Exploring a Potential Role for Education in the Relation between Loneliness and Cognition

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BACKGROUND
Feeling of loneliness have been associated with increased dementia risk and rate of cognitive decline, as well as reduced performance on tasks measuring processing speed, working and long-term memory, and spatial ability. Prior work suggests that individuals with less education may be particularly vulnerable to experiencing poor cognitive functioning in the context of loneliness. However, education moderation has only been explored for memory (immediate and delayed recall) and executive function/verbal ability (verbal fluency).

Study Aims:
• Examine relations between loneliness and four domains of cognitive function (verbal ability, spatial ability, processing speed, working memory)
• Test for moderation of these relations by educational attainment and age

SAMPLE
Participants (n = 12,977, age range 25-102 years, M_age = 61.76 (13.8), 51% F) were drawn from nine studies participating in the Consortium on Interplay of Genes and Environment across Multiple Studies (IGEMS). The age distribution is shown in Figure 1.

Figure 1. Age distribution by study

MEASURES
Harmonized Loneliness: CES-D (I felt lonely), CAMDEX (Have you felt lonely lately?)
• (72.6% Not Lonely, 24.9% Occasionally Lonely, 2.5% Often/Always Lonely)

Cognitive Performance:
Verbal Ability (Synonyms, M = 47.49, SD = 10.6)
Processing speed (Symbol Digit, M = 45.66, SD = 11.8)
Spatial Ability (Block Design, M = 43.10, SD = 11.3)
Working memory (Digits Back, M = 48.70, SD = 9.8)

Educational Attainment:
Years of education (M = 9.90, SD = 3.6)

STATISTICAL ANALYSES

Table 1. Polyserial correlations between loneliness and performance on the four cognitive tasks

<table>
<thead>
<tr>
<th></th>
<th>Age (years)</th>
<th>50-59</th>
<th>60-69</th>
<th>70+</th>
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</thead>
<tbody>
<tr>
<td>Synonyms</td>
<td>0.04</td>
<td>-0.15</td>
<td>-0.15</td>
<td>-0.09</td>
</tr>
<tr>
<td>Block Design</td>
<td>-0.15**</td>
<td>-0.15**</td>
<td>-0.09**</td>
<td></td>
</tr>
<tr>
<td>Digits Back</td>
<td>-0.09**</td>
<td>-0.09**</td>
<td>-0.09**</td>
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</tbody>
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Model Fitting. Nested multiple mixed linear models were fit for processing speed (n = 6459, 54% F) and spatial ability (n = 1897, 60% F), adjusting for pair status.

RESULTS

Figure 3. Estimated cognitive performance by education and loneliness

CONCLUSIONS

For both spatial ability (Block Design) and processing speed (Symbol Digit), higher levels of loneliness and lower educational attainment each independently contributed to poorer cognitive performance.

Moderation of the relationship between loneliness and cognition by education was not supported.