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Introduction

Perceived stress (PS) and inflammation are both individually associated with worse cognitive function, but inflammation has not been studied as a moderator in the association between PS and cognition.

- Perceived stress has been associated with worse cognitive function^{1,2}.
- Inflammation also has its own reported association with poor cognitive function³, but it is unclear whether inflammation moderates the association between PS and cognitive function (Figure 1).
- We hypothesize that inflammation may amplify the association between PS and cognition, such that individuals with both high PS and high inflammation will have the worst cognitive outcomes.
- We examined this question in a multi-site cohort of middle-aged individuals.

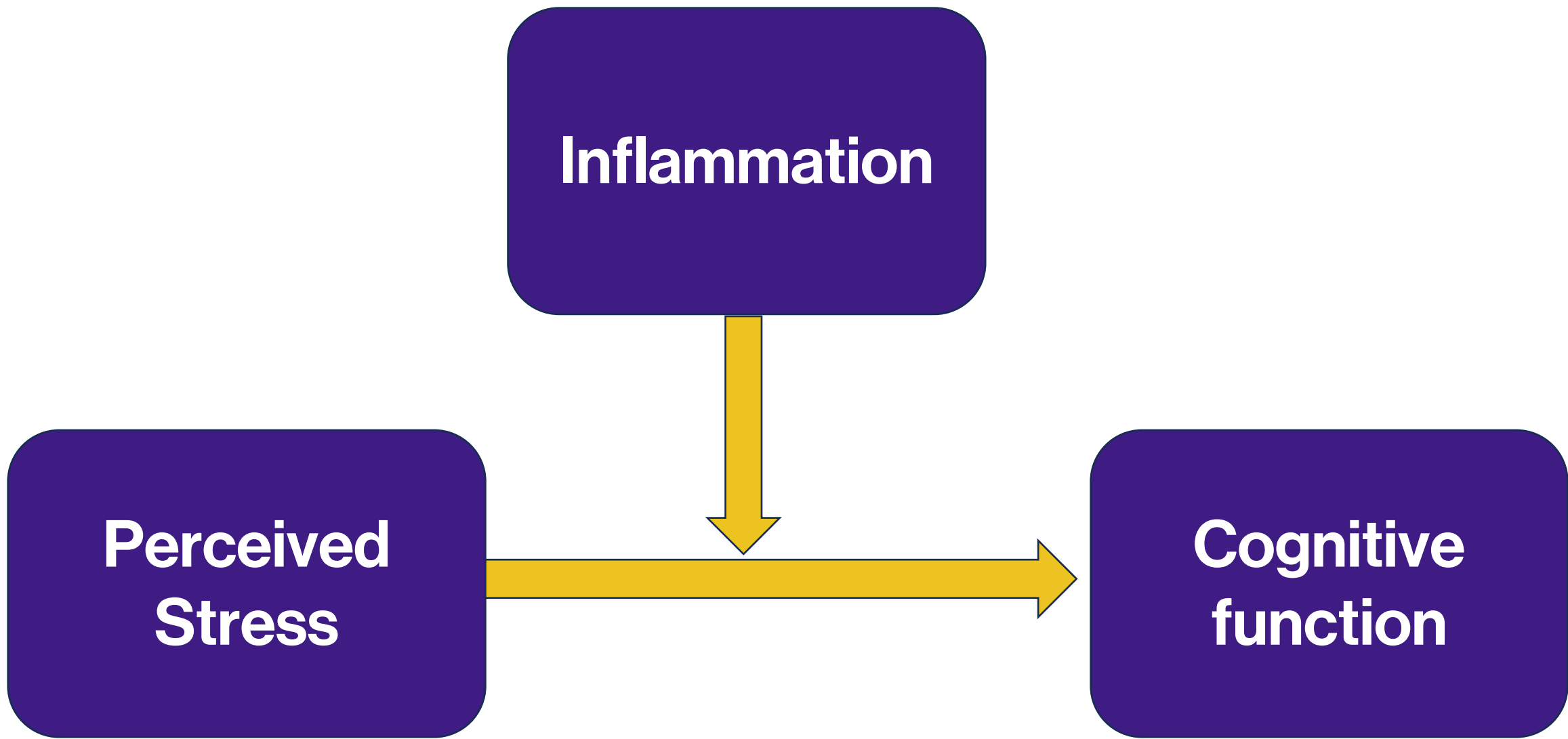


Figure 1. Proposed moderation model between PS, inflammation, and cognitive function.

Method

Linear regressions were conducted to examine PS and inflammation as predictors of cognitive function, and to assess moderation.

