

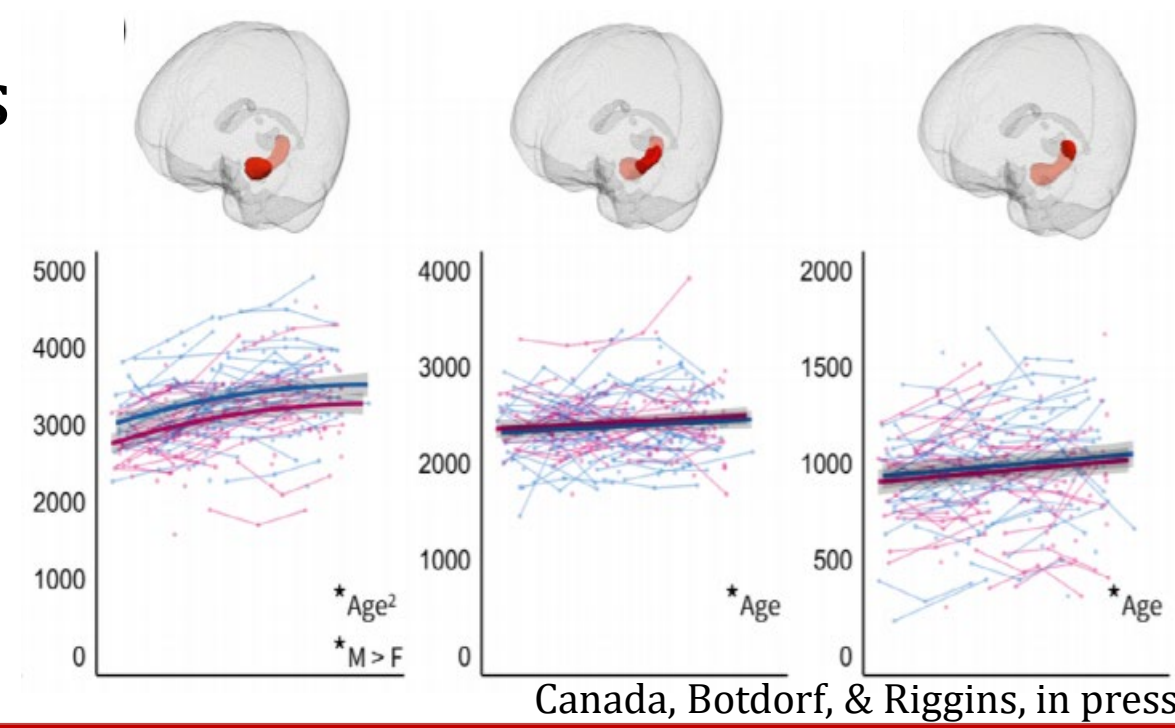
Is Habitual Nap Status Related to Hippocampal Volumes during Early Childhood?

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Introduction

- Research shows marked differences in memory performance between habitual nappers and non-nappers (Kurdziel, Duclos, & Spencer, 2013).
- Importantly, during the same developmental period when children transition out of their afternoon nap, the hippocampus demonstrates age-related changes in structure (Riggins et al 2015; Riggins et al., 2018).
- Previous research has demonstrated there are volumetric difference in hippocampal subfield volumes between nappers and non-nappers (Riggins & Spencer, in press).
- **Purpose:** To expand upon previous work assessing the role of hippocampal structure in memory differences between nappers and non-nappers by examining subregions



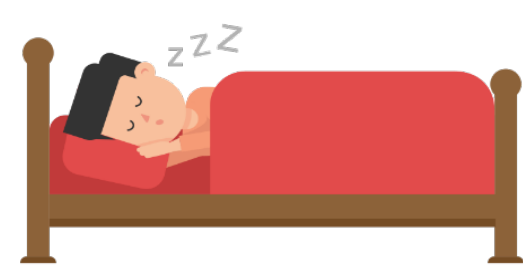
Methods

Participants

- Participants are part of an ongoing longitudinal study.
- N = 36 participants ($M_{age}=4.28$ years, 10 female).

Nap Status

- Nap status was determined via parent report on either a 2-week sleep diary, a parent questionnaire, or an over the phone interview.



