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Different amounts of protest in 4-month-old infants of depressed vs. non-depressed mothers

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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 a 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 phonetic 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 < .001).

Background
A significantly heightened amount of protest has previously been reported for infants of depressed mothers during face-to-face interaction (Field, Healy, Goldenberg, & Gauthier, 1990). The two studies have also reported a heightened amount of protest in infants of depressed mothers on a tendency level (Murray, Fore-Cowley, Hooper, & Cooper, 1996; Friedman, Beebe, Jaffe, Ross, & Triggs, 1996). Previous studies have predominantly used composite multimodal measures, which measure several modalities together (Field et al., 1990; Murray, 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., 2008).

Aim
The aim of the present study was to measure amount of Infant protest in infants of depressed vs. non-depressed mothers. Infants were measured through a face-to-face interaction. Five minutes of interaction was measured in total. The behavioral interaction was audio recorded and transcribed in transcriber PRAAT. Afterward, the transcribed audio was analyzed 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 negative (protest) and neutral/positive vocalizations by blind coders. Coders were trained to achieve reliability at minimum kappa (κ) ≥ 0.80 for event and ≥ 0.80 for percentage agreement, which is considered acceptable (Cohen, 1988). Inter-rater reliability was calculated for 20% of each recording. Time-based and event-based kappa was calculated with sequential analysis software (Bakeman & Quera, 2011). For protest time-based K = 0.56 and for κ = 0.84, η = 0.7. Seven files were consensus-coded because reliability could not be reached.

Methods
Participants
The sample consisted of 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 18 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.

Measures
Depression status was measured with the self-report measure Edinburgh Postnatal Depression Status (EDPS) and the standardized psychiatric interview Present State Examination (PSE). Wing, Cooper, & Sartorius, 1986; which was administered by a clinical psychologist at a psychiatric outpatient treatment program. Edinburgh Postnatal Depression Status (EDPS) measured any substances.

Results
Maternal and infant characteristics
Basic characteristics of the groups 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 depression diagnosis.

Protost 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 = 4.76). This difference was highly significant (t(63.92) = 3.61, p < .001).

Conclusion
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.