Supplementary Table 1 – Items of the Center for Epidemiological Studies – Depression (CES-D) questionnaire included in the English Longitudinal Study of Ageing

|  |  |
| --- | --- |
| **Item name** | **Item content** |
| PScedA | *Whether respondent has felt depressed much of the time during the past week* |
| PScedB | *Whether respondent felt everything they did during the past week was an effort* |
| PScedC | *Whether respondent felt their sleep was restless during the past week* |
| PScedD | *Whether respondent was happy much of the time during the past week* |
| PScedE | *Whether respondent felt lonely much of the time during the past week* |
| PScedF | *Whether respondent enjoyed life much of the time during the past week* |
| PScedG | *Whether respondent felt sad much of the time during the past week* |
| PScedH | *Whether respondent could not get going much of the time during the past week* |

Supplementary Table 2 – *Incident dementia cases per Wave in the analytical sample*

|  |  |
| --- | --- |
| **ELSA Wave** | **Incident dementia cases** |
| 2 (baseline) | - |
| 3 | N=36 |
| 4 | N=114 |
| 5 | N=198 |
| 6 | N=265 |
| 7 | N=340 |
| 8 | N=425 |
| 9 | N=501 |

Supplementary Table 3 – Fit indices of the factor solutions derived from exploratory factor analysis of social relationship items in the English Longitudinal Study of Ageing.

|  |  |  |  |
| --- | --- | --- | --- |
| **Solution** | **RMSEA** | **TLI** | **CFI** |
| One factor | .14 | .42 | .45 |
| Two factors | .12 | .57 | .62 |
| Three factors | .12 | .67 | .74 |
| Four factors | .09 | .73 | .79 |
| Five factors | .08 | .78 | .84 |
| Six factors | .08 | .88 | .83 |
| Seven factors | .06 | .89 | .93 |
| Eight factors | .05 | .92 | .96 |
| Nine factors | .04 | .95 | .97 |

Abbreviations: CFI=Comparative fit index; RMSEA=Root mean squared error of approximation; TLI=Tucker-Lewis Index

