

Reflective functioning in fathers with young children born preterm and at term

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ABSTRACT

The present study assessed 322 parents of 173 children aged between 12 and 20 months (74 children born preterm) with the Parent Development Interview (PDI) to capture parents' *Reflective Functioning* (RF). RF scores were obtained, and topics were disclosed, for which modeling with Latent Dirichlet Allocation (LDA) was applied. The study addressed (a) whether RF scores differed between fathers of children born preterm and at term, and diverged from the mothers' RF and, (b) whether topics on fathers' minds differed regarding parenting preterm or at-term children, and diverged from topics on parenting raised by mothers. Results indicated that parents of at-term children revealed similar RF scores, though fathers of children born preterm scored lower than mothers of children born preterm. Whereas fathers' RF scores were associated with topics about the paternal role, interests and activities, mothers' RF was related to concerns about how to meet the child's needs.

KEYWORDS

Parenting; mentalization; father role; topics about parenting; child's needs

Because fathers are able to serve as attachment figures, an important follow-up question involves whether the antecedents of attachments for fathers are similar to those established for mothers. Accordingly, past research has focused on aspects of father-child interaction that are analogous to aspects of mother-child interaction known to be associated with the quality of relationships. For example, fathers' enriched engagements in daily care routines were a significant predictor of father-child attachment security (see Caldera, 2004; Piskernik & Ahnert, *in press*), but research showed that early interaction qualities did not always predict attachment security at 12 months to father (e.g. Braungart-Rieker, Courtney, & Garwood, 1999; Volling & Belsky, 1992). Clearly, mothers and fathers are socialized differently regarding how they parent. The gap in emotional socialization, in which mothers and fathers are found to value emotional support differently and therefore respond differently to their children (e.g. Baker, Fenning, & Crnic, 2011), may be grounded in different parental mind patterns. For this reason, the present study focused on processes that guide parenting through mentalization.

Parents who mentalize are inclined to interpret their child's behavior in terms of envisioned mental states such as emotions, thoughts, desires, and intentions. This is especially important when parenting young children. Preverbal children rely on their

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caregivers to intuit their mental states because they might be unable to clearly express their thoughts and feelings. High parental mentalization has been characterized as awareness of the mental world of the child, as accuracy in interpreting the infant's internal states, and as reflections on how this is embedded in parenting. Research on the assessment of mentalization has led to an index known as *Parental Reflective Functioning* (Slade, 2005), which has been used successfully to predict the quality of parent-child relationships (Fonagy, Steele, Moran, Steele, & Higgitt, 1991; Kelly, Slade, & Grienenberger, 2005). Although studies on *Reflective Functioning* (RF) in fathers (specifically of young children) are rare (for an overview see Benbassat & Priel, 2015), there is evidence that levels of RF in both parents are similar (see Steele & Steele, 2008; Taubner et al., 2013), whereas other studies show differences with fathers scoring lower than mothers (Benbassat-Lifshitz, 2008; Cooke, Priddis, Luyten, Kendall, & Cavanagh, 2017).

However, RF might be challenged by higher levels of parenting stress. For example, Georg, Schröder, Cierpka, and Taubner (2018) reported that parents of children with regulatory disorders tend to reflect inadequately about their children, where low RF scores tap statements that were flat or excessively deep and detailed without convincing descriptions (see also Taubner et al., 2013). The present study involved parents of children born preterm (in addition to children born at term) and focused on descriptions and concerns in parenting. Past research has shown that children born preterm cause parenting stress because they interact less responsively and clearly (e.g. Mughal, Ginn, Magill-Evans, & Benzie, 2017; Singer et al., 2003). Evidently, children born preterm have not yet developed the capacities to form and maintain interactions as well as to regulate emotions (e.g. Arpi & Ferrari, 2013; Hall et al., 2015), which can be traced back to delayed and distinct brain maturation (see Clark, Woodward, Horwood, & Moor, 2008; Feldman, 2009).

In addition, Korja, Latva, and Lehtonen (2012)'s meta-analysis showed not only behavioral and emotional deficits in maternal interaction with children born preterm, but also differences in maternal cognitions revealing a higher prevalence of unrealistic fears for the child's safety. Interestingly, Montirosso et al. (2017) investigated brain activation in mothers of infants born preterm and at term in an fMRI study, three months after delivery. Mothers viewed images of their infant showing happy, neutral, and distressed facial expressions, along with a matched unknown infant. While viewing their own infant's face, mothers of infants born preterm showed increased activation in the areas of emotional processing (i.e. inferior frontal gyrus), social cognition (i.e. supramarginal gyrus) and affiliative behaviors (i.e. insula), suggesting differential brain activation as a consequence of the atypical parenthood transition related to prematurity. As follows, mothers of children born preterm might not only differ from mothers of children born at term in parenting behavior, but also in the underlying neural mechanisms that might block appropriate mentalization. Unfortunately, empirical data regarding fathers in the specific risk situation of preterm birth is limited. When Harrison and Magill-Evans (1996) explored parents' interaction with infants, they found it not as enriched with children born preterm as with term infants. These differences appeared greater in fathers who were less able to adjust to their preterm children and reported more stress regarding perceived (deficient) child characteristics.

