



HIPPOCAMPAL VOLUME, CAREGIVER CHANGES, AND FAMILY COHESION IN ADOLESCENTS WITH PRENATAL DRUG EXPOSURE

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Introduction

- Prenatal exposure to drugs (defined here as in-utero exposure to cocaine and/or heroin; PDE) can cause changes to neurodevelopment¹.
- Effects of PDE can also be modified by postnatal environmental factors, such as, relationships between primary caregivers and children³.
- This study aims to explore the interaction between PDE and postnatal family functioning on brain development.

Hypothesis

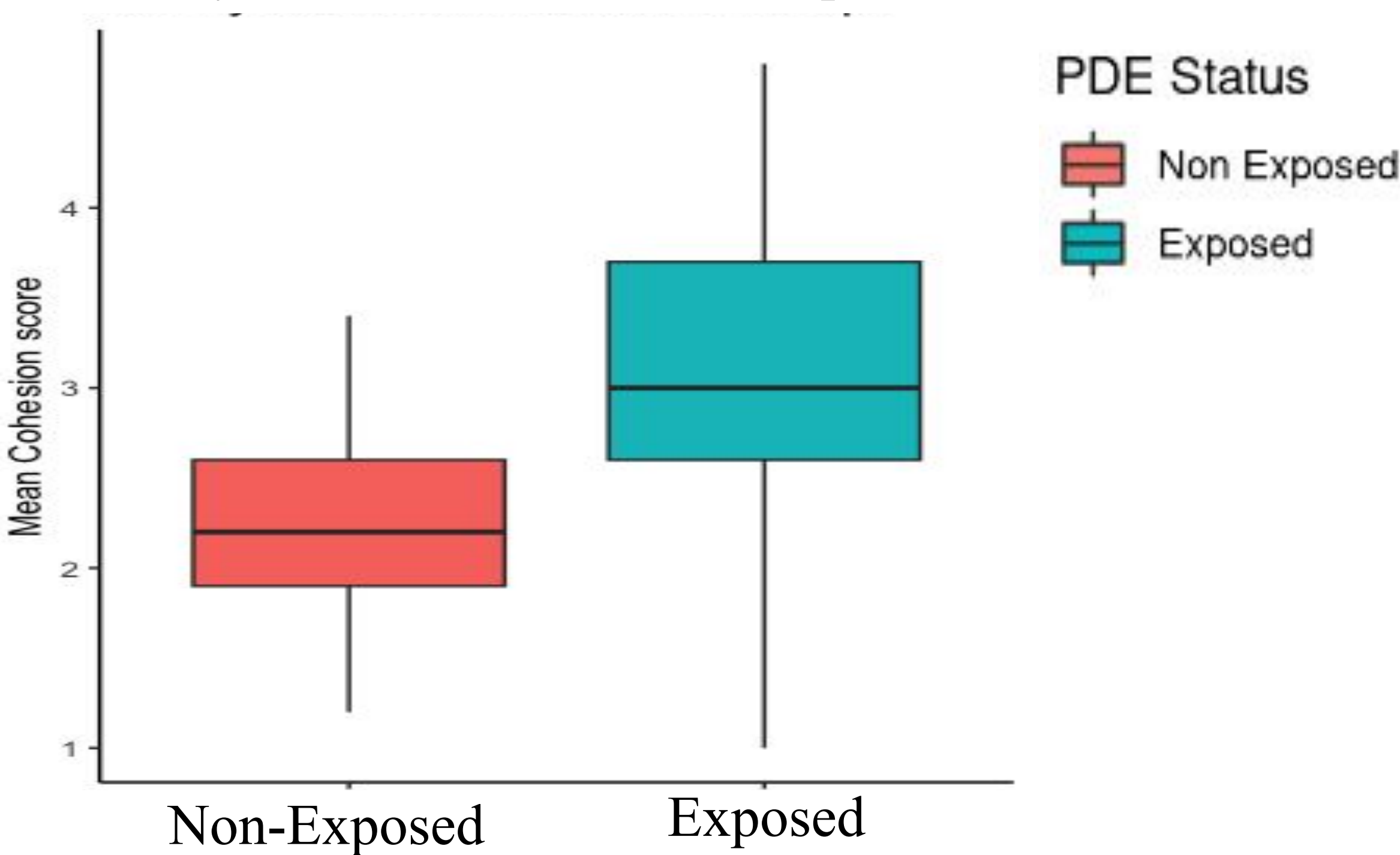
- **H1:** Participants in the PDE group will have more caregiver changes than those in the nonPDE group.
- **H2:** Participants with PDE will report less family cohesion and lower health scores than those without PDE.
- **H3:** Hippocampal volume will differ among participants in the PDE group and nonPDE group.
- **H4:** The number of caregiver changes within the PDE group will be related to variations in hippocampal volumes and positively correlated with family cohesion and family health and competence.