Supplementary Table 4 – Item loadings of the OBLIMIN-rotated exploratory factor analysis of social relationship items in the English Longitudinal Study of Ageing. In a subsequent confirmatory factor analysis, items scchdg, scchdh, scfamg and scfamh (selectively loading on factors 2, 3 and 4) were loaded solely on factors 3 and 4, respectively. Loadings ≥|0.4| are marked in green.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Item content** | **Item name** | **Factor 1** | **Factor 2** | **Factor 3** | **Factor 4** | **Factor 5** | **Factor 6** | **Factor 7** |
| How often the respondent meets up with their children on average | SCCHDG | -0,170\* | 0,447\* | -0,528\* | 0,069\* | -0,023 | 0,078\* | -0,095\* |
| How often the respondent speaks on the phone to their children | SCCHDH | -0,009 | 0,452\* | -0,638\* | 0,101\* | -0,007 | 0,044\* | -0,115\* |
| How often the respondent writes to or emails their children | SCCHDI | 0,779\* | -0,214\* | -0,183\* | -0,054\* | 0,087\* | 0,060\* | -0,072\* |
| How often the respondent meets up with other relatives | SCFAMG | -0,063\* | 0,613\* | -0,044\* | -0,461\* | 0,012 | 0,078\* | -0,004 |
| How often the respondent speaks with other relatives on the phone | SCFAMH | 0,035\* | 0,589\* | -0,045\* | -0,540\* | 0,086\* | 0,048\* | -0,023\* |
| How often the respondent writes to or emails other relatives | SCFAMI | 0,738\* | -0,147\* | -0,127\* | -0,235\* | 0,155\* | 0,078\* | -0,044\* |
| How often the respondent meets up with their friends | SCFRDG | -0,014 | 0,357\* | 0,009 | 0,095\* | 0,117\* | -0,501\* | 0,046\* |
| How often the respondent speaks with their friends on the phone | SCFRDH | 0,122\* | 0,398\* | 0,005 | 0,084\* | 0,189\* | -0,569\* | -0,004 |
| How often the respondent writes to or emails their friends | SCFRDI | 0,758\* | -0,108\* | -0,083\* | -0,017 | 0,103\* | -0,077\* | -0,080\* |
| Organisational membership: none | SCORG09 | -0,405\* | -0,069\* | -0,041\* | -0,077\* | 0,108\* | 0,082\* | -0,048\* |
| How often respondent goes to the cinema | SCACTA | 0,613\* | 0,217\* | 0,143\* | 0,111\* | -0,179\* | -0,068\* | 0,026 |
| How often respondent eats out of the house | SCACTB | 0,418\* | 0,205\* | 0,093\* | 0,095\* | -0,185\* | -0,078\* | 0,073\* |
| How often respondent goes to an art gallery or museum | SCACTC | 0,683\* | 0,169\* | 0,147\* | 0,093\* | -0,201\* | -0,037\* | 0,054\* |
| How often respondent goes to the theatre, a concert or the opera | SCACTD | 0,686\* | 0,253\* | 0,137\* | 0,104\* | -0,195\* | -0,054\* | 0,089\* |
| Activities during last month: voluntary work | WPACTVW | 0,368\* | 0,055\* | 0,088\* | 0,066\* | -0,104\* | -0,085\* | 0,025 |
| Whether has a husband, wife or partner with whom they live | SCPTR | -0,060\* | 0,077\* | -0,039\* | -0,018 | 0,628\* | -0,260\* | 0,167\* |
| How much the children understand the way the respondent feels about things | SCCHDA | -0,077\* | 0,076\* | 0,670\* | 0,089\* | 0,082\* | 0,103\* | -0,138\* |
| How much the respondent can rely on their children if they have a problem | SCCHDB | -0,048\* | 0,010 | 0,784\* | 0,019 | 0,095\* | 0,049\* | -0,113\* |
| How much the respondent can open up to their children about their worries | SCCHDC | -0,029\* | 0,116\* | 0,751\* | 0,138\* | 0,077\* | 0,141\* | -0,024\* |
| How much their children criticises the respondent | SCCHDD | -0,033\* | -0,006 | -0,068\* | 0,039\* | 0,005 | 0,035\* | 0,614\* |
| How much their children lets the respondent down when they are counting on them | SCCHDE | 0,028\* | -0,036\* | -0,400\* | 0,031\* | -0,065\* | 0,047\* | 0,508\* |
| How much do family members understand how respondent feels about things | SCFAMA | -0,019\* | -0,039\* | 0,089\* | 0,764\* | 0,011 | 0,067\* | -0,080\* |
| How much respondent can rely on other relatives if they have a serious problem | SCFAMB | -0,021\* | -0,029\* | -0,019\* | 0,876\* | 0,070\* | 0,027\* | -0,025\* |
| How much respondent can open up to these other relatives if they need to talk | SCFAMC | 0,010 | 0,030\* | 0,014 | 0,915\* | 0,052\* | 0,085\* | 0,020\* |
| How much other relatives criticise the respondent | SCFAMD | -0,024\* | 0,008 | 0,014 | 0,032\* | 0,035\* | 0,065\* | 0,742\* |
| How much other relatives let the respondent down | SCFAME | 0,036\* | 0,002 | 0,011 | -0,334\* | -0,019 | 0,055\* | 0,597\* |
| How much these friends understand how respondent feels about things | SCFRDA | -0,004 | 0,042\* | 0,097\* | 0,049\* | -0,013 | 0,759\* | -0,003 |
| How much respondent can rely on these friends if they have a serious problem | SCFRDB | -0,022\* | 0,071\* | 0,019 | 0,054\* | 0,093\* | 0,822\* | 0,007 |
| How much respondent can open up to these friends if they need to talk | SCFRDC | 0,025\* | 0,083\* | 0,025\* | 0,083\* | 0,017\* | 0,871\* | 0,076\* |
| How much these friends criticise the respondent | SCFRDD | -0,058\* | -0,017 | -0,013 | 0,044\* | 0,029\* | 0,091\* | 0,630\* |
| How much these friends let the respondent down | SCFRDE | -0,023 | -0,066\* | -0,030 | 0,006 | -0,063\* | -0,222\* | 0,506\* |
| How often respondent feels they lack companionship | SCFEELA | 0,028\* | 0,027\* | 0,017 | 0,035\* | 0,882\* | -0,002 | 0,039\* |
| How often respondent feels left out | SCFEELB | 0,003 | -0,006 | 0,087\* | 0,054\* | 0,800\* | 0,092\* | -0,111\* |
| How often respondent feels isolated from others | SCFEELC | 0,020 | -0,036\* | 0,047\* | 0,050\* | 0,851\* | 0,115\* | -0,074\* |
| Whether respondent felt lonely much of the time during the past week | PSCEDE | -0,055\* | 0,038\* | 0,039\* | -0,015 | 0,806\* | -0,101\* | 0,053\* |
| How often the respondent meets up with their children on average | SCCHDG | -0,170\* | 0,447\* | -0,528\* | 0,069\* | -0,023 | 0,078\* | -0,095\* |

\*Statistically significant (*p*≤.05)



*Supplementary Figure 1* – Mediation of the association between Fchildren and dementia risk by depressive symptoms (Fdepression). \*Statistically significant (p≤.05)



*Supplementary Figure 2* – Mediation of the association between Factivity and dementia risk by depressive symptoms (Fdepression). \*Statistically significant (p≤.05)



*Supplementary Figure 3* – Mediation of the association between Fneg.exp. and dementia risk by depressive symptoms (Fdepression). \*Statistically significant (p≤.05)



*Supplementary Figure 4* – Mediation of the association between Floneliness and dementia risk by depressive symptoms (Fdepression). \*Statistically significant (p≤.05)