Supplementary material for paper

Bridge or Barrier? The Impact of Network Capital on Access to Long-Term Care Services in Germany

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Appendix A. Detailed Information of SHARE Data

In the study, data from the Survey of Health, Ageing and Retirement of Europe (SHARE) are used. SHARE is a multidisciplinary, cross-national panel database of micro data on health, socio-economic status, and social and family networks of individuals aged 50 and older (SHARE-ERIC, 2020). The panel began in 2004 (wave 1) with eleven European countries and has since been conducted biennially. The most current wave is wave 8 (data collected in 2019/20) (SHARE-ERIC, 2019). Currently, all 26 continental EU member states as well as Switzerland and Israel are part of the SHARE project (Bergmann et al., 2019).

The SHARE target population consists of all individuals aged 50 years and over at the time of sampling with their main residence in one of the respective SHARE countries (for the following paragraph, cf. Bergmann et al., 2019; Stuck et al., 2019). Individuals who are incarcerated, hospitalized, out of the country during the entire survey period, unable to speak the country’s language, could not be located due to errors in the sampling frame, or have moved to an unknown address are excluded (Bergmann et al., 2019). Individuals living in nursing homes or other institutions for elderly are generally part of the target population, but may not be equally well represented in all countries due to sampling frame coverage (Bergmann et al., 2019).

In wave 1, all age-eligible individuals per sampled household were selected for an interview (for the following paragraph, cf. Bergmann et al., 2019; Stuck et al., 2019). Since wave 2, only one age-eligible individual per household was selected. Current partners living in the same household are interviewed regardless of their age. Age-eligible respondents who participated at least once are traced and re-interviewed if they relocate. Younger partners, new partners, and partners who never participated in SHARE are not traced in case of relocation. If age-eligible respondents pass away, end-of-life interviews are conducted.

The central identifier is each participant’s unique and non-changing person identifier for all waves (‘mergeid’), which is generated when they enter the SHARE panel, irrespective of whether they completed an interview (see below remarks concerning questionnaire modules). A second relevant identifier is the household identifier, assigned at the first panel entry. This identifier is updated with each interview to capture household splits (Stuck et al., 2019).

The SHARE survey design follows probability-based sampling. In all countries, refreshment samples are drawn regularly to represent subsequent age cohorts and to compensate for panel attrition. For detailed information about sampling design and refreshment sampling, cf. Bergmann et al. (2019).

SHARE data collection is based on computer-assisted personal interviewing (CAPI) (Stuck et al., 2019). If physical and/or cognitive limitations make it impossible for a respondent to
complete the interview her-/himself, a so-called proxy respondent is allowed to assist the respondent. However, some modules in the questionnaire are defined as non-proxy sections as they cannot be answered by other persons (Stuck et al., 2019). For more details on SHARE data collection see the methodology of Börsch-Supan and Jürges (2005).

Not all questions of the regular questionnaire are answered by all respondents of a household. Instead, selected household members serve as family, financial, or household respondents to answer specific questions regarding these areas on behalf of the couple or the whole household. The information from these specific questions are therefore only available for the financial, family, or household respondents, respectively. Data is stored for all respondents in generated variables prepared by SHARE (Stuck et al., 2019).

By surveying the network of respondents and, in particular, the characteristics of the respondent’s children, SHARE provides a comprehensive data set useful for the analysis of parent-child relationships.

References:
Bergmann, M., Kneip, T., De Luca, G., & Scherpenzeel, A. (2019). Survey participation in the Survey of Health, Ageing and Retirement in Europe (SHARE), Wave 1-7. Based on Release 7.0.0. [SHARE Working Paper Series (41-2019)]. Munich: MEA, Max Planck Institute for Social Law and Social Policy.
Börsch-Supan, A., Jürges, H. (Eds.). (2005). The Survey of Health, Ageing and Retirement in Europe – Methodology. Mannheim: Mannheim Research Institute for the Economics of Aging (MEA).
SHARE-ERIC. (2019). Survey of Health, Ageing and Retirement in Europe (SHARE). http://www.share-project.org/index.php?id=116 (last accessed 8 May 2021).
SHARE-ERIC. (2020). Dates and Facts about SHARE. http://www.share-project.org/organisation/dates-facts.html (last accessed 8 May 2021).
Stuck, S., Zuber, S., Kotte, M., Franzese, F., Gruber, S., Birkenbach, T., & Pflüger, S. (2019). SHARE Release Guide 7.0.0. München: Munich Center for the Economics of Aging.

Appendix B. Detailed Coding Information of Education
Table B1. Detailed coding information for all education variables.

| Highest school degree                                                                 | ISCED-97 | ISCED-2011 | Highest further degree | Years in school partner | Education of respondent / partner / child | Education of respondent / partner / child (binary) |
|----------------------------------------------------------------------------------------|----------|------------|------------------------|-------------------------|------------------------------------------|------------------------------------------------|
| 1 No degree * / Never attended school †                                               | 0        | 0          |                        | 0-4                     | 0                                        | 0                                              |
| 2 Primary school not finished †                                                       |          | 0          |                        |                         | 0                                        | 0                                              |
| 3 Primary school finished †                                                           |          | 1          |                        |                         | 0                                        | 0                                              |
| 4 Lower secondary school ('Volks-/Hauptschulabschluss'); Polytechnic secondary school with completion of 8th or 9th grade ('Polytechnische Oberschule') | 2        | 2          |                        | 5-10                    | 1                                        | 0                                              |
| 5 Intermediate secondary school ('Realschulabschluss'); Polytechnic secondary school with completion of 10th grade ('Polytechnische Oberschule') | 2        | 2          |                        |                         | 1                                        | 0                                              |
| 6 University of Applied Science entrance qualification ('Fachabitur')                   | 3        | 3 if hfd=1 / 4 if hfd>1 |                        | 11-13 / 14-15           | 2 if hfd=1 / 3 if hfd>1                   | 0 if hfd=1 / 1 if hfd>1                        |
| 7 University entrance qualification ('Abitur')                                          | 3        | 3 if hfd=1 / 4 if hfd>1 |                        | 2 if hfd=1 / 3 if hfd>1 | 0 if hfd=1 / 1 if hfd>1                   |                                                 |

