

Evaluation of the Danish version of the prenatal parental reflective functioning questionnaire in early pregnancy as a screening tool

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Abstract

Parental reflective functioning (PRF) is the capacity to focus on feelings and experiences in oneself as a parent and in the child. Research has demonstrated that, the better the PRF the better outcomes for the child. This paper evaluated the Danish version of the prenatal parental reflective functioning questionnaire (P-PRFQ). We used data from a cluster-randomized trial of pregnant women recruited from Danish general practice. The sample included 605 mothers. Factor structure and internal consistency were investigated. Linear regression analysis was used to examine the associations between the P-PRFQ score and the five most predictive variables. The confirmatory factor analyses supported the three-factor model. The P-PRFQ had moderate internal consistency. The regression analysis showed a decrease in the P-PRFQ score with increasing age, increasing parity, current employment, better self-reported health, lower anxiety score, and fewer negative life events with persistent impact. The directions of the associations between P-PRFQ score and the predictive variables were opposite of what was hypothesized raising questions about whether the P-PRFQ can be used as an early pregnancy screening tool assessing prenatal PRF. Further validation studies are required to assess the extent to which the P-PRFQ truly measures reflective functioning.

KEYWORDS

parental mentalization, pregnancy, psychometric properties, prenatal parental reflective functioning, P-PRFQ

1 | INTRODUCTION

Becoming a mother is a transition across the spectrum of social, psychological/emotional, occupational, and health functioning. The transition into motherhood can be chal-

lenging (Cowan & Cowan, 1995) and requires preparation for the role including increasing emotional engagement with the fetus (Slade, 2009). Specifically, the mother's ability to "mentalize" or understand the mental state of her infant is crucial to the child's socio-emotional development

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(Fonagy et al., 2007). The mother's implicit mentalization in relation to her own and the baby's feelings and thoughts, is essential for making sense of her own and her child's behaviors. This in turn requires understanding of mental states including intentions, feelings, and thoughts. This capacity is known as *reflective functioning* (an operationalization of mentalization) (Slade, 2005). Poor maternal reflective functioning (RF) has been associated with behavioral problems in the offspring (Benbassat & Priel, 2011) such as social withdrawal and anxiety as well as dysfunctional mother-child interactions (Esbjörn et al., 2015; Fonagy et al., 2018; Smaling et al., 2016). Child social and emotional difficulties are also associated with increased risk of poor health and socioeconomic outcomes later in life (Caspi et al., 2017). Parental reflective functioning (PRF) may be influenced by many different factors, such as childhood experiences, current mental well-being, pathological and psycho-social factors in adult life (Camoirano, 2017). Parents adversely affected by these factors may also experience difficulties in grasping their infant's emotional states and understanding cues about their child's basic needs for comfort and emotional regulation (Kalland et al., 2016). In Denmark, health professionals working in family practice hold responsibility for a program of scheduled pregnancy and child development assessments (Wilson et al., 2018), including evaluation of the parent-child relationship (Anbefalinger for svangreomsorgen, 2013) (section 15.2.5). These health professionals often know a lot about the context of their patients, such as the family's socio-economic situation and medical history and they regularly observe parent-child interaction. The health professionals could play an important role in identifying situations where parents have difficulties in responding adequately to the child's signs and needs and they could potentially benefit from tools to help in evaluating these situations (Lykke et al., 2013).

1.1 | Mentalization

RF or mentalization were described as the ability to think about, understand, and interpret the actions of ourselves and others as meaningful based on intentional mental states such as feelings, beliefs, desires, thoughts, and fantasies (Fonagy et al., 1991). Mentalization differs from empathy and self-reflection by involving both oneself and others. Mentalization goes both ways, seeing ourselves from the outside and others from the inside. It is the capacity to hold other's mind in mind (Bateman & Fonagy, 2008; Fonagy et al., 2018). In the context of parenting, mentalizing has been defined as the parent's ability to understand their child's mental states, to keep those mental states

Key Findings

1. We found evidence supporting the previously reported three-factor structure of the P-PRFQ in a Danish general sample. The questionnaire showed moderate internal consistency.
2. Age, parity, occupation, anxiety, self-reported health status and recent life events may be important predictors for the prenatal parental mentalization capacity.
3. Despite a good factor structure, the P-PRFQ's moderate internal consistency, lack of association with constructs such as depression, trauma and attachment, its negative association with age and parity, and positive associations with anxiety, occupation, and health, indicate that the P-PRFQ may not reflect P-PRF in early pregnancy or be an adequate screening instrument.

in mind, and to understand how they impact the child's behavior (Ordway et al., 2015; Slade, 2005). More specifically, the mother's PRF is characterized by the ability to visualize herself in the maternal role, thinking of her child and the relationship with the child (Slade, 2005). It is difficult for outsiders to access the process of maternal mentalization, but it might be investigated through the woman's representations of herself as a mother and of the baby. Such representations become increasingly specific throughout pregnancy, where studies have shown that maternal mentalization develops (Fonagy et al., 1991). It is therefore important to realize that RF is a dynamic, developmental, and bidirectional capacity that is context- and relationship specific (Luyten, Nijssens, et al., 2017; Slade, Grienenberger, et al., 2005).

1.2 | The prenatal parental reflective functioning questionnaire

The prenatal parental reflective functioning questionnaire (P-PRFQ) was developed from the parental reflective functioning questionnaire (PRFQ) (Luyten, Mayes, et al., 2017) to assess self-reported PRF in the prenatal period (Pajulo et al., 2015). The questionnaire was designed to assess capacity for RF in the second and third trimesters. Both exploratory and confirmatory factor analyses have yielded three factors within the P-PRFQ namely: Factor 1 "*Opacity of mental states*" reflecting the parent's ability to recognize the opacity of mental states, specifically the extent to which

the parent is certain or uncertain about the mental states of the child; Factor 2 “*Reflecting on the fetus-child*” reflects the degree of consideration of mental states and relationship with the baby at the current stage of pregnancy; Factor 3 “*The dynamic nature of mental states*” reflects the level of flexibility in considering mental states in different persons through present/past/future (Pajulo et al., 2015).

1.3 | Impacts on reflective functioning

Most published research has primarily investigated maternal RF in the postnatal period. Less is known about RF during pregnancy and its effect on future parenting practices. It is well established that the mother’s experience of the pregnancy and the nature of her developing relationship with the baby is expected to influence her postnatal interactive behavior with her child (Fonagy et al., 2007; Slade, 2005; Smaling et al., 2016). Research regarding PRF has convincingly demonstrated that the higher the PRF, the better social outcomes and the fewer internalizing and externalizing problems within the child (Camoirano, 2017; McMahon & Bernier, 2017). PRF has been positively linked to maternal sensitivity (Camoirano, 2017; Kelly et al., 2005) and secure mother-infant attachment (Camoirano, 2017; Fonagy et al., 2018; Kelly et al., 2005; Slade, 2005; Slade, Sadler, et al., 2005). Studies have investigated the risk factors for poor PRF. Substance abuse and alcohol consumption during pregnancy (Cyr et al., 2010; Pajulo et al., 2012; Suchman et al., 2010), maternal/parental psychiatric illness (Condon & Corkindale, 1997; Perry et al., 2015), single parenthood (Huth-Bocks et al., 2004), low educational attainment (Pajulo et al., 2006; Rosenblum et al., 2008), high levels of stress/arousal (Bateman & Fonagy, 2008; Fonagy et al., 2018; Slade, Sadler, et al., 2005), mother’s own insecure attachment (Luyten et al., 2010), and adverse childhood events (Håkansson et al., 2018; Yu et al., 2020) tend to be negatively associated with mentalizing, whereas some find no association (Stacks et al., 2022; Suardi et al., 2020). A study from 2014 consisting a diverse sample of women with or without a history of childhood maltreatment showed that concurrent depression symptoms positively correlated with mother’s PRF (Stacks et al., 2014), where in contrast the study from Perry et al. (2015) concluded that prenatal PRF was significantly negatively correlated with depression.

