Different amounts of protest in 4-month-old infants of depressed vs. non-depressed mothers
Gufler, Sandra Rejnholdt; Smith-Nielsen, Johanne; Væver, Mette Skovgaard; Harder, Susanne

Publication date:
2014

Document Version
Early version, also known as pre-print

Citation for published version (APA):
Different amounts of protest in 4-month-old infants of depressed vs. non-depressed mothers

Sandra Gufler, M.Sc., Johanne Smith-Nielsen, M.Sc., Mette Væver, Ph.D., Susanne Harder, Ph.D.
Copenhagen University, Copenhagen

Abstract
Amount of vocal protest was measured in 4-month-old infants of depressed vs. non-depressed mothers during 10 minute face-to-face interaction. The sample consisted of two groups of mothers with their infants: depressed (n=17) and non-depressed (n=49), in total N=66. Vocal protest was measured using PRAAT software and manual, reliable coding. Results showed that infants of depressed mothers expressed a lower amount of vocal protest compared to infants of non-depressed mothers as measured in mean percentage of time (p < 0.001).

Background
A significantly heightened amount of protest has previously been reported for infants of depressed mothers during face-to-face interaction (Field, Healy, Goldstein, & Guthertz, 1990). The other studies have also reported a heightened amount of protest in infants of depressed mothers on a tendency level (Murray, Fon-Cowley, Hooper, & Cooper, 1996; Friedman, Beebe, Jaffe, Ross, & Trigges, 1999). Previous studies have predominantly used composite multimodal measures, which measure several modalities together (Field et al., 1990; Murray, et al., 1996). However, multimodal measures may cover up so-called discordant affects (the infant is expressing converging affects through different modalities), which have been detected in infants of depressed mother (Beebe et al., 2009).

Aim
The aim of the present study was to measure amount of infant protest in infants of depressed vs. non-depressed mothers. Instead of the measured through a single modality, the vocal modality, which has been found to be the most salient system through which both mother and infant communicate with each other at a distance of approximately 50 cm, the infant face interaction were recorded. Time-based and event-based protest has previously been measured in 4-10 month-old infants of depressed mothers (Beebe et al., 2008).

Protest results
On average, infants of non-depressed mothers showed a higher percentage of time in protest (M = 11.56, SD = 14.65) than infants of depressed mothers (M = 2.31, SD = 4.78). This difference was highly significant (F(1, 63.92) = 3.61, p < .001).

Discussion
Contrary to previous findings, the results of the present study showed a lowered amount of vocal protest in infants of depressed mothers. Possible interpretations will now be discussed. Figure 1 shows the results from the present and previous studies.

One possible explanation is the use of different measures. However, only across the depressed samples does the measure seem to largely impact the amount of protest. This could be explained by the presence of discordant affect in the infants of depressed mothers, which would result in different amount of protest when different modalities are measured.

Sample characteristics might have affected the results. The depressed women in the present sample can be considered low-risk (Table 1), while Field has often used particularly high-risk samples. Interactions of high-risk infant-mother dyads are quantitatively and qualitatively different (Murray & Cooper, 1997; Fiest, 1967). Furthermore, it has been argued that there are different types of depressed mothers characterized by different behavior patterns in mother and infant (Cohn, Malas, Tronick, Cornel, & Lyons-Ruth, 1986; Tronick & Weinberg, 1997; Fiest, Hernandez-Rafe, & Diegos, 2005). Infants of under stimulating depressed mothers have been found to withdraw and be less responsive to the mother. This research shows that the infants of the disengaged mothers might turn passive and turn to self-regulation in time (Tronick & Weinberg, 1997).

Method
Participants
The sample consisted of 46-66 primiparous mothers and their infants from the urban Copenhagen area with PPD group (n=17) and non-depressed group (n=49). Inclusion criteria were: Primiparous mother, healthy infant, mother at least 16 years, living in the Copenhagen area, normal hearing and vision abilities. Exclusion criteria were: Psychosis and/or presence of co-morbid bipolar disorder and abuse of any substances.

Procedure
Set-up
The interaction took place according to a standardization design of mother-infant face-to-face interaction. Mother and infant were seated in front of each other at a distance of approximately 50 cm, the infant in an infant seat and the mother on a small chair. Vocal recordings were made using individually head-mounted high-quality microphones. The mother was instructed to play with their infants as she would usually do at home.

Data analysis
Vocal coding and reliability
Acoustic analysis and labeling was carried out using PRAAT software for phonetic analysis. The recordings were segmented into speech and non-speech intervals using a semi-automated procedure during which possible segments of speech were first identified based on intensity threshold levels. The segments were then verified and adjusted manually and infant vocalizations were reliably separated into neutral (protest) and neutral-positive vocalizations by blind coders. Coders were trained to achieve reliability at minimum kappa (K) ≥ 0.60 for event and ≥ 0.80 for percentage agreement, which is considered acceptable (Cohen, 1988). Interrater-reliability was calculated for 20% of each recording. Time-based and event-based values were calculated with sequential analysis software (Bakeman & Quera, 2011). For protest time-based K = 0.80 and for the K value 0.84, 7% files were consensus-coded because reliability could not be reached.

Ethics
All participants were thoroughly informed about the project and all agreed to participate in short procedures during which possible segments of speech were first identified. All participants gave written informed consent, and all procedures were approved by the Regional Scientific Ethical Committee.

Results
Maternal and infant characteristics
Basic characteristics of the sample are presented in Table 1. No significant differences were found in maternal age, single parent status, maternal unemployment status, maternal years of education, infant gender or infant birth weight. The two groups only differed according to diagnosis.

Table 1

<table>
<thead>
<tr>
<th>Variable</th>
<th>Depressed mothers</th>
<th>Non-depressed mothers</th>
<th>Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maternal age (years)</td>
<td>29.8 (SD = 4.7)</td>
<td>29.2 (SD = 4.9)</td>
<td>-0.6</td>
</tr>
<tr>
<td>Marital status</td>
<td>36%</td>
<td>38%</td>
<td>-2%</td>
</tr>
<tr>
<td>Education level</td>
<td>Beggars</td>
<td>36%</td>
<td>30%</td>
</tr>
<tr>
<td>Infant gender</td>
<td>Male</td>
<td>53%</td>
<td>52%</td>
</tr>
<tr>
<td>Infant birth weight</td>
<td>3.4 kg (SD = 0.5)</td>
<td>3.5 kg (SD = 0.5)</td>
<td>-0.1</td>
</tr>
</tbody>
</table>

Conclusions
Finally, the infants of depressed mothers might as a group show both a heightened and a lowered amount of protest. Adopting Beebe’s mid-range model for protest would indicate that the different depressed samples are facing different types of regulatory differences. A heightened amount of protest would indicate that the infant is preoccupied with the interactive regulation, while a lowered amount would indicate that the infant has turned to self-regulation (Beebe, Ruster, Soror, & Kniblaub 2005).

References