



**Ruprecht-Karls-Universität Heidelberg
Medizinische Fakultät Mannheim
Dissertations-Kurzfassung**

The Impact of Prenatal Stress on Mother-Infant Behavior at six Months after Birth: The Role of different Dimensions of Stress

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Early life stress is known to influence mothers and consequently also the infant pre-, peri-, and postnatally. Both stress sensitization and inoculation theories have speculated about the conflicting previous findings of beneficial as well as impairing influences of early life stress. Findings of an impact on infant development, behavior and later vulnerability for cognitive and emotional problems, physical diseases and mental disorders, suggested the need to identify possible pathways between early life stress and infant outcome. Suggested underlying processes, such as fetal programming, were discussed.

The present thesis focused on the possible impact of prenatal maternal stress on mother-infant dyadic behavior in a standardized observation paradigm, i.e. the still-face paradigm. Study I aimed to illuminate the prospective influence of psychological and physiological stress during pregnancy on mother-infant dyadic behavior in the first play episode of the still-face paradigm. In Study II, both the first play episode and the reunion episode were investigated.

In Study I, the first play episode of the still-face paradigm was investigated. The findings provided evidence of an impact of psychosocial prenatal stress on mother-infant dyadic behavior during the normal mother-infant play, as it was expected for the first play episode. Mother-infant dyads with more psychosocial PS in pregnancy showed significantly more positive dyadic behavior than the less stressed dyads. The same was found for perceived maternal prenatal stress, although the effect vanished when analyses were conducted including all covariates. Hence, the findings were considered as providing only restricted evidence. No other stress index (i.e., psychopathological PS, cortisol decline and cortisol AuCg) reached significance in predicting mother-infant dyadic play behavior.

In Study II, the impact of prenatal stress on mother-infant dyadic behavior in both play situations of the still-face paradigm was investigated. The dyadic behavior in the first play episode was compared with that in the reunion episode. The results provided evidence for the “still-face” and “carry-over” effect, with mother-infant dyads in both the high- and low-stress groups showing decreasing positive and increasing negative dyadic behavior in the reunion episode. Here too, mother-infant dyads with higher psychosocial prenatal stress showed significantly more positive dyadic behavior in the first play episode, but not in the reunion episode. In the latter episode, the positive behavior of the dyads with high prenatal stress decreased to approximately the same level as that of the dyads with low stress.

In Study II, significant results emerged for physiological stress dimensions, with mother-infant dyads with a prenatally flat diurnal cortisol decline and low diurnal cortisol AUCg levels showing a distinctive, significant increase in negative dyadic behavior in the reunion episode. Mediation analyses run in both studies showed that maternal behavior was not a significant mediator between prenatal stress and infant behavior.

The present findings contribute to inoculation theories on the impact of stress. Nevertheless, both studies provide merely a glimpse into the complex relationship of early life stress factors, maternal and environmental factors, and the infant’s development. Taken together, given the vast amount of studies reporting an impairing impact of prenatal stress on the infant, the present results should be interpreted with caution. The results add further support to the idea of individual resilience factors, suggesting that some individuals are not influenced by stressors or even benefit from them. Future research should focus on the underlying mechanisms, such as early programming, sensitive time periods in infant development, as well as possible influencing factors, in order to contribute to the explaining the mixed results, and to inform the creation of preventive programs for mothers and infants.