Nappers (≥ 5 days/week)= 22



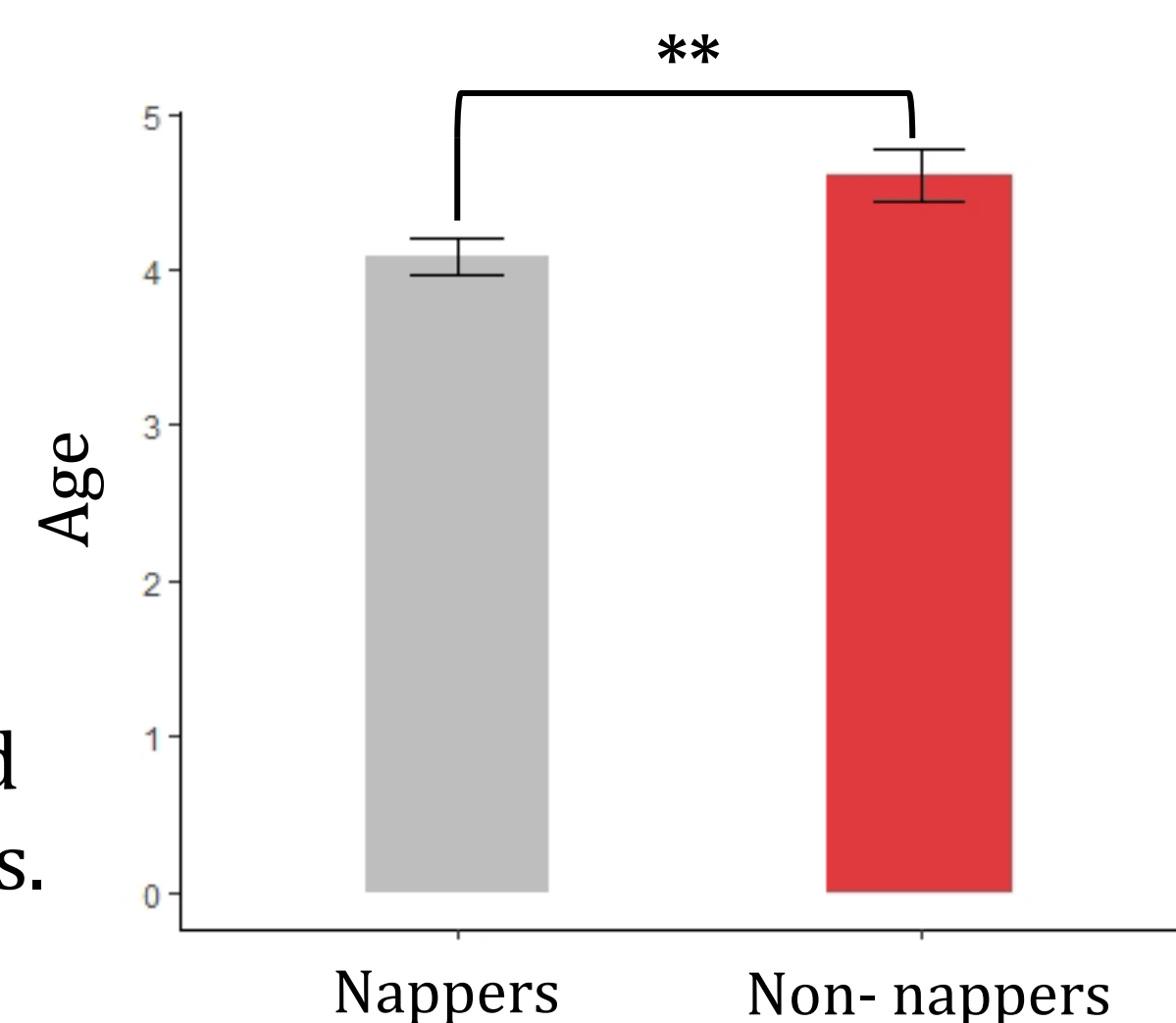
Non-nappers (< 5 days/week)= 14

Structural MRI Data

- A T1-weighted structural MRI scan (.9 mm³) was obtained using a Siemens 3T scanner with a 32-channel coil.
- Hippocampal volumes were extracted via Freesurfer v6.0 (Fischl, 2012) and refined using ASAT (Automated Segmentation Adapter tool, Wang et al., 2011).
- Hippocampal subregions (head, body, tail) were defined using standard anatomical landmarks (DeMaster et al., 2013; Riggins et al., 2015).