The present study, therefore, assumed that parents of children born preterm experience more difficulties in parenting and thus tend to have more difficulties in mentalizing these problems, which may be especially true for fathers of these children. A few

researchers have used qualitative interviews to explore concerns about parenting children born preterm. They found that premature birth is considered an emotionally traumatizing crisis for parents and can be associated with a loss of control and trust in the child, as well as a loss in parents' sense of competence in their roles as parents. For example, Loehr, von Gontard, and Roth (2000) carried out 20 interviews six weeks after birth and found notable variations in how parents of children born preterm described their perceptions and feelings. While mothers were shocked and grieving, fathers expressed some insecurity but appeared rather positive, presumably suppressing mentalization. However, these paternal perceptions and feelings were unfortunately not examined with RF. To our knowledge, this is the first study that explored major topics of concerns in parents of children born preterm compared to parents of children born at term, which emerge when parents are being interviewed about their child using the Parent Development Interview. It was assumed (1) that fathers mentalize on similar levels about their children as mothers do, but that their RF might be lower if they parent children born preterm, (b) that topics on fathers' minds differ in terms of parenting (a preterm or at term child) from those of mothers, and (3) that fathers' RF levels are associated with different topics than those of mothers, thereby revealing a different way of mentalizing about a child.

Method

Participants

The sample consisted of 322 parents of 173 children aged between 12 and 20 months of whom 74 were born preterm. Parents of children born preterm were recruited at the children's hospital of the Medical University in Vienna after the Ethics Committee of the Medical University of Vienna had approved the research study (ECS 1710/2013). Parents of children with apparent neurosensory impairments were not invited. Parents of children born at term were contacted through childcare centers and playgroups. All families represented the Austrian middle class. On average, fathers were 37.56 ($SD = 6.18$) years old, highly educated (53.0% with a university degree) and mostly worked full-time with an average of 39.16 hours per week. In contrast, mothers were on average 35.06 ($SD = 5.43$) years old, and 52.6% of them had a university degree. In the preterm vs. at term group, 59.6% vs. 55.8% of the mothers were on maternity leave and worked less than 10 hours per week (for a detailed sample description see [Table 1](#)).

Procedures

Each family was visited at home. After obtaining informed consent and demographic information, parents were interviewed using the Parent Development Interview (PDI; Slade, 2005). We interviewed 154 fathers (with 65 children born preterm and 89 born at term) and 168 mothers (with 71 children born preterm and 97 at term). If fathers and mothers of the same child agreed to attend, they were involved in a randomized order on separate days with almost two months between the interviews. Among the 322

Table 1. Sample description.

| | Preterm (<i>n</i> = 74) | | At term (<i>n</i> = 99) | | Total (<i>n</i> = 173) | |
|-------------------------|--------------------------|------|--------------------------|------|-------------------------|-------|
| | <i>M</i> (<i>SD</i>) | % | <i>M</i> (<i>SD</i>) | % | <i>M</i> (<i>SD</i>) | % |
| CHILD | | | | | | |
| Age (months) | 15.68 (2.15) | | 16.10 (2.27) | | 15.92 (2.23) | |
| Gender (female) | | 45.9 | | 40.8 | | 42.9 |
| Gestational age (weeks) | 28.30 (3.08) | | 39.88 (1.17) | | 33.37 (6.25) | |
| FATHER | | | | | | |
| Age (years) | 38.21 (6.10) | | 36.78 (6.25) | | 37.56 (6.18) | |
| Education | | | | | | |
| University degree | | 45.5 | | 62.2 | | 53.0 |
| High school degree | | 20.0 | | 28.8 | | 24.00 |
| Vocational diploma | | 30.9 | | 8.9 | | 21.0 |
| Employment status | | | | | | |
| Unemployed | | 1.8 | | 0.0 | | 1.0 |
| Paternal leave | | 1.8 | | 4.3 | | 3.0 |
| Employed (hours/week) | 41.07 (8.55) | 89.1 | 37.02 (10.96) | 93.5 | 39.16 (9.92) | 91.1 |
| MOTHER | | | | | | |
| Age (years) | 35.78 (5.80) | | 34.15 (4.84) | | 35.06 (5.43) | |
| Education | | | | | | |
| University degree | | 46.2 | | 60.5 | | 52.6 |
| High school degree | | 26.9 | | 25.6 | | 26.3 |
| Vocational diploma | | 21.2 | | 14.0 | | 17.9 |
| Employment status | | | | | | |
| Unemployed | | 1.9 | | 0.0 | | 1.1 |
| Maternal leave | | 59.6 | | 55.8 | | 57.9 |
| Employed (hours/week) | 22.31 (11.81) | 30.8 | 21.39 (11.01) | 39.5 | 21.84 (11.26) | 34.7 |

M = Mean; *SD* = Standard Deviation.

parent interviews, 298 interviews included parents in the same family; this was taken into account as a nested data structure in analyses.

