What are the psychosocial consequences when fear of falling starts or ends? Evidence from an asymmetric fixed effects analysis based on longitudinal data from the general population

André Hajek | Hans-Helmut König

Objectives: The purpose of this study was to identify whether the onset and the end of fear of falling (FOF) are associated with psychosocial consequences (in terms of depressive symptoms, loneliness, social isolation, autonomy, and subjective well-being).

Methods/Design: Longitudinal data for this study were taken from the nationally representative German Ageing Survey which included community-dwelling individuals ≥40 years (wave 5 and wave 6). Psychosocial outcome measures were assessed using widely established and well-validated scales. The presence of FOF was used as the main explanatory variable. It was adjusted for age, family status, labor force participation, self-rated health, physical functioning, as well as the number of chronic conditions.

Results: Linear fixed effects regressions revealed that FOF was associated with adverse psychosocial outcomes (increased depressive symptoms, lower life satisfaction, lower positive affect, higher negative affect, and lower perceived autonomy). Asymmetric fixed effects regressions analysis showed that the onset of FOF was associated with reduced life satisfaction as well as reduced autonomy, whereas the end of FOF was associated with reduced depressive symptoms, decreased loneliness scores, as well as decreased negative affect.

Conclusions: The study findings suggest that future studies should analyze the consequences of FOF differently (onset and end of FOF) which has practical important implications. More specifically, while strategies to avoid the onset of FOF may help to maintain satisfaction with life and autonomy, strategies to end FOF may contribute to avoid increased loneliness, feelings of negative affect, as well as increased depressive symptoms.

KEYWORDS
autonomy, cohort study, depression, fear of falling, life satisfaction, loneliness, longitudinal study, negative affect, positive affect, psychological factors, social isolation

1 | INTRODUCTION

Experiencing a fall is a frequent phenomenon among older adults.1,2 Some of these individuals develop a fear of falling (FOF). Furthermore, FOF is also frequent among individuals who did not experience a fall. There is a positive association between FOF and age. Therefore, it is projected that the number of individuals with FOF will rise sharply due to the ongoing demographic shift. FOF is associated with...
increased neuroticism, frailty, and increased depressive symptoms. Therefore, knowing the factors associated with FOF is crucial. However, to date, there is a lack of longitudinal studies determining whether changes in FOF are associated with psychosocial consequences. Therefore, the first aim of this study was to investigate the link between changes in FOF and psychosocial factors in terms of depressive symptoms, loneliness, social isolation, autonomy, and subjective well-being. More specifically, and probably the particular benefit of our study was to identify whether the onset and the end of fear of falling (FOF) are associated with different psychosocial factors (second aim). This can have important practical implications. For example, when the onset of FOF is associated with reductions in different psychosocial factors compared to the end of FOF, this knowledge can help to develop interventional strategies that are more appropriate.

Psychosocial factors that appeared both to be theoretically and empirically important were considered as outcomes in our study. Previous research has demonstrated that there is a link between FOF and increased depressive symptoms. Thus, we hypothesize that FOF is associated with increased depressive symptoms. Moreover, it has been demonstrated that FOF is associated with increased loneliness. Consequently, we hypothesize that FOF is associated with increased loneliness and social isolation. Oh et al showed that there is an association between FOF and decreased life satisfaction. Furthermore, a recent study showed that FOF is associated with lower positive and higher negative affect. In sum, we hypothesize that FOF is associated with reduced subjective well-being. Furthermore, we hypothesize that FOF is associated with reduced perceived autonomy.

With regard to our second aim, we examined the asymmetric effects of FOF (consequences of the onset of FOF and the end of FOF on psychosocial outcomes) in an exploratory fashion because there is a lack of studies using this approach.

2 METHODS

2.1 Sample

Starting in 1996, the German Ageing Survey is a longitudinal cohort-based survey (with a cohort-sequential design, which means that new baseline samples were introduced in wave 2 to 3 and wave 5) of individuals residing in private households aged 40+. In 2002 (wave 2), 2008 (wave 3), 2011 (wave 4), 2014 (wave 5), and 2017 (wave 6) further waves were performed.

In our study, data were used from wave 5 and 6 because FOF was solely measured in these waves. In total, over 10 300 participants took part in wave 5 and more than 6600 participants took part in wave 6. Klaus et al provide additional details with regard to the DEAS study.

