Social Support Availability and Cognitive Function Among Middle- and Older-aged Adults: A Cross-sectional Analysis of the Canadian Longitudinal Study on Aging

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Background

- As the population ages, cognitive function (CF) becomes an important health outcome and a risk factor for other health outcomes
- Declines in CF affect people's daily lives
  - Loss of autonomy and independence
    - Reliance on others to help with routine chores
    - Can no longer drive
    - Risk of depression
    - Lower quality-of-life
  - More serious declines in CF can lead to dementia

Background

- Mental and physical stimulation preserve CF
  - Protective factors include...
    - Education
    - Religiousness / spirituality
    - Physical activity
- High levels of social support availability (SSA) provide another vehicle through which people can stimulate their mental processes
  - Opportunity to interact with people who provide friendship, assistance, etc.
  - The availability of help itself is protective against adverse health outcomes

Research Question & Hypothesis

- To explore the association between SSA and CF in persons aged 45 – 85 years using baseline data from the CLSA
- Higher levels of SSA are positively associated with higher levels of CF

Methods

- 29,842 persons recruited for the CLSA Comprehensive
- SSA measured using the 19-item MOS Social Support Survey
  - Answers converted to a continuous 1 (low SSA) to 5 (high SSA) range for overall SSA and four subscales:
    - Emotional/informational
    - Tangible
    - Positive social interaction
    - Affectionate

Methods

- CF measured in three cognitive domains:
  - Memory
    - Rey Auditory Verbal Learning Test
    - Rey Auditory Verbal Learning Test – Delayed Recall
  - Executive function
    - Mental Alternation Test
    - Animal Naming Test
    - Controlled Oral Word Association Test (or F-A-S)
  - Psychomotor speed
    - Choice Reaction Time

Methods

- Converted raw cognitive test scores into z-scores separately for English and French speakers
- Summed the z-scores across multiple tests in the same domain
- Animal Naming Test – 2 scoring algorithms
  - # 1: A strict definition was used such that only taxonomically distinct animals that differed at the level of species received a point (applied in this analysis)
  - # 2: Participants received a point for each unique animal named within the allotted 60 seconds (scores were slightly higher for the second algorithm)

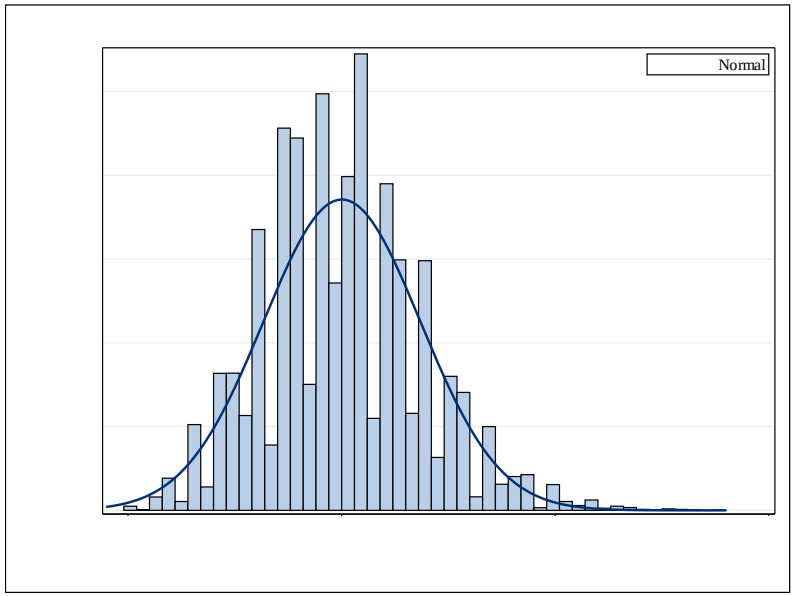
Methods

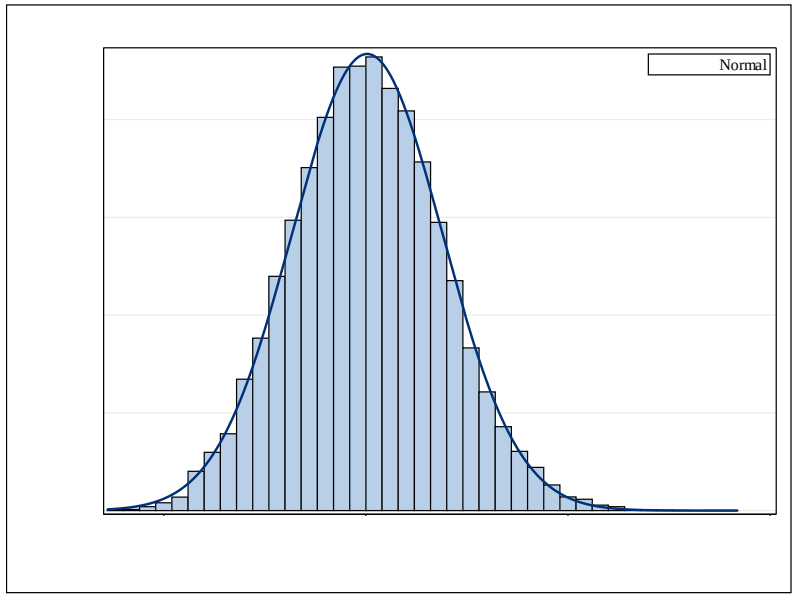
- Separate multiple linear regression models for each cognitive domain, controlling for age, sex, and education
- To improve model fit, we employed robust standard errors for memory and executive function, and the natural logarithmic transformation of psychomotor speed
- Analyses weighted by the CLSA sample weights