(continued)
| Highest school degree | ISCED-97 | ISCED-2011 | Highest further degree | Years in school partner | Education of respondent / partner / child | Education of respondent / partner / child (binary) |
|-----------------------|----------|------------|------------------------|-------------------------|------------------------------------------|------------------------------------------------|
| 1 | No vocational qualification / no studies | 5-10 / 14-15 | 1 if dn010<6 / 3 if dn010>=6 | 0 if dn010<6 / 1 if dn010>=6 |
| 2 | Certificate of completion of basic vocational training year, vocational school † | 11-13 / 14-15 | 2 if dn010<6 / 3 if dn010>=6 | 0 if dn010<6 / 1 if dn010>=6 |
| 3 | Vocational-in-company training period with final certificate, but no apprenticeship † | 2 if dn010<6 / 3 if dn010>=6 | 0 if dn010<6 / 1 if dn010>=6 |
| 4 | Certificate of completion for medical assistants, nurses/caregivers † | 2 if dn010<6 / 3 if dn010>=6 | 0 if dn010<6 / 1 if dn010>=6 |
| 5 | Career examination for the intermediate service ('Laufbahnprüfung für den mittleren Dienst') † | 2 if dn010<6 / 3 if dn010>=6 | 0 if dn010<6 / 1 if dn010>=6 |
| 6 | Qualification in the Dual System ('Lehre') * / Completed industrial or agricultural apprenticeship ('Abgeschlossene gewerbliche oder landwirtschaftliche Lehre') † | 2 if dn010<6 / 3 if dn010>=6 | 0 if dn010<6 / 1 if dn010>=6 |
| 7 | Qualification in the Dual System ('Lehre') * / Completed commercial training ('Abgeschlossene kaufmännische Lehre') † | 2 if dn010<6 / 3 if dn010>=6 | 0 if dn010<6 / 1 if dn010>=6 |
| 8 | Qualification of a vocational full-time school ('Berufsfachschule') | 2 if dn010<6 / 3 if dn010>=6 | 0 if dn010<6 / 1 if dn010>=6 |
| Highest school degree | ISCED-97 | ISCED-2011 | Highest further degree | Years in school partner | Education of respondent / partner / child | Education of respondent / partner / child (binary) |
|-----------------------|---------|------------|------------------------|------------------------|-------------------------------------------|-----------------------------------------------|
|                       | 5       | 5          | 9 Trade and technical schools (Fachschule') */ / Technical school of the GDR (Fachschule der DDR') † | 16                     | 4                           | 1                                             |
|                       | 5       | 5          | 10 Master Craftsmen's qualification ('Meister'); Qualification of specialised academies ('Abschluss einer Fachakademie') † | 4                     | 1                           |                                               |
|                       | 5       | 5          | 11 Diploma (University of Cooperative Education ('Berufsakademie')) † | 4                     | 1                           |                                               |
|                       | 5       | 5          | 12 Intermediate examination, intermediate diploma ('Zwischenprüfung, Vordiplom') (University, University of Applied Science)) † | 16                    | 4                           | 1                                             |
|                       | 5       | 6          | 13 University of Applied Sciences degree * / Bachelor degree (University of Applied Science, University of Cooperative Education ('Berufsakademie')) † | 17-21                  | 5                           | 1                                             |
|                       | 5       | 7          | 14 University of Applied Sciences degree * / Master degree (University of Applied Science) † | 5                     | 1                           |                                               |
|                       | 5       | 6          | 15 University of Applied Sciences degree * / Diploma (University of Applied Science) † | 5                     | 1                           |                                               |

(continued)
| Highest school degree |
|----------------------|
| ISCED-97  | ISCED-2011 | Highest further degree |
| 5        | 6          | 16 University degree * / Bachelor degree (University; College of Art, Music and Education) † |
| 5        | 7          | 17 University degree * / Master degree, Postgraduate studies (University; College of Art, Music and Education) † |
| 5        | 7          | 18 University degree * / Diploma, Master's degree, State examination ('Diplom, Master, Staatsexamen') (University; College of Art, Music and Education) † |
| 5        | 8          | 19 University degree * / Doctoral degree, Habilitation † |
|          |            | Years in school partner |
|          |            | Education of respondent / partner / child |
|          |            | Education of respondent / partner / child (binary) |

**Note:** Table preparation using UNESCO ISCED mappings (http://uis.unesco.org/en/ised-mappings). German terms have been added for better comprehensibility and can be looked up in the UNESCO tables. Data in columns 1-5 are given by SHARE. Columns 6 and 7 show the recoding for the current analysis. hfd = highest further degree, hsd = highest school degree.

* Waves 1-4 (years 2004-2011/12)
† Waves 5-7 (years 2013-2017)
Terms without marks apply to all waves.

a Categories are: 0=no/primary education; 1="lower secondary education”; 2="upper secondary education”; 3=”post-secondary non-tertiary education”; 4=”short-cycle tertiary education”; 5=”tertiary education (university)”
b Categories are: 0="low education”; 1=”high education”
Appendix C. Main Analysis Results

### C1. Overall

| Model 1     | Model 2     | Model 3     |
|-------------|-------------|-------------|
| Number of health limitations | 0.408*** | 0.326*** | 0.322*** |
| (7.83)      | (3.95)      | (3.50)      |
| Network position of caregiver |           |             |           |
| (Reference: Immediate family) |           |             |           |
| Extended family | -0.649   |             |           |
| (-0.39)      |             |             |           |
| Not family   | 0.324       |             |           |
| (-0.30)      |             |             |           |
| Interaction: Number of health limitations and network position of caregiver |           |             |           |
| (Reference: No health limitations, caregiver from immediate family) |           |             |           |
| One (more) health limitation, caregiver from extended family | 0.0496   |             |           |
| (-0.14)      |             |             |           |
| One (more) health limitation, caregiver not from family | -0.0396  |             |           |
| (-0.12)      |             |             |           |
| Education of caregiver (1=high) |           | 0.103       |           |
| (Reference: No health limitations, caregiver has low education) |           | (0.09)      |           |
| Female respondent (1=yes) | 0.331     | -0.242      | -0.516    |
| (0.75)       | (-0.37)     | (-0.72)     |
| Age of respondent | 0.0617** | -0.00366    | 0.0198    |
| (2.76)       | (-1.01)     | (0.47)      |
| Education of respondent | -0.991   | -1.053      | -0.578    |
| (1=high)     | (-1.62)     | (-1.12)     | (-0.56)   |
| Income of respondent | 0.00581** | 0.00418     | 0.00341   |
| (in 1,000 euro) | (2.66)     | (1.76)      | (1.37)    |
| Assets of respondent | 0.0103   | -0.0334     | -0.0345   |
| (in 100,000 euro) | (1.72)     | (-0.66)     | (-0.78)   |
| Constant     | -9.567***   | -3.853      | -4.735    |
| (5.74)       | (-1.50)     | (-1.52)     |
| Likelihood Ratio Test | chi²(1)=46.95; | chi²(1)=16.82; | chi²(1)=14.41; |
| p=0.0000     | p=0.0000    | p=0.0001    |
| N            | 2,604       | 417         | 203        |

Note: Model 1: Test of Hypothesis 1; Model 2: Test of Hypothesis 2; Model 3: Test of Hypothesis 3.