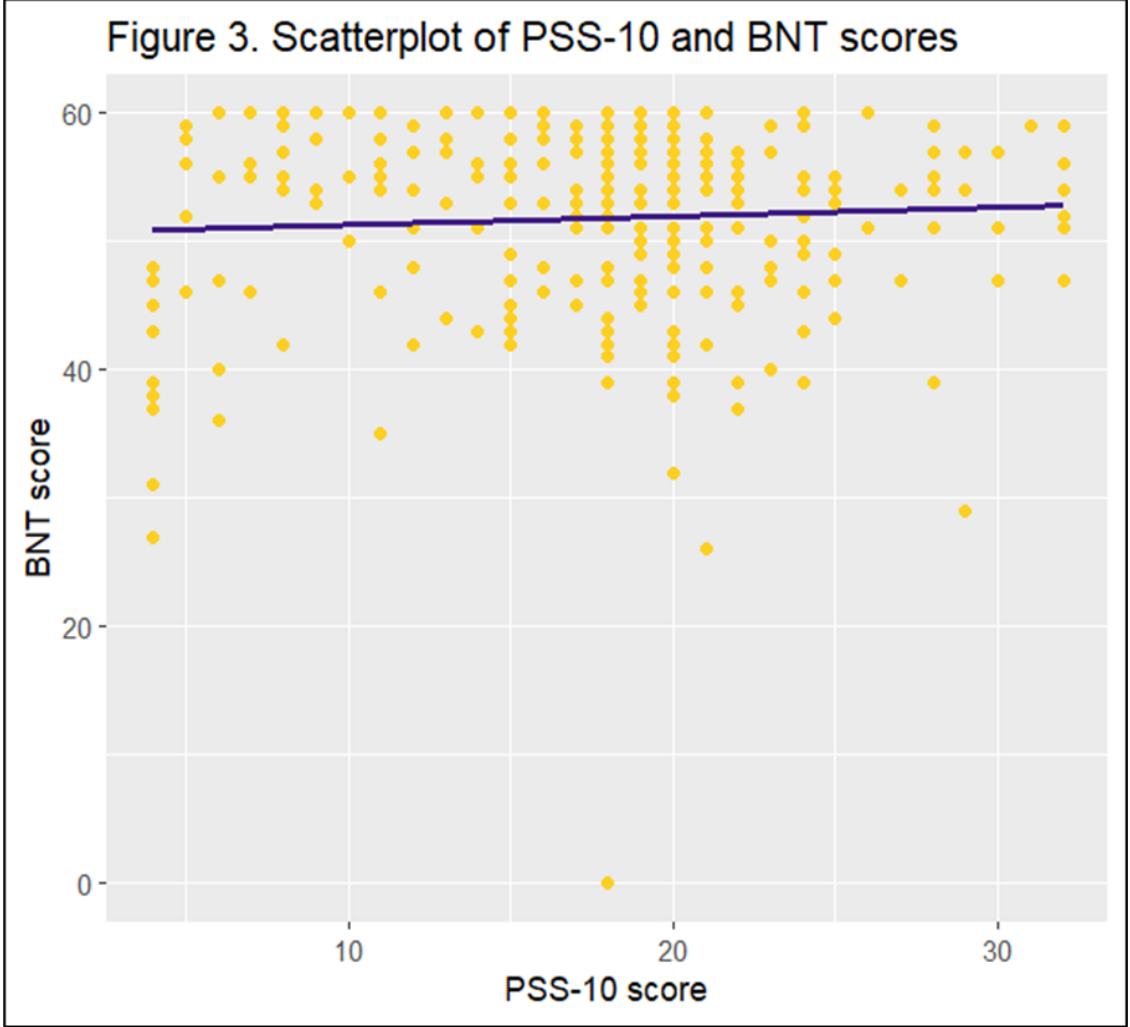
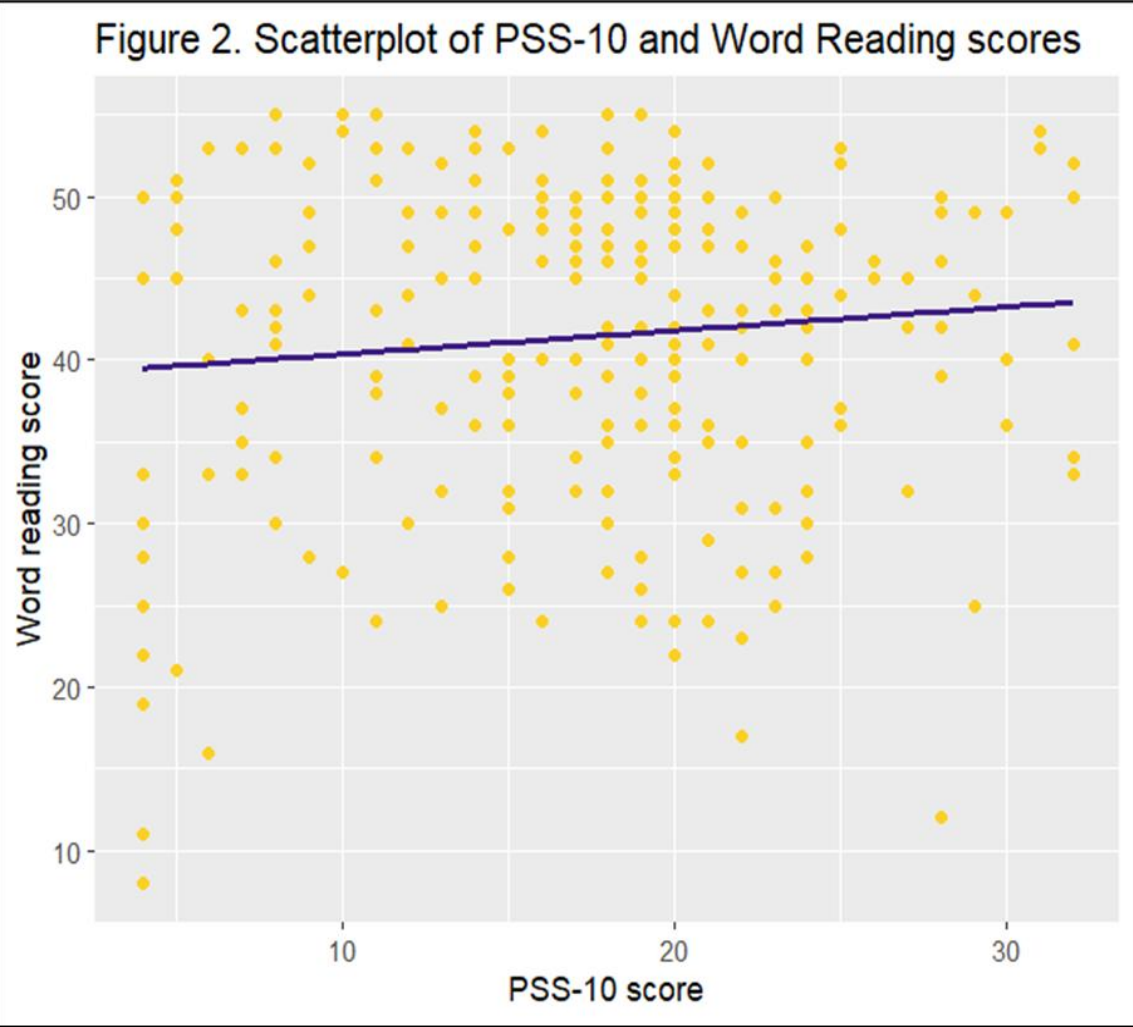
- 266 participants from the Disparities and Equity in Childhood Cardiovascular Exposures and Alzheimer's Dementia (DECADE) study completed the 10-item Perceived Stress Scale (PSS-10)⁴ and neuropsychological (NP) testing.
- Serum high-sensitivity C-reactive protein (hsCRP) was used as a measure of inflammation.
- Individual NP tests consisted of logical memory tasks, digit span tasks, Trail Making Task B, word reading, and the Boston Naming Test (BNT).
- A global cognition score was created by standardizing NP test scores and calculating the average.
- Linear regressions were conducted to test for an association between PS and hsCRP, and to examine if PS and hsCRP were individually associated with cognition.
- A PS x hsCRP interaction term was added to the models to test for moderation.
- Age, sex, and education were included as covariates in all models.

