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Affective facial expression in sub-clinically depressed and non-depressed mothers during contingent and non-contingent face-to-face interactions with their infants

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Abbreviations:
DV
Double video
EPDS
Edinburgh Postnatal Depression Scale
MINI
MINI International Neuropsychiatric Interview

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ABSTRACT

Background: Depression in the postpartum period involves feelings of sadness, anxiety and irritability, and attenuated feelings of pleasure and comfort with the infant. Even mild- to-moderate symptoms of depression seem to have an impact on caregivers affective availability and contingent responsiveness. The aim of the present study was to investigate non-depressed and sub-clinically depressed mothers interest and affective expression during contingent and non-contingent face-to-face interaction with their infant.

Methods: The study utilized a double video (DV) set-up. The mother and the infant were presented with live real-time video sequences, which allowed for mutually responsive interaction between the mother and the infant (Live contingent sequences), or replay sequences where the interaction was set out of phase (Replay non-contingent sequences). The DV set-up consisted of five sequences: Live1-Replay1-Live2-Replay2-Live3. Based on their scores on the Edinburgh Postnatal Depression Scale (EPDS), the mothers were divided into a non-depressed and a sub-clinically depressed group (EPDS score ≥ 6).

Results: A three-way split-plot ANOVA showed that the sub-clinically depressed mothers displayed the same amount of positive and negative facial affect independent of the quality of the interaction with the infants. The non-depressed mothers displayed more positive facial affect during the non-contingent than the contingent interaction sequences, while there was no such effect for negative facial affect.

Conclusions: The results indicate that sub-clinically level depressive symptoms influence the mothers' affective facial expression during early face-to-face interaction with their infants. One of the clinical implications is to consider even sub-clinical depressive symptoms as a risk factor for mother-infant relationship disturbances.

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1. Introduction

The caregiver displays multimodal emotional expressions during early social interaction with the infant, such as affective facial expression, gaze, physical touch, and vocalization (Stern, 1974). The affective quality and contingency are important components during early face-to-face interaction (Bornstein & Manian, 2013). The infant is, through her/his intersubjective awareness (Trevarthen, 2011), receptive to the caregiver's affective expressions, as well as attuning his/her internal state for emotional sharing with the caregiver during early interactions (Trevarthen, 1980, 2001; Trevarthen & Aitken, 2001). An increasing body of research have shown how the infant is intuitively social, and how this shapes the affective relations with shared meaning between the caregiver and the infant (for a review see Trevarthen and Delafield-Butt, 2017).

Postpartum depression, both in mothers (Goodman et al., 2011) and fathers (Ramchandani, Stein, Evans, & O'Connor, 2005), is associated with adverse child outcomes. Based on a meta-analysis of 193 studies Goodman et al. (2011) found that maternal depression was significantly related to higher levels of internalizing- and externalizing behavioral problems and general psychopathology in children, and that these associations were strongest for younger children. The mechanisms that explain these associations are not clear, but regulation of emotions in the early transactions between the mother and the infant is suggested as possible mechanisms (Field, Healy, Goldstein, & Guthertz, 1990). Maternal depression is associated with impairment in the mother's capacity to synchronize with the infant's positive affective state, as well as increased negative affect and irritation or intrusiveness during face-to-face interaction (Cohn, Campbell, Matias, & Hopkins, 1990). Based on findings from their meta-analytic review, Lovejoy and colleagues suggested that the parenting difficulties experienced by depressed mothers may not be associated with depression per se, but rather to more general distress associated with having psychological problems (Lovejoy, Graczyk, O'Hare, & Neuman, 2000). Thus, even sub-clinical levels of depression may influence the early mother-infant interaction negatively.

It has been suggested that a mild-to-moderate depression has a more selective impact on maternal behavior during early mother-infant interaction, in terms of the mothers contingent responsiveness and affective availability (Hoffman & Drotar, 1991). In an earlier experimental perturbation study with sequences of real-life contingent interactions and with sequences where the interactions were set out of phase, we found that infants of sub-clinically depressed mothers were less sensitive to the interruptions of the contingency than were infants of non-depressed mothers (Skotheim et al., 2013). A possible explanation of this finding is that the infants of the sub-clinically depressed mothers were more accustomed to non-contingent interaction.

The purpose of the present study was to investigate if even sub-clinical levels of depression may impact maternal behavior and affective responsiveness during sequences of mutually face-to-face interaction with their infants and when the interaction are set out of phase, using the double video (DV) set-up. Field et al. (2005) found in a similar perturbation DV design that clinically depressed mothers displayed the same amount of positive affect both before and after the interaction with their infant was set out of phase, while the non-depressed mothers displayed reduced positive affect after the perturbation of the interaction. Nadel et al. (2005) found, also using the same design, that both the non-depressed and the clinically depressed mothers evidenced a similar decrease in positive affect after the perturbation of the interaction. However in both studies (Field et al., 2005; Nadel et al., 2005), the mothers were told in advance about of the perturbation, which may have influenced the interactions with their infants. In addition, the clinically depressed mothers in Field et al's (2005) study displayed less positive affect than the non-depressed mothers already from the start of the experiment, which suggests that the results may be attributable to an effect of maternal depression and not the manipulation of contingency.

In the present study the mothers focus of gaze and facial expression of affect were examined in groups of sub-clinically depressed and non-depressed mothers during face-to-face interaction with their infants. This was examined, drawing on the same sample of sub-clinically and non-depressed mothers as in Skotheim et al. (2013). In the present study, we examined the mothers' responses to live (contingent) and non-contingent interaction with their infants. More specifically, we investigated if sub-clinically depressed mothers would change their focus of gaze and facial expression of affect in response to shifts between contingent interaction and non-contingent interaction in a DV-experiment.

2. Method

2.1. Participants

Fifty-one mothers and their three months old infants took part in this study. The participants were drawn from a prospective longitudinal population-based study on nutrition, mental health and infant development (Markhus et al., 2013) where all the mothers (n = 105) were asked to participate in the current study. Informed consent was obtained from 51 mothers. Twelve mother-infant dyads had to be excluded from the analyses, either because of excessive infant crying (n = 5), or because the mother and the infant did not manage to establish mutual gaze contact at the start of the experiment (n = 7). Thus the final sample comprised 39 mothers (mean age = 32 years, range 21–41 years) and their three months old infants (mean age = 13 weeks, range 9–20 weeks; Boys = 16 (41%).

None of the mothers fulfilled the DSM-IV criteria for major depression, based on the clinical interview with the Norwegian version of the MINI International Neuropsychiatric Interview (MINI; Leiknes, Malt, & Malt, 2007; Sheehan et al., 1998). The mothers were divided into two groups, based on their levels of self-reported depressive symptoms on a validated Norwegian version of the Edinburgh Postnatal Depression Scale (EPDS; (Berle, Aarre, Mykletun, Dahl, & Holsten, 2003), using an EPDS total cut-off score ≥ 6 (Nadel et al., 2005). Twenty-four mothers were categorized as non-depressed (mean EPDS score 3.26, range 0–5) and 15 mothers were categorized as sub-clinically depressed (mean score of 8.26, range 6–13). There were no significant differences between the two