All participants provided written informed consent. The DEAS study follows the principles of the Declaration of Helsinki. Because the criteria for an ethical statement were not fulfilled (eg, risk for the respondents or use of invasive methods), an ethics committee approval was not required for the DEAS study. It should also be noted that the German Centre of Gerontology (DZA), who is responsible for the DEAS study did not apply for an ethics vote, based on the recommendation of a standing council of the DEAS that decided no ethics vote to be necessary.

2.2 Dependent variables

A tool, developed by Schwarzer, was used to assess the perceived autonomy (consisting of four items). The score ranges from 1 to 4, whereby higher values correspond to higher perceived autonomy. In our study, Cronbach's alpha was .81.

Bude and Lantermann developed a scale to measure social isolation, consisting of four items (each ranging from 1 [strongly agree] to 4 [strongly disagree]). All items were recorded and subsequently the mean rating across all items was computed, with higher values reflecting higher perceived social isolation. In our study, Cronbach's Alpha was .88.

A short 6-item version of the widely used 11-item De Jong Gierveld Loneliness Scale was used to assess loneliness (from 1 [strongly agree] to 4 [strongly disagree]). The psychometric properties have been shown elsewhere. Higher values correspond to higher levels of loneliness. In our study, Cronbach's alpha was .83.

In this study, the 15-item version of the Center for Epidemiologic Studies Depression Scale (CES-D) was used to quantify depressive symptoms (2 items have been recorded; each item ranges from 1 (rarely/none of the time) to 4 (most/all of the time); value range was recorded from 1 to 4 to 0 to 3). The scale ranges from 0 (no depressive symptoms) to 45 (severe depressive symptoms). This means that the scale reflects the sum of all 15 items. Favorable psychometric properties have been shown. In our study, Cronbach's alpha was .87.

The cognitive evaluation of life (life satisfaction) was measured using the Satisfaction with Life Scale (SWLS), consisting of five items (five levels per item). The mean of all items defines the final score (higher values reflect higher life satisfaction; Cronbach's alpha was .86 in our study).

Key Points
- Longitudinal data were obtained from a nationally representative cohort of older adults
- The onset of fear of falling (FOF) was associated with decreases in positive psychosocial outcome measures
- The end of FOF was associated with decreases in negative psychosocial outcome measures
- While strategies to avoid the onset of FOF may help to maintain satisfaction with life and autonomy, strategies to end FOF may contribute to avoid increased loneliness, feelings of negative affect, as well as increased depressive symptoms
To assess positive (eg, joy) and negative emotions (anxiety or anger), the Positive Affect and Negative Affect Schedule (PANAS) was used (in each case: 10 items). The final score ranges from 0 to 5, with higher values corresponding to higher positive or negative affect, respectively (Cronbach's alpha for the positive affect subscale was .87, and Cronbach's alpha for the negative affect subscale was .86 in our study).

2.3 | Independent variables

The key independent variable was fear of falling. Individuals self-rated fear of falling ("Were you afraid that you might fall during the last 12 months?" no; yes). This is a widely used form in large cohort studies to quantify FOF (eg, in the Survey of Health, Ageing and Retirement in Europe [SHARE]).

With regard to covariates, it was controlled for age, familial status (married, living together with spouse; others (divorced; single; widowed; married, and living separated from spouse), and employment status (distinquishing between employed, retired, and other—not employed). Furthermore, it was controlled for several health-related factors, namely for physical functioning by using the subscale physical functioning of the SF-36 which ranges from 0 (worst) to 100 (best), for self-rated health (from 1 = very good to 5 = very bad), and for the number of physical illnesses (eg, cardiac and circulatory disorders; ranging from 0 to 11).

In the sensitivity analysis, we examined whether gender or age (younger than 65 years; 65 years and above) moderated the relation between FOF and the psychosocial outcome measures.

2.4 | Statistical analysis

In accordance with previous studies analyzing the determinants of psychosocial factors over time, linear FE regressions were used. FE regressions offer the advantage that they allow for an arbitrary correlation between time-constant unobserved factors (such as genetic factors). Hausman-tests with robust standard errors also substantiated our choice (eg, with depressive symptoms as outcome measure: Sargan-Hansen statistic equaled 67.3, P < .001). FE estimates exclusively use intraindividual variations in the observation period (eg, changes in FOF within individuals from wave 5 to wave 6).

To check how the onset and the end of FOF affect psychosocial factors, asymmetric FE regression analysis was used. The significance level was set at P < .05. Stata 15.1 (StataCorp, College Station, Texas, USA) was used in the present study.