Methods

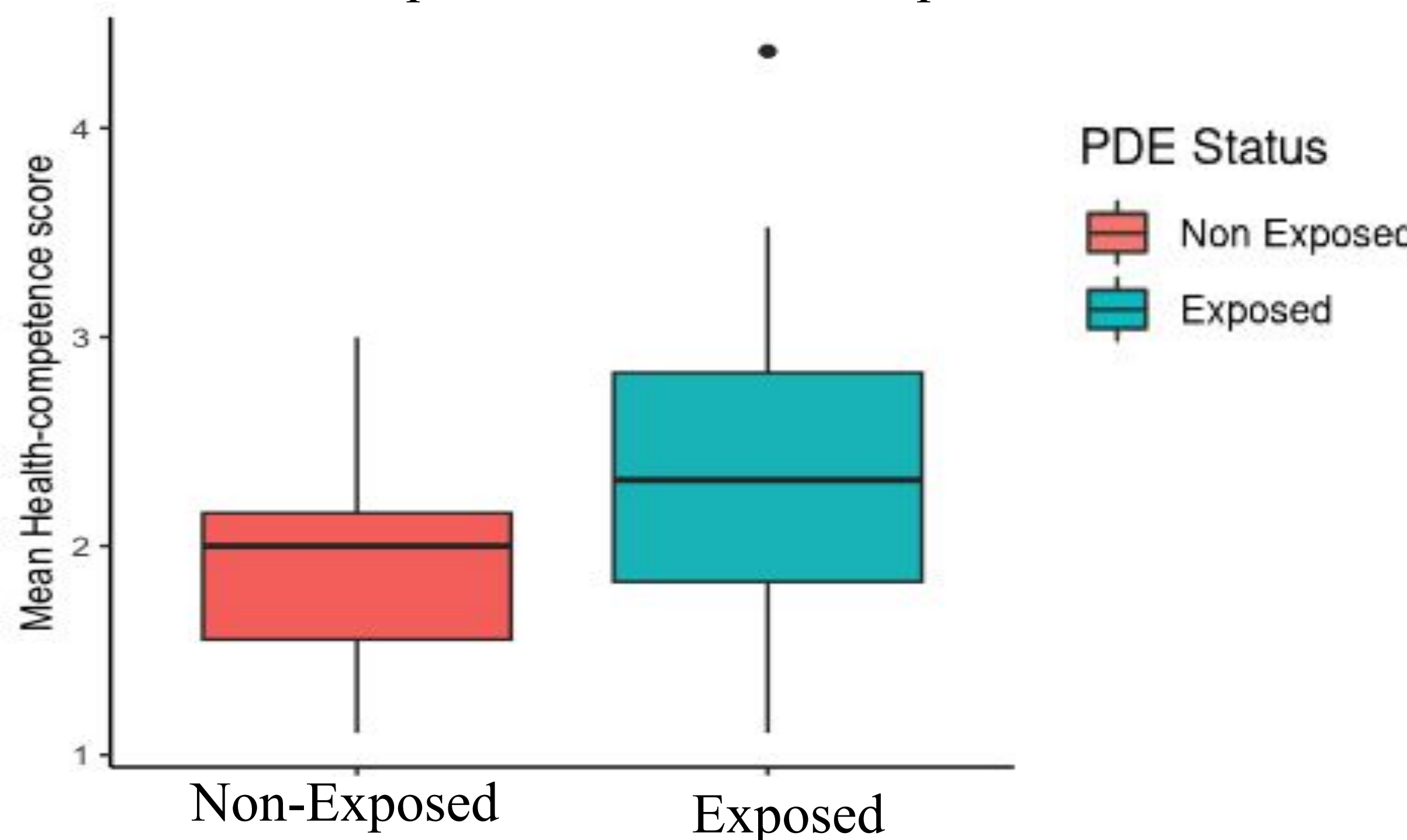
- PDE Group: Parent-infant dyads were enrolled at delivery from an urban University Hospital and followed until 18 years⁴.
- Non PDE Group: A Community Comparison sample, matched for age and demographics, was enrolled at age 6 years and followed until 18 years.
- Formal and informal caregiver changes were documented every six months throughout the first 7 years of the study.
- During early adolescence, participants completed the Self-Report Family Instrument (SFI)⁵.
 - Higher scores on the SFI scales are indicative of lower family cohesion and lower health and competence⁵
- Participants also completed T1-weighted structural MRI scans. Scans were processed in FreeSurfer v5.2. Volumes were adjusted for age, sex, and intracranial volume (ICV)⁶.