* z statistics in parentheses; ‘ p < 0.05, ** p < 0.01, *** p < 0.001 (two-tailed tests)
### C2. Hypothesis 2

**Table C2.** Predicted probabilities of the receipt of care benefits by network position of caregiver and number of health limitations (columns 2-4), differences in probabilities of caregiver’s network position across levels of health limitations (columns 5-7), and average marginal effects of caregiver’s network position as well as differences in effects of health limitations for caregiver’s network position (second differences) (N = 417).

| Number of health limitations | Network position of caregiver | Differences in probabilities between caregiver’s network position |
|-----------------------------|--------------------------------|---------------------------------------------------------------|
|                             | Immediate family | Extended family | Not family | Immediate vs. extended family | Immediate vs. not family | Extended vs. not family |
| 0                          | 0.0195           | 0.00904         | 0.0117     | -0.010                      | -0.008                   | 0.003                   |
|                            | (1.91)           | (0.66)          | (1.17)     |                            |                          |                         |
| 1                          | 0.0267*          | 0.0119          | 0.0155     | -0.015                      | -0.011                   | 0.004                   |
|                            | (2.17)           | (0.78)          | (1.40)     |                            |                          |                         |
| 2                          | 0.0364*          | 0.0156          | 0.0205     | -0.021                      | -0.016                   | 0.005                   |
|                            | (2.48)           | (0.90)          | (1.40)     |                            |                          |                         |
| 3                          | 0.0493**         | 0.0204          | 0.0271     | -0.029                      | -0.022                   | 0.007                   |
|                            | (2.83)           | (0.99)          | (1.19)     |                            |                          |                         |
| 4                          | 0.0665**         | 0.0267          | 0.0356     | -0.040                      | -0.031                   | 0.009                   |
|                            | (3.17)           | (0.99)          | (0.96)     |                            |                          |                         |
| 5                          | 0.0889***        | 0.0349          | 0.0468     | -0.054                      | -0.042                   | 0.012                   |
|                            | (3.42)           | (0.90)          | (0.78)     |                            |                          |                         |
| 6                          | 0.118***         | 0.0454          | 0.0611     | -0.072                      | -0.057                   | 0.016                   |
|                            | (3.51)           | (0.79)          | (0.66)     |                            |                          |                         |
| 7                          | 0.154***         | 0.0589          | 0.0794     | -0.095                      | -0.075                   | 0.021                   |
|                            | (3.46)           | (0.68)          | (0.57)     |                            |                          |                         |
| 8                          | 0.199***         | 0.0760          | 0.103      | -0.123                      | -0.096                   | 0.027                   |
|                            | (3.33)           | (0.60)          | (0.51)     |                            |                          |                         |
| 9                          | 0.253*           | 0.0974          | 0.131      | -0.155                      | -0.122                   | 0.034                   |
|                            | (3.19)           | (0.53)          | (0.46)     |                            |                          |                         |
| 10                         | 0.315**          | 0.124           | 0.166      | -0.191                      | -0.149                   | 0.042                   |
|                            | (3.10)           | (0.48)          | (0.43)     |                            |                          |                         |
| 11                         | 0.384**          | 0.156           | 0.208      | -0.228                      | -0.177                   | 0.051                   |
|                            | (3.07)           | (0.45)          | (0.41)     |                            |                          |                         |
| 12                         | 0.458**          | 0.195           | 0.256      | -0.263                      | -0.202                   | 0.061                   |
|                            | (3.12)           | (0.42)          | (0.40)     |                            |                          |                         |
| 13                         | 0.534**          | 0.240           | 0.311      | -0.294                      | -0.223                   | 0.070                   |
|                            | (3.26)           | (0.41)          | (0.40)     |                            |                          |                         |
| 14                         | 0.608***         | 0.292           | 0.371      | -0.316                      | -0.237                   | 0.079                   |
|                            | (3.50)           | (0.40)          | (0.41)     |                            |                          |                         |
| 15                         | 0.677***         | 0.349           | 0.434      | -0.329                      | -0.243                   | 0.086                   |
|                            | (3.86)           | (0.41)          | (0.42)     |                            |                          |                         |

AMEs | 0.017*** | 0.005 | 0.005 | -0.012 | -0.012 | 0.000 |

Second Diff. | 0.005 | 0.005 | -0.012 | -0.012 | 0.000 |

z statistics in parentheses; *p < 0.05, **p < 0.01, ***p < 0.001 (two-tailed tests)
### Table C3. Predicted probabilities of the receipt of care benefits by educational level of the caregiver and the number of health limitations (columns 2-3), differences in the probabilities of the caregiver’s educational level across levels of health limitations (column 4), and average marginal effects of caregiver’s educational level as well as difference in effects of health limitations for caregiver’s educational level (second difference) (N = 203).

| Number of health limitations | Education of caregiver | Difference in probabilities between caregiver’s education |
|-----------------------------|------------------------|---------------------------------------------------------|
|                             | Low                    | High                      |                                                          |
| 0                           | 0.0237                 | 0.0260                    | 0.002                                                   |
|                             | (1.54)                 | (1.31)                    |                                                          |
| 1                           | 0.0323                 | 0.0301                    | -0.002                                                  |
|                             | (1.76)                 | (1.52)                    |                                                          |
| 2                           | 0.0439*                | 0.0348                    | -0.009                                                  |
|                             | (2.02)                 | (1.66)                    |                                                          |
| 3                           | 0.0594*                | 0.0401                    | -0.019                                                  |
|                             | (2.32)                 | (1.66)                    |                                                          |
| 4                           | 0.0798**               | 0.0463                    | -0.034                                                  |
|                             | (2.66)                 | (1.51)                    |                                                          |
| 5                           | 0.106*                 | 0.0533                    | -0.053                                                  |
|                             | (2.98)                 | (1.32)                    |                                                          |
| 6                           | 0.140*                 | 0.0612                    | -0.079                                                  |
|                             | (3.21)                 | (1.14)                    |                                                          |
| 7                           | 0.182*                 | 0.0703                    | -0.112                                                  |
|                             | (3.28)                 | (0.99)                    |                                                          |
| 8                           | 0.234*                 | 0.0805                    | -0.153                                                  |
|                             | (3.23)                 | (0.87)                    |                                                          |
| 9                           | 0.294*                 | 0.0920                    | -0.202                                                  |
|                             | (3.14)                 | (0.77)                    |                                                          |
| 10                          | 0.362*                 | 0.105                     | -0.257                                                  |
|                             | (3.07)                 | (0.70)                    |                                                          |
| 11                          | 0.435**                | 0.119                     | -0.316                                                  |
|                             | (3.07)                 | (0.64)                    |                                                          |
| 12                          | 0.512*                 | 0.136                     | -0.377                                                  |
|                             | (3.15)                 | (0.59)                    |                                                          |
| 13                          | 0.588**                | 0.153                     | -0.435                                                  |
|                             | (3.32)                 | (0.55)                    |                                                          |
| 14                          | 0.661***               | 0.173                     | -0.487                                                  |
|                             | (3.62)                 | (0.52)                    |                                                          |
| 15                          | 0.726***               | 0.195                     | -0.532                                                  |
|                             | (4.06)                 | (0.50)                    |                                                          |

AMEs

| Second Diff.     | 0.022***               | 0.005                     | -0.017                                                  |

z statistics in parentheses; * p < 0.05, ** p < 0.01, *** p < 0.001 (two-tailed tests)
Appendix D. Results and Discussion of Model fit and Robustness Checks

Model fit
All models were tested for model fit using the information criteria AIC and BIC, as well as McFadden’s pseudo $R^2$. The step-by-step construction of the basic model for Hypothesis 1 shows that, overall, the second model (with confounding factors) seems to be the best fit to the data. While the BIC increases slightly compared to the first model, the AIC and McFadden’s pseudo $R^2$ develop in the required direction (decreases and increases, respectively), whereas in the third model both AIC and BIC increase again or further, respectively, and McFadden’s pseudo $R^2$ even decreases compared to the second model (see Table 3 in the paper for all measures of fit values). According to these values it seems plausible to continue to control for respondent characteristics as influencing factors and to exclude the assumed mediating variables, which seem to unnecessarily overload the model. This is also a useful strategy to uncover the total effects of the correlations of interest.