3 | RESULTS

3.1 | Description of the analytical sample

Observations of the FE regression analysis (with depressive symptoms as outcome measure; FE regression analysis with other psychosocial outcome measures had almost the same analytical sample) are described in Table 1. In the analytical sample used, mean age was 65.5 years (±10.7 years) and 50.4% were female. Average depressive symptoms score was 6.5 (±5.7), average loneliness score was 1.7 (±0.5), average social isolation score was 1.6 (±0.6), average life satisfaction score was 3.9 (±0.5), average positive affect score was 3.6 (±0.5), average negative affect score was 2.1 (±0.5), and average autonomy score was 3.5 (±0.5). Further details are given in Table 1.

3.2 | Regression analysis

Results of FE regressions are described in Table 2 (with changes in FOF as main independent variable), Table 3 (with the onset of FOF as

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| TABLE 1 | Sample characteristics for individuals (n = 8836 observations) included in FE regression analysis (wave 5 to wave 6, pooled) |
|-----------------|--------------------------------------------------|
| Age (in years): Mean (SD) | 65.5 (±10.7) |
| Female: N (%) | 4456 (50.4%) |
| Education (ISCED-97): N (%) | | |
| - Low education | 378 (4.3%) |
| - Medium education | 4366 (49.4%) |
| - High education | 4092 (46.3%) |
| Married, living together with spouse: N (%) | 6279 (71.1%) |
| Employment status: N (%) | | |
| - Employed | 3122 (35.3%) |
| - Retired | 5070 (57.4%) |
| - Other: not employed | 644 (7.3%) |
| Self-rated health (from 1 = very good to 5 = very bad): Mean (SD) | 2.5 (±0.8) |
| Physical functioning (from 0 [worst] to 100 [best]): Mean (SD) | 83.0 (±21.6) |
| Number of physical illnesses (from 0 to 11): Mean (SD) | 2.6 (±1.9) |
| Absence of FOF: N (%) | 7263 (82.2%) |
| Depressive symptoms (from 0 to 45; higher values correspond to more depressive symptoms) | 6.3 (±5.7) |
| Loneliness (from 1 to 4; higher values correspond to higher loneliness) | 1.7 (±0.5) |
| Social isolation (from 1 to 4; higher values correspond to higher social isolation) | 1.6 (±0.6) |
| Life satisfaction (from 1 to 5; higher values correspond to higher life satisfaction) | 3.9 (±0.5) |
| Positive affect (from 1 to 5; higher values correspond to higher positive affect) | 3.6 (±0.5) |
| Negative affect (from 1 to 5; higher values correspond to higher negative affect) | 2.1 (±0.5) |
| Perceived autonomy (from 1 to 4; higher values correspond to higher perceived autonomy): Mean (SD) | 3.5 (±0.5) |

Note: It is worth emphasizing that time-constant factors (here: sex and education) were only shown for descriptive purposes.
In total, 669 individuals changed FOF status from wave 5 to wave 6. More specifically, while the onset of FOF occurred in 431 individuals, the end of FOF occurred in 238 individuals. Results of FE regressions exclusively rely on these individuals in estimating the link between falls and psychosocial factors. However, individuals reported, for example, also changes on labor force participation (e.g., from employment to retirement) from wave 5 to wave 6. For example, these changes also contribute to the FE estimates. Therefore, more than 8800 observations were used in the FE regression analysis.

Linear FE regressions revealed that FOF was associated with adverse psychosocial outcomes (increased depressive symptoms ($\beta = 0.58$, $P < .05$), lower life satisfaction ($\beta = -0.05$, $P < .05$), lower positive affect ($\beta = -0.03$, $P < .05$), higher negative affect ($\beta = 0.03$, $P < .05$), and lower perceived autonomy ($\beta = -0.07$, $P < .001$)). Asymmetric fixed effects regressions analysis showed that the onset of FOF was associated with reduced life satisfaction ($\beta = -0.06$, $P < .05$) as well as reduced autonomy ($\beta = -0.12$, $P < .001$), whereas the end of FOF was associated with reduced depressive symptoms ($\beta = -1.08$, $P < .05$), decreased loneliness scores ($\beta = -0.06$, $P < .05$), as well as decreased negative affect ($\beta = -0.07$, $P < .05$).