Measures

Parent development interview

The Parent Development Interview (PDI; Slade, 2005) is a semi-structured interview that discloses parents' thoughts and feelings about the child and the parent-child relationship, as well as challenges in parenting. Parents provide a variety of relevant information on life with their children and, at the same time, demonstrate their ability to mentalize about the issues they have spoken about. To evaluate and analyze the interviews, they were audiotaped and then transcribed.

Reflective functioning. A reflective functioning (RF) score was derived from the PDIs to describe parents' ability to mentalize based on the so-called demand questions. Demand questions directly probe for reflective functioning, such as "Tell me about a time in the last week or two when you felt really angry as a parent. What kinds of situations make you feel this way? How do you handle your angry feelings? When your child is upset, what does he/she do? How does that make you feel? What do you do? Does (your child) ever feel rejected?" The RF score is determined for each interview as a whole on an 11-point scale ranging from -1 (negative RF) to 9 (exceptional RF). A cut-off of 4 indicates low reflective functioning, whereas scores of 5 and greater indicate strong evidence of mentalizing abilities. After attending a training at the Anna Freud National Centre for Children and

Families, a group of four raters coded RF independently from the transcribed PDIs and reached satisfactory interrater reliability: $ICC = .78$ (for fathers) and $ICC = .80$ (for mothers).

Prevalence of topics. Parents' responses to eight questions (# 08, 09, 10, 11, 27, 36, 40, and 41) focusing on parenting issues during the PDI were analyzed separately. These questions triggered parents' responses about their relationship with the child (e.g. *How do you think your relationship with your child is affecting his/her development or personality?*) or focused on critical care situations, like separations and rejections that the child had experienced (e.g. *Now I'd like you to think of a time you and your child weren't together, when you were separated. Can you describe it to me? What kind of effect did it have on the child? What kind of effect did it have on you?*). The parents' responses were later subjected to Topic Modeling with Latent Dirichlet allocation (LDA; developed by Blei, Ng, & Jordan, 2003) which is the most common topic model currently in use.

LDA is a text-mining technique for discovering hidden semantic structures in a text. Assuming that the parents' interviews covered a small number of topics and that topics often use a small number of specific words, one would expect particular words to appear in an interview more or less frequently. For example, "*fun*" would appear more often in interviews about *Togetherness*, whereas "*despair*" would appear more often in interviews about *Separation*, and "*the*" and "*is*" would appear equally in both. Because an interview typically includes multiple topics in different proportions, an interview that is 10% about *Separation* and 90% about *Togetherness* would probably contain about nine times more fun words than despair words. LDA thus allows examination of what the topics might be and what the balance of the topics in each interview is, by using a mathematical framework to explore the various distributions of the set of topics, their associated word probabilities, the topic of each word, and the particular topic mixture of each interview (for more details see below).

Data analysis

Latent Dirichlet allocation

The parenting section of the PDI was subjected to Latent Dirichlet Allocation (R package by Grün & Hornik, 2011) to reveal prevalent topics on parents' minds by analyzing the probability and distribution of all words in all interviews. As a result of this procedure, the prevalence of a topic within an interview was represented by a γ -value ranging from 0–100%. In preparing this procedure, first we removed punctuation marks, stop words (e.g. "and", "or", "if") as well as rare words, which appeared in less than five interviews. Second, we also lemmatized words with GermaLemma (Konrad, 2017) to unify all inflected forms of the same word. Mothers used 120 ($SD = 48$) unique words on average, adding up to a total of 204 ($SD = 116$) words if word repetitions were included. Likewise, fathers used 116 ($SD = 45$) unique words on average, which amounted to a total of 196 ($SD = 102$) words (including word repetitions). Third, we set the number of topics between 6 and 15, thereby avoiding both too general and too detailed topics, and followed the algorithm (Deveaud, Sanjuan, & Bellot, 2014; Murzintcev, 2016), which recommended 11 topics.

Linear mixed effects model

Taking the nested data structure into account, we used linear mixed effects modeling (Bates, Mächler, Bolker, & Walker, 2015) and explored both, the RF scores and the topics of the PDI. We tested (1) whether the RF scores systematically varied with *Parent gender* and the *Birth status* of the child (applying linear contrasts for individual comparisons), and (2) whether the prevalence of the topics differed by *Parent gender* and *Birth status*, and (3) whether and how the topics related to the RF scores for which log-odds transformed γ -values were computed to avoid violations of distributional requirements.

