

Maternal Depression and the Effects on Offspring's Hypothalamic-Pituitary-Adrenal (HPA) Axis



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Introduction

- Offspring of depressed parents are six times more likely to develop depression themselves (Downey & Coyne, 1990).
- The HPA axis is responsible for regulating reactions to stress. Dysfunctions of the HPA axis have been associated with several psychological disorders, including major depressive disorder (MDD), immune system impairment, and cardiovascular disease.
- Research examining HPA activity in offspring of mothers with depression has yielded inconclusive results and few studies have examined both basal and reactive cortisol levels.

Objective

- The purpose of this study is to examine the neurobiological effects of maternal depression on offspring by examining cortisol levels in depressed adolescents whose mothers are depressed and those that are well.
- Basal cortisol was measured by collecting at home saliva samples. Saliva samples were collected during the Trier Social Stress Test (TSST) and MRI to measure stress reactivity.

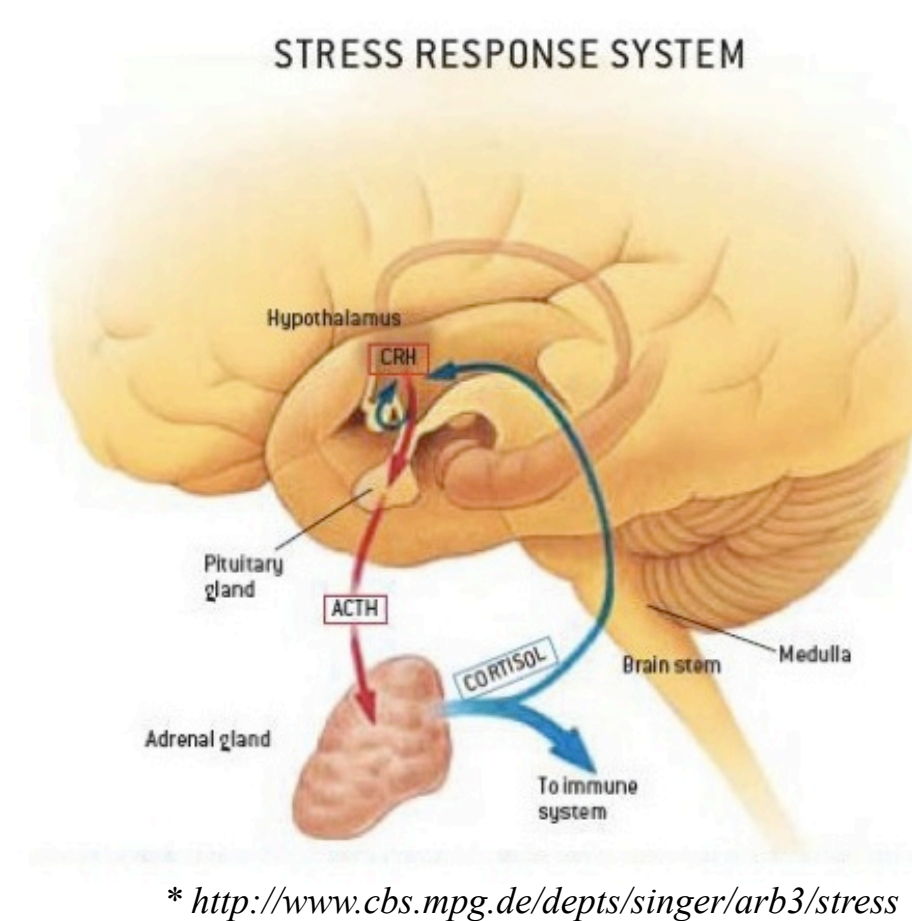


Figure 1.
The Hypothalamic-Pituitary-Adrenal (HPA) Axis

Figure 2. The Trier Social Stress Test (TSST) includes a speech and arithmetic task in front of "judges",



