

# Moderating effects of maternal emotional availability on language development in toddlers of mothers exposed to a natural disaster in pregnancy: The QF2011 Queensland Flood Study.



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## ABSTRACT

Prenatal maternal stress (PNMS) has been linked to less than optimal developmental outcomes in toddlers. Maternal emotional availability (EA) is associated with better cognitive and language abilities. It is less clear whether early care-giving relationships can moderate the impact of prenatal stress on child development. Data were available in 131 families. Measures of prenatal stress were collected within one year of the 2011 Queensland floods. Women were then assessed for emotional availability (sensitivity and structuring) at 16 months based on video recorded mother-child play interactions. The toddlers' cognitive and language development was assessed at 30 months. Moderation analyses determined whether maternal EA moderated the relationship between PNMS and toddler cognitive and language functioning. Prenatal stress was not directly associated with toddlers' cognitive and language development at 30 months. Overall, high maternal structuring and sensitivity were associated with better toddler vocabulary. However, children who were exposed to moderate to high levels of overall subjective stress and peritraumatic distress spoke more words relative to toddlers of low structuring mothers exposed to high levels of overall subjective stress and to a lesser extent high peritraumatic distress. A similar difference was detected for PTSD-like symptoms and to a lesser extent peritraumatic distress: children of low structuring mothers spoke fewer words as maternal stress exposure increased. The current study highlights the importance of maternal emotional availability (especially structuring) for cognitive and language development in young children. Findings suggest that toddlers exposed to higher levels of PNMS in utero may benefit from high maternal structuring in their language development. Moreover, the results also suggest that toddlers of mothers exposed to enduring subjective stress (i.e., PTSD-like symptoms) speak fewer words at 30 months of age when their mothers exhibit low levels of structuring during joint play at 16 months.

## INTRODUCTION

- Prenatal maternal stress (PNMS) is linked to less than optimal developmental outcomes in toddlers.
- The post-natal environment may buffer the effects of PNMS on child outcomes.
- Maternal emotional availability (EA) is associated with better cognitive and language abilities.

### Problematic

- It is less clear whether early maternal EA can moderate the impact of PNMS on developmental outcomes like cognitive and language abilities.

## OBJECTIVES

**Determine if maternal EA moderates the relationship between PNMS and toddler cognitive and language abilities.**

## METHODS

### Sample

- In January 2011 Queensland, Australia had its worst flooding in 30 years. We have been following a cohort of children whose mothers were pregnant during the disaster
- Data were available for 131 families (Boys = 54.2% ; Girls = 45.8%)