Results

Reflective functioning in fathers and mothers of children born preterm and at term

Exploring all RF scores according to the cut-offs for low vs. high RF, 36% fathers vs. 40.2% mothers with children born at term displayed high RF, so did 24.6% fathers vs. 35.2% mothers of children born preterm. Because of the nested data structure, linear mixed effects models were used to test statistical evidence. The model revealed only a main effect of *Parent gender* on RF, i.e. mothers scored higher on reflective functioning than fathers, $F(1, 162.98) = 3.96, p = .048$. There was no effect of birth status of the child, $F(1, 166.56) = 3.59, p = .060$, or *Birth status X RF* interaction, $F(1, 162.98) = 0.20, p = .66$. According to the research questions, however, linear contrasts compared RF scores among the parents of children born at term only and failed to detect a significant effect ($t(314.5) = 1.16, p = .12$). In contrast, RF scores among the parents of preterm children, however, differed with fathers scoring lower than mothers, $t(314.5) = 1.68, p = .047$. In other words, fathers' low RF scores were associated with children born preterm, only (see Figure 1).

Defining topics from the parent development interview

Using LDA to analyze parents' responses to the parenting text section of the Parent Development Interview, 11 topics were extracted, and γ -values determined. The γ -values represented the prevalence of each topic within an individual interview, and ranged from 1% to 51% across all interviews, depending on the parent and the topic. The semantic content of each topic was determined by the authors in an open discourse, based on the interpretation of five interviews that revealed the highest γ -values for the respective topic. As a result, three areas of discourse about parenting were evident. These concerned (1) parental care attitudes, (2) parental roles, as well as a broad range of issues about (3) child's development, including worries, and hopes about child's needs, potentials, well-being, and feelings (topics with examples from individual interviews are listed in Table 2).

Topics of fathers and mothers parenting children born preterm or at term

Linear mixed effect models were again used to investigate whether the prevalence of certain topics differed by *Parent gender*, *Birth status* of the child and *Parent gender X Birth*

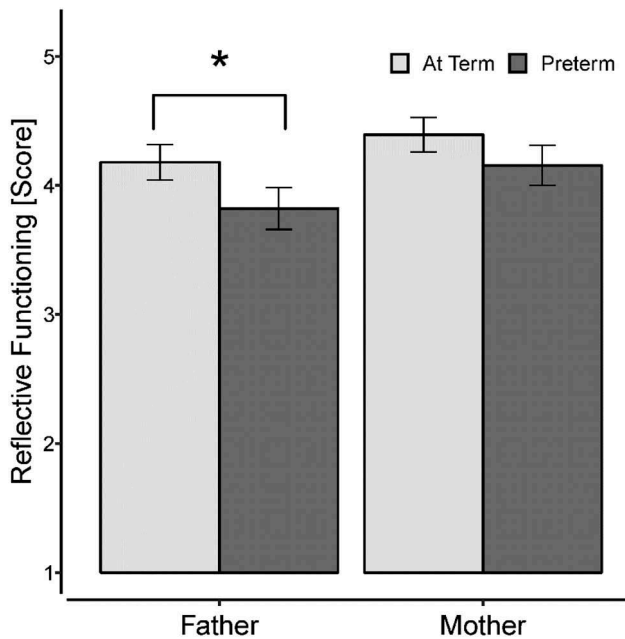


Figure 1. Reflective functioning (mean scores) in fathers and mothers of children born preterm and at term.

Note. Only RF scores from 1 and greater (but not lower) were obtained.

status interaction. Results foremost indicated main effects and only one interaction effect. In terms of *Parent gender*, fathers talked more about their parental roles and specific care attitudes than mothers, e.g. they described how they handle daily care routines (Topic 1: $F(1, 155.1) = 9.0$; $p = .003$), how they entertain the child (Topic 5: $F(1, 156.1) = 11.6$; $p = .001$) and how they match parenthood with other interests (Topic 6: $F(1, 145.3) = 2.6$; $p = .110$), although the latter topic showed only a weak effect. In contrast, mothers talked more about general care attitudes and child development than fathers, e.g. they stressed how they shaped the family atmosphere (Topic 2: $F(1, 161.2) = 18.0$; $p < .001$), how they meet the child's needs (Topic 7: $F(1, 160.0) = 43.7$; $p < .001$), and understand the child's thoughts and feelings (Topic 11: $F(1, 158.9) = 39.2$; $p < .001$). In terms of the child's birth status, two topics were prevalent in interviews of both parents: Topic 4 (overcoming ambivalence in parenting: $F(1, 159.5) = 4.3$; $p = .040$) and Topic 11 ($F(1, 159.9) = 6.1$; $p = .014$). Finally, one interactions effect revealed that mothers of children born at term liked to talk more about the child's potential than other parents (Topic 10: $F(1, 158.4) = 4.3$; $p = .039$); see Table 3 first block.

