

FROM INNER TO DYADIC CONNECTION: THE EFFECT OF MINDFULNESS INTERVENTION ON MOTHER-INFANT BIO-BEHAVIOURAL SYNCHRONY

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Background: During infancy, mother-infant bio-behavioural synchrony, the temporal coordination of mother's and infant's behavioural and neuro-physiological cues during interactions, is considered the core aspect of positive parent-child relationship, with positive effects on infant later development. The literature on mindfulness claims that we connect better with others if we are aware of and connected with our own inner experience. Thus, mindfulness, while promoting the mother's connection with her own inner world, might promote maternal attunement with the infant's states.

Aims: To explore the effects of mindfulness on mother-infant synchrony.

Method: 67 mother-infant dyads were video-recorded during face-to-face interactions at 3 and 6 months of life. Mothers completed questionnaires on their dispositional (FFMQ) and interpersonal (IMP) mindfulness. Mother's and infant's affective behaviours were coded with Tronick's ICEP coding system. Physiological activation was computed with each partner's Respiratory Sinus Arithmis (RSA, with ECG sensors) each 20s. Mother's and infant's neural activation was recorded with EEG cups. 34 dyads participated at a mindfulness intervention of 5 weeks, 18 were part of the control group. Both groups were assessed again 5 weeks later.

Results: RSA of more mindful mothers was more influenced by infant's RSA ($\beta = 0.57, p < .00$) (high physiological synchrony) than RSA of low mindful mothers. Mindfulness was associated with more matching of mother-infant's positive affective states ($r = .24$). A greater lateralization of brain activity for the alpha and gamma bands power ($F = 2.50, p = .03$ and $F = 4.12, p = .05$) was evidenced only in high mindful mothers. This high hemispheric specialization of high mindful mothers indicates an optimized emotional and cognitive functioning representing motivation to social engagement during the interaction. Preliminary findings on the effectiveness of the intervention suggested an increase in interpersonal mindfulness ($t = 1.99, p = .05$) and in the proportion of shared interactive moments ($t = 2.15, p = .03$) only in the intervention group.

Conclusions: These results highlight the role of expectations on informing perception. At the neural level, our data provides time sensitive evidence of expectation effects on early perception at a latency of around 100 ms. Importantly, the present findings reveal the critical role of higher-level expertise on forming priors.

Keywords: Mother-infant interaction, Mindfulness, Behavioral synchrony, Physiological synchrony, Neural activity

Publications:

Passaquindici, I., Nardoza, O., Sperati, A., Lionetti, F., D'Urso, G., Fasolo, M., Spinelli, M. (*under review*). Maternal dispositional mindfulness and mother-child relationship: The mediating role of emotional control during parenting. *Child: Care, Health and Development*.

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