In sensitivity analysis (results not shown, but available upon request), it was tested whether gender or age (younger than 65 years; 65 years and above) moderated the relation between FOF and the psychosocial outcome measures. However, none of the interaction terms achieved statistical significance.

### DISCUSSION

Using longitudinal data from the nationwide representative DEAS study, the objective of this study was to determine whether the onset

| Independent variables | (1) Depressive symptoms | (2) Loneliness | (3) Social isolation | (4) Life satisfaction | (5) Positive affect | (6) Negative affect | (7) Autonomy |
|-----------------------|------------------------|---------------|---------------------|---------------------|-------------------|------------------|-------------|
| Changes in FOF        | 0.58* (0.25)           | 0.03+ (0.02)  | 0.03 (0.02)         | -0.05* (0.02)       | -0.03* (0.02)     | 0.03* (0.02)     | -0.07*** (0.02)|
| Age (in years)        | 0.02 (0.03)            | -0.00 (0.00)  | 0.00 (0.00)         | 0.00 (0.00)         | 0.01*** (0.00)    | -0.00+ (0.00)   | -0.01* (0.00) |
| Marital status: Other | 1.31* (0.51)           | 0.08* (0.04)  | 0.01 (0.05)         | -0.09+ (0.05)       | -0.05 (0.04)      | 0.01 (0.03)      | 0.03 (0.04)   |
| Employment status: Retired (Ref.: Employed) | -0.56+ (0.33) | -0.03 (0.02) | -0.01 (0.03) | -0.01 (0.03) | 0.05* (0.02) | -0.06* (0.03) | 0.05* (0.03) |
| Other: not employed   | 0.17 (0.47)            | 0.04 (0.03)   | 0.08* (0.04)        | -0.11** (0.04)      | 0.01 (0.03)       | -0.02 (0.03)    | 0.00 (0.03)   |
| Self-rated health (from 1 = very good to 5 = very bad) | 1.57*** (0.14) | 0.03* (0.01) | 0.02+ (0.01) | -0.06*** (0.01) | -0.05*** (0.01) | 0.04*** (0.01) | -0.03*** (0.01) |
| Physical functioning (Physical functioning subscale of the SF-36; ranging from 0 (worst) to 100 (best)) | -0.04*** (0.01) | 0.00 (0.00) | 0.00 (0.00) | 0.00** (0.00) | 0.00*** (0.00) | -0.00* (0.00) | 0.00*** (0.00) |
| Total number of physical illnesses (ranging from 0 to 11) | -0.01 (0.06) | 0.01* (0.00) | 0.02** (0.01) | -0.01 (0.01) | -0.01 (0.00) | 0.02*** (0.00) | -0.00 (0.01) |
| Constant              | 3.15 (2.15)            | 1.72*** (0.16) | 1.13*** (0.20)      | 3.79*** (0.21)      | 3.14*** (0.15)    | 2.21*** (0.14)  | 3.74*** (0.17) |

Note: Results of linear fixed effects regressions (wave 5 and wave 6). Beta-coefficients were reported; cluster-robust standard errors in parentheses; ***$P < .001$, **$P < .01$, *$P < .05$, +$P < .10$. 

main independent variable), and Table 4 (with the end of FOF as main independent variable). In total, 669 individuals changed FOF status from wave 5 to wave 6. More specifically, while the onset of FOF occurred in 431 individuals, the end of FOF occurred in 238 individuals. Results of FE regressions exclusively rely on these individuals in estimating the link between falls and psychosocial factors. However, individuals reported, for example, also changes on labor force participation (e.g., from employment to retirement) from wave 5 to wave 6. For example, these changes also contribute to the FE estimates. Therefore, more than 8800 observations were used in the FE regression analysis.
and the end of fear of falling (FOF) were associated with psychosocial consequences—in terms of depressive symptoms, loneliness, social isolation, autonomy, and subjective well-being.

Regressions showed that FOF was associated with adverse psychosocial outcomes (increased depressive symptoms, lower life satisfaction, lower positive affect, higher negative affect, and lower perceived autonomy). Furthermore, asymmetric fixed effects regressions analysis showed that the onset of FOF was associated with reduced life satisfaction, as well as reduced autonomy, whereas the end of FOF was associated with reduced depressive symptoms, decreased loneliness scores, as well as decreased negative affect.

In sum, our findings, based on longitudinal data, are difficult to compare with existing studies. For example, one cross-sectional study, which also used data from the German Ageing Survey, revealed that increased fear of falling was associated with, among others, lower life satisfaction, lower positive affect, higher negative affect, and higher loneliness scores. Other studies, which investigated the link between psychological factors and FOF, were mainly limited to psychological variables that are directly linked to FOF.