Reflective functioning as related to selected topics

Most interestingly, however, was the question whether and how the topics parents emphasized related to the levels of mentalization; in other words, whether RF scores were associated with the prevalence of certain topics depending on *Parent gender* and *Birth status* of the child. In contrast to topics that neither intensified nor suppressed

Table 2. Topics from the parent development interview including examples.

| Care Attitude | |
|---|--|
| TOPIC 1: Adapting to daily care routines: | “When I say ‘Come on, let’s get dressed’, he does sit down on the stairs and lets me put on his sweater and then his jacket, his hood, put on the shoes and then the scarf, and yes, those are the situations that actually show that we really get along very well.” (Father of a 14-month old, born at term) |
| TOPIC 2: Shaping the family atmosphere: | [...] “But I still think he gets on well with me. And as I have influenced him now, yes I believe that the basic mood in the family and the happiness, that this already works, that you pass that on. He is also very cheerful. This is certainly related to the family. It is quite clear, I would say, that if there is a negative atmosphere at home, the children are not happy either.” (Mother of a 14-month old, born at term) |
| TOPIC 3: Teaching and sharing social norms: | “He already understands that he is not allowed to do it and strangely enough there are things he accepts that he is not allowed to do and other things, where he just does not accept it ... but in the end, he is too small for someone to really say he should behave well.” (Mother of a 14-month old, born preterm) |
| Parental Role | |
| TOPIC 4: Overcoming ambivalence in parenting: | “I don’t feel so good as a dad because I think I’m there for Lisa, but at that moment, in those 5 tense minutes, she makes me feel the opposite, because she does not feel comfortable with me. Because it is 100% better with mom.” (Father of a 14-month old, born preterm) |
| TOPIC 5: Providing fun and entertainment: | “We danced on Saturday morning and were perfectly attuned to each other. There are some songs, I suppose it depends on the beat or the bass, where she starts to dance, that was after the shower, and she was with me in the bathroom, and then we both just started to dance. That was pretty funny, actually!” (Father of a 15-month old, born at term) |
| TOPIC 6: Matching parenthood with other interests: | “So I always bring him to the child minder, but not before 9 a.m. But he gets up between 6 a.m. and 7 a.m. These 3 hours in between, I spend with him alone in the morning, as I said. We just keep up our rituals and then in the evening I try to spend time with him, at least my play lesson with him or my reading time.” (Father of a 16-month old, born at term) |
| Child Development | |
| TOPIC 7: Meeting the child’s needs: | “When he wakes up in the night and is thirsty or he just wants me to stay with him, I lay him down and caress him. If he just notices someone is there, he often falls asleep right away...” (Father of a 14-month old, born preterm) |
| TOPIC 8: Monitoring the child’s development: | “Well, as she was transferred from one hospital to the other and then somehow a lot of tubes were all over her... I go back home at 9.30 p.m. at the latest, and feel sad that I left my little one behind. And now, if I say goodbye, she knows exactly Daddy is just going to work, well, that’s not a big problem anymore.” (Father of a 16-month old, born at term) |
| TOPIC 9: Ensuring the child’s well-being: | “... he feels that he is being loved. He actually feels that way because the attachment is secure. And it doesn’t matter, even if he goes away a bit, it stays that way. You cannot take that away; he takes this secure feeling with him. And I want to give him the security somewhere so that he knows okay, I’m alone in the nursery, but it’s not a problem.” (Mother of a 14-month old, born preterm) |
| TOPIC 10: Recognizing the child’s developmental potential: | “He really understands a lot already and I just said, Johannes, can you pass me the cheese, and he takes the cheese, wants to give it to me, and his arm is just too short and he can’t reach me. And before I lean over, my husband wants to take the cheese and pass it on to me and Johannes is so mad at his Daddy and says ‘No, Mummy.’” (Mother of a 16-month old, born at term) |
| TOPIC 11: Understanding the child’s thoughts and feelings: | “You just notice when you are very close with each other or you look into each other’s eyes or when you have critical situations where you look someone deeply in the eyes and say, ‘You cannot do that’, you then realize that he accepts it, that he has to have full confidence, of course, but that he feels that confidence anyway.” (Mother of a 12-month old, born preterm) |