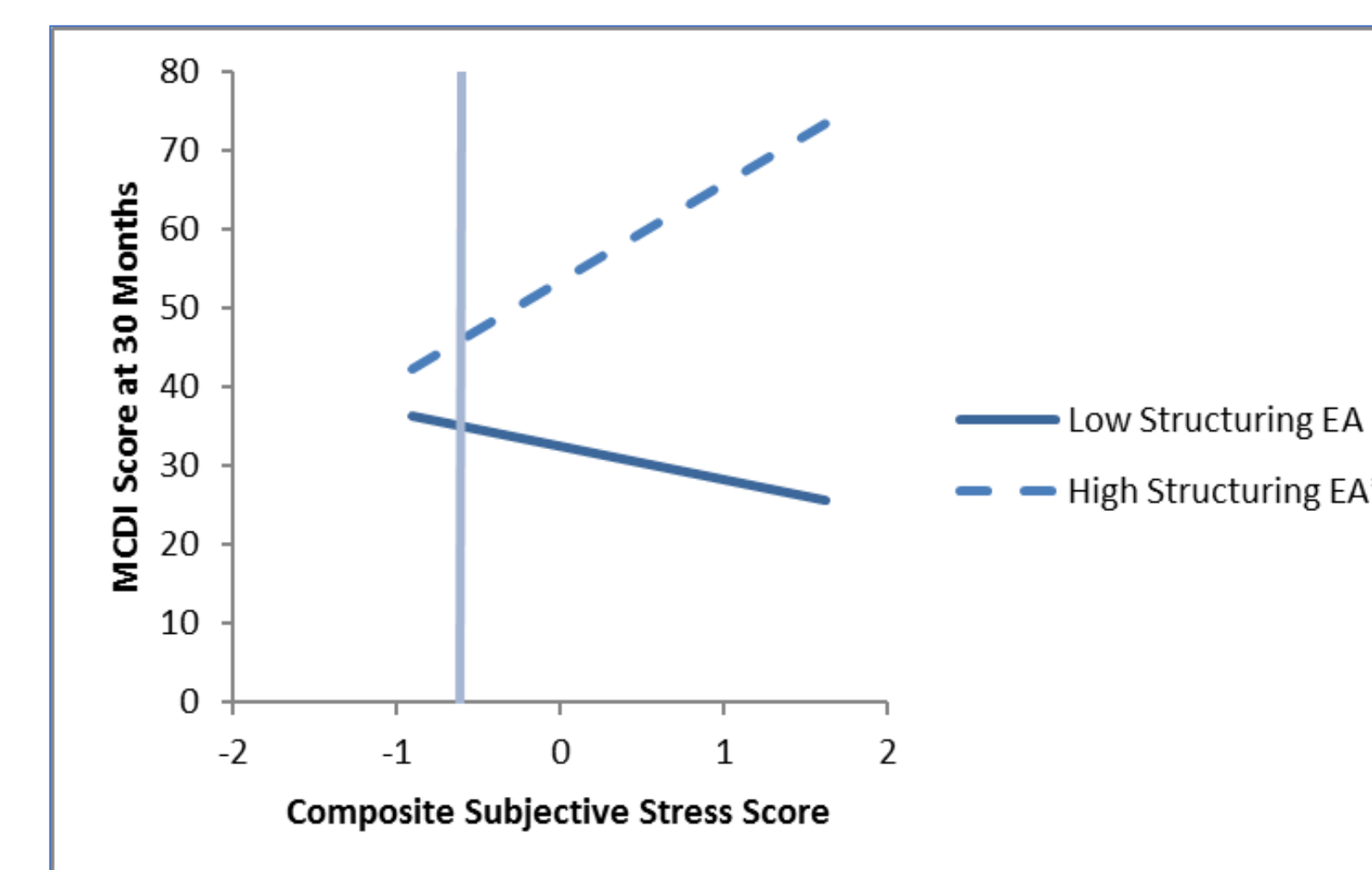
### Measures

1. Subjective distress
  - Peritraumatic Distress Inventory
  - Peritraumatic Dissociative Experiences Questionnaire
  - Impact of Event Scale – Revised
  - The COmposite Score for MOthers' Subjective Stress
2. Maternal emotional availability
  - Based on video recorded mother-child play interactions when the child was 16 months
3. Toddlers' cognitive abilities at 30 months
  - Bayley infant scales of development 3<sup>rd</sup> ed.
4. Toddlers' language abilities at 30 months
  - MacArthur Communicative Development Inventory



