

## Adverse Childhood Experiences Effect on Young Adult's Chronic Stress Response

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### Research AIM

To determine if ACEs predict cortisol levels when ACE, SES and individual demographics are simultaneously considered.

### Framework

McEwen's model of neurobiological stress which proposes pathways by which psychosocial factors impact allostasis and ultimately unfavorable health outcomes.

### Method

A cross-sectional design was used to determine the best predictors of cortisol levels using questionnaires and hair cortisol assays.

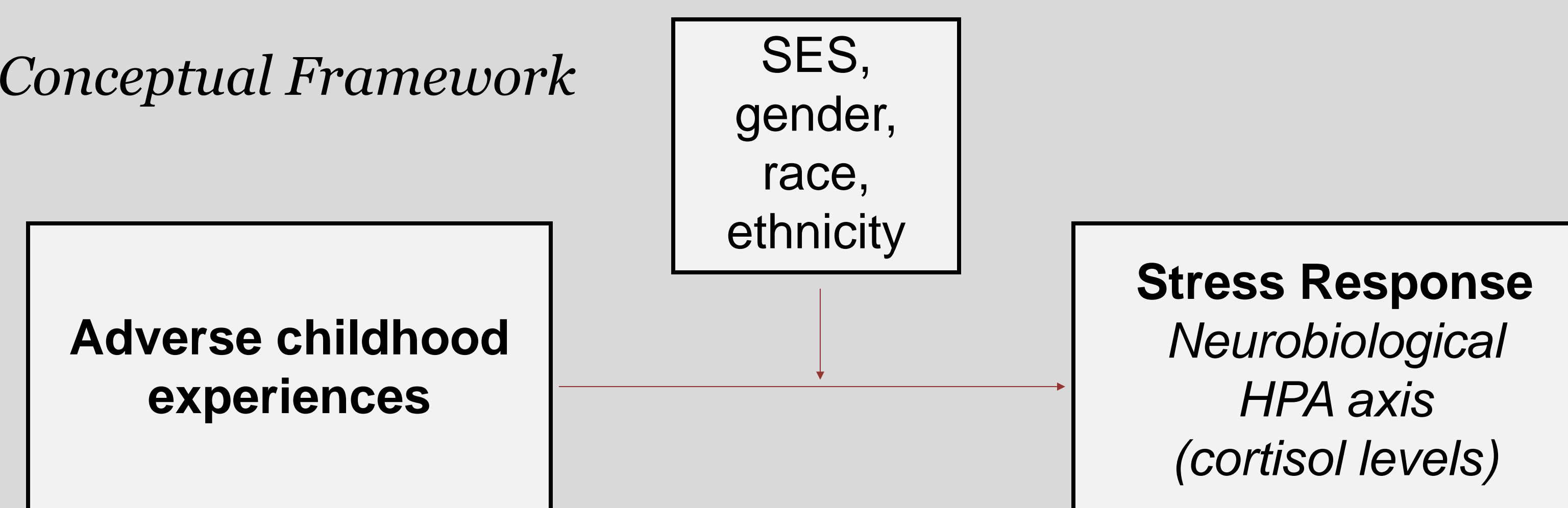
### Sample

A sample of 54 college students ages 18-24 completed questionnaires and provided hair samples.

