**Purpose in Life** is a feeling and/or belief that there is meaning to one’s life, having goals, and a sense of directedness.

Psychological Wellbeing Scale

1. Purpose in Life items:
   - Purpose in Life is a protective factor for:
     - All-cause mortality regardless of age
     - Cardiovascular events
     - Alzheimer’s disease and cognitive decline

2. The hippocampus is a plastic brain structure critical for learning and memory.

3. Hippocampal volumes:
   - Are susceptible to aging and chronic or severe stress.
   - Reductions in volume (atrophy) are associated with age-related cognitive decline.
   - Can distinguish between mild cognitive impairment and neurodegenerative diseases.
   - Serve as a marker of brain aging and neurodegeneration.

**Research Question**

Is feeling greater **Purpose in Life** associated with larger volumes of the hippocampus, a brain structure critical for learning and memory, and indicative of brain health?

**Background**

**Purpose in Life** is a feeling and/or belief that there is meaning to one’s life, having goals, and a sense of directedness.

Psychological Well-Being questionnaire

1. Purpose in Life self-report items from Psychological Well-Being questionnaire

2. Structural MRI data processed with FreeSurfer version 5.3.0 (MR) and 6.0.0 (M3).

3. Controls: Intracranial volume (total brain + CSF), age, sex (Male/Female), race (BIPOC/White), education (High school/GED, Some college, College degree +)

4. Control volume of interest: Calcarine sulcus corresponding to primary visual cortex.

5. As expected, hippocampal volume is negatively associated with age in both MIDUS samples: MR ($\beta=-11.95$, SE=2.86, t=-4.36, p<0.001), M3 ($\beta=-17.42$, SE=2.68, t=-6.49, p<0.001).

**Methods**

Midlife in the U.S. Refresher (MR)

- Sample size n=127, 53% Female, 36.5% BIPOC, Mean age of 48.69 years (range 26-76 years)

Midlife in the U.S. 3rd wave (M3)

- Sample size n=154, 59% Female, 27.3% BIPOC, Mean age of 64.82 years (range 48-95 years)

**Purpose & Volumetric Measures**

- 7 Purpose in Life self-report items from Psychological Well-Being questionnaire

**Controls:**

- Covariates: Intracranial volume (total brain + CSF), age, sex (Male/Female), race (BIPOC/White), education (High school/GED, Some college, College degree +)

**Results**

Greater purpose is associated with larger hippocampal volumes in both MIDUS samples:

MR ($\beta=10.22$, SE=4.87, t=2.10, p=0.038)

M3 ($\beta=8.19$, SE=4.01 t=2.04, p=0.043)

- No significant interactions were found between purpose and age (all p > 0.11) for hippocampal volume in either sample.
- No significant associations were found between purpose and the calcarine sulcus control region of interest volume: MR ($\beta=0.36$, SE=5.43, t=0.06, p=0.95), M3 ($\beta=4.63$, SE=5.02, t=0.93, p=0.36).

**Discussion**

- Although hippocampal volumes decrease with age, having a greater feeling of purpose is associated with larger hippocampal volumes across our samples’ adult age ranges.

- This suggests interventions designed to increase feelings of purpose and meaning in life may be beneficial at all ages for maximizing hippocampal volume.

- However, the cross-sectional nature of this analysis also allows the interpretation that larger hippocampi may somehow provide the capacity for greater feelings of purpose.

- Alternatively, other mechanisms may underlie the associations: exercise is positively associated with purpose and has been shown to benefit hippocampal volumes.

**Questions?** Email: laurekrist@gmail.com

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