parents’ mentalization, several topics were related to parents’ RF scores and appeared reasonably connected to parental reflective functioning abilities. Topic 3 (*Teaching and sharing social norms*: $F(1, 289.9) = 4.1$; $p = .043$), and Topic 6 (*Matching parenthood with other interests*: $F(1, 291.8) = 4.5$; $p = .035$) were positively related to RF scores, with Topic 6 particularly in fathers $F(1, 252.3) = 4.0$; $p = .047$), suggesting intensified mentalization if these topics were focused on in an interview. A similar (interaction) effect of RF was revealed with Topic 7 (*Meeting the child’s expectation*: $F(1, 281.5) = 13.5$; $p = .001$) for mothers of preterm children showing higher RF scores which were related to a higher prevalence of this topic. In contrast, Topic 2 (*Shaping the family atmosphere*: $F(1, 286.5) = 4.1$; $p = .045$), Topic 10 (*Recognizing the child’s potential*: $F(1, 290.3) = 20.0$; $p = .001$) and Topic 11 (*Understanding the child’s thoughts*: $F(1, 284.1) = 17.2$; $p = .001$) were negatively related to RF scores, with Topic 10 particularly in mothers $F(1, 270.8) = 4.7$; $p = .031$), suggesting suppressed mentalization if these topics were raised. Interestingly,

Table 3. Prevalence of topics predicted by parent gender, birth status and reflective functioning.

| Variable | Care Attitude | | | | | | | | | | | | | | | | | |
|-----------------------------------|---|----------|------|------|---|----------|-----|-------|---|----------|-------|------|------|-------|------|-----|-------|------|
| | Topic 1: Adapting to daily care routines | | | | Topic 2: Shaping the family atmosphere | | | | Topic 3: Teaching and sharing social norms | | | | | | | | | |
| | F | df (1,x) | p | | F | df (1,x) | p | | F | df (1,x) | p | | | | | | | |
| Parent gender | 9.0 | 155.1 | .003 | 18.0 | 161.2 | >.001 | 0.1 | 155.2 | .736 | 1.1 | 152.7 | .306 | 11.6 | 156.7 | .001 | 2.6 | 145.3 | .110 |
| Birth status | 0.8 | 160.2 | .370 | 0.5 | 163.8 | .501 | 0.3 | 161.4 | .584 | 4.3 | 159.5 | .040 | 0.5 | 166.4 | .474 | 0.6 | 157.9 | .427 |
| Parent gender × Birth status | 0.0 | 155.1 | .908 | 1.1 | 161.2 | .307 | 2.0 | 155.2 | .156 | 2.6 | 152.7 | .111 | 0.7 | 156.7 | .400 | 0.0 | 145.3 | .929 |
| RF | 1.2 | 288.9 | .273 | 4.1 | 286.5 | .045 | 4.1 | 289.9 | .043 | 0.2 | 290.4 | .685 | 0.0 | 291.8 | .957 | 4.5 | 291.8 | .035 |
| RF × Parent gender | 0.1 | 272.8 | .735 | 0.9 | 278.7 | .353 | 3.5 | 270.7 | .063 | 0.0 | 268.5 | .840 | 2.0 | 263.7 | .159 | 4.0 | 252.3 | .047 |
| RF × Birth status | 0.8 | 288.9 | .371 | 0.2 | 286.5 | .691 | 0.1 | 289.9 | .755 | 2.1 | 290.4 | .154 | 0.0 | 291.8 | .881 | 2.1 | 291.8 | .145 |
| RF × Parent gender × Birth status | 1.1 | 272.8 | .288 | 0.4 | 278.7 | .544 | 0.0 | 270.7 | .951 | 2.5 | 268.5 | .115 | 2.0 | 263.7 | .163 | 0.1 | 252.3 | .754 |

| Variable | Child Development | | | | | | | | | | | | | | | | |
|-----------------------------------|---------------------------------------|----------|-------|-----|--|----------|-----|-------|---|----------|-------|-------|-------|-------|-------|-------|-------|
| | Topic 7: Meeting the child's needs | | | | Topic 8: Monitoring the child's development | | | | Topic 9: Ensuring the child's well-being | | | | | | | | |
| | F | df (1,x) | p | | F | df (1,x) | p | | F | df (1,x) | p | | | | | | |
| Parent gender | 43.7 | 160.0 | >.001 | 1.3 | 163.7 | .250 | 2.1 | 158.1 | .145 | 2.1 | 158.4 | .145 | 158.4 | .145 | 39.2 | 158.9 | >.001 |
| Birth status | 0.6 | 160.8 | .424 | 2.0 | 165.0 | .162 | 3.3 | 164.9 | .073 | 0.8 | 164.9 | .376 | 6.1 | 159.9 | .014 | 159.9 | .014 |
| Parent gender × Birth status | 0.0 | 160.0 | .947 | 0.0 | 163.7 | .973 | 0.2 | 158.1 | .633 | 4.3 | 158.4 | .039 | 0.1 | 158.9 | .791 | 158.9 | .791 |
| RF | 0.0 | 283.8 | .846 | 0.1 | 285.0 | .784 | 0.4 | 290.5 | .531 | 20.0 | 290.3 | >.001 | 17.2 | 284.1 | >.001 | 284.1 | >.001 |
| RF × Parent gender | 13.5 | 281.5 | >.001 | 0.1 | 281.2 | .715 | 1.1 | 270.1 | .301 | 4.7 | 270.8 | .031 | 1.3 | 280.9 | .264 | 280.9 | .264 |
| RF × Birth status | 0.2 | 283.8 | .627 | 0.0 | 285.0 | .860 | 0.5 | 290.5 | .464 | 0.0 | 290.3 | .862 | 0.4 | 284.1 | .520 | 284.1 | .520 |
| RF × Parent gender × Birth status | 0.1 | 281.5 | .321 | 1.1 | 281.2 | .289 | 0.5 | 270.1 | .505 | 0.8 | 270.8 | .377 | 0.7 | 280.9 | .395 | 280.9 | .395 |