Kirschbaum, Pirke, & Hellhammer, 1993

Method

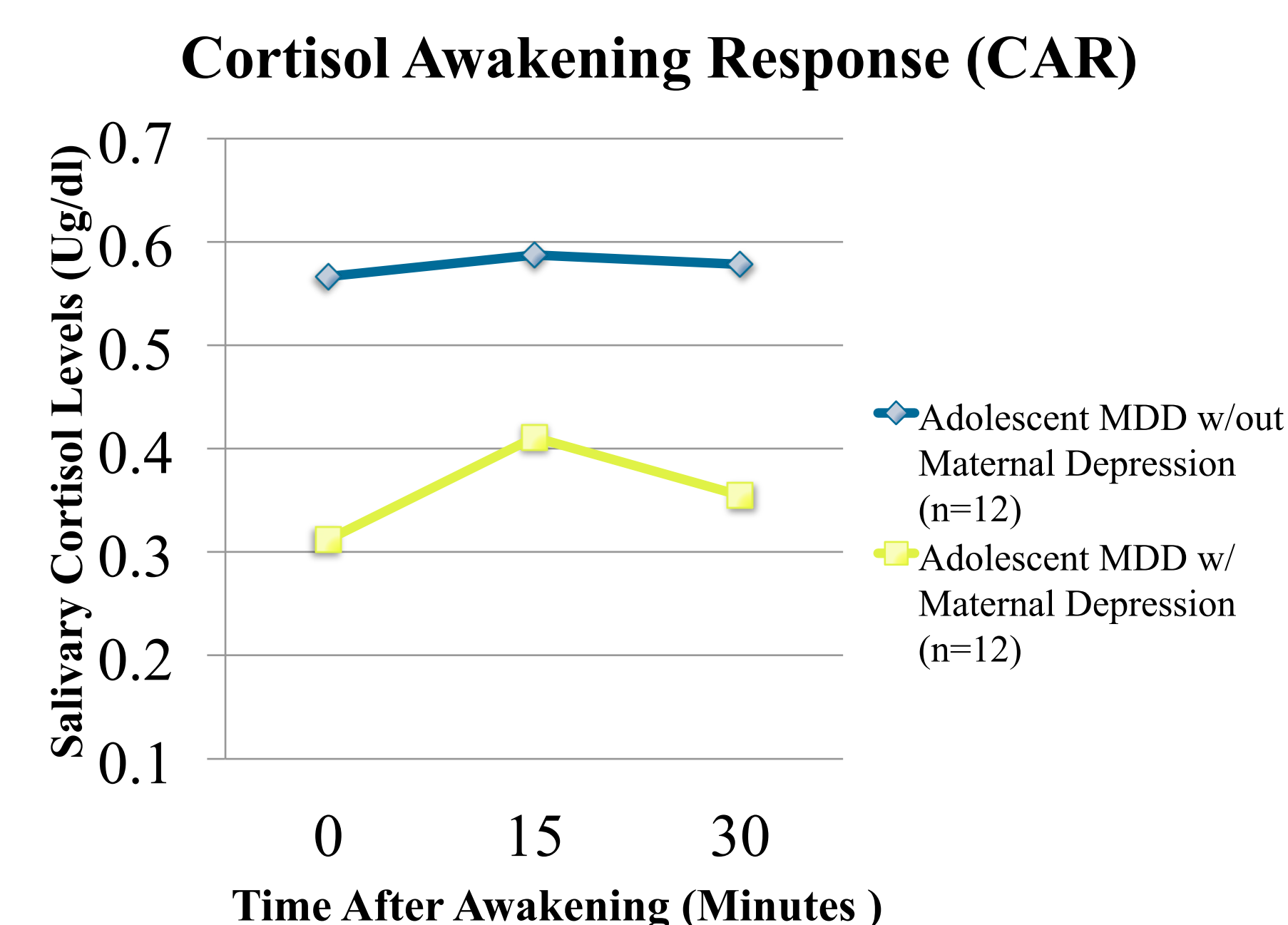
Participants:

- The present study includes 54 adolescents with a diagnosis of MDD. Ages ranged from 12 to 19 with a mean age 15.98 ($SD = 1.92$). The participants were primarily Caucasian (78%).
- Participants were divided into two groups: MDD adolescents with maternal depression ($n = 33$) and MDD adolescents without maternal depression ($n = 21$)
- All participants were interviewed using the the Schedule of Affective Disorders and Schizophrenia for School-Age Children-Present and Lifetime Version (Kaufman et al., 1997) to determine diagnosis and family history of depression.
- Participants provided the following saliva samples to measure cortisol: 5 at home saliva samples, 5 during the TSST, and 2 during MRI appointments.