Robustness Checks
To ascertain whether the results of the main analyses are largely stable with the data used, various robustness checks were conducted. Though neither the effects nor the significance levels of the robustness analyses differed substantially from the main analyses, there are some interesting findings pointed out in the following. Three steps were taken in the robustness analysis.

First, the models corresponding to hypotheses 2 and 3 were each calculated both ways, with mediating and confounding factors and without (see Supplementary Table D1.1). Neither the effects nor the significance levels deviated substantially from the main analyses. Two things are nevertheless noteworthy: While controlling for mediating factors (i.e., care intensity), the effects become smaller; in particular, the predicted probabilities of receiving care benefits among individuals with a non-family caregiver decrease to almost zero. The gap between respondents with a caregiver from their immediate family and respondents with a non-family caregiver is significant – with the former having a significantly higher probability to receive care benefits – when comparing individuals with between 5 and 12 health limitations, as well as for those with 15 health limitations (all contrasts $p < 0.1$). In addition, by omitting all confounding and mediating factors in the estimation for Hypothesis 3, a significant difference at the 5 percent level was found in the average effects of health limitations on the probability of receiving care between care recipients whose caregiver has a low educational level and those with a highly educated caregiver. See Supplementary Table D1.2, Supplementary Table D1.3
and Supplementary Figure D1.1, respectively, for results of robustness checks for Hypothesis 2. See Supplementary Table D1.4 and Supplementary Figure D1.2, respectively, for results of robustness checks for Hypothesis 3.

Second, the original samples were extended through samples in which educational status of children were only estimated in cases where the educational data was obviously not up to date (in the main analyses, only educational data that could be validly assumed to be correct was included). The analysis shows only marginal changes in effect size and significance level (not significance per se) for hypotheses 2 and 3. There is, however, a visible variation in the estimates for Hypothesis 2 with the second robustness sample, which is reflected in a larger AME of 1 percentage point (vs. 0.5 in the base sample) for individuals with a caregiver from their extended family, leading to increasing probabilities that exceed those for individuals with a caregiver from their immediate family (contrary to the results of the base sample analysis) (see Supplementary Figure D2 for predicted probabilities, Supplementary Table D2.1 and Supplementary Table D2.2 for a comparison of estimated AMEs, and Supplementary Table D2.3 for Firth logistic regression estimates of all hypotheses models with extended robustness samples.). Nevertheless, this effect also remains insignificant ($p = 0.055$).

Third, all models were calculated with the dependent variable restricted to the IADL index, as opposed to a sum index of ADL and IADL. One could assume that especially a restriction to ADL may lead to (stronger) significant effects of the moderating variables: Since difficulties with ADL imply that the respondent is more severely in need of care, a moderating effect of caregiver network distance should also be more apparent, as more distant contacts should be less willing to provide personal care than close family members. However, results are not substantially different from those of the original analysis, with only a slight increase in effects and no change in significance when using IADL limitations as the dependent variable, and an expected increase in the probability of formal long-term services for respondents with a caregiver not from the family when using ADL limitations as the regressand (see Supplementary Figure D3.1 and Supplementary Figure D3.2 for predicted probabilities, Supplementary Table D3.1 and Supplementary Table D3.2 for a comparison of estimated AMEs, and Supplementary Table D3.3 and Supplementary Table D3.4 for Firth logistic regression estimates).
### Table D1.1. Robustness test of Hypotheses 2 and 3. Firth logistic regression estimates of models with and without mediating and confounding variables, respectively.

|                                | Hypothesis 2                | Hypothesis 3                |
|--------------------------------|----------------------------|----------------------------|
|                                | without mediating &         | without mediating &         |
|                                | confounding variables       | confounding variables       |
| Number of health limitations    | 0.350**                    | 0.359**                    |
|                                | (4.28)                     | (3.83)                     |
| Network position of caregiver   |                            |                            |
| (Reference: Immediate family)   |                            |                            |
| Extended family                 | -0.684 (-0.42)             | -0.0762 (-0.05)            |
| Not family                      | -0.408 (-0.39)             | 0.663 (0.54)               |
| Interaction: Number of health   |                            |                            |
| limitations and network position of caregiver (Reference: No health limitations, caregiver from immediate family) |                            |                            |
| One health limitation, caregiver from wider family | -0.0106 (-0.03) | 0.0111 (0.03) |
| One health limitation, caregiver not from family | -0.0373 (-0.12) | -0.225 (-0.61) |
| Education of caregiver (1=high) | -0.0690 (-0.06) | 0.340 (0.27) |
| Interaction: Number of health   | -0.181 (-0.79)             | -0.172 (-0.74)             |
| limitations and education of caregiver (Reference: No health limitations, caregiver has low education) |                            |                            |
| Female respondent (1=yes)      | -0.374 (-0.56)             | -0.559 (-0.80)             |
| Age of respondent              | -0.00503 (-0.15)           | 0.0107 (0.26)              |
| Education of respondent (1=high) | -1.137 (-1.18)            | -0.623 (-0.62)             |
| Income of respondent (in 1,000 euro) | 0.00302 (1.16)     | 0.00216 (0.83)             |
| Assets of respondent (in 100,000 euro) | 0.00743 (0.10)    | -0.00874 (-0.13)           |
| Number of areas with help provided (Reference: None) |                            |                            |
| One task                       | -0.386 (-0.22)             | -0.350 (-0.20)             |
| Two tasks                      | -1.197 (-0.53)             | -0.730 (-0.32)             |
| Three tasks                    | -1.000 (-0.41)             | -0.328 (-0.14)             |

(continued)
Table D1.1. Continued

| Hypothesis 2 | Hypothesis 3 |
|--------------|--------------|
| without | with | without | with |
| mediating & | mediating & | mediating & | mediating & |
| confounding | confounding | confounding | confounding |
| variables | variables | variables | variables |

Frequency of help provided
(Reference: Less than once a month)

| About every month | 1.061 | 1.734 |
|                   | (0.54) | (1.03) |
| About every week  | 3.081 | 2.781 |
|                   | (1.88) | (1.57) |
| About daily       | 4.206*** | 3.987*** | 4.776*** | 4.559*** |
|                   | (-7.17) | (-5.75) | (-1.51) | (-1.35) |

N 417 417 203 203

z statistics in parentheses; * p < 0.05, ** p < 0.01, *** p < 0.001 (two-tailed tests)

Table D1.2. Robustness test of Hypothesis 2 without mediating (number of provided care tasks, care frequency) and confounding (gender, age, education, income, and assets of respondent) variables. Predicted probabilities of the receipt of care benefits by network position of caregiver and number of health limitations (columns 2-4), differences in probabilities of caregiver’s network position across levels of health limitations (columns 5-7), and average marginal effects of caregiver’s network position as well as differences in effects of health limitations for caregiver’s network position (second differences) (N = 417).