Most of the examined risk factors have been investigated in relation to postnatal PRF but not in relation to prenatal PRF. Because of the importance of early parent-child relationships, changing distorted parent attitudes and dysfunctional parent behaviors is likely to be more important when children are smaller (Pajulo et al., 2015).

Consequently, more attention has been given to interventions and preventive programs during pregnancy to improve prenatal parental reflective functioning (P-PRF). There are few available studies on P-PRF. Some studies show correlations between psychosocial risk factors during pregnancy and P-PRF, and other studies show none. One study found that women with mental health problems, substance use or social problems had lower P-PRF than did pregnant women with none of the problems mentioned above (Smaling et al., 2015). However, the Perry study (Perry et al., 2015) gives somewhat different findings, concluding that psychosocial risk factors or involvement with child protection services among women on opiate substitution treatment were not associated with P-PRF (Perry et al., 2015). P-PRF was associated with maternal-fetal bonding (Røhder et al., 2020), where the association was measured in early pregnancy at a mean gestation age 16.4 (SD 3.9; range 10.3–27.7) weeks. A study by Wong reported no difference in P-PRF or PRF between primiparae and multiparae (Wong, 2016), where another study showed that primiparae have higher P-PRF as measured with P-PRFQ (Vahidi et al., 2021).

The P-PRFQ is one of the very few tools aiming to access information about parent’s prenatal mentalization skills. To access the parent’s mentalization skill as early as possible is clinically important, since the mother’s capability of mentalizing her unborn child is likely to predict the mother-child relationship and the child’s social outcomes. It could potentially be valuable to have a valid brief screening tool available for antenatal consultations in primary obstetric care, yielding useful information about P-PRF to the clinician.

1.4 | Study aims

This exploratory study aimed to validate the P-PRFQ as a screening tool in early pregnancy, for use by physicians in a Danish context. The instrument has been used in Denmark once previously (Røhder et al., 2020), but has not been validated before use. We first tested the dimensional structure of the P-PRFQ. We expected to find evidence for the three-factor structure mentioned above. We aimed to determine which factors from the Pregnancy Health Record, sociodemographics, physical, and mental well-being were most strongly related to P-PRFQ score in a Danish sample of pregnant women. Since it is the first time that associations of these predictors with the P-PRFQ have been investigated, no specific hypotheses were made about the relative weight of each risk factor. We hypothesized that older and multiparous women with no mental or physical illness would achieve higher P-PRFQ scores consistent with finding from previous studies.

2 | METHODS

2.1 | Design

This cross-sectional descriptive study was part of a general practice-based cluster randomized trial “Family Well-being in General Practice” (FamilieTrivsel). The FamilieTrivsel trial focuses both on quality improvement of preventive parent-child consultations in general practice (GP) and on child and family mental health (FamilieTrivsel i almen praksis: a mentalisation programme for families with young children, 2019).

2.2 | Setting

Data were collected from patients attending GPs in two regions: Capital Region and Region Zealand. Sixty-nine GP clinics participated in a project about strengthening a focus on psycho-social well-being in the setting of scheduled antenatal appointments. The study was nested in the FamilieTrivsel cluster-randomized controlled trial where participants in the intervention arm were encouraged to use a web-based program to increase resilience in families (FamilieTrivsel i almen praksis: a mentalisation programme for families with young children, 2019). FamilieTrivsel recruited pregnant women from October 2019 to June 2021. All women were given oral and written information about the study at their first antenatal visit. Women who wanted to participate gave written consent granting access to the Pregnancy Health Record and allowing the researchers to contact them regarding questionnaires to be filled out.

2.3 | Participants

Exclusion criteria in the FamilieTrivsel project for families were as follows: Inability to complete questionnaires or participate in intervention because of very limited Danish language comprehension, families planning to move to a new GP during pregnancy or shortly after giving birth, mothers who have already participated in the trial, and first presentation to the GP after the time for the third scheduled antenatal visit (32 weeks gestation). Miscarriage or other pregnancy loss after recruitment to the original study led to late exclusion (FamilieTrivsel i almen praksis: a mentalisation programme for families with young children, 2019). Further exclusion criteria for the subsample in this study were incomplete P-PRFQ and missing items in relevant questionnaires. Participating women answered questionnaires about psycho-social wellbeing at

the time of recruitment. All responses submitted in the study database (REDCap) before March 11, 2021, were included in this study. Two hundred and eighteen of 906 women did not join or left the study for different reasons. Based on reports from 34 of 58 practices, we know that the three most common reasons for not participating recorded by the GP were *no specific reason* (21.5%), *language problems* (15.5%), and *lack of time* (12.8%).

2.4 | Measures

Data were collected from the baseline-measures in the FamilieTrivsel trial. Information about the women was collected from an electronic self-report patient questionnaire and from The Pregnancy Health Record. The following parts of the questionnaire were used: age, cohabitation status, children living at home, and occupation. The following parts from the Pregnancy Health Record were used: fertility treatment, parity, lifestyle risk factors (Smoking, alcohol consumption, substance abuse during pregnancy), use of psychotropic drugs during pregnancy, and experience of fetal death (induced- or spontaneous abortion and stillbirth).

2.4.1 | Prenatal parental reflective functioning questionnaire

The P-PRFQ is a 14-item questionnaire which claims to assess the pregnant woman's capacity to think of the fetus as a separate individual with its own needs, temperament, and developing features (Pajulo et al., 2015). Item response options are on a 7-point Likert scale. The questionnaire includes three types of items: nine items were “High-Low” scaling (7 = optimal PRF, 1 = low PRF), one item with “Low-High” scaling (1 = optimal PRF, 7 = low PRF) and four items with “Middle” scaling (4 = optimal PRF, 1 and 7 = low PRF, i.e., scoring 1, 3, 5, 7, 5, 3, 1). Higher scores should indicate higher prenatal mentalizing capacity (Pajulo et al., 2015). The reliability and validity of the P-PRFQ was investigated in the Finn-Brain Birth Cohort study, a large cohort consisting of 600 couples. The P-PRFQ showed good internal consistency. Cronbach alphas were .773 on the total scale and .687–.774 on the three factors (Pajulo et al., 2015). The results showed that the P-PRFQ scale was highly associated in a sample of 29 women with the interview-based prenatal PRF as coded with the Pregnancy Interview (Pajulo et al., 2015; Slade et al., 2004). We used a Danish version of the P-PRFQ, translated by Røhder et al. using backward-forward translation (Røhder et al., 2020)

2.4.2 | The experiences in close relationships scale – short form

With the experiences in close relationship scale – short form (ECR-S), adult attachment style was assessed through the 12-item questionnaire (Wei et al., 2007). With a 7-point Likert scale items are rated from 1 (strongly disagree) to 7 (strongly agree). ECR-S includes two subscales that address avoidance and anxiety related to adult attachment style. The avoidance subscale characterized individuals who avoided intimacy or felt discomfort with closeness, whereas the anxiety subscale characterized individuals who were afraid of being rejected or abandoned (Brennan et al., 1998). Higher scores are associated with more insecure adult attachment styles (Wei et al., 2007). Research has demonstrated good internal consistency reliability with coefficient alphas being .71 for anxiety and .84 for avoidance (Wei et al., 2007). In this study, the Danish translation of the ECR-S was used (Esbjörn et al., 2015).