two topics (Topic 8 and 9) which embraced the child's development and well-being in general did not systematically vary in terms of their prevalence across the parents and the children and were also not related to levels of reflective functioning. See Figure 2 for the interplay of topic emphasis (except Topics 8 and 9), parent gender, and birth status on RF and Table 3 for all Results.

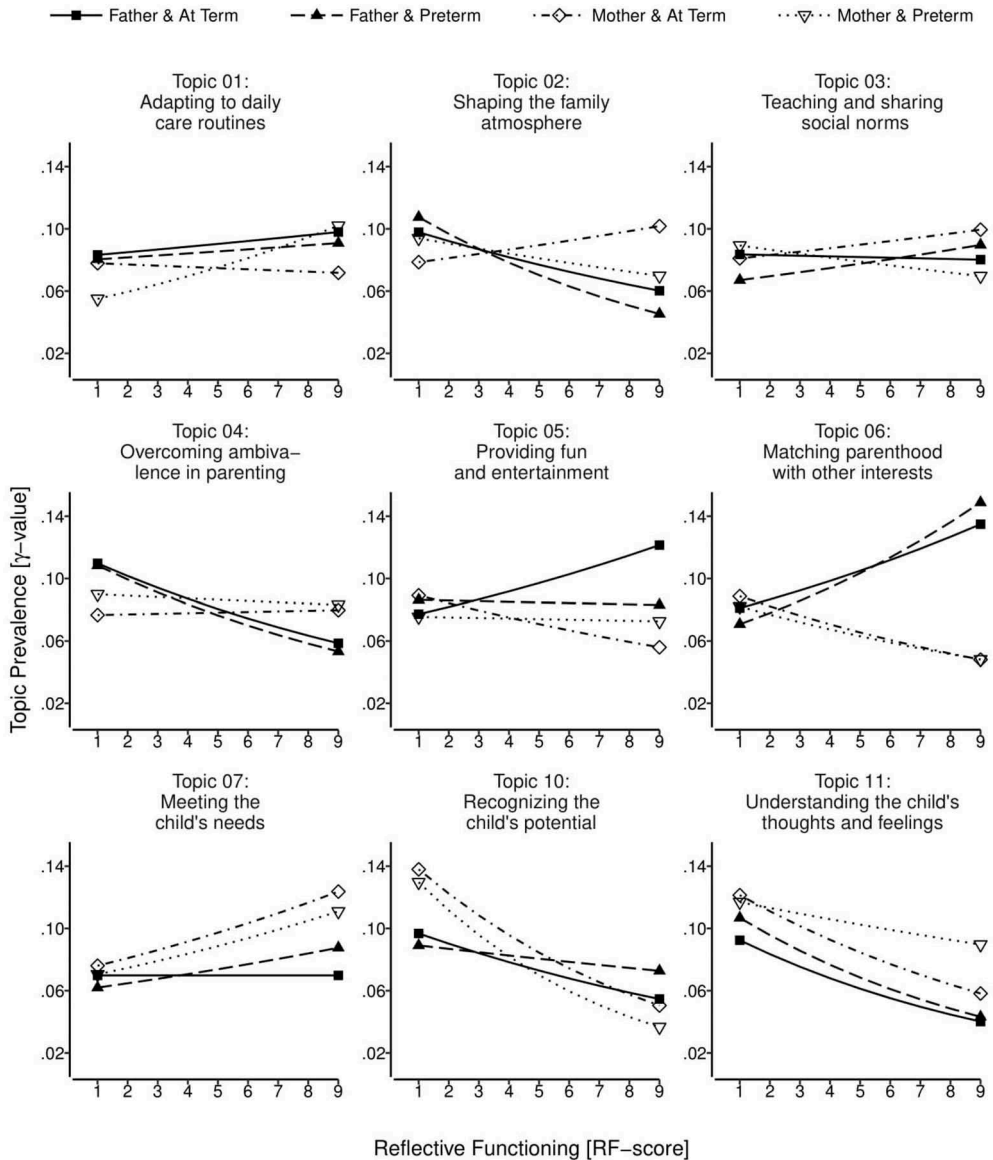


Figure 2. Prevalence of selected topics as related to RF scores of fathers and mothers of children born preterm and at term.