Results

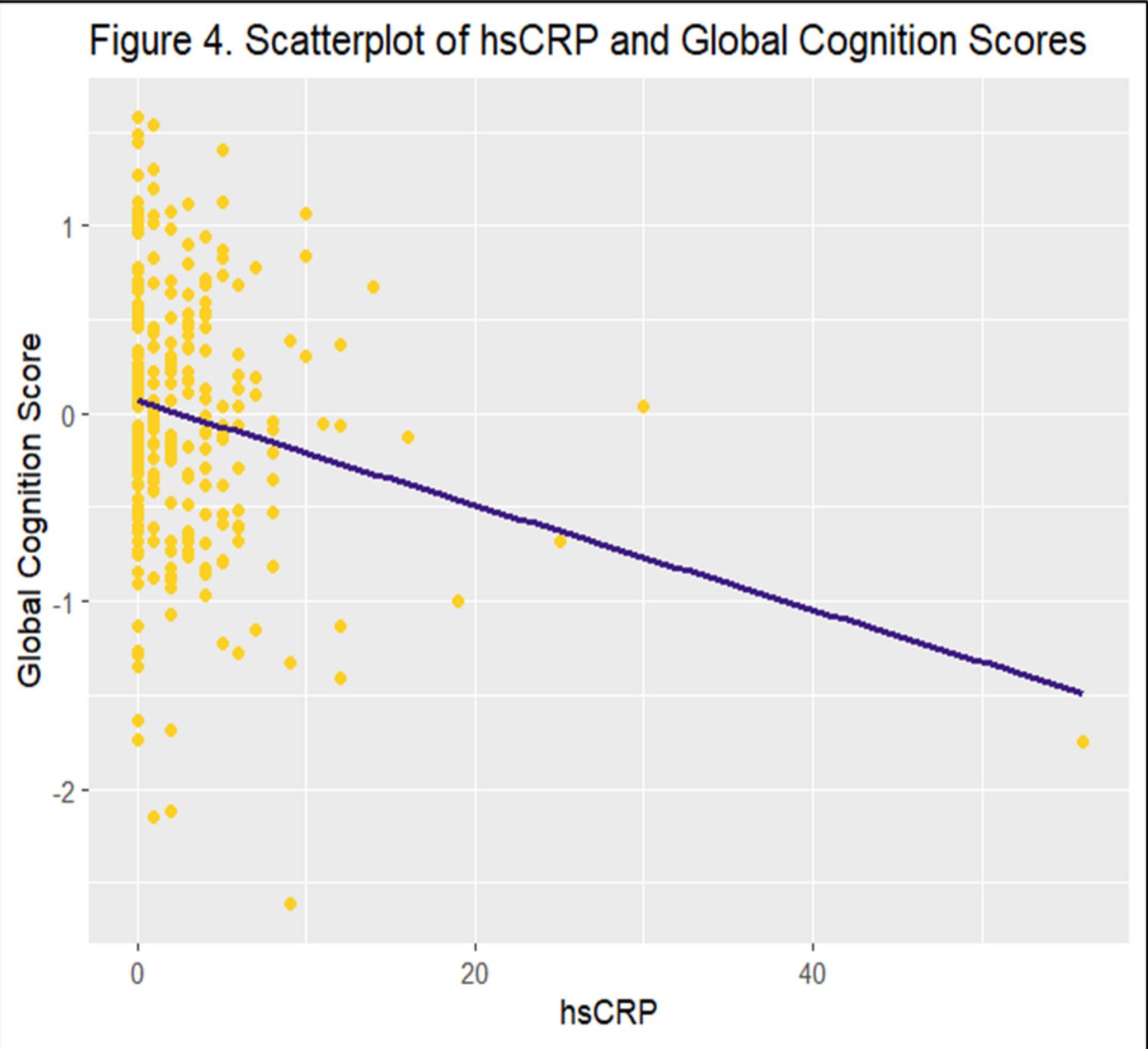
PS was not significantly associated with hsCRP. Higher PS was associated with better performance on some cognitive tasks, and higher hsCRP was associated with worse cognition.

Table 1. Sample demographic information	
Age, M(SD)	56.2(7.7)
Sex, N (%)	
Male	82(30.8%)
Female	184(69.2%)
Education level, N(%)	
Less than high school	16(6%)
High school or equivalent	112(42.1%)
Technical or professional certification/degree	10(3.7%)
Associate degree	37(13.9%)
Some college	11(4.1%)
4-year degree	50(18.8%)
Master's degree	24(9%)
Doctoral degree	2(0.7%)
Missing	4(1.5%)

- Participants ranged in age from 35.6-72.1 years old (mean age = 56.2 ± 7.7) and were mostly Female (Table 1)
- 42.1% of participants reported high school as their highest level of educational attainment.



- Higher PS was associated with better performance on the word reading task (Figure 2) and the Boston Naming Test (Figure 3).

