UNIVERSITY OF MICHIGAN
PSYCHOLOGY
exploring the mind

Early childhood endocrine functioning and parenting behaviors as predictors of pre-adolescent internalizing symptoms

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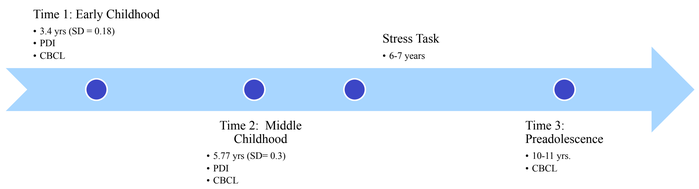
BACKGROUND

Internalizing symptoms are widely used as a predictive measure of the development of mood disorders such as Major Depression. Adolescence (age 13-17) represents a period of increased risk for the development of mood disorders (Costello et at., 2003). Understanding the development of internalizing symptoms is critical to understanding the pathogenesis of related disorders.

Research in humans as well as rodents and non-human primates have well documented the effects of positive an negative parenting behaviors on the development of an infant. Research with rodents demonstrates that high levels of maternal nurturance during infancy leads to the development of adaptive adjustment strategies later in life and facilitates the adaptive development of the HPA-axis (physiological stress response system; (Essex et al., 2002; Meaney, 2001). Likewise, the lack of maternal nurturance in rat pups has been associated with hyper-reactivity of the HPA-Axis later in life. Research in human infants has replicated these findings (See Gunnar & Quevedo, 2007 for a review) and goes further to demonstrate that maternal behavior during early development dictates later social development (Silk et al., 2007; Masten, 2004). Few studies have replicated these findings between parenting behavior and internalizing symptoms at later points in child development, nor have any studies used longitudinal methodologies to investigate mechanism of the pathogenesis of internalizing symptoms.

This study adopts a developmental psychopathology perspective on the etiology of internalizing symptoms from ages 2-12 in order to more thoroughly examine relationships between parenting behavior and preadolescent internalizing symptoms.

METHODS



•72 children (39 boys) participating in a longitudinal study

Measures

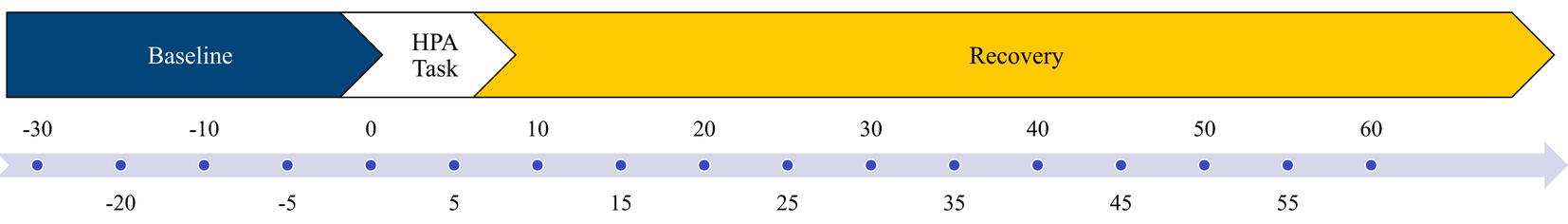
•Child Behavior Checklist (Teacher Report; Achenbach, 1991) Internalizing Scale

•Parenting Dimensions Inventory (Mother's Report; Slater & Power, 1987)

- •Maternal Warm Responsiveness
- •Induction
- •Physical Punishment

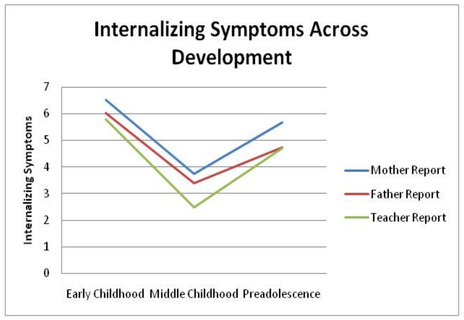
Laboratory stress task: Calkin's (1997) frustrating/fear paradigm

- •17 total saliva samples collecting over 90-minute paradigm
- •Endocrine reactivity is defined as Area Under the Curve Increase (AUCi) calculated from 14 post stress samples.



INTERNALIZING SYMPTOMS

Mother, father and teacher completed reports of internalizing symptoms (CBCL) across three developmental time periods demonstrated a consistent pattern in internalizing behaviors. Children demonstrated significantly higher levels of internalizing symptoms during Early Childhood, a dramatic decrease into Middle Childhood and a return to Early Childhood levels during Preadolescence. Each participant in this study was within the typical range for internalizing symptoms which suggests that this pattern of internalizing symptoms across development is indicative of typical development.