### Analysis

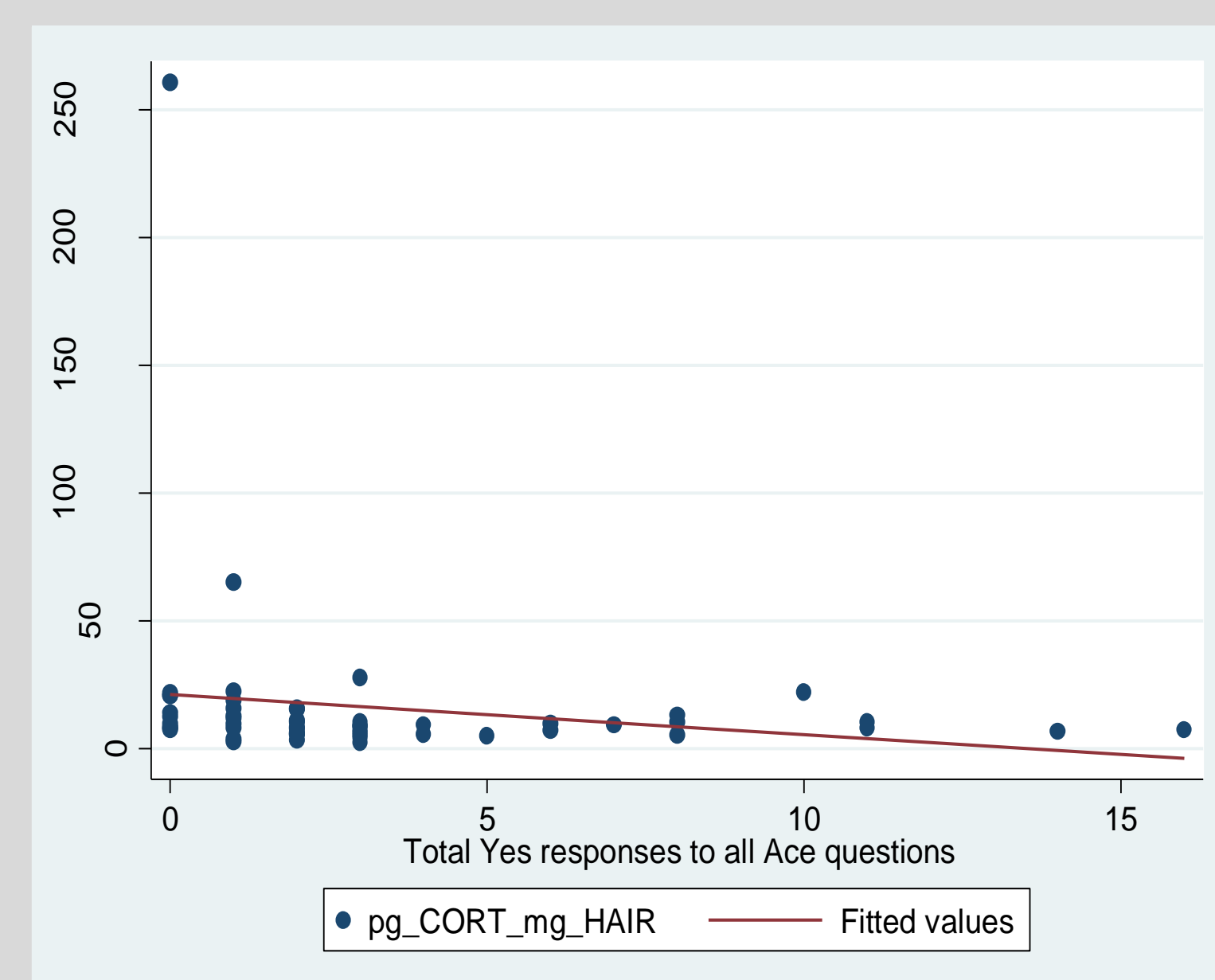
Linear Regression was used to analyze the relationship between log hair cortisol and ACEs. Lowess curves were used to test the linear relationship and continuous variables were collapsed into categories when non-linear. Backward stepwise regression, with a cutpoint of 0.20, was used to determine adjusted models.

### Conceptual Framework



### Results

It was determined that ACE score, gender, race, housing, and father's employment should be kept in the model. After adjusting for these factors, ACE score was significantly, inversely related to a hair cortisol level ( $p=0.011$ ).



Total Yes responses to all ACEs collapsed	Freq	Percent	Cumm.
0	11	14.86	14.86
1	15	20.27	35.14
2	13	17.57	52.70
3	10	13.51	66.22
4+	25	33.78	100.00
Total	74	100.00	

### Lessons Learned

1. The sample size was insufficient to test a graded relationship between ACEs and cortisol.
2. African American and Hispanic males were disproportionately excluded from the study due to hair length.
3. Acute stress within the three months prior to hair collection may influence cortisol and needs to be measured in subsequent studies
4. insufficient variability was found in the sample to test SES influence on cortisol levels.

### Adverse Childhood Experiences (ACE)

are childhood events, varying in severity and often chronic, occurring within a child's family or social environment that cause harm or distress, thereby disrupting the child's physical or psychological health and development. Examples; childhood physical, sexual, or emotional abuse and household dysfunction.

**Cortisol** is the primary hormone of the HPA axis in humans responsible for the regulation of inflammation, metabolism, and gluconeogenesis.

### Procedure

A convenience sample of young adult college students completed online questionnaires for childhood adversity, SES and demographics. Subjects then permitted hair samples to be obtained for analysis of cortisol levels. Subjects who self-reported no ACEs were considered controls.

### Summary of Results

ACE score was significantly, inversely related to hair cortisol level ( $p=0.011$ ) in statistically adjusted model.

### Conclusions

Conditions characterized by prolonged activation of the stress response, such as ACE, may negatively affect health as a result of insufficient glucocorticoids. This represents a rich area of study among foster and adopted children who may experience childhood adversity.