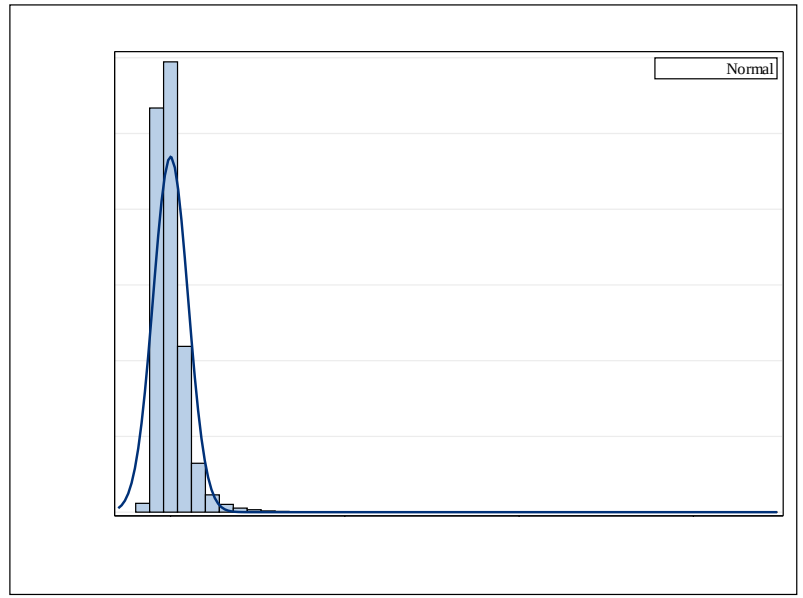
Results

- Median age = 62 years (IQR = 17 years); 51% female
- 81% completed high school
- 81% spoke English
- Median overall SSA score = 4.42 (IQR = 0.95)

Label	Minimum	25th Pctl	50th Pctl	75th Pctl	Maximum
Memory	-4.96	-1.29	-0.07	1.05	8.74
Executive Function	-12.43	-2.49	0.02	2.55	18.21
Psychomotor Speed (CRT)	-1.55	-0.58	-0.20	0.32	34.66







Results

Regression Coefficients (95% Confidence Intervals): SSA and CF

	Memory	Executive Function	Psychomotor Speed
Overall	0.22 (0.18,0.25)	0.50 (0.43,0.57)	-0.06 (-0.10,-0.03)
Emotional/informational	0.19 (0.16,0.22)	0.43 (0.36,0.49)	-0.06 (-0.09,-0.02)
Tangible	0.15 (0.12,0.17)	0.38 (0.32,0.44)	-0.04 (-0.07,-0.02)
Positive social interaction	0.14 (0.11,0.17)	0.34 (0.27,0.40)	-0.06 (-0.10,-0.03)
Affectionate	0.17 (0.14,0.19)	0.35 (0.29,0.41)	-0.06 (-0.09,-0.03)

Controlling for age, sex, education.

Memory and executive function: higher scores = better CF.

Psychomotor speed: lower scores = faster reaction time.

The coefficients represent changes in z-score or log z-score for every one-unit change in SSA score.

Discussion

- Higher levels of SSA are positively associated with higher levels of CF
- Assessment of clinical significance depends on development of population norms for the cognitive tests (ongoing)
- Strengths
  - Population-level study of persons in middle- to older-age
  - Multiple measures of CF to reflect the multidimensional nature of cognition as a construct
- Limitations
  - Cross-sectional: poor CF could precede declines in SSA
  - Selection bias (?): baseline sample has high CF and high SSA

Next Steps

- Spatial analyses to map patterns of SSA and CF in Canada
- Longitudinal analyses to examine change over time
- Broader assessment of potential effect modifiers and confounders
- Use the full scope of cognitive tests available in the CLSA
- Incorporate methods work regarding analyses of cognitive tests

Acknowledgments

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The End