Loneliness and memory change across Lifebrain European samples

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Loneliness & Health

Subjective state, negative emotion
30 millions Europeans feel lonely

1- Poor health
2- Living alone

Conditions
Depression, anxiety, suicide, cardiovascular and cerebrovascular disease, diabetes

Dementia and cognitive function (ELSA, SHARE,..)

‘Pathways’
- Negative immune, neuroendocrine effects
- Unhealthy behaviours, poor sleep, substance abuse.
Objectives
To explore the effects of Loneliness on memory function across Lifebrain samples

1. Is there a constant effect of Loneliness on memory or does it act accelerating memory decline in Advanced ages?

2. Memory-loneliness associations are stronger for persistent loneliness or its transient oscillations?
Memory change in our cohorts & confounders

Effect of sex on memory scores (difference in means) in the Betula cohort.

Effect of years of education on memory scores in the Betula cohort. High, medium and low groupings are based on terciles for the sake of representation.
Little association between age and loneliness in the Lifebrain cohorts

- **Sweden**
  - $N=143$ (60-85yrs)
  - Not significant effect of age ($\chi^2 = 4.9$, $p=0.08$)

- **Germany**
  - $N=1187$ (60-85yrs)
  - Significant linear effect of age ($\chi^2 = 19.8$, $p=8.5\times10^{-6}$)
  - Not significant improvement with quadratic term ($\chi^2 = 0.05$, $p=0.8$)

- **Norway**
  - $N=87$ (60-80yrs)
  - Not significant effect of age ($F=0.44$, $p=0.5$)

- **Spain**
  - $N=44$ (63-76yrs)
  - No significant effect of age ($F=2.8$, $p=0.09$)
## Persistent and transient loneliness vs. memory performance

### Predictors of verbal memory

| Predictor                      | Stand. Beta | t-value | Pr(>|t|)       |
|-------------------------------|-------------|---------|----------------|
| Education                     | 0.29        | 6.4     | 5.25e-10 ***   |
| Sex                           | -0.19       | -4.5    | 1.06e-05 ***   |
| Age from60                    | -0.35       | -11.8   | < 2e-16 ***    |
| **Persistent Loneliness**     | -0.04       | -0.8    | 0.409          |
| **Loneliness oscillations**   | -0.02       | -1.0    | 0.316          |

### Predictors of memory performance

| Predictor                      | Stand. Beta | t-value | Pr(>|t|)       |
|-------------------------------|-------------|---------|----------------|
| Education                     | 0.19        | 7.2     | 7.23e-13 ***   |
| Sex                           | -0.16       | -6.1    | 1.35e-09 ***   |
| Age                           | -0.04       | -2.667  | 0.00771 **     |
| **Persistent Loneliness**     | -0.05       | -2.024  | 0.04317 *      |
| **Loneliness oscillations**   | -0.01       | -0.741  | 0.45868        |
Persistent loneliness vs. memory decline (adding an interaction term...)

Loneliness may accelerate rate of memory decline in advanced ages

Z-score of 4 verbal memory assessments. Loneliness: LOW loneliness= 1st, 2nd and 3rd quartiles; HIGH = 4th quartile

Significant effect on rate of change (i.e. addition of interaction term, $\chi^2=7.1$, $p=0.008$)

* Quadratic terms did not significantly improve the model

Number of words recalled (delayed memory). Loneliness: LOW loneliness= 1st, 2nd and 3rd quartiles; HIGH = 4th quartile

No significant effect on rate of change but tendency towards it ($\chi^2=4.4$, $p=0.1$)

* Quadratic terms did not significantly improve the model

Loneliness may accelerate rate of memory decline in advanced ages
Conclusions and further steps

We found slight increase in loneliness with age in our cohorts (for some, not even significant)

Persistent loneliness but not transient oscillations seem to have an impact on memory and its age-associated decline.

Look for moderators of the effects, i.e. social isolation, personality

Look for underlying brain mechanisms (i.e. HPC atrophy?)