2.4.3 | Hospital anxiety and depression scale

The hospital anxiety and depression scale (HADS) is a 14 item self-rating scale comprising two sub-scales, HADS-anxiety and HADS-depression measuring anxiety and depression symptoms, respectively (Zigmond & Snaith, 1983). Individual items are rated on a five-point (0–4) Likert scale. The subscale scores range from 0 to 21. 0–7 indicates low risk, 8–10 indicates borderline risk, and 11–21 indicates high risk for depression and/or anxiety (Zigmond & Snaith, 1983). HADS has been translated into Danish, and psychometric properties of the scale have been explored and good internal consistency was shown with Cronbach's alpha of .87 for HADS-anxiety and .82 HADS-depression (Christensen et al., 2020).

2.4.4 | The recent life events questionnaire

The recent life events questionnaire (RLEQ) was developed by the UK Department of Health. The questionnaire assesses life events occurring in the last 12 months and the present influence of these life events on the respondents (Recent Life Events Questionnaire June 22, 2021). The questionnaire includes “chronic difficulties”, such as poverty or persistently discordant relationships and negative life events such as divorce, death of someone close, physical illness, and unemployment (Recent Life Events Questionnaire, June 22, 2021).

RLEQ is developed from the list of threatening experiences (Brugha et al., 1985) with an additional nine items. The scoring is binary, 1 if the event happened and 0 if

not. If the event still affects them, they were given 1 point. Total number of events that still affect the respondents is counted in addition to the simple count. The higher the score, the greater likelihood of long-term impact, particularly if the event still affects the participant (RLEQ, June 22, 2021). RLEQ was forward translated, back translated, and appraised to be used in the FamilieTrivsel trial.

2.4.5 | Adverse childhood experiences questionnaire

The adverse childhood experiences (ACEs) questionnaire was used to assess mothers' ACEs during the first 18 years of their lives. These childhood experiences have been shown to be highly linked to increased health problems and risk behaviors in adulthood (Felitti et al., 1998). This questionnaire assesses experience with forms of abuse (physical, emotional, and sexual), neglect (physical and emotional), and household dysfunction (e.g., domestic violence, substance abuse, etc.), retrospectively. The responses to the ACE items were dichotomized to convey exposure to a given type of experience, giving a total score ranging from 0 to 10 of ACE categories reported (Murphy et al., 2014). Four or more ACEs are typically interpreted as a threshold marking high ACE exposure (Dong et al., 2003). The ACEs demonstrated good internal consistency with Cronbach's alpha .86 (Murphy et al., 2014) and a good test-retest reliability (Dube, 2003).

2.4.6 | EuroQol 5D-5L or EQ-5D-5L

Group's 5-dimension health status questionnaire (EQ-5D-5L) is a brief self-reported generic measure of current health, which consists of five different dimensions: mobility, self-care, usual activities, discomfort/pain, and anxiety/depression. Each dimension has five levels: no problems, slight problems, moderate problems, severe problems, and extreme problems. The participants' score results in a 5-digit number that expresses the level of each dimension, which describes the participants' health state (11111 = best health vs. 55555 = worst health) with 3125 possible health states (Herdman et al., 2011). The score is converted into a single index utility-score, using a scoring algorithm based on Danish public preferences. Potential values from the algorithm ranged from $-.624$ to 1, where values lower than zero represent states considered to be worse than death (Van Hout et al., 2012). The questionnaire also includes a visual analogue scale (EQ-VAS), a rating of self-perceived health ranging from 0 to 100, ranging from the worst to the best health you can imagine, respectively (Herdman et al., 2011). The EQ-5D-5L has been used in a multitude of health

conditions. Validation studies can be found at the following link: <https://euroqol.org/eq-5d-instruments/3l-vs-5l/comparing-eq-5d-3l-and-eq-5d-5l-descriptive-system/>. The official EQ-5D-5L language version for Denmark was used (EQ-5D-5L | Self-complete version for use in REDCap, June 22, 2021).

3 | STATISTICAL ANALYSIS

3.1 | Confirmatory factor analysis

We applied a confirmatory factor analysis (CFA), to test if the three-factor structure of the P-PRFQ as indicated by the authors in the original paper was an acceptable fit for the data. The fit indices used were goodness of fit index (GFI) > .95; root mean square error of approximation (RMSEA) > .10 indicates poor fit, .08–.10 indicates mediocre fit, <.08 indicates an acceptable model fit, and <.05 a good model fit; Standardized root mean square residual (SRMR) < .06; and the comparative fit index (CFI) > .90 signifies acceptable fits and >.95 signifies good fits (Schreiber et al., 2006). Internal consistency was evaluated by Cronbach's alpha.

3.1.1 | Relative importance method

We used the relative importance method to explore which predictive variables yielded most information about P-PRFQ. We ranked possible predictive variables from the pregnancy health record, sociodemographics, physical, and mental wellbeing to access importance. The variables were analyzed as a categorical variables to avoid undue influence of outliers. The relative importance method is a useful supplement to multiple regression, because it provides information not readily available from the indices that are typically produced from a multiple regression analysis (Tonidandel & Lebreton, 2011). Relative importance refers to the proportionate contribution each predictor variable makes to the total predicted variance in a regression model, R^2 , considering a variable's contribution by itself and in combination with other predictor variables. The relative importance is calculated as the mean increase in the coefficient of determination, R^2 , associated with the addition of predictive variables to a multivariable linear regression model that can be constructed from the remaining variables that were investigated. In this way the relative importance of the predictive variables is calculated regardless of their position in a causal ordering. The Relative Importance Method is discussed in the following references (Collins & Feeney, 2004; Meredith et al., 2008; Tonidandel & Lebreton, 2011).

3.2 | Multivariable linear regression analyses

Subsequently multivariable linear regression analyses were conducted for the five most important factors identified by the relative importance method on the total P-PRFQ score and on each of the P-PRFQ factors. p -values < .05 were considered statistically significant. Statistical analysis was conducted using RStudio 1.3.1093 and SAS 9.4.

4 | RESULTS

Participants were included in the FamilieTrivsel project consecutively by their GP at their first antenatal assessment between October 2019 and June 2021. The sample consisted of 779 mothers, who submitted their response before March 11, 2021. Of these, 124 (15.9%) failed to return the P-PRFQ and were excluded from the analyses. A further 50 women (6.4%) were excluded due to questionnaires with missing items. No imputation was made, because of the small number of participants excluded due to missing questionnaire items. This left 605 mothers (77.7%), who had answered all the questionnaires with no missing items, who were included in the final analysis sample (Figure 1).

P-PRFQ scores did not differ significantly between those women who completed all the relevant items and those who had missing responses. The demographic characteristics of the sample are summarized in Table 1. Since all participants were female, gender is not included in the table. The mothers in the study were aged between 19 and 50 years old ($M = 31.74$, $SD = 4.71$). Mean gestational age at completion of the P-PRFQ was 11.98 weeks ($SD = 4.88$ weeks).

4.1 | Descriptive statistics

Initially, descriptive statistics for each variable were examined (see Table 2). Mothers endorsed moderate levels of total RF on the P-PRFQ total score ($M = 4.03$, $SD = .91$), for factor 1 “*Opacity of mental states*” the mean score was 4.33 ($SD = 1.27$), factor 2 “*Reflecting on the fetus-child*” slightly lower ($M = 3.80$, $SD = 1.26$) and for factor 3 “*The dynamic nature of mental states*” it was 4.00 ($SD = 1.25$). We plotted the P-PRFQ scores of participants against gestational age, finding that the mean score increases slightly over time. The difference was small, and only the increases in P-PRFQ total score and factor 1 “*Opacity of mental states*” were statistically significant (Supplementary Files 1 and 2).