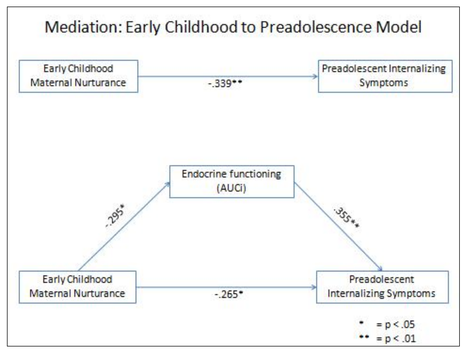


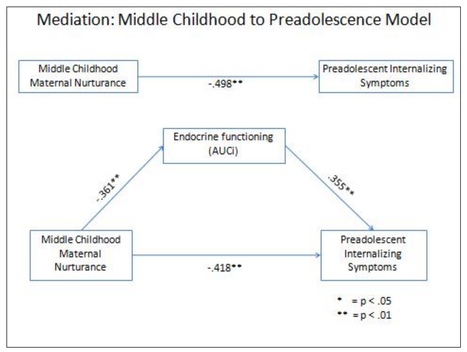
RESULTS

Predictors of Middle Childhood Internalizing Symptoms: Multiple regression analyses were conducted to examine the predictors of internalizing symptoms. High maternal nurturance/responsiveness in early childhood was associated with lower internalizing symptoms (b=-2.81; p < .01). Furthermore, low maternal nurturance/responsiveness during early childhood was a strong predictor of increased endocrine reactivity during middle childhood (b=-0.27; p<.05), but was not a predictor of baseline levels.

Predictors of Preadolescent Internalizing Symptoms: Greater endocrine reactivity in middle childhood predicted internalizing symptoms in pre-adolescence (b=.38; p < .01) and increases in internalizing symptoms from Time 2 to Time 3 (Auto-correlated model; b=2.51; t=2.41; p=.019). Among all of the parenting dimensions, Low Maternal warm responsiveness in middle childhood marginally predicted greater internalizing symptoms in pre-adolescence (b=-.146, p=.070).

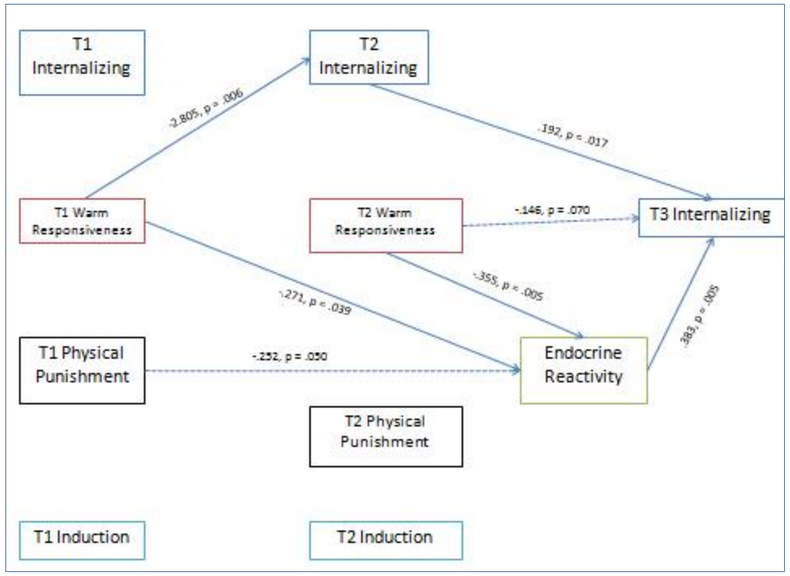
MEDIATION





Endocrine functioning partially mediated the effects of maternal warm responsiveness on internalizing symptoms using both Early Childhood (Sobel's test = -1.86, p = .06). and Middle Childhood parenting behaviors (Sobel test =-2.08; p=.037).

DEVELOPMENTAL MODEL



CONCLUSIONS

Our results indicate that maternal warmth and endocrine functioning in early and middle childhood predicted the development of internalizing symptoms in pre-adolescence. However, maternal warmth was associated with a reduced endocrine stress response, and this partially explained the association between maternal warmth and pre-adolescent internalizing symptoms. This highlights the impact of parenting behaviors on a key physiological system during a critical developmental period, which has long term implications for a child's mental health. Furthermore, our mediation model results indicate that middle childhood and the transition into adolescence may be a period of vulnerability for the development of adaptive HPA-Axis reactivity and resilience to the development of internalizing disorders. These results are critical to understanding the developmental mechanisms that underlie adolescence as a high-risk period for psychopathology.

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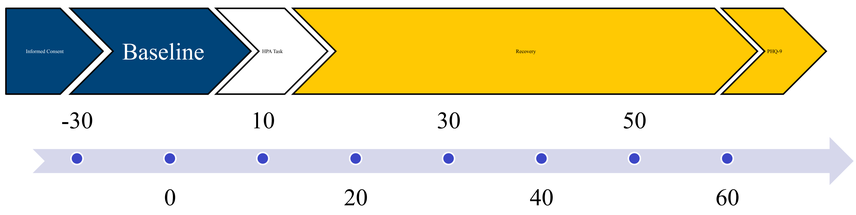
Informed Consent
Baseline
HPA Task
Recovery
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