| Number of health limitations | Network position of caregiver | Differences in probabilities between caregiver’s network position |
|------------------------------|-------------------------------|---------------------------------------------------------------------|
|                              | Immediate family | Extended family | Not family | Immediate vs. extended family | Immediate vs. not family | Extended vs. not family |
| 0                            | 0.0147 (1.73) | 0.00746 (0.66) | 0.00981 (1.17) | -0.007 | -0.005 | 0.002 |
| 1                            | 0.0207 (1.95) | 0.0104 (0.77) | 0.0134 (1.37) | -0.010 | -0.007 | 0.003 |
| 2                            | 0.0291* (2.22) | 0.0146 (0.89) | 0.0182 (1.41) | -0.015 | -0.011 | 0.004 |
| 3                            | 0.0409* (2.52) | 0.0204 (0.98) | 0.0247 (1.25) | -0.020 | -0.016 | 0.004 |
| 4                            | 0.0570** (2.84) | 0.0284 (1.00) | 0.0335 (1.04) | -0.029 | -0.024 | 0.005 |
| 5                            | 0.0791** (3.11) | 0.0395 (0.93) | 0.0453 (0.86) | -0.040 | -0.034 | 0.006 |
| 6                            | 0.109** (3.27) | 0.0546 (0.82) | 0.0609 (0.73) | -0.054 | -0.048 | 0.006 |
| 7                            | 0.147*** (3.30) | 0.0750 (0.72) | 0.0814 (0.63) | -0.073 | -0.066 | 0.006 |
| 8                            | 0.197** (3.23) | 0.102 (0.64) | 0.108 (0.56) | -0.095 | -0.089 | 0.006 |
| 9                            | 0.258** (3.14) | 0.138 (0.57) | 0.142 (0.51) | -0.121 | -0.116 | 0.004 |
| 10                           | 0.331** (3.09) | 0.183 (0.53) | 0.185 (0.48) | -0.148 | -0.146 | 0.001 |

(continued)
Table D1.2. Continued

| Number of health limitations | Network position of caregiver | Differences in probabilities between caregiver’s network position |
|-----------------------------|-------------------------------|------------------------------------------------------------------|
|                             | Immediate family              | Extended family | Not family | Immediate vs. extended family | Immediate vs. not family | Extended vs. not family |
| 11                          | 0.413**                       | 0.240           | 0.237      | -0.173                        | -0.176                    | -0.003                 |
|                             | (3.13)                        | (0.51)          | (0.46)     |                               |                          |                        |
| 12                          | 0.499**                       | 0.307           | 0.298      | -0.192                        | -0.201                    | -0.009                 |
|                             | (3.28)                        | (0.50)          | (0.46)     |                               |                          |                        |
| 13                          | 0.586***                      | 0.383           | 0.367      | -0.202                        | -0.219                    | -0.017                 |
|                             | (3.56)                        | (0.51)          | (0.46)     |                               |                          |                        |
| 14                          | 0.668***                      | 0.466           | 0.442      | -0.201                        | -0.225                    | -0.024                 |
|                             | (4.01)                        | (0.54)          | (0.49)     |                               |                          |                        |
| 15                          | 0.740***                      | 0.551           | 0.520      | -0.189                        | -0.220                    | -0.031                 |
|                             | (4.67)                        | (0.59)          | (0.52)     |                               |                          |                        |
| AMEs                        | 0.016***                      | 0.005           | 0.005      | -0.011                        | -0.012                    | -0.001                 |
| Second Diff.                |                               |                 |            |                               |                          |                        |

z statistics in parentheses; *p < 0.05, **p < 0.01, ***p < 0.001 (two-tailed tests)

Table D1.3. Robustness test of Hypothesis 2 with mediating (number of provided care tasks, care frequency) and confounding (gender, age, education, income, and assets of respondent) variables. Predicted probabilities of the receipt of care benefits by network position of caregiver and number of health limitations (columns 2-4), differences in probabilities of caregiver’s network position across levels of health limitations (columns 5-7), and average marginal effects of caregiver’s network position as well as differences in effects of health limitations for caregiver’s network position (second differences) (N = 417).

| Number of health limitations | Network position of caregiver | Differences in probabilities between caregiver’s network position |
|-----------------------------|-------------------------------|------------------------------------------------------------------|
|                             | Immediate family              | Extended family | Not family | Immediate vs. extended family | Immediate vs. not family | Extended vs. not family |
| 0                           | 0.0280†                       | 0.0127           | 0.0189     | -0.015                        | -0.009                    | 0.006                  |
|                             | (1.98)                        | (0.68)          | (1.30)     |                               |                          |                        |
| 1                           | 0.0351†                       | 0.0161           | 0.0192     | -0.019                        | -0.016                    | 0.003                  |
|                             | (2.31)                        | (0.82)          | (1.59)     |                               |                          |                        |
| 2                           | 0.0437**                      | 0.0204           | 0.0194     | -0.023                        | -0.024                    | -0.001                 |
|                             | (2.67)                        | (0.96)          | (1.54)     |                               |                          |                        |
| 3                           | 0.0541**                      | 0.0257           | 0.0197     | -0.028                        | -0.034                    | -0.006                 |
|                             | (3.03)                        | (1.03)          | (1.22)     |                               |                          |                        |
| 4                           | 0.0668**                      | 0.0323           | 0.0199     | -0.034                        | -0.047                    | -0.012                 |
|                             | (3.27)                        | (0.97)          | (0.94)     |                               |                          |                        |
| 5                           | 0.0820***                     | 0.0404           | 0.0202     | -0.042                        | -0.062                    | -0.020                 |
|                             | (3.29)                        | (0.85)          | (0.74)     |                               |                          |                        |
| 6                           | 0.100**                       | 0.0503           | 0.0205     | -0.050                        | -0.080                    | -0.030                 |
|                             | (3.12)                        | (0.73)          | (0.61)     |                               |                          |                        |
| 7                           | 0.121**                       | 0.0621           | 0.0207     | -0.059                        | -0.100                    | -0.041                 |
|                             | (2.87)                        | (0.63)          | (0.51)     |                               |                          |                        |
| 8                           | 0.145**                       | 0.0762           | 0.0210     | -0.069                        | -0.124                    | -0.055                 |
|                             | (2.61)                        | (0.56)          | (0.44)     |                               |                          |                        |
| 9                           | 0.173†                       | 0.0926           | 0.0213     | -0.080                        | -0.152                    | -0.071                 |
|                             | (2.40)                        | (0.51)          | (0.39)     |                               |                          |                        |
| 10                          | 0.204†                       | 0.112            | 0.0215     | -0.092                        | -0.182                    | -0.090                 |
|                             | (2.23)                        | (0.47)          | (0.34)     |                               |                          |                        |