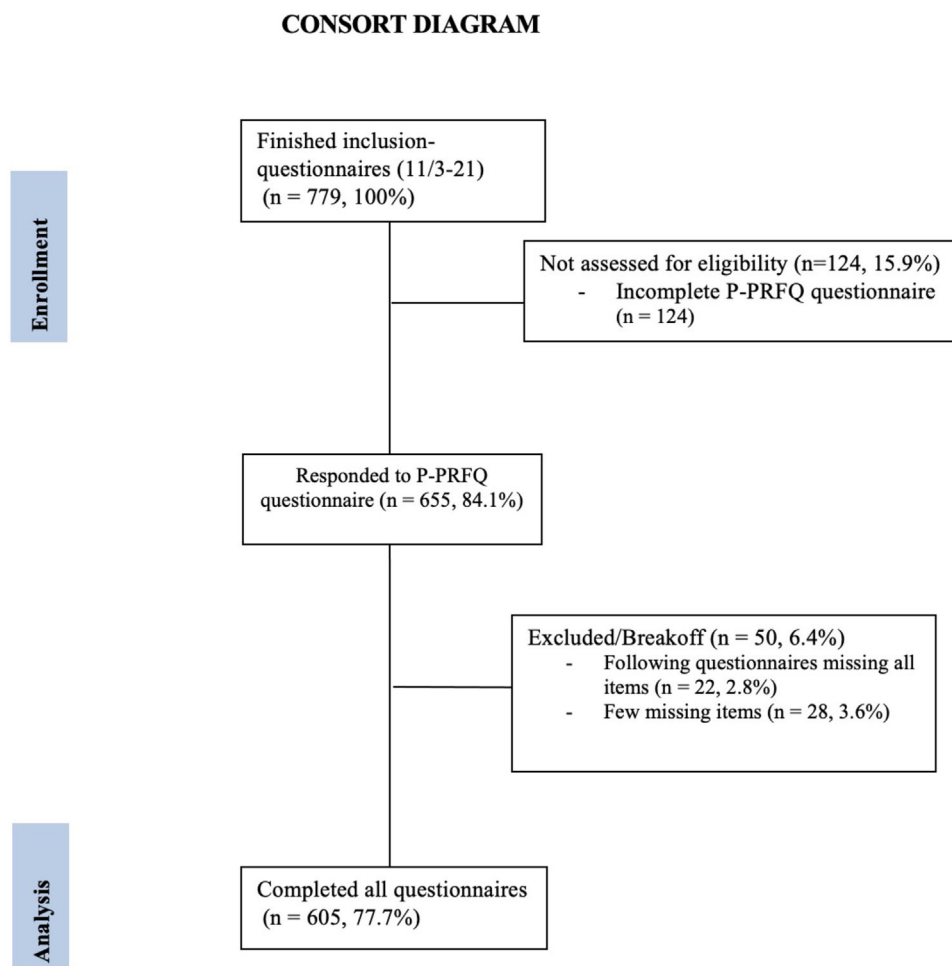


FIGURE 1 Consort flowchart.

In general, the sample was quite privileged with low scores in HADS-anxiety, HADS-depression, ECR (avoidant and anxiety score individually), the RLEQ and ACEs. The sample showed good self-reported health (utility-score $M = .83$, $SD = .12$ and VAS-score $M = 78.48$, $SD = 16.26$).

4.2 | Confirmatory factor analyses

Table 3 presents absolute and relative fit indices for a single factor model as well for Pajulo et al.'s three factor model including all 14 items. According to the fit indices, the three factor models was an improvement over the single factor model. The three-factor model had a lower RMSEA value, a higher GFI, and higher CFI value. The single factor model showed mediocre fit whereas the three factor models showed an acceptable fit in this sample. The instrument showed moderate internal consistency. Cronbach alphas were .753 on the total scale and .600–.702 on the three factors in this study. These findings confirm the factor model suggested by the original study (Pajulo et al., 2015).

4.3 | Relative importance method

Relative importance analyses testing the most important associations between the potential predictive variables and P-PRFQ with the three factors, respectively, are presented in Figures 2–5.

Detailed estimates of the predictive variables, representing the allocated individual R^2 contribution of P-PRFQ are presented in the Table 1. Correlation between parity and number of children <18 years in the home was highly correlated ($r = .85$, $p < .0001$) therefore only parity was included in the relative importance method. Figures 2–5 show how the predictive variables have differential impacts across the P-PRFQ factors. Some findings are especially noteworthy:

1. *Age and parity* were among the five most predictive variables for all of the three P-PRFQ factors and the P-PRFQ total score.
2. Compared to other predictive variables, *adverse childhood experiences* were less predictive for factor 3

TABLE 1 Sociodemographic characteristics.

	N = 605, n (%)
Age	
≤24 years	26 (4.3)
25–29 years	171 (28.2)
30–34 years	246 (40.7)
35–39 years	122 (20.2)
≥40 years	40 (6.6)
Cohabitation	
Single	33 (5.4)
Living with partner	571 (94.4)
Missing	1 (.2)
Children living at home	
Yes	353 (58.3)
No	251 (41.5)
Missing	1 (.2)
Occupation	
Employed	446 (73.7)
Studying	94 (15.5)
Unemployed	28 (4.6)
Sick leave	25 (4.1)
On leave from job	10 (1.7)
Not Specified	2 (.4)
Parity	
Para 0	281 (46.4)
Para 1	263 (43.5)
Para ≥ 2	61 (10.1)
Fetal death^a	
Yes	219 (36.2)
No	386 (63.8)
Lifestyle risk factors^b	
Yes	20 (3.3)
No	585 (96.7)
Use of psychotropic drugs	
Yes	14 (2.3)
No	591 (97.7)
ACEs	
None	218 (36.0)
One	170 (28.1)
Two	95 (15.7)
Three	49 (8.1)
Four or more	73 (12.1)
HADS-depression	
Low	567 (93.7)
Borderline	29 (4.8)
High	9 (1.5)
HADS-anxiety	
Low	498 (82.3)
Borderline	74 (12.2)
High	33 (5.5)

Abbreviation: ACEs, Adverse childhood experiences.

^aProvoked and/or spontaneous abortion + Stillborn.

^bSubstance abuse, intake of alcohol and/or smoking during pregnancy.

PPRFQ total score

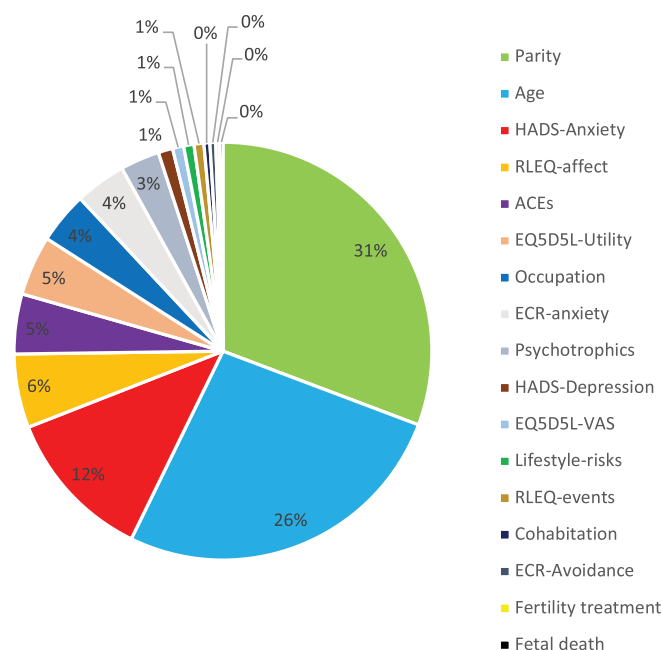


FIGURE 2 Relative importance analysis. The relative importance percentage R^2 of the predictive variables assessed for importance for prenatal parental reflective functioning questionnaire (P-PRFQ) total score. Estimates are adjusted to sum to 100%.