Our findings in the study—the onset of FOF was associated with reduced life satisfaction and reduced autonomy—may be explained by the fact that the onset of FOF may contribute avoiding social contacts. Moreover, individuals might fear falling again and, therefore, may feel that they do not get by well on their own—factors that may explain why autonomy and life satisfaction are reduced. In a similar vein, a recent study showed that falls are associated with reduced autonomy cross-sectionally.

In our study, the end of FOF was associated with reduced depressive symptoms, decreased loneliness scores, as well as decreased

### Table 3: Onset of FOF and psychosocial outcome measures

| Independent variables | (1) Depressive symptoms | (2) Loneliness | (3) Social isolation | (4) Life satisfaction | (5) Positive affect | (6) Negative affect | (7) Autonomy |
|-----------------------|-------------------------|---------------|---------------------|----------------------|-------------------|-------------------|-------------|
| Onset of FOF          | 0.32 (0.32)             | 0.02 (0.02)   | 0.06+ (0.03)        | -0.06* (0.03)        | -0.04+ (0.02)     | 0.01 (0.02)       | -0.12*** (0.03) |
| Age (in years)        | 0.04 (0.03)             | -0.00 (0.00)  | 0.00 (0.00)         | 0.00 (0.00)          | 0.01*** (0.00)    | -0.00 (0.00)      | -0.00 (0.00)  |
| Marital status: Other (single; divorced; widowed; married, and living separated from spouse [Ref.: married, and living together with spouse]) | 1.32* (0.52) | 0.07+ (0.04) | -0.01 (0.05) | -0.09+ (0.05) | -0.05 (0.04) | 0.01 (0.03) | 0.02 (0.04) |
| Employment status: Retired (Ref.: Employed) | -0.73* (0.33) | -0.03 (0.03) | -0.02 (0.03) | -0.01 (0.03) | 0.05+ (0.02) | -0.07*** (0.03) | 0.05+ (0.03) |
| Other: not employed | 0.10 (0.46)             | 0.05+ (0.03)  | 0.06 (0.04)         | -0.10+ (0.04)        | 0.00 (0.03)       | -0.01 (0.03)      | 0.00 (0.03)  |
| Self-rated health (from 1 = very good to 5 = very bad) | 1.55*** (0.15) | 0.03** (0.01) | 0.02+ (0.01) | -0.06*** (0.01) | -0.05*** (0.01) | 0.04*** (0.01) | -0.04*** (0.01) |
| Physical functioning (Physical functioning subscale of the SF-36; ranging from 0 [worst] to 100 [best]) | -0.04*** (0.01) | 0.00 (0.00) | 0.00 (0.00) | 0.00** (0.00) | 0.00*** (0.00) | -0.00* (0.00) | 0.00*** (0.00) |
| Total number of physical illnesses (ranging from 0 to 11) | -0.01 (0.06) | 0.01 (0.00) | 0.02** (0.01) | -0.01 (0.01) | -0.01 (0.00) | 0.01** (0.00) | -0.00 (0.01) |
| Constant              | 2.16 (2.20)             | 1.71*** (0.17) | 1.24** (0.20)      | 3.72*** (0.21)       | 3.08*** (0.15)    | 2.15*** (0.15)    | 3.52*** (0.18) |
| Observations          | 8408                    | 8430          | 8434               | 8466                 | 8472              | 8470              | 8450        |
| Number of individuals | 4204                    | 4215          | 4217               | 4233                 | 4236              | 4235              | 4225        |
| R²                    | 0.08                    | 0.01          | 0.01               | 0.02                 | 0.02              | 0.02              | 0.03        |

Note: Results of linear fixed effects regressions (wave 5 and wave 6). Beta-coefficients were reported; cluster-robust standard errors in parentheses; ***P < .001, **P < .01, *P < .05, +P < .10.
negative affect. We assume that the end of FOF has the potential to mark a decisive turning point in life for individuals who scored high in these adverse conditions (severe depressive symptoms, high loneliness, or frequent negative emotions) when they had FOF. Thus, it appears plausible that these individuals are better off when FOF ends. However, future research is required to elucidate the underlying reasons for the end of FOF.