Results

Cortisol Awakening Response (CAR)

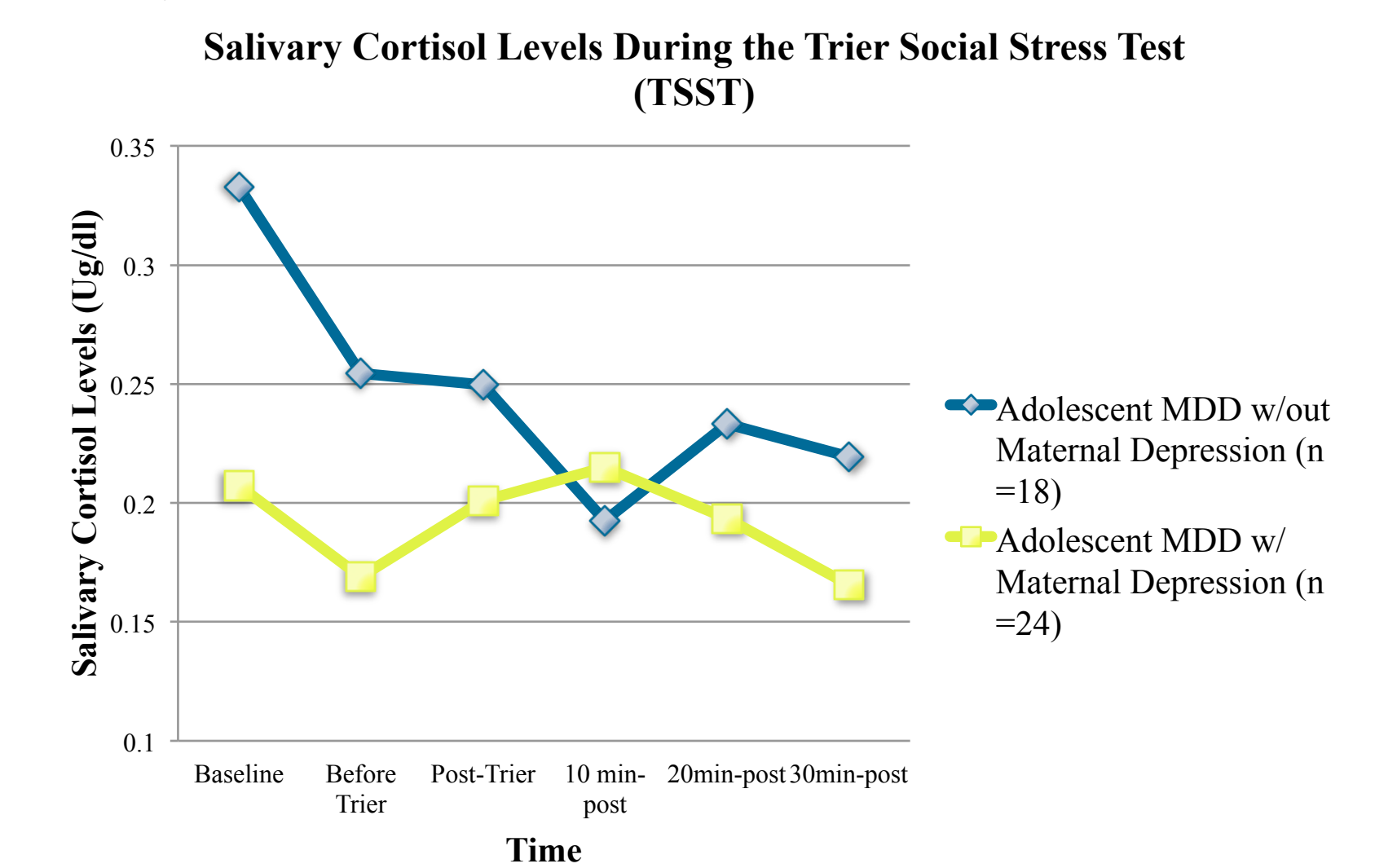
- A one-way ANOVA was used to test for differences in the CAR between MDD participants with maternal depression and those without. There was a significant effect of maternal depression on offspring's CAR between the two groups [$F(1, 21) = 4.62, p = 0.043$].



