study extends our knowledge on differential expression of maternal sensitivity across situations, several limitations should be mentioned. First, as mentioned earlier, mother and child behavior during the meal were coded by the same coder, which may have inflated the relation between observed mother and child behavior. Second, we did not observe food fussy behavior as a distinct construct, but observed child challenging behavior in a more general way. Therefore, we cannot conclude whether it is specifically fussiness with respect to food that challenges parents during the meal, or rather more general difficult behavior (or both). Third, we designed the observed measure of food enjoyment ourselves, and our observed measure of challenging child behavior was only used in one earlier study. However, both observed measures moderately correlated with child behavior reported by mother through the frequently used CEBQ, which pleads for the validity of our observed measure and which is in line with the moderate correlations between self-report and observation that are generally found in other studies (Fernandez et al., 2018; Morsbach & Prinz, 2006). Fourth, we solely focused on mothers, limiting generalizability to other caregivers. Fifth, we did not employ an experimental design and therefore cannot draw conclusions about causality. Finally, we did not observe child behavior during the free-play situation, so we could not examine this in relation to sensitivity during free play or as an explanatory factor in the same way we did with child

eating behavior. Future studies should aim to include multiple explanatory factors when studying the expression of parental behavior in different contexts, in order to inform (clinical) practice for the purpose of intervention programs.

In summary, the present study demonstrated that mothers are less sensitive during mealtime than during free play, which was partly explained by the degree of challenging child behavior during the meal. This implies that parent as well as child behavior can be context specific, and that parents may show other strategies in one context compared to another. Therefore, it is important for researchers as well as practitioners to take context into account when observing parental sensitivity. It is essential to be aware that an observation of parental behavior in a certain context is not entirely generalizable to parental behavior in another context, let alone to the general quality of parental behavior. Indeed, others have already plead for examining parenting practices in a context-specific way, in order to increase ecological validity and maintain a closer alignment with daily parent-child interaction (Sorkhabi & Middaugh, 2018). To optimize assessments of parent-child interaction that reflect a variety of daily family life situations, it is necessary to include diverse situations. Daily family life with young children is dynamic, and different situations evoke different behavior in both parents and children. When children show challenging behavior in a certain situation, it is harder for parents to respond in a sensitive way, complicating the interaction for both parent and child. It is important to increase awareness in professionals as well as parents that certain daily life situations are more challenging than others, and that parents can always ask for assistance if needed. In the meantime, more knowledge on differential expression of parent-child interaction across situations is needed to better understand parent-child dynamics, as well as to be able to more effectively support parents in the upbringing of their children.