“The dynamic nature of mental states” and Recent Life Events with persistent impact for factor 1 “Opacity of mental states.”

Apart from the above-mentioned variables, different predictive variables contributed to the total score and the three factors. For P-PRFQ total score and factor 2 *“Reflecting on the fetus-child” anxiety* was included in the five most important predictive variables. For factor 1 *“Opacity of mental states” depression and occupation* were included in the five most important predictive variables. For factor 3 *“The dynamic nature of mental states”, occupation and health-related quality of life utility score* were among the five most important predictive variables (Table 4).

4.4 | Multivariable linear regression analysis

Table 5 reports the direction of the effects on the five most important predictive variables identified in the relative importance analyses for P-PRFQ total score and the three factors individually. Supplementary File 3 shows a correlation matrix including P-PRFQ data and the individual variables. The effect estimates show that P-PRFQ

TABLE 2 Descriptive statistics.

	Range		Potential	Actual	α
	M	SD			
P-PRFQ					
Total score	4.03	.91	1–7	1.14–6.29	.753
Factor 1 “ <i>Opacity of mental states</i> ”	4.33	1.27	1–7	1–7	.600
Factor 2 “ <i>Reflecting on the fetus-child</i> ”	3.80	1.26	1–7	1–7	.685
Factor 3 “ <i>The dynamic nature of mental states</i> ”	4.00	1.25	1–7	1–7	.702
HADS					
HADS-anxiety	4.59	3.27	0–21	0–21	.793
HADS-depression	2.97	2.55	0–21	0–18	.741
RLEQ					
No. of events	3.14	2.46	0–21	0–12	.631
No. of events with persistent impact	.92	1.37	0–21	0–10	.579
EQ-5D-5L “Health related quality of life.”					
Utility-score	.83	.12	–.62–1	.16–1.0	.704
EQ-VAS	78.52	16.08	0–100	10–100	
ECR-S					
Total score	28.71	7.75	2–84	14–65	.665
Avoidant-score	11.29	4.14	6–42	6–29	.606
Anxiety-score	17.43	5.62	6–42	6–42	.616
ACEs					
Total score	1.47	1.75	0–10	0–9	.696

Note: Means, Standard Deviations, Potential/actual range, and Cronbach’s alphas for the predictive psychometric variables.

Abbreviations: ACEs, Adverse childhood experiences; ECR-S, The Experiences in Close Relationships Scale; EQ-5D-5L, EuroQol Group’s 5-dimension health status questionnaire; HADS, Hospital Anxiety and Depression Scale; P-PRFQ, Prenatal Parental Reflective Functioning questionnaire; RLEQ, The Recent Life Events Questionnaire.

TABLE 3 Results of confirmatory factor analyses (CFA) in the Danish sample ($n = 605$.)

	GFI	RMSEA (90% CI)	SRMR	CFI	Cronbach’s α
Target value	>.95	<.06	<.06	>.95	>.95
One factor	.8552	.1108 (.1030–.1188)	.0923	.6911	.753
Three factors	.9020	.0861 (.0780–.0944)	.0696	.8208	.600 .685 .702

Abbreviations: CFI, Comparative Fit Index; GFI, Goodness of Fit; RMSEA, Root Mean Square Error of Approximation; SRMR, Standardized Root Mean Residual.

scores decrease with increasing age, parity, higher health-related quality of life utility score, lower anxiety score, fewer negative life events with persistent and current impact and current employment. We found no association between adjusted *depression* and *adverse childhood experience* scores and the P-PRFQ score, respectively.

5 | DISCUSSION

In line with other studies, we found that the P-PRFQ has a three-factor structure in this Danish sample. The instrument also showed moderate internal consistency. Age, parity, occupation, anxiety-score, self-reported health status, and recent negative life events with persistent

impact tend to be associated with mentalization capacity. That P-PRF was not associated with attachment in close relationships, was negatively associated with age and parity and its moderate Cronbach’s alphas raise concerns regarding whether the P-PRFQ can be used as a brief screening instrument to assess RF in early pregnancy. Further research is needed to assess whether it has value as an instrument in primary health care.

5.1 | Dimensionality of the P-PRFQ

Confirmatory factor analysis provided support for the suggested three-factor model of the P-PRFQ, assessing *Opacity of mental states*, *Reflecting on fetus-baby*, and *the dynamic*

TABLE 4 The relative importance percentage R^2 of the five most predictive variables assessed for importance for P-PRFQ total score and the three factors.

P-PRFQ total score		Factor 1 "Opacity of mental states"		Factor 2 "Reflecting on the fetus-child"		Factor 3 "The dynamic nature of mental states"	
Predictive variable	RI estimate	Predictive variable	RI estimate	Predictive variable	RI estimate	Predictive variable	RI estimate
Parity	.3074	ACEs	.2457	Age	.2954	Parity	.3308
Age	.2649	Occupation	.1643	ACEs	.1623	Age	.1541
HADS-anxiety	.1184	Age	.1247	Parity	.1385	Occupation	.0879
Negative life event with persistent impact*	.0571	Parity	.1186	HADS-anxiety	.1026	Negative life event with persistent impact*	.0827
ACEs	.0464	HADS-depression	.0875	Negative life event with persistent impact*	.072	EQ-5D-5L utility score	.0743

Abbreviations: EQ-5D-5L, EuroQol Group's 5 dimension health status questionnaire; HADS, Hospital Anxiety and Depression Scale; P-PRFQ, Prenatal Parental Reflective Functioning questionnaire; *RLEQ, The Recent Life Events Questionnaire.

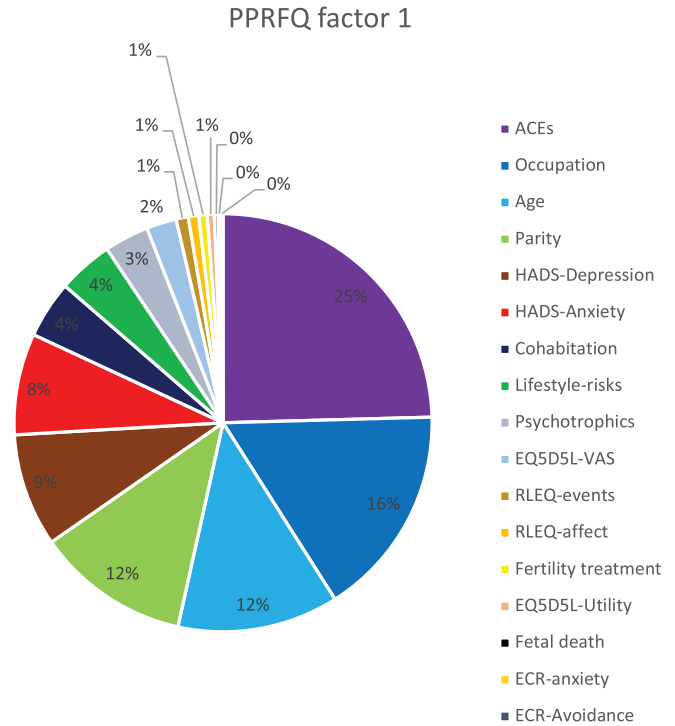


FIGURE 3 Relative importance analysis. The relative importance percentage R^2 of the predictive variables assessed for importance for prenatal parental reflective functioning questionnaire (P-PRFQ) factor 1 "Opacity of mental states." Estimates are adjusted to sum to 100%.

nature of the mental states. The CFA fit indices were somewhat lower in the present study compared to the good fit in the original study (Pajulo et al., 2015). These differing results suggest that each study using P-PRFQ should undertake their own factor analyses based on their own sample, to decide if the structure is applicable for their sample. The Cronbach's alpha demonstrated satisfactory internal consistency.