Cortisol Reactivity

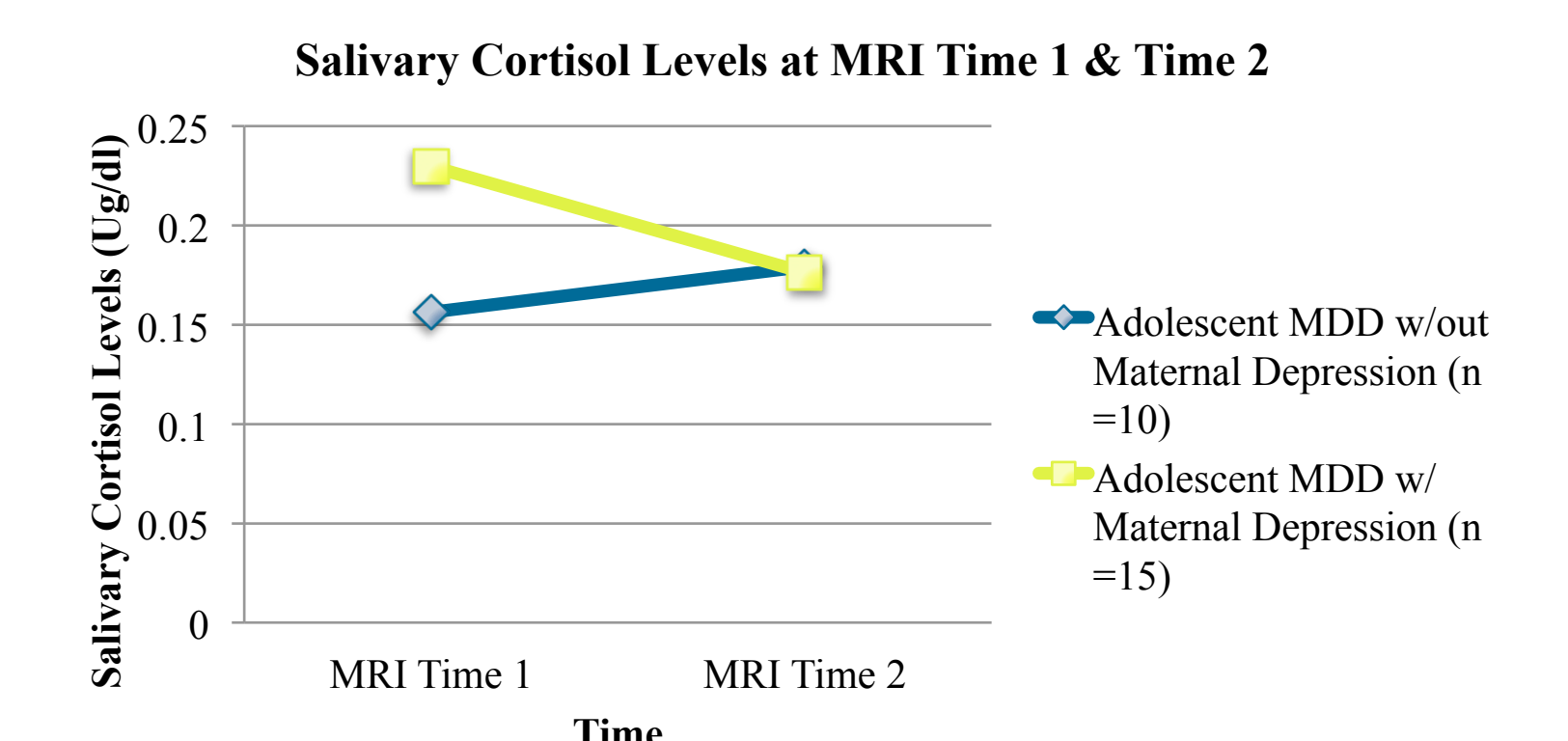
Trier Social Stress Test (TSST)

A one-way ANOVA showed a significant effect of maternal depression on the difference in cortisol measures between the two groups (before TSST and 10 min post TSST) [$F(1, 40) = 7.15, p = 0.011$].



MRI

A one-way ANOVA was used to test for differences between Time 1 and Time 2 MRI. There was a significant effect of maternal depression on offspring's cortisol at Time 1 and Time 2 between the two groups [$F(1, 34) = 4.40, p = 0.048$].



Conclusions

- The current findings suggest neurobiological differences in MDD adolescents with maternal depression compared to MDD adolescents with a healthy mother.
- The implications of these findings could aid in detection and the development of early interventions for at-risk children.
- The current sample does not include healthy adolescent controls. Future directions include: (1) exploration of maternal depression compared to healthy adolescent controls (2) examination of MRI cortisol with respect to previous scan experience.

Acknowledgments

This project was primarily supported by the Center for Neurobehavioral Development at UMN, the Deborah E. Powell Center for Women's Health at UMN, the NIMH and the Undergraduate Research Opportunities Program.