## RESULTS

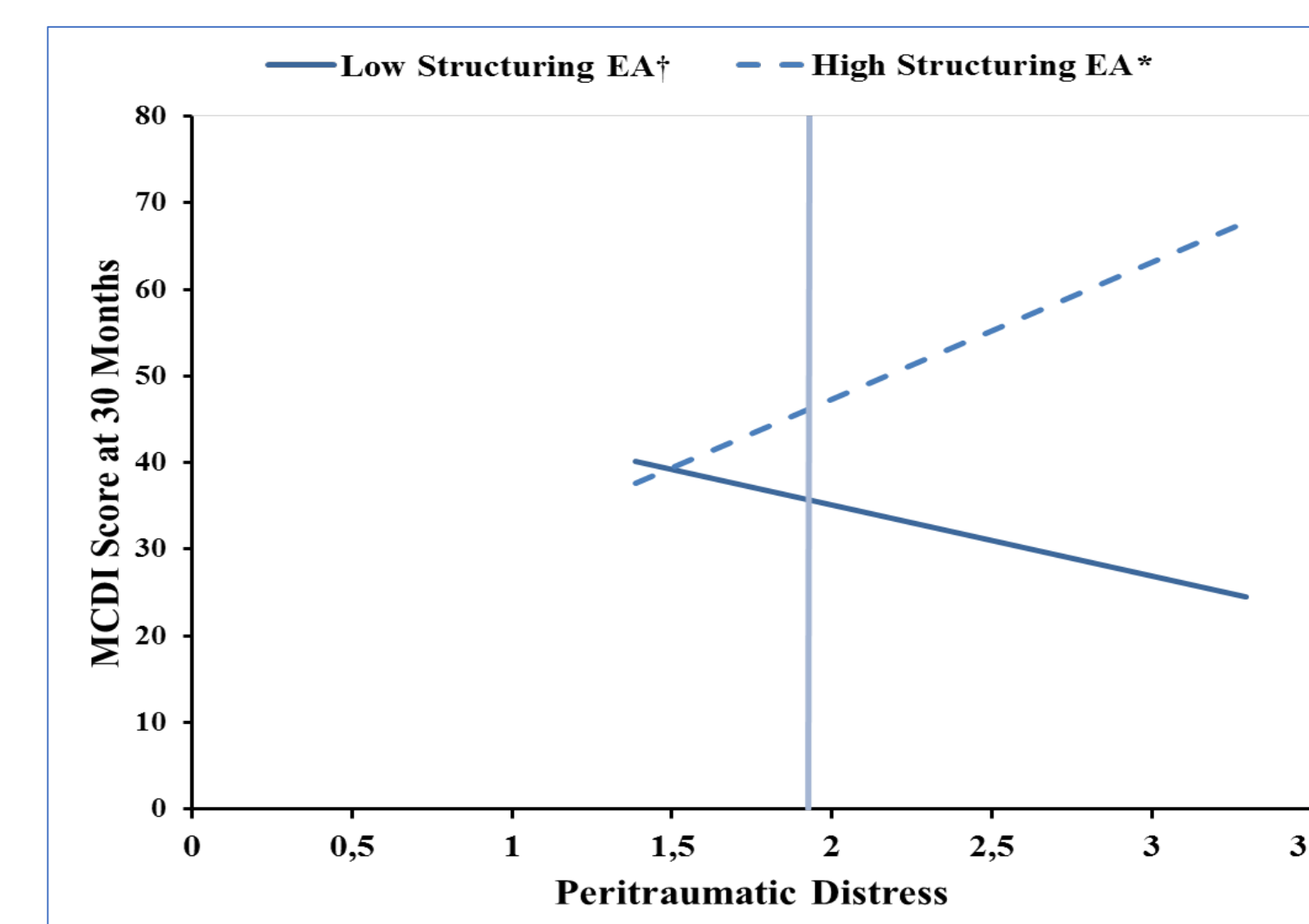
**Figure 1. High maternal structural emotional availability was associated with higher vocabulary For toddlers whose mothers reported high subjective stress during the flood**



Only the slope of high maternal structuring is significant (p = 0.002)

**Interaction effect for the maternal composite subjective stress score (COSMOSS) and maternal structuring on MCDI vocabulary levels at 30 months.** No impact of Maternal Structuring on MCDI scores was detected for toddlers of mothers who experienced low composite subjective stress scores. However, the higher the maternal composite subjective stress scores, the greater the association between maternal structuring and the toddlers' vocabulary at 30 months. When Maternal Structuring was low, prenatal subjective stress was not found to have an effect on language development at 30 months; however, for toddlers with mothers who were highly structuring and exposed to the highest levels of composite subjective stress, their vocabulary scores were up to 50 words larger than those of toddlers with lower structuring mothers. Thus, for those toddlers with high structuring mothers, the higher the maternal composite subjective stress scores the higher their vocabulary score.

**Figure 2. High maternal structural emotional availability was associated with higher vocabulary For toddlers whose mothers reported high peritraumatic distress during the flood**