5.2 | P-PRFQ and predictive variables

We found that age and parity are among the most important predictors of the P-PRFQ total score and the three factors. The results show that older women and multiparous women tend to have a lower P-PRFQ score, initially suggesting they might have lower mentalizing capacity than primiparous young mothers. That the P-PRFQ was negatively correlated with maternal age and parity was unexpected. One of the strongest predictors for PRF, the mothers' own attachment history, was surprisingly not among the five most important predictors in the relative importance method when indirectly assessed through the ECR-S.

TABLE 5 Multivariable linear regression analysis for the five most important predictive variables on each PPRFQ total score and each factor.

	Mean + SD	P-PPRFQ total score		Factor 1 "Opacity of mental states"		Factor 2 "Reflecting on the fetus-child"		Factor 3 "The dynamic nature of mental states"	
		Estimate (CI)	p value	Estimate (CI)	p value	Estimate (CI)	p value	Estimate (CI)	p value
Parity	.66 (.75)	-.19 (-.29, -.08)	.003	-.12 (-.28, -.03)	.1087	-.16 (-.31, -.02)	.0221	-3.22 (-.46, -.18)	<.001
Age	31.7 (4.71)	-.03 (-.04, -.01)	.003	<.01 (-.02, .02)	.9992	-.04 (-.06, -.02)	.0002	-.03 (-.06, .01)	.0037
HADS-anxiety	4.59 (3.27)	.05 (.02, .07)	< .001	-	-	.06 (.03, .09)	.0003	-	-
RLEQ - No. affects	.92 (1.37)	.06 (.00, .12)	.0276	-	-	.06 (-.02, .13)	.1360	.12 (.04, .19)	.0015
ACEs	1.47 (1.75)	<.01 (-.03, .04)	.7799	-.05 (-.11, .01)	.0808	.05 (-.00, .11)	.0663	-	-
HADS-depression	2.97 (2.55)	-	-	<.01 (-.04, .04)	.9976	-	-	-	-
EQ-5D-5L utility score	.83 (.12)	-	-	-	-	-	-	-1.19 (-2.05, -.33)	.0069
Occupation N (%)	-	-	-	-	-	-	-	-	-
Employed	446 (73.7)	-	-	Ref	Ref	-	-	Ref	Ref
Studying	94 (15.5)	-	-	<.01 (-.31, .30)	.9906	-	-	.02 (-.27, .30)	.9116
Unemployed	28 (4.6)	-	-	.45 (-.03, .94)	.0686	-	-	-.48 (-.94, -.01)	.0423
Sick leave	25 (4.1)	-	-	.42 (-.10, .94)	.1143	-	-	-.38 (-.89, .12)	.1380
On leave from job	10 (1.7)	-	-	.54 (-.27, 1.36)	.1937	-	-	.611 (-.15, 1.38)	.1174
Missing	2 (.4)	-	-	-.10 (-1.87, 1.67)	.9137	-	-	.54 (-1.12, 2.20)	.5255

Note: The table shows the distribution of the predictive variables, and the size and direction of their effects.

Bold font indicates statistical significance, p-value < .05.

Abbreviations: ACEs, Adverse childhood experiences; EQ-5D-5L, EuroQol Group's 5-dimension health status questionnaire; HADS, Hospital Anxiety and Depression Scale; P-PPRFQ, Prenatal Parental Reflective Functioning questionnaire; RLEQ, The Recent Life Events Questionnaire.

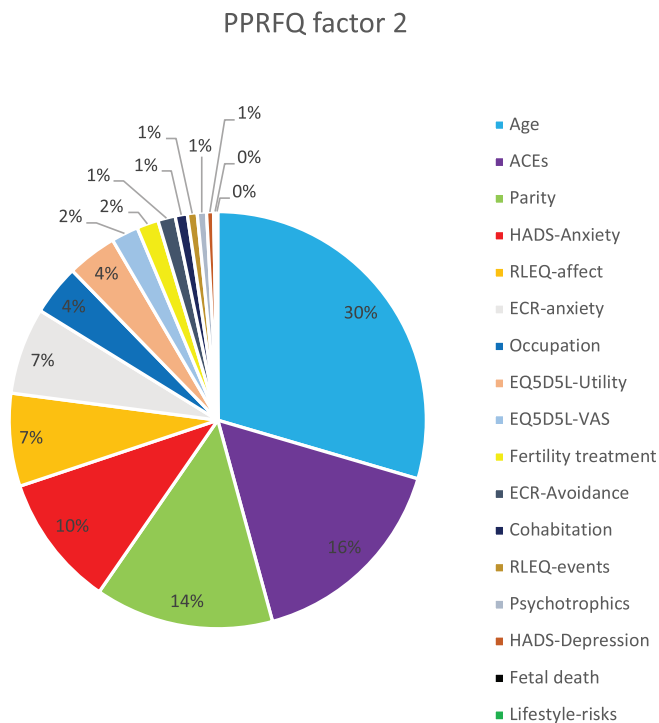


FIGURE 4 Relative importance analysis. The relative importance percentage R^2 of the predictive variables assessed for importance for prenatal parental reflective functioning questionnaire (P-PRFQ) factor 2 “Reflecting on the fetus child.” Estimates are adjusted to sum to 100%.

Maternal RF has been reported to develop as the mother grows into the maternal role, becoming more experienced with the infant and mother and child get to know each other better (Fonagy et al., 1991). Another study reports that older mothers tend to have higher levels of RF, which is largely in line with the fact that the capacity for RF develops over time and across adolescence and early adulthood (Sleed et al., 2020). In addition, first-time mothers tended to have higher RF scores in our study than those with children, which is quite contrary to what might be expected (Fonagy et al., 1991; Sleed et al., 2020; Smaling et al., 2016). Pajulo et al. (2015) did not find any associations between P-PRFQ scores and parental age, but also concluded that parity negatively correlated with P-PRF. Similar results were found in a study by Vahidi (Vahidi et al., 2021). Another study found no difference in P-PRF between primiparae and multiparae (Wong, 2016). One possible explanation for these paradoxical findings could be that inexperienced first time mothers may need to work harder to make sense of their unborn children, especially in the first trimester, an active process of mentalizing compared to experienced mothers as the transition to motherhood happened during the first pregnancy (McGuire et al., 1995; Slade, 2009). This is shown especially in factor 2 “*Reflecting on the fetus-child*” where items included are closely related