(continued)
Table D1.3. Continued

| Number of health limitations | Network position of caregiver | Differences in probabilities between caregiver’s network position |
|------------------------------|-------------------------------|---------------------------------------------------------------|
|                              | Immediate family | Extended family | Not family | Immediate vs. extended family | Immediate vs. not family | Extended vs. not family |
| 11                            | 0.238* (2.10)     | 0.133 (0.44)    | 0.0218 (0.31) | -0.104 | -0.216 | -0.111 |
| 12                            | 0.274* (2.01)     | 0.157 (0.42)    | 0.0221 (0.28) | -0.117 | -0.252 | -0.135 |
| 13                            | 0.313 (1.95)      | 0.184 (0.40)    | 0.0224 (0.26) | -0.128 | -0.290 | -0.162 |
| 14                            | 0.353 (1.91)      | 0.214 (0.39)    | 0.0227 (0.24) | -0.139 | -0.330 | -0.191 |
| 15                            | 0.395 (1.89)      | 0.246 (0.38)    | 0.0230 (0.22) | -0.149 | -0.372 | -0.223 |
| AMEs                          | 0.013*            | 0.005           | 0.000        | -0.008 | -0.013 | -0.005 |

Second Diff. in parentheses; *p < 0.05, **p < 0.01, ***p < 0.001 (two-tailed tests)

Figure D1.1. Robustness test of Hypothesis 2. Predicted probabilities of the receipt of care benefits by network position of the caregiver and the number of health limitations, without mediating and confounding variables (left), and with mediating and confounding variables (right) in the model. (N=417)
Table D1.4. Robustness test of Hypothesis 3. Results of models with and without mediating and confounding factors. \((N = 203)\)

| Number of health limitations | with mediating and confounding variables |  |  |
|-----------------------------|-----------------------------------------|--|--|
|                             | Education of caregiver | Differences in probabilities between caregiver’s education |  |  |
|                             | Low | High |  | Low | High |  |
| 0                           | 0.0381 | 0.0405 | 0.002 | 0.0182 | 0.0170 | -0.001 |
|                             | (1.65) | (1.40) |  | (1.47) | (1.10) |  |
| 1                           | 0.0478 | 0.0432 | -0.005 | 0.0259 | 0.0203 | -0.006 |
|                             | (1.92) | (1.66) |  | (1.66) | (1.26) |  |
| 2                           | 0.0597* | 0.0460 | -0.014 | 0.0366 | 0.0241 | -0.013 |
|                             | (2.24) | (1.84) |  | (1.90) | (1.39) |  |
| 3                           | 0.0744** | 0.0490 | -0.025 | 0.0516* | 0.0286 | -0.023 |
|                             | (2.59) | (1.79) |  | (2.19) | (1.43) |  |
| 4                           | 0.0922** | 0.0522 | -0.040 | 0.0722* | 0.0340 | -0.038 |
|                             | (2.89) | (1.57) |  | (2.51) | (1.36) |  |
| 5                           | 0.114** | 0.0556 | -0.058 | 0.100** | 0.0403 | -0.060 |
|                             | (3.05) | (1.32) |  | (2.83) | (1.22) |  |
| 6                           | 0.139** | 0.0592 | -0.080 | 0.138** | 0.0478 | -0.090 |
|                             | (3.00) | (1.10) |  | (3.07) | (1.07) |  |
| 7                           | 0.169** | 0.0629 | -0.106 | 0.186*** | 0.0565 | -0.129 |
|                             | (2.80) | (0.94) |  | (3.20) | (0.93) |  |
| 8                           | 0.203* | 0.0669 | -0.136 | 0.246*** | 0.0667 | -0.180 |
|                             | (2.57) | (0.81) |  | (3.22) | (0.82) |  |
| 9                           | 0.241* | 0.0711 | -0.170 | 0.319** | 0.0787 | -0.240 |
|                             | (2.36) | (0.71) |  | (3.21) | (0.73) |  |
| 10                          | 0.284* | 0.0755 | -0.209 | 0.401** | 0.0925 | -0.308 |
|                             | (2.19) | (0.64) |  | (3.23) | (0.66) |  |
| 11                          | 0.331* | 0.0802 | -0.251 | 0.489*** | 0.108 | -0.381 |
|                             | (2.07) | (0.57) |  | (3.35) | (0.60) |  |
| 12                          | 0.381* | 0.0851 | -0.296 | 0.578*** | 0.127 | -0.457 |
|                             | (2.00) | (0.52) |  | (3.60) | (0.56) |  |
| 13                          | 0.433* | 0.0903 | -0.342 | 0.662*** | 0.148 | -0.515 |
|                             | (1.96) | (0.48) |  | (4.01) | (0.52) |  |
| 14                          | 0.486* | 0.0957 | -0.390 | 0.737*** | 0.172 | -0.566 |
|                             | (1.96) | (0.45) |  | (4.64) | (0.49) |  |
| 15                          | 0.539* | 0.101 | -0.437 | 0.801*** | 0.198 | -0.603 |
|                             | (1.99) | (0.42) |  | (5.55) | (0.47) |  |
| AMEs                        | 0.019* | 0.003 | -0.016 | 0.023*** | 0.004 | -0.018* |
| Second Diff.                |  |  |  |  |  |  |

Note: Left side with mediating (number of provided care tasks, care frequency) and confounding (gender, age, education, income, and assets of respondent) variables. Right side without mediating and confounding variables. Predicted probabilities of the receipt of care benefits by educational level of the caregiver and the number of health limitations (columns 2-3 and 5-6, respectively), differences in the probabilities of the caregiver’s educational level across levels of health limitations (columns 4 and 7, respectively), and average marginal effects of caregiver’s educational level as well as differences in effects of health limitations for caregiver’s educational level (second differences).

z statistics in parentheses: * \(p < 0.05\), ** \(p < 0.01\), *** \(p < 0.001\) (two-tailed tests)
Figure D1.2. Robustness test of Hypothesis 3. Predicted probabilities of the receipt of care benefits by educational level of the caregiver and the number of health limitations, without mediating and confounding variables (left), and with mediating and confounding variables (right) in the model. (N=203)

D2. Alternative Sample Specifications

Figure D2. Robustness test of Hypothesis 2. Predicted probabilities of the receipt of care benefits by network position of the caregiver and the number of health limitations. Extended sample size (N=445).
### Table D2.1. Average marginal effects of caregiver’s network position and differences in effects of health limitations for caregiver’s network position (second differences), depending on sample definition. Robustness test of Hypothesis 2.

| AMEs          | Second Differences |
|---------------|---------------------|
|               | Immediate family    | Extended family | Not family | Immediate vs. extended family | Immediate vs. not family | Extended vs. not family |
| Analysis sample (N = 417) | 0.017*** | 0.005 | 0.005 | -0.012 | -0.012 | 0.000 |
| Robustness sample 1 (N = 422) | 0.017*** | 0.005 | 0.005 | -0.012 | -0.012 | 0.000 |
| Robustness sample 2 (N = 445) | 0.015*** | 0.010 | 0.004 | -0.005 | -0.011 | -0.006 |

*p < 0.05, **p < 0.01, ***p < 0.001 (two-tailed tests)

### Table D2.2. Average marginal effects of caregiver’s educational level and differences in effects of health limitations for caregiver’s educational level (second differences), depending on sample definition. Robustness test of Hypothesis 3.