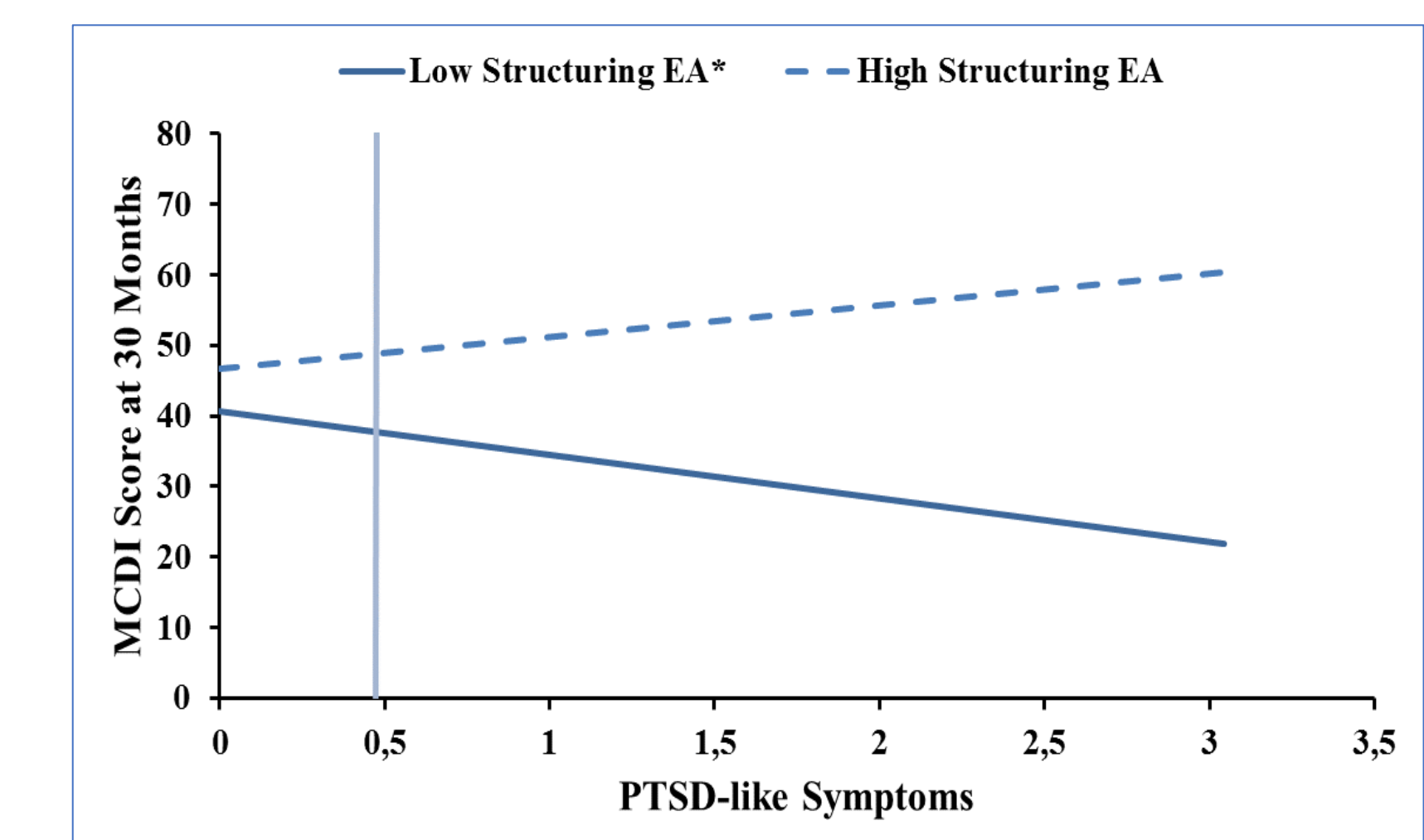


The slope for high maternal structuring was significant (p = 0.001). The slope for low maternal structuring approached significance (p = 0.084).

**Interaction effects for the maternal peritraumatic distress and maternal structuring on MCDI vocabulary levels at 30 months.** Children of higher structuring mothers had more spoken words. Furthermore, for children of high structuring mothers, the number of words spoken significantly increased with increased in utero exposure to maternal peritraumatic distress levels. The opposite pattern was observed for children of low structuring mothers: there was a strong tendency for the number of words spoken by the child to decrease with increased in utero exposure to maternal peritraumatic distress levels.

## RESULTS

**Figure 3. High structuring EA protected against a decrease in vocabulary experienced by toddlers whose mothers reported high PTSD-like symptoms during the floods**



The slope for low maternal structuring was significant (p = 0.048).

**Interaction effects for the maternal PTSD-like symptoms and maternal structuring on MCDI vocabulary levels at 30 months.** A very different pattern was observed when PTSD-like symptoms were included into the model. For children of high structuring mothers, the level of in utero exposure to maternal PTSD-like symptoms was unrelated to the number of words spoken. On the other hand, the number of words spoken by children of low structuring mothers significantly decreased with increased in utero exposure to maternal PTSD-like symptoms.

## CONCLUSIONS AND DISCUSSION

### CONCLUSIONS

- The current study highlights the importance of maternal emotional availability (especially structuring) for cognitive and language development in young children.
- It suggest that toddlers exposed to higher levels of prenatal maternal stress in utero may benefit from high maternal structuring in their language development.
- It also suggest that toddlers of mothers exposed to enduring subjective stress (i.e., PTSD-like symptoms) speak fewer words at 30 months of age when their mothers exhibit low levels of structuring during joint play at 16 months.
- EA did not moderate the relationship between PNMS and cognitive abilities.

### DISCUSSION

- The findings of the current study align with previous research that found that maternal autonomy support was associated with better expressive language development at 2 years.
- Given the strong association between EA and quality of attachment the current findings also align with previous research that shows attachment security is associated with more optimal language and cognitive development in children