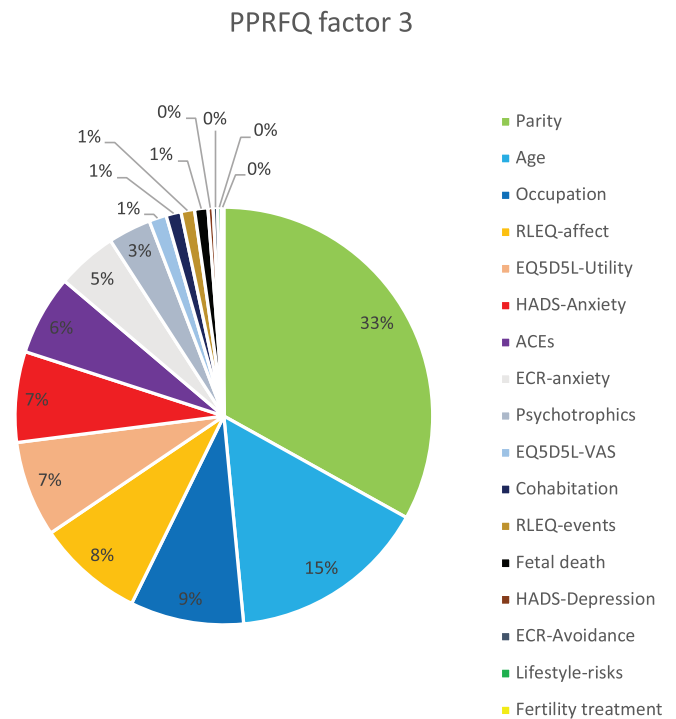


FIGURE 5 Relative importance analysis. The relative importance percentage R^2 of the predictive variables assessed for importance for prenatal parental reflective functioning questionnaire (P-PRFQ) factor 3 “The dynamic nature of the mental states.” Estimates are adjusted to sum to 100%.

to experiencing emotional connectedness and thinking of the fetus-baby, which may be greater for nulliparous women (Pajulo et al., 2015). Another explanation could be that women with several children are more likely to be preoccupied with other matters having less focus on the fetus compared to nulliparous women. The findings from this study make several contributions to the current literature, confirming the common associations of age and parity. The relative importance method attempts to disentangle the effects of age and parity but may not fully succeed and possibly the importance of age and parity have to be viewed as covering both the age and parity concepts. An association between low RF and reports of mental health difficulties such as depression, anxiety and adverse childhood events is expected. We did not find that depression or adverse childhood events were associated with P-PRF, and furthermore we found that mothers who had more anxiety reported higher P-PRF. These findings are not consistent with many other studies. While some studies do show depression and P-PRF and PRF are not associated (Alismail, 2017), many studies have found these associations. Symptoms of depression (Condon & Corkindale, 1997; Huth-Bocks et al., 2004), anxiety (Bateman & Fonagy, 2012; Nolte et al., 2011) and adverse childhood events (Håkansson et al., 2018; Yu et al., 2020) feature

deficits in mentalizing. Hence, assessing the interrelationship of these risk factors and RF, and screening for each of them in pregnancy, could identify women who should have special attention because of potential future mother-infant difficulties. It was surprising that anxiety had a weak, but positive correlation with the P-PRFQ score, indicating the higher anxiety the higher the P-PRFQ score. Surprisingly no significant correlation between the P-PRFQ score and tendency towards depression or greater number of adverse childhood events, respectively, was found, given that previous studies report antenatal RF being significantly negatively correlated with depression (Perry et al., 2015). This correlation was confirmed in the study by Condon and Corkindale (1997), where depression had a significant impact on antenatal RF and attachment. Regarding adverse childhood events, it is possible that exposure to adverse events does not impact mentalization capacity, but only mentalization regarding trauma. Similar findings support this hypothesis, showing that pregnant women with a history of childhood abuse did not exhibit reduction in their general mentalization, but had significant impairments in mentalizing specifically in the context of trauma (Ensink et al., 2014).

The positive correlation between RF and mental health difficulties may be linked to specific aspects of mentalizing, such as implicit or automatic mentalizing and with distorted modes of mentalizing, for example, hypermentalizing which could explain the positive correlation in the anxiety score (Bateman & Fonagy, 2012). Bateman and Fonagy explain that hypomentalization is often surprisingly accompanied by “extreme pretend mode” also known as hypermentalization, in which the relation to reality may be severed. Reports on mentalization may, on first impression, seem to be based on genuine mentalizing, but later several features may distinguish this pretend-mode/distorted mode from genuinely high levels of mentalizing. For example, such individuals often give overly detailed responses, but they may have a self-serving function and be overly cognitive.

These findings are supported by the health-related quality of life (EQ-5D-5L) which was important for factor 3 “*The dynamic nature of mental states*”, indicating the higher the utility score (better health), the lower the ability to consider mental states in different persons through time. This finding was statistically significant but again counterintuitive. As no previous study has investigated health related quality of life as predictor of P-PRFQ directly, we cannot compare these results with others. However, other studies have suggested that being healthy and having good physical wellness affect the way pregnant women adapt to motherhood and the feeling of being connected to the fetus, which may be highly important for the mother’s capacity to mentalize (Ji & Han, 2010).

A previous study found that being exposed to recent stressful life events and experiences will negatively affect one’s mentalization capacity: people who experienced stressful life events showed greater difficulty in discriminating emotional signals, difficulty in being attentive and aware of the experience of the present moment in daily life and difficulty in interpreting others’ perspective or point of view (Parada-Fernández et al., 2020). It was therefore not anticipated that the number of recent life events with persistent impact still affecting the participants had a significant positive association with the P-PRFQ total score and with factor 3 “*The dynamic nature of mental states*”. Similar results were found by Paris et al., showing P-PRFQ to be positively associated with trauma symptoms (posttraumatic stress disorder checklist) and psychological distress (brief symptom inventory) and to be negatively associated with a measure of resiliency (The Connor-Davidson resilience scale) Paris et al. (2023). Loss of mentalization is associated with stress, resulting in temporary failures of mentalization which arise when intense interchanges are experienced. In such situations, the parent can be quite preoccupied with concrete life issues, for example, crisis at work, serious illness, and death of family members which reduce the capacity for mentalization (Midgley & Vrouva, 2012). On the other hand, the authors of the previous study point out that stressful life events improved compassion and concerns for others, in this situation the unborn child, which may explain the positive correlation between affecting life events and P-PRFQ (Parada-Fernández et al., 2020).

Finally, occupation was one of the five most predictive variables for factor 1 “*Opacity of mental states*” and 3. In general there were no significant differences between RF of mothers regarding occupation, except in factor 3 “*The dynamic nature of mental states*”, where unemployed mothers had statistically negative correlation to the P-PRFQ, which was unsurprising given that high levels of chronic stress of being unemployed may lower the ability to mentalize (Sleed et al., 2020).

Previous studies have showed that high level of arousal, stress, and distress are known to impair mentalizing capacity, and may potentially influence RF of mothers. (Bateman & Fonagy, 2008; Fonagy et al., 2018; Slade, Sadler, et al., 2005). The nonsignificant difference between mother’s RF and current occupation was therefore not expected given that parents with a higher level of education and higher probability of employment are related to higher PRF and an assumption of higher overall intelligence, where mentalizing has shown a positive association in studies by Sleed et al. (2020). The reason may be that parents who are unemployed, on sick leave etc. overestimate their parental RF compared to parents with a higher level of education, where it is expected that more highly educated parents

assess their ability to mentalize more accurately. Pajulo and colleagues (2015) reported similar findings, that the P-PRFQ negatively correlated with maternal education level.

5.3 | Is the P-PRFQ an appropriate screener in early pregnancy?

Despite a good factor structure, the P-PRFQ's moderate internal consistency, lack of association with constructs such as depression, trauma, and attachment, its negative association with age and parity, and positive associations with anxiety, occupation, and health, indicate that the P-PRFQ may not reflect P-PRF in early pregnancy or be an adequate screening instrument.

To assess face validity, we made regressions analyses on the five most important predictive variables to see its associations to the P-PRFQ scores. Nevertheless, the direction of its associations with the predictive variables tested is completely the opposite of what was expected. The fact that all predictors produced the opposite result than expected, for example, reduced RF with age and experience of child-rearing raise concerns about whether the P-PRFQ measures RF or another construct altogether such as the amount of preoccupation with the pregnancy.

There are several possible explanations for our findings.