Note. Only RF scores from 1 and greater (but not lower) were obtained.

Discussion

The present study used data derived from the Parent Development Interview to explore mothers' and fathers' mentalization about parenting as well as parenting-related topics on their minds. The study also focused on children who were born preterm (in addition to children born at term) to examine a context in which parenting may be especially challenging, given that preterm children struggle to interact as well as to regulate emotions which can cause parenting stress (e.g. Mughal et al., 2017; Singer et al., 2003). In the search for specific parenting influences, the present study focused on the capacity to mentalize and captured the reflective functioning (RF) score of the parents. Similar to research by Steele and Steele (2008) as well as Taubner et al. (2013), the RF score did not differ between fathers and mothers whose children were born at term. This underscores the fact that fathers are generally able to mentalize on the same level as mothers and fulfill a requirement for being equal parents (see discussion by Fagan, Day, Lamb, & Cabrera, 2014). However, in the context of high parenting stress and difficult children as it is the case with children born preterm, these fathers were not able to achieve the levels of mentalization that they would activate otherwise. It thus seemed not only important to examine how intensely parents mentalize, but also what they mentalize about, and in accordance with which topics RF might be suppressed or even intensified.

The present study, therefore, approached the semantic content of the Parent Development Interview using machine learning techniques for topic modeling. Applying the most common topic model currently in use, the Latent Dirichlet allocation (LDA) determined eleven topics which covered three areas of parenting. These topics concerned parental care attitudes and parental roles, as well as a broad range of issues about the child's development. Fathers typically talked about their parental roles, how they handle the daily care routines, entertain the child, and combine fatherhood with other interests. In contrast, mothers talked more about the child's development, and how they might meet the child's needs, recognize the child's potential, and understand the child's thoughts and feelings. In other words, fathers seemed to concentrate more on their parenting activities and interests than the child's needs and feelings upon which mothers tended to focus. This clearly indicates different attitudes and concepts for parenting. Perhaps men are socialized to parent in a different way than women and value activities more than emotional and social issues (Baker et al., 2011). Both parents in the present study, however, are also faced with distinct experiences in their daily lives. Almost 60% of the mothers were on maternity leave, spending a great deal of time with their children while the fathers went to work. It is therefore not surprising that child development was more prevalent on mothers' than fathers' minds, and that fathers were, in contrast, rather more concerned with balancing work and family life.

The present study, however, revealed that most topics were related to parents' capacity to mentalize. Also, mothers and fathers seemed to achieve high levels of mentalization through different pathways. Whereas fathers intensified their reflective functioning along their concerns on how to fulfill the parental role, mothers' reflective functioning was connected to their concerns about meeting the child's needs. These results might have important implications for parent-child attachment as recent research has indicated that child-focused RF but not self-focused RF of parents is related to

children's attachment security (Borelli, St. John, Cho, & Suchman, 2016). Because mentalization is an essential step to build up and maintain an attachment with children, not surprisingly, father-child attachment scored lower in preterm than at-term children (Ruiz, Piskernik, Witting, Fuiko, & Ahnert, 2018).

Interestingly, mothers who talked more about the child's potentials and how they understand the child's thoughts and feelings had lower RF scores than mothers who talked less about these topics. This might be explained by the concept of hypermentalization (see Taubner et al., 2013), where low RF describes statements that are excessively detailed but rather unconvincing. Mothers of children born preterm, however, tended to reflect intensively on understanding the child's thoughts and feelings, compared to all other parents. This is in line with Montirosso et al. (2017)'s research on intensified emotional processing related to prematurity and might be the reason why mothers of preterm children reached similar levels of mentalization as mothers of at-term children, who most reflected on how to meet children's needs. In contrast, fathers' RF appeared lower in preterm than at-term children. One can speculate that they kept prominent self-focused considerations about their fathering role and daily parental activities to overcome stressful parenting while suppressing daunting issues regarding child development. This can even have a quite healthy function in families with children born preterm and might compensate for the worries that mothers may be paralyzed by when meeting a preterm child's needs.

The LDA analyses also revealed that some topics were more difficult to mentalize than others, specifically when child development was concerned. Parent counseling would benefit from more detailed information on the topic-related basis of parents' mentalization, and its bias by parent gender. Although the present study has confirmed that RF is a useful construct for research on parenting, results are clearly limited in generalizability. Because RF data were obtained from two-parent middle class families, results might differ for low-income families, or single-parent, step-, binational, and same-sex families.

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