	PDE (n=27)	NON PDE (n=23)
Race	100% African American	100% African American
Mean Age (years)	14.24 (±1.23)	14.24 (±1.23)
Biological Sex	14 female : 13 male	14 female : 9 male

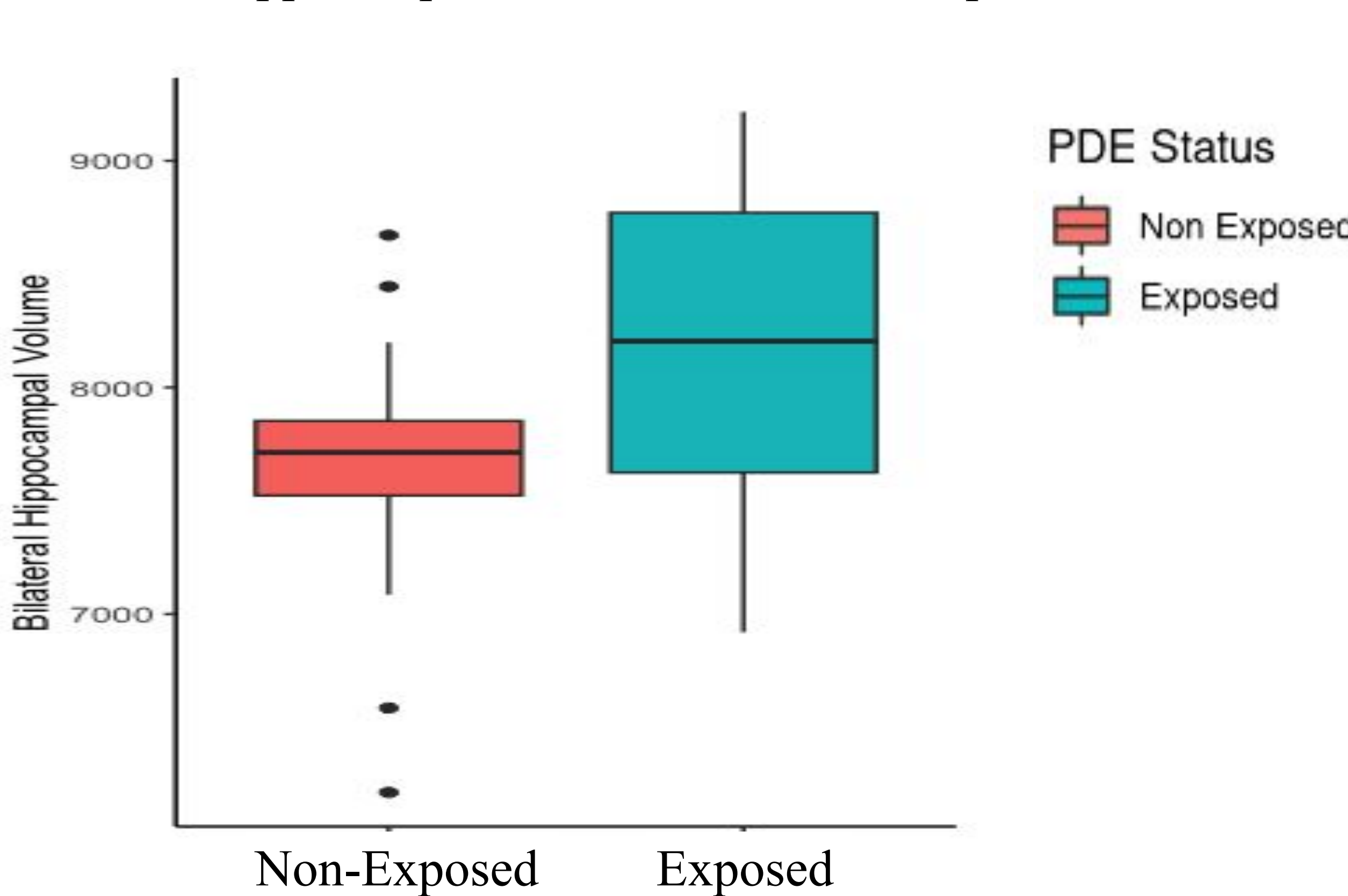
Family Cohesion Between Groups



Health & Competence Between Groups

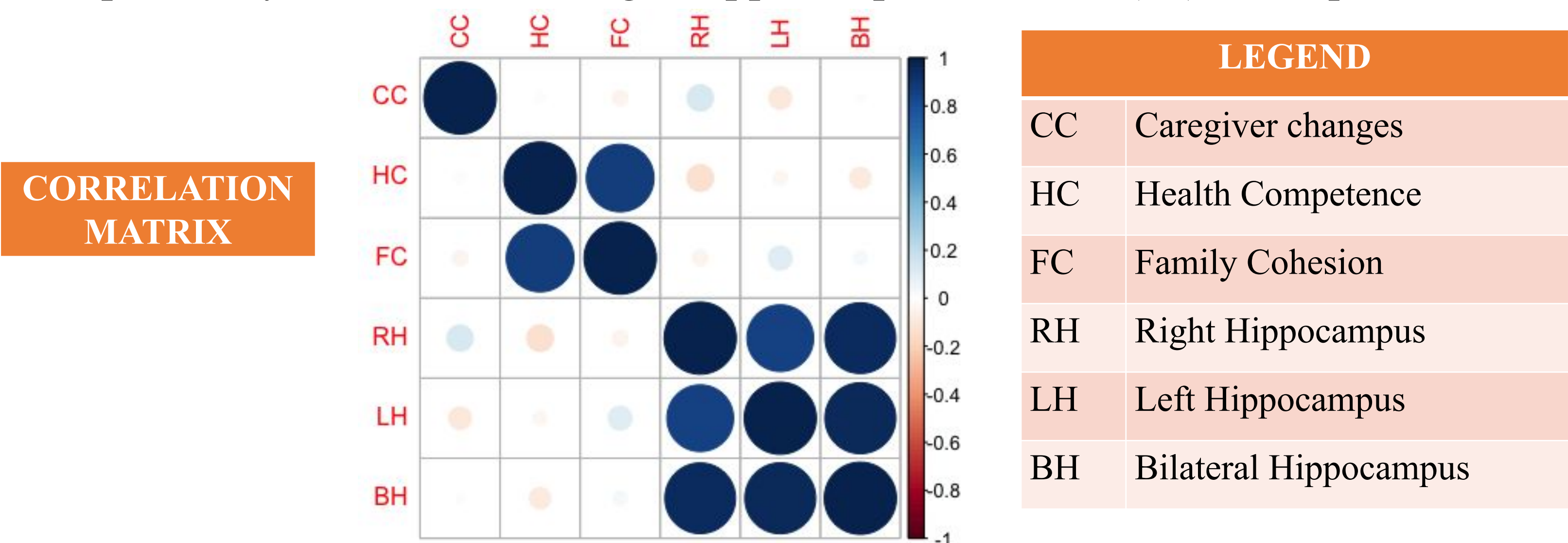


Bilateral Hippocampal Volume Between Groups



Results

- **H1:** Participants with PDE had more caregiver changes ($M = .85 \pm 1.03$) than participants without PDE ($M = 0$), $t(26) = -4.31$, $p < .001$, Cohen's $D = 1.07$.
- **H2:** Participants with PDE reported less family cohesion ($M = 2.9 \pm 0.66$) compared to nonPDE participants ($M = 2.25 \pm 0.55$), $t(40) = -2.9$, $p < .01$, Cohen's $D = .8$. Participants with PDE ($M = 2.38 \pm 0.38$) also reported less health competence than nonPDE participants ($M = 1.91 \pm 0.53$), $t(44) = -2.49$, $p = .02$, Cohen's $D = .71$.
- **H3:** Adjusted bilateral hippocampal volume was significantly larger for those with PDE ($M = 8222.65 \pm 742.35$) compared to those without PDE ($M = 7593.10 \pm 634.55$), $t(48) = -3.23$, $p = .002$, Cohen's $D = .91$.
- **H4:** Within the PDE group number of caregiver changes was not associated with family cohesion, $r(24) = -.04$, $p = .83$, or health competence, $r(24) = -.02$, $p = .92$. However, it was positively correlated with right hippocampal volume, $r(25) = 0.40$, $p = 0.04$.



Discussion

- The PDE and nonPDE groups differed significantly on postnatal environmental variables (health & competence, family cohesion, and number of caregiver changes), and neuroanatomical variables (hippocampal volume).
- Bilateral hippocampal volume was larger for the PDE group; however, within the PDE group, only right hippocampal volume was related to caregiver changes.
- Only the PDE group experienced caregiver changes, a potential index of family continuity.
- Associations reinforce the theme that development is influenced by both prenatal and postnatal factors.

Limitations

- Indices of family functioning are not entirely reflective of the child environment.
- Analyses utilizing caregiver changes only consisted of the PDE group because the non PDE group did not experience any caregiver changes
- Results are limited in external validity by homogeneity in the sample.

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References