| AMEs          | Second Differences |
|---------------|---------------------|
|               | Low Education | High Education | |
| Analysis sample (N = 203) | 0.022*** | 0.005 | -0.017 |
| Robustness sample 1 (N = 205) | 0.021*** | 0.005 | -0.016 |
| Robustness sample 2 (N = 220) | 0.019*** | 0.003 | -0.016 |

*p < 0.05, **p < 0.01, ***p < 0.001 (two-tailed tests)
## Table D2.3. Robustness test of all three hypotheses with two extended robustness samples, Firth logistic regression estimates. (Estimates of firthlogit models from the main analyses can be seen in Supplementary Table C1.)

|                                | Hypothesis 1 | Hypothesis 2 | Hypothesis 3 |
|--------------------------------|--------------|--------------|--------------|
|                                | Robust sample 1 | Robust sample 2 | Robust sample 1 | Robust sample 2 | Robust sample 1 | Robust sample 2 |
| Number of health limitations   | 0.408***      | 0.398***     | 0.327***     | 0.284***     | 0.323***     | 0.314***     |
|                                | (7.83)        | (8.01)       | (3.95)       | (3.75)       | (3.50)       | (3.49)       |
| Network position of caregiver  |              |              |              |              |              |              |
| (Reference: Immediate family)  |              |              |              |              |              |              |
| Extended family                | -0.699**      | -2.055**     | -0.42**      | -0.81**      | -0.307       | -0.580       |
| Not family                     | (-0.28)       | (-0.55)      |              |              |              |              |
| Interaction: Number of health  |              |              |              |              |              |              |
| limitations and network position of caregiver (Reference: No health limitations, caregiver from immediate family) | | | | | | |
| One health limitation, caregiver from extended family | 0.0408 | 0.260 | (-0.12) | (0.80) | | |
| One health limitation, caregiver not from family | -0.0415 | -0.0092 | (-0.12) | (-0.03) | | |
| Education of caregiver (1=high) | 0.118 | 0.801 | (0.10) | (0.79) | | |
| Interaction: Number of health limitations and education of caregiver (Reference: No health limitations, caregiver has low education) | | | | | | |
| Female respondent (1=yes)      | 0.329 | 0.344 | -0.259 | -0.341 | -0.535 | -0.656 |
|                                | (0.75) | (0.82) | (-0.40) | (-0.55) | (-0.75) | (-0.95) |
| Age of respondent              | 0.0622**     | 0.0574**     | 0.0045      | 0.0113      | 0.0207      | 0.0218      |
|                                | (2.78)       | (2.71)       | (0.13)      | (0.34)      | (0.48)      | (0.53)      |
| Education of respondent (1=high) | -0.990 | -1.078 | -1.048 | -1.041 | -0.576 | -0.823 |
|                                | (-1.62) | (-1.80) | (-1.11) | (-1.14) | (-0.56) | (-0.83) |
| Income of respondent (in 1,000 euro) | 0.00582** | 0.00566* | 0.00420 | 0.00395 | 0.00342 | 0.00294 |
|                                | (2.67) | (2.56) | (1.77) | (1.69) | (1.37) | (1.23) |
| Assets of respondent (in 100,000 euro) | 0.0103 | 0.00978 | -0.0333 | -0.0349 | -0.0346 | -0.0371 |
|                                | (1.72) | (1.59) | (-0.66) | (-0.76) | (-0.78) | (-0.86) |
| Constant                       | -9.607***    | -9.154***    | -3.921      | -4.113      | -4.808      | -4.883      |
|                                | (-5.77) | (-5.85) | (-1.53) | (-1.69) | (-1.54) | (-1.63) |
| N                              | 2625 | 2734 | 422 | 445 | 205 | 220 |
| Difference to N of analysis samples* | +21 | +130 | +5 | +28 | +2 | +17 |

* z statistics in parentheses; * p < 0.05, ** p < 0.01, *** p < 0.001 (two-tailed tests)
* Analysis samples were used in the main analyses.
**D3. Alternative Regressand Specification**

**Figure D3.1.** Robustness tests of hypotheses 2 and 3. Predicted probabilities for Hypothesis 2 (left; N=417) and Hypothesis 3 (right; N=203) with dependent variable is ‘Limitations with Instrumental Activities of Daily Living (IADL)’.

**Figure D3.2.** Robustness tests of hypotheses 2 and 3. Predicted probabilities for Hypothesis 2 (left; N=417) and Hypothesis 3 (right; N=203) with dependent variable is ‘Limitations with Activities of Daily Living (ADL)’.
### Table D3.1. Average marginal effects of caregiver’s network position and differences in effects of health limitations for caregiver’s network position (second differences) for different dependent variables. Robustness test of Hypothesis 2. (N=417)

| Dependent variable | AMEs | Second Differences |
|--------------------|------|--------------------|
|                    | Immediate family | Extended family | Not family | Immediate vs. extended family | Immediate vs. not family | Extended vs. not family |
| Number of health limitations a | 0.017*** | 0.005 | 0.005 | -0.012 | -0.012 | 0.000 |
| Number of IADL limitations b | 0.024*** | 0.008 | 0.007 | -0.016 | -0.017 | -0.001 |
| Number of ADL limitations c | 0.028* | 0.012 | 0.018 | -0.016 | -0.010 | 0.006 |

* p < 0.05, ** p < 0.01, *** p < 0.001 (two-tailed tests)

a Sum of ADL and IADL limitations.

### Table D3.2. Average marginal effects of caregiver’s educational level and differences in effects of health limitations for caregiver’s educational level (second differences) for different dependent variables. Robustness test of Hypothesis 3. (N=203)

| Dependent variable | AMEs | Second Differences |
|--------------------|------|--------------------|
|                    | Low Education | High Education | | | | |
| Number of health limitations a | 0.022*** | 0.005 | -0.017 |
| Number of IADL limitations | 0.030*** | 0.011 | -0.019 |
| Number of ADL limitations c | 0.041* | 0.007 | -0.034 |

* p < 0.05, ** p < 0.01, *** p < 0.001 (two-tailed tests)

a Sum of ADL and IADL limitations.
**Table D3.3. Robustness test of all three hypotheses with different dependent variable (IADL limitations), Firth logistic regression estimates. (Estimates of firthlogit models from the main analyses can be seen in Supplementary Table C1.)**