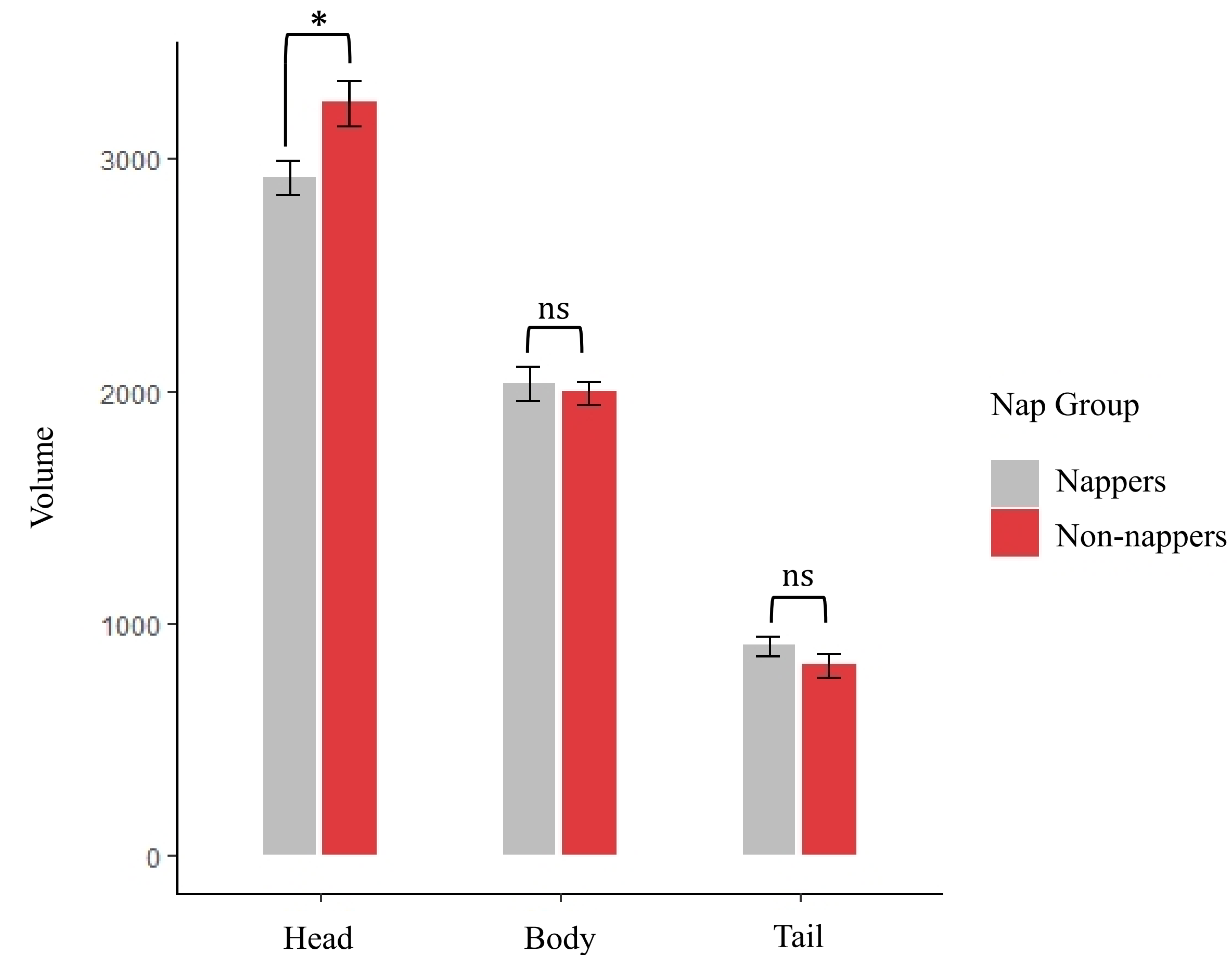
Covariates

- There were no significant group differences in ICV ($p = .26$) or sex ($p = .38$).
- There were group differences in age ($p = .001$).
- ICV, sex, and age were used as covariates in all analyses.