Self-report questionnaires to measure the capacity for mentalization are easy to administer, although their validity may be limited by the participant's own judgement about their mentalization capacity. Mentalization is a skill, and the ability to report precisely on it may require exactly this skill. We do find concerns about whether the P-PRFQ measures mentalization capacity or if it only assesses the attitude towards mentalizing more than the ability itself. Genuine mentalizing should not be confused with hypermentalizing. With a self-report questionnaire, we think it may be impossible to address this problem. However, these assessed attitudes from the P-PRFQ may be directly linked to the actual mentalizing capacity. Limitation in self-knowledge and consequent biases associated with assessment of personality features through self-report questionnaires are well demonstrated (Roefs et al., 2011). In contrast, undertaking an interview measuring RF by being asked direct questions about intimate thoughts and feeling is different to questionnaire completion and may perhaps give a clearer picture of mentalization capacity. Self-report questionnaires require the participant to have insight into their own skills and may be more vulnerable to biased forms of reporting, whereas the interviewer's capacity to uncover unconscious bias in discerning different levels of RF capacity plays a crucial role in interview-based assessment. It is likely that structured observation of inter-

actions could yield a more accurate assessment of reflective function. Observational measures are of particular interest because they have the potential to assess on-going mentalization as a live process (Fogtman Fosgerau et al., 2018; Jensen et al., 2021). Further research is needed to achieve more insight regarding this problem.

The recruited women in the present study were sent the P-PRFQ questionnaire after they gave consent to participate the study at the first antenatal visit. One possible explanation for our findings could be that the questionnaire was used too early in the pregnancy. Pajulo et al. (2015) explained the prenatal mentalization to the parent's capacity to think of the fetus-child, from at least the last trimester onward with a sample above average gestational age compared to our sample. In this study the questionnaire was generally completed in the first trimester. To address this limitation, we compared the P-PRFQ scores of mothers in their first trimester to those of women in their second and third trimester. These analyses showed a small difference in the P-PRFQ total score and factor 1 score "*Opacity of mental states*", but no statistically significant difference in factor 2 "*Reflecting on the fetus-child*", and factor 3 "*The dynamic nature of mental states.*" These results suggest that the P-PRFQ is as likely to be as informative in early pregnancy as in later pregnancy since the results are similar to those reported in other published studies (Supplementary Files 1 and 2).

In addition, the sample of women was quite privileged, which may be seen as a nonrepresentative sample. Thus, it is suggested to continue research in different contexts of the pregnancy and with more representative at-risk samples to build more consistent knowledge.

To test the construct validity, the authors from the original study calculated Pearson correlation coefficients between the P-PRFQ and to the Pregnancy Interview (PI), which is seen as the gold standard assessment of P-PRF capacity. These analyses were based in a group consisting of only 29 pregnant women. The Pearson coefficients showed high correlation in the P-PRFQ total score and moderate correlation for the three factors.

The psychometric properties of the questionnaire were not fully investigated. An analysis of these properties forms the core of construct validation with, for example, test of differential item functioning (DIF). Without such measurement it is not clear to what extent the content of an item affects the endorsement of subgroups. With DIF it is possible to determine whether the items and the P-PRFQ score are varying in the same way for all subgroups as, for example, age and parity. With these analyses, unexpected behavior of items on a test can be detected (Brodersen et al., 2007). Since Pajulo et al. (2015) did not apply such test, but only validated the construct validity by Pearson correlation coefficients on only 29 women, we see this validation as

superficial, measuring only criterion validity and is not an assessment of the instrument's real psychometric properties. Ignoring such analyses can induce variance and make a weak instrument.

6 | STRENGTHS AND LIMITATIONS

This is the first study to use CFA to assess dimensionality of the P-PRFQ in a large Danish sample. The validity of the P-PRFQ was further explored against the five most important predictors found by the relative importance method. Mapping a parent's ability to have their child's mind in mind would be valuable for any researcher or clinician working with mental health and child development. The P-PRFQ is one of the very few tools aiming to access information about parent's prenatal mentalization skills. To obtain the full picture, certain limitations of the P-PRFQ should be addressed.

First, all data were assessed using self-report instruments rather than clinical interviews or observations of interactions, which may contribute to response bias and recall bias. To study further validation of the instrument we should have implemented interview-based tool to assess P-PRF, for example, PI, which may result in more accurate findings. This was not possible, because we did not have access to a certified interviewer. We also expected mothers' own attachment history to be one of the five most predictive variables for the P-PRFQ score, which proved not to be the case. The ECR-S does not assess maternal attachment history directly, and an attachment interview would have been more informative. Such analyses could be very valuable in the future.

Second, the women in our sample were quite privileged with good physical and mental health, the majority were in employment and in intimate relationships. It seems reasonable to assume that women with severe physical and mental health problems and lower socioeconomic status will present with greater mentalization difficulties. Participants had to speak and comprehend Danish properly, potentially introducing selection bias. An important direction for future research is to investigate this issue as well as potential differences in prenatal mentalization capacity among different at-risk groups.

Third, we collected data from our sample in early pregnancy when mentalization capacity may be poorly developed. Little is known about PRF in early pregnancy, but it is likely to be less well developed than in late pregnancy, where Pajulo et al. first validated the measure. Nevertheless, we found our scores to be rather similar to those obtained in late pregnancy in similar populations.

Replication of our findings in later pregnancy would be valuable.

Fourth, our dataset did not include background information regarding educational background, marital status, whether experience of pregnancy loss was induced or resulting from spontaneous abortions etc.

We used the relative importance method to approach what directly could be considered as predictive variables for the P-PRFQ instrument. A limitation to this approach is that it does not attempt to infer causal relationships, since we analyze without any assumptions about causality. With this method we only address predictive variables found in the Pregnancy Health Record, sociodemographics, physical and mental well-being to the development of mentalization capacity.

The present study was the first to look at the psychometric performance of the P-PRFQ in a Danish context. We must emphasize further studies within this area are required. Since only one study in Denmark has applied the P-PRFQ in a clinical population (Røhder et al., 2020), future research should further consider rigorous examination of the psychometric properties of the Danish P-PRFQ version, specifically in an at-risk population. Additionally, future research should look carefully at translated measures. Our findings may have implications for practice, as a health professional may intuitively think that older and multiparous women need less attention on their ability to mind their children's mind and the mentalization capacity does not necessarily increase with age and being multiparous. A brief screening tool to assess women's P-PRF could potentially be very useful. Assessing the impact of such a tool on clinician knowledge about prenatal parental reflecting functioning will require further research. At present we do not see the P-PRFQ as being a useful tool for health professionals to address women with great risk of low RF in early pregnancy.

7 | CONCLUSION

The present study confirms the proposed three-factor structure of the P-PRFQ in a Danish context.

The present study raises serious questions about whether the questionnaire is measuring what it claims to measure, since the direction of the association with predictive variables was opposite to that which was expected and supplementary analyses did not show any substantial increase in the P-PRFQ scores with increasing gestational age. Furthermore, the scores obtained in our early pregnancy sample were very similar to those obtained in a demographically similar sample in their third trimester (Pajulo et al., 2018). That P-PRF was not associated with attachment, being negatively associated with age and parity, associated with variables that it theoretically should not be like health and occupation,

and moderate alphas raise flags with regard to whether the P-PRFQ can be used as a brief assessment of P-PRF in early pregnancy. We can, however, not rule out that our sample is limited by self-referral bias and thus cannot be generalizable to the overall population.

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CONFLICT OF INTEREST STATEMENT

The authors declare that no competing interests exist.

DATA AVAILABILITY STATEMENT

The datasets used and/or analyzed during the present study are available from the corresponding author on reasonable request.

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SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

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