In sum, the study findings showed that while the onset of FOF was associated with decreases in positive psychosocial outcome measures (life satisfaction and autonomy), the end of FOF was associated with decreases in negative psychosocial outcome measures (depressive symptoms, negative affect, and loneliness). However, and in contrast to the other negative psychosocial outcome measures, it is quite puzzling why the end of FOF was not associated with decreases in social isolation. A possible explanation may be that even a major life event, such as the end of FOF, does not have the power to reduce social isolation because feelings of isolation may remain largely stable over the years among middle-aged and older adults with FOF. Thus, individuals developing feelings of social isolation caused by FOF, several years ago, may have difficulties in overcoming these feelings of isolation. Maybe it needs even stronger positive life events, such as remarriage, to overcome social isolation in late life. However, future research, based on longitudinal data (eg, other cohort studies), is required to clarify the link between the end of FOF and changes in social isolation.

This is one of the first longitudinal studies investigating the link between fear of falling and psychosocial outcomes. Not only socioeconomic confounders were included, but also various health-related confounders. FE regression analysis was used in order to mitigate the problem of unobserved heterogeneity, which is the main challenge in large survey studies. Furthermore, asymmetric fixed effects regressions analysis showed that the onset of FOF has different consequences for psychosocial factors compared to the end of FOF. This also has important practical implications which are described in the

| Table 4: End of FOF and psychosocial outcome measures |
|------------------------------------------------------|
| Independent variables                                 |
| (1) Depressive symptoms                               |
| (2) Loneliness                                        |
| (3) Social isolation                                  |
| (4) Life satisfaction                                 |
| (5) Positive affect                                    |
| (6) Negative affect                                    |
| (7) Autonomy                                         |
| End of FOF                                            |
| Age (in years)                                        |
| Marital status: - Other (single; divorced; widowed; married, and living separated from spouse [Ref.: married, and living together with spouse]) |
| Employment status: - Retired (Ref.: Employed)         |
| Other: not employed                                   |
| Self-rated health (from 1 = very good to 5 = very bad) |
| Physical functioning (Physical functioning subscale of the SF-36; ranging from 0 [worst] to 100 [best]) |
| Total number of physical illnesses (ranging from 0 to 11) |
| Constant                                             |

Note: Results of linear fixed effects regressions (wave 5 and wave 6). Beta-coefficients were reported; cluster-robust standard errors in parentheses; ***P < .001, **P < .01, *P < .05, +P < .10.
conclusion section. Longitudinal data were taken from a large nationwide representative study. Psychosocial outcome measures were assessed using widely established and well-validated scales. Future longitudinal studies are needed to investigate the link between the severity of fear of falling and psychosocial factors. A small sample selection bias and some panel attrition occurred in the course of the DEAS study. Self-reported data were used in this study (in contrast to validated falls efficacy scales used in other studies). Therefore, the possibility of a recall bias cannot be completely dismissed (eg, remembering whether one experienced FOF in the past 12 months). Furthermore, due to reasons of data availability, frailty, and personality factors, such as neuroticism, were not included in our study. Future longitudinal studies are required to clarify the link between FOF and these factors.

5 | CONCLUSION

Findings of the study suggest that future studies should analyze the consequences of FOF differently (onset and end of FOF) which has practical, important implications. More specifically, while strategies to avoid the onset of FOF may help to maintain satisfaction with life and autonomy, strategies to end FOF may contribute to avoid increased loneliness, feelings of negative affect, as well as increased depressive symptoms.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

AUTHOR CONTRIBUTIONS

A.H., H.-H. K. Design and concept of analyses, preparation of data, statistical analysis and interpretation of data, preparing of the manuscript. Both authors critically reviewed the manuscript, provided significant editing of the article, and approved the final manuscript.

DATA AVAILABILITY STATEMENT

The data used in this study are third-party data. The anonymized data sets of the DEAS (1996, 2002, 2008, 2011, 2014, and 2017) are available for secondary analysis. The data have been made available to scientists at universities and research institutes for scientific purposes. The use of data is subject to written data protection agreements. Microdata of the German Ageing Survey (DEAS) is available free of charge to scientific researchers for non-profitable purposes. The FDZ-DZA provides access and support to scholars interested in using DEAS for their research. However, for reasons of data protection, signing a data distribution contract is required before data can be obtained. Please see the following link for further information (data distribution contract): https://www.dza.de/en/dzd/access-to-data/formular-deas-en-english.html.

ORCID

André Hajek https://orcid.org/0000-0002-6886-2745

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