

# Greater psychological resilience during the COVID-19 pandemic is associated with lower tau burden in cognitively unimpaired individuals

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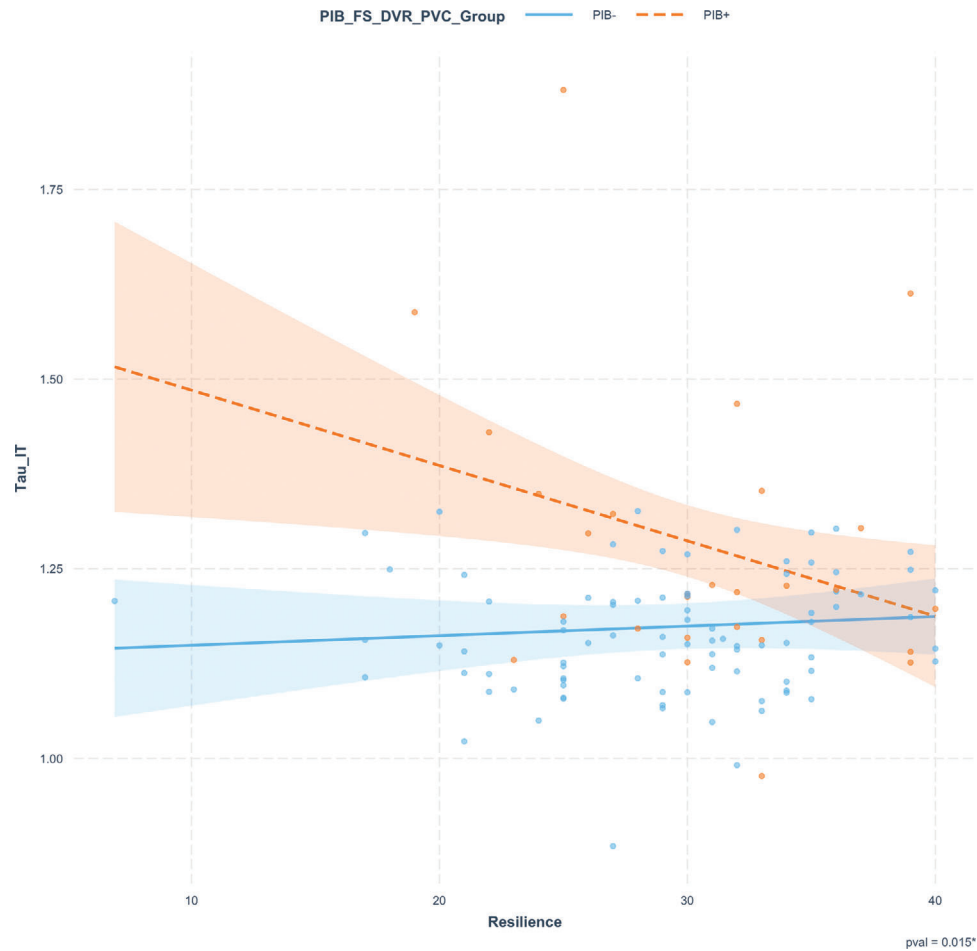
## Abstract

**Background:** The outbreak of the 2019 novel coronavirus SARS-CoV-2, causing the COVID-19 pandemic, along with the global measures used to control the spread of the disease, have been particularly stressful for older individuals. Robust evidence suggests that stress-related physiological processes may play a significant role in the onset of age-related cognitive decline and dementia, such as Alzheimer's disease (AD). For example, previous animal and human research have shown that stress exacerbates tau pathology and subsequent cognitive impairment. One important factor determining a person's level of stress is psychological resilience, which refers to a person's ability to return to equilibrium when difficulties occur. As such, resilience may buffer and protect individuals against the deleterious effects of stress. The objectives of this study were to examine the relationship between psychological resilience and tau burden in cognitively unimpaired individuals, and to evaluate whether amyloid (A $\beta$ ) pathology modifies this relationship.

**Method:** A total of 114 older adults (mean age=74.5;66 females (57.9%)) enrolled in the Harvard Aging Brain Study or the Instrumental Activities of Daily Living study completed an electronic survey online including measures of psychological resilience (Connor-Davidson Resilience Scale-10, where a higher score indicates greater resilience) during the COVID-19 pandemic period (May 2020). We used previously collected (mean time from survey=1.75 year) PET imaging data to assess A $\beta$  and tau burden.

**Results:** Overall, participants demonstrated high levels of resilience (mean=29.5,range=9-40). Multiple regression analyses (correcting for age, gender and time difference between survey and PET) demonstrated an interaction between resilience and amyloid on tau pathology ( $\beta$ =-0.01,p=0.015, Figure1). Specifically, in A $\beta$ + individuals (SUVR>1.324), those with higher psychological resilience also had lower tau pathology. No relationship was seen in A $\beta$ - individuals.

**Conclusion:** Our findings suggest that greater resilience during the pandemic is associated with lower tau burden in individuals at higher risk of cognitive decline (i.e. pre-clinical AD). Future studies are needed to determine the impact of stress and psychological resilience on prospective pathological brain changes and subsequent cognitive decline. Furthermore, resilience may be an important target for interventions to support older adults navigating stressful situations and to lessen the influence of stressors on AD pathological processes.



**FIGURE 1**