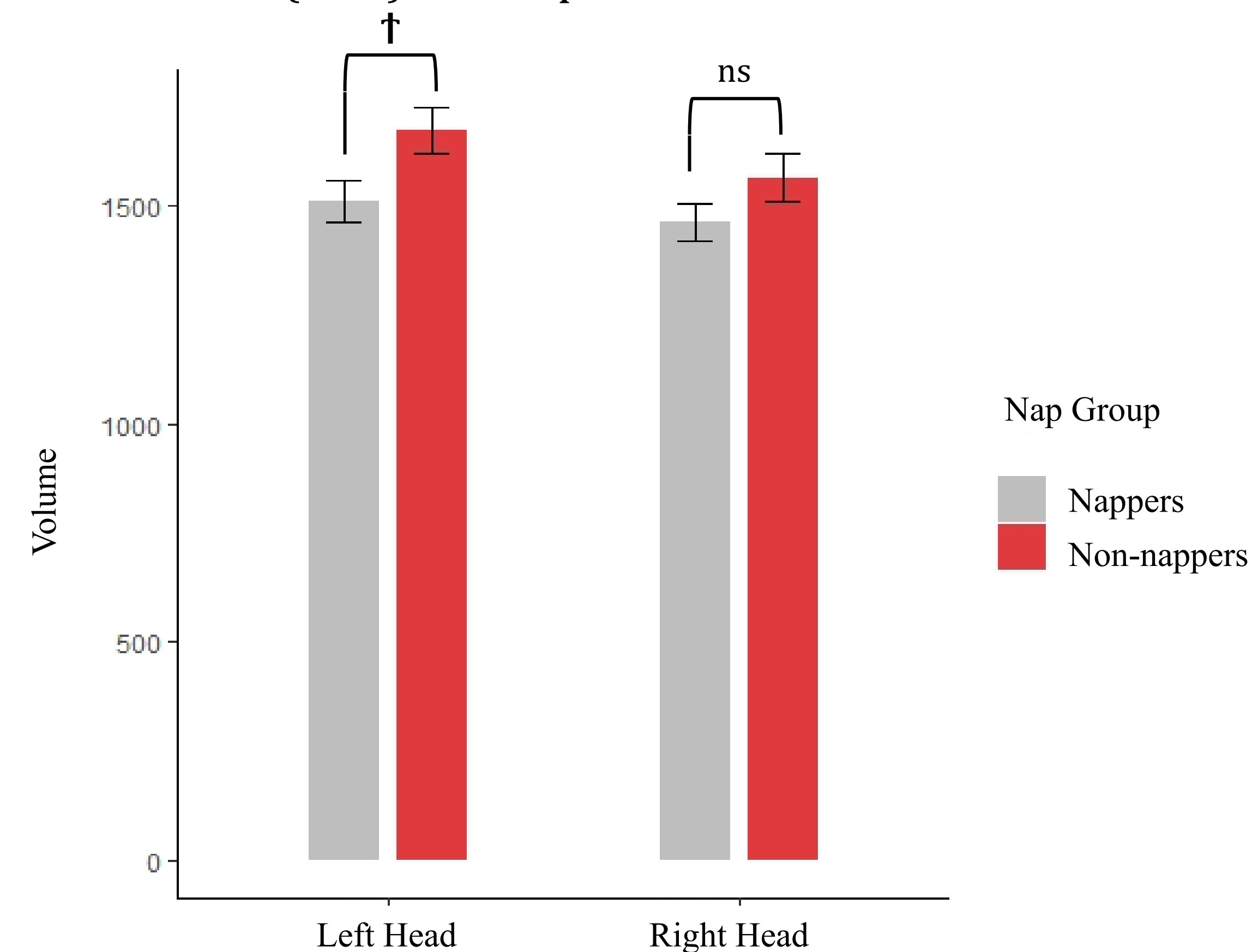
Results: Bilateral Subregion Differences

An ANOVA revealed that **bilateral hippocampal head volume was larger in non-nappers compared to habitual nappers** controlling for age, ICV, and sex, $F(1,30) = 5.04, p < .04$.



Results: Lateralized Differences in Hippocampal Head

Sperate ANOVAs revealed a marginal **group difference in left, but not right hippocampal head volume**, controlling for age, ICV, and sex, $F(1,31) = 3.88, p < .06$.



Discussion

- These results suggest hippocampal subregion volumes vary as a function of nap status. Specifically, non-nappers showed larger hippocampal head volumes compared to habitual nappers.
- This is consistent with previous findings that demonstrate differences in hippocampal subfield volumes between nappers and non-nappers (Riggins & Spencer, in press).
- Differences in hippocampal volumes may underlie previously reported differences in memory performance. Such effects may arise due to differences in sleep physiology.
- **Future Directions:** Future analyses will examine differences in memory and sleep spindle between nappers and non-nappers.

Take-Home Message

Children who have transitioned out of their afternoon nap have larger hippocampal head volumes compared to children who have not transitioned out of their afternoon nap

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