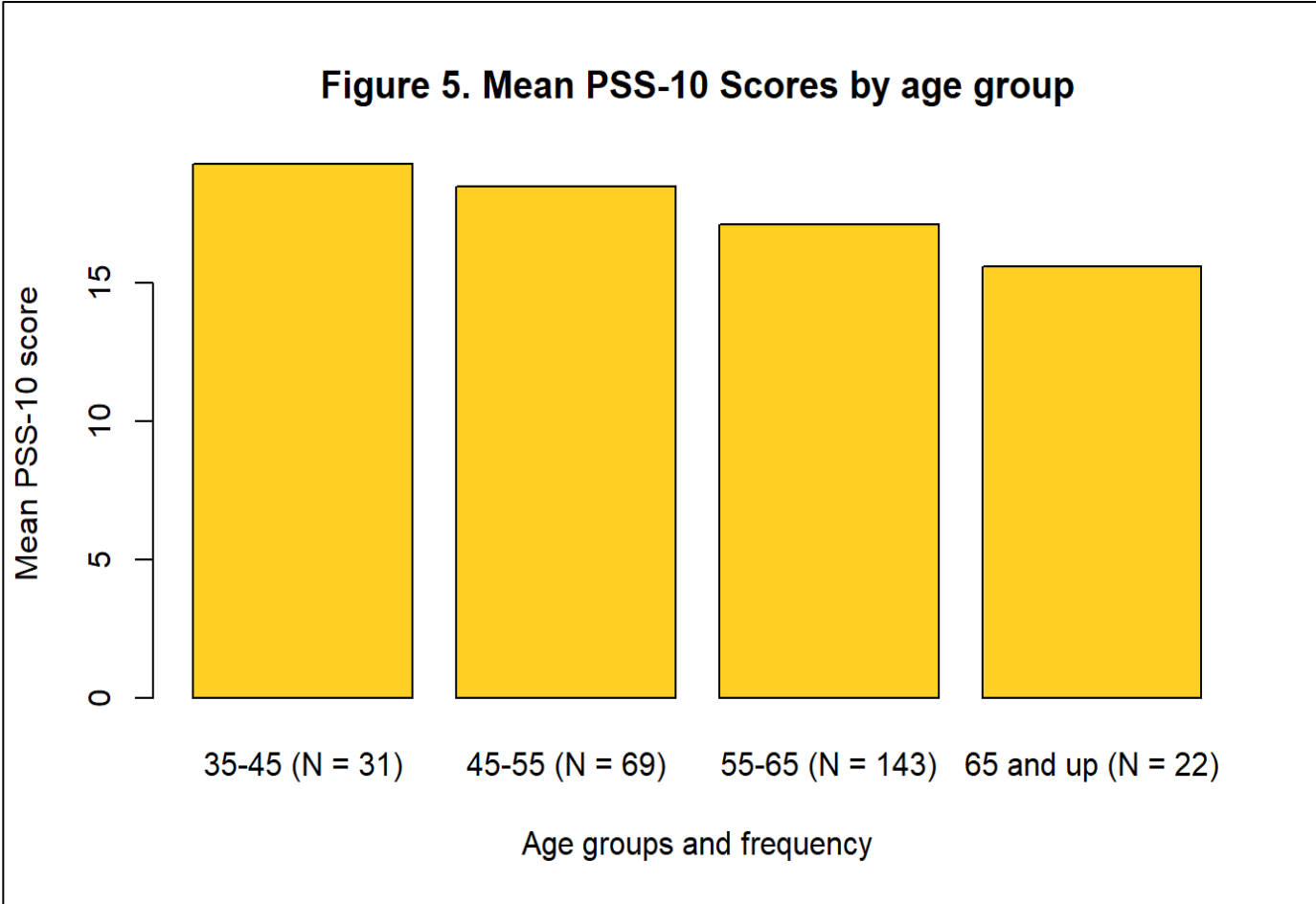


- Higher hsCRP was associated with worse global cognition (Figure 4), and worse performance on the logical memory I, word reading, and BNT subtests (data not shown).
- The PS x hsCRP interaction term was not significant in any models.

Conclusion

hsCrP did not moderate the association between PS and cognition in a cohort of middle-aged adults.

- The counterintuitive association between PS and word reading/BNT scores may be due to lower levels of PS in middle age.



- Normative data for the PSS-10 has shown that PS decreases with age⁵, and this was also true in the current study (Figure 5)
- It is possible that, due to our sample being mostly middle aged, PS levels were not high enough to negatively affect cognitive function.
- The word reading task and BNT are also measures of crystallized intelligence and may not be as strongly impacted by PS.
- Our finding that inflammation was associated with worse cognitive function is consistent with existing literature³, but we did not find that inflammation moderated the association between PS and cognitive function.
- Future studies should continue to study this association, potentially in younger samples with higher levels of PS

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