| Model | Number of IADL limitations | Network position of caregiver | Interaction: Number of IADL limitations | Education of caregiver (1=high) | Interaction: Number of IADL limitations and education of caregiver | Female respondent (1=yes) | Age of respondent | Education of respondent | Income of respondent | Assets of respondent | Constant |
|-------|----------------------------|-----------------------------|----------------------------------------|--------------------------------|--------------------------------|------------------------|-----------------|----------------------|---------------------|---------------------|----------|
|       | Model 1                     | Model 2                     | Model 3                                |                                 |                                 |                        |                 |                      |                     |                     |          |
|       | 0.586**                    | 0.469***                    | 0.444***                               |                                 |                                 |                        |                 |                      |                     |                     |          |
|       | (7.89)                      | (4.14)                      | (3.64)                                 |                                 |                                 |                        |                 |                      |                     |                     |          |
|       | Extended family             |                             |                                       | Extended family                 | -0.795                         | -0.47                  | -0.46          |                      |                     |                     |          |
|       | Not family                  |                             |                                       | Not family                      | -0.479                         |                       |               |                      |                     |                     |          |
|       | One (more) IADL limitation, | -0.0295                     | -0.06                                 | One (more) IADL limitation,     | -0.0882                        | -0.27                  |               |                      |                     |                     |          |
|       | caregiver from extended     |                             |                                       | caregiver not from family       |                                |                        |               |                      |                     |                     |          |
|       | family                      |                             |                                       |                                 |                                |                        |               |                      |                     |                     |          |
|       | -0.0295                     | -0.06                       | -0.0882                               | -0.27                           |                                 |                        |               |                      |                     |                     |          |
|       | -0.212                      | (0.18)                      | -0.136                                | (0.36)                          |                                 |                        |               |                      |                     |                     |          |
|       | -0.0295                     | -0.06                       | -0.0882                               | -0.27                           |                                 |                        |               |                      |                     |                     |          |
|       | 0.311                       | -0.379                      | -0.553                                |                                 |                                 |                        |               |                      |                     |                     |          |
|       | (0.70)                      | (-0.58)                     | (-0.77)                               |                                 |                                 |                        |               |                      |                     |                     |          |
|       | 0.0571*                     | -0.0000550                  | 0.0184                                |                                 |                                 |                        |               |                      |                     |                     |          |
|       | (2.55)                      | (-0.00)                     | (0.43)                                |                                 |                                 |                        |               |                      |                     |                     |          |
|       | -0.950                      | -0.782                      | -0.249                                |                                 |                                 |                        |               |                      |                     |                     |          |
|       | (-1.56)                     | (-0.85)                     | (-0.25)                               |                                 |                                 |                        |               |                      |                     |                     |          |
|       | 0.00573**                   | 0.00373                     | 0.00323                               |                                 |                                 |                        |               |                      |                     |                     |          |
|       | (2.64)                      | (1.61)                      | (1.30)                                |                                 |                                 |                        |               |                      |                     |                     |          |
|       | 0.0104                      | -0.0257                     | -0.0292                               |                                 |                                 |                        |               |                      |                     |                     |          |
|       | (1.75)                      | (-0.41)                     | (-0.61)                               |                                 |                                 |                        |               |                      |                     |                     |          |
|       | -9.212***                   | -3.502                      | -4.520                                |                                 |                                 |                        |               |                      |                     |                     |          |
|       | (-5.56)                     | (-1.36)                     | (-1.45)                               |                                 |                                 |                        |               |                      |                     |                     |          |

**Note:** Model 1: Test of Hypothesis 1; Model 2: Test of Hypothesis 2; Model 3: Test of Hypothesis 3. 
**z** statistics in parentheses; **p < 0.05, ***p < 0.01, ****p < 0.001 (two-tailed tests)
### Table D3.4. Robustness test of all three hypotheses with different dependent variable (IADL limitations), Firth logistic regression estimates. (Estimates of firthlogit models from the main analyses can be seen in Supplementary Table C1.)

|                                 | Model 1          | Model 2          | Model 3          |
|---------------------------------|------------------|------------------|------------------|
| **Number of ADL limitations**   | 0.744*** (5.81)  | 0.453*** (2.61)  | 0.486* (2.41)    |
| **Network position of caregiver** |                  |                  |                  |
| (Reference: Immediate family)   |                  |                  |                  |
| Extended family                 | -1.442 (-0.89)   |                  |                  |
| Not family                      | -1.062 (-1.08)   |                  |                  |
| **Interaction: Number of ADL limitations and network position of caregiver** |                  |                  |                  |
| (Reference: No ADL limitations, caregiver from immediate family) |                  |                  |                  |
| One (more) ADL limitation, caregiver from extended family | 0.216 (0.34)     |                  |                  |
| One (more) ADL limitation, caregiver not from family | 0.413 (0.50)     |                  |                  |
| **Education of caregiver (1=high)** |                  | -0.597 (-0.58)  |                  |
| **Interaction: Number of ADL limitations and education of caregiver** |                  | -0.260 (-0.64)  |                  |
| (Reference: No ADL limitations, caregiver has low education) |                  |                  |                  |
| **Female respondent (1=yes)**   | 0.329 (0.77)     | -0.385 (-0.62)   | -0.619 (-0.91)   |
| **Age of respondent**           | 0.0745*** (3.36) | 0.0073 (0.23)    | 0.0284 (0.72)    |
| **Education of respondent (1=high)** | -1.065 (-1.80) | -1.145 (-1.28)   | -0.731 (-0.76)   |
| **Income of respondent (in 1,000 euro)** | 0.00559*** (2.56) | 0.00339 (1.47)   | 0.00353 (1.44)   |
| **Assets of respondent (in 100,000 euro)** | 0.00852 (1.35) | -0.036 (-0.85)   | -0.0328 (-0.80)  |
| **Constant**                    | -10.143*** (-6.10) | -3.308 (-1.41) | -4.528 (-1.59)   |
| **N**                           | 2,604            | 417              | 203              |

**Note:** Model 1: Test of Hypothesis 1; Model 2: Test of Hypothesis 2; Model 3: Test of Hypothesis 3. 
Z statistics in parentheses; *p < 0.05, **p < 0.01, ***p < 0.001 (two-tailed tests)
Appendix E. Overview of missing values and reduction of case numbers

Initial sample
\( N = 4,412 \)

Drop observations with missing or inconsistent values
\( N = 2,887 \)

| Variable: | missing values: | inconsistencies\(^d\): |
|-----------|-----------------|------------------------|
| Receipt of care benefits | 11 | |
| Number of health limitations | 9 | |
| Network position of caregiver\(^a\) | 53 | |
| Education of caregiver\(^b\) | 265 | |
| Number of areas with help provided | 8 | |
| Frequency of help provided | 2 | |
| Age of respondent | 0 | |
| Gender of respondent | 0 | |
| Education of respondent | 41 | |
| Total household income per month of respondent\(^c\) | 241 | 2 |
| Total assets of respondent\(^c\) | 847 | 258 |

Notes: Missing values and inconsistencies partly overlap. The sum of the cases listed in the table is therefore higher than the number of observations actually excluded.

\(^a\) Includes three cases with missing values on all network variables.

\(^b\) Children’s education is missing if the respondent could not or would not indicate it, and if a child’s educational status was not followed up to the current wave despite its young age and possible associated changes in educational attainment.

\(^c\) Household income and assets were collected from only one household participant and were imputed to the partner in the data preparation when possible. Missing values due to non-response are consequently doubled.

\(^d\) In some cases, financial information is available from both household members. If these differ, the cases were excluded as inconsistent on the corresponding values.

Limit data to reasonable range of values
\( N = 2,820 \)

| Number of cases excluded: |
|--------------------------|
| Age respondent (< 50 years): | 42 |
| Income respondent (< 400 Euro): | 25 |

Sample construction

**Sample 1**: Individuals with none or at most one caregiver
\( N = 2,604 \)

**Sample 2**: Individuals with one caregiver only
\( N = 417 \)

**Sample 3**: Individuals with one caregiver who is their partner or child
\( N = 203 \)