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The Risks of Experiencing Severe Loneliness Across Middle and Late Adulthood

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Abstract

Objectives: From a theoretical point of view, older adults may not necessarily face a greater risk of becoming lonely than middle-aged adults but are more likely at a disadvantage in fighting loneliness. Therefore, in this study, we differentiate between the risk of becoming lonely and the risk of remaining lonely.

Methods: A large longitudinal data set representative of the German noninstitutionalized population from 40 to 85 years of age ($N = 15,408$; 49% female participants) was used in the analysis. Lagged logistic regression models were estimated to investigate the effect of earlier experiences of severe loneliness on the risk of being lonely after three years across middle age and late adulthood. Individual differences in health, views on aging, and social activities were taken into account to explore their role in age differences in the risk of remaining lonely.

Results: The analysis revealed marginal age differences in the risk of becoming lonely but a marked age gradient regarding the risk of remaining lonely. Lonely older adults who were older than 75 years of age were more likely to remain lonely after three years than lonely middle-aged adults. Controlling for individual differences in health, views on aging as social loss, and social activities accounted for this age difference.

Discussion: Interventions against loneliness may prioritize older age groups because losses in capacities, shifts in motivations, and a degraded opportunity structure render it increasingly less likely that older adults leave a state of loneliness on their own accord.

Keywords: Longitudinal change, Personal relationships, Self-perceptions of aging, Social networks

If existing social relationships are unable to meet the individual's social needs, people experience loneliness (Tesch-Roemer & Huxhold, 2019). From the perspective of the currently most prominent theoretical approach, loneliness is an evolutionarily ingrained warning signal similar to hunger or pain (Cacioppo et al., 2006; Hawkey & Cacioppo, 2010). Moderate experiences of loneliness indicate missing social connections and serve as incentives to seek closeness with other people (Das, 2021). Thus, some experiences of loneliness are common occurrences in all age groups and are not harmful per se.

In contrast, severe or prolonged episodes of loneliness act as chronic stressors that can damage well-being and health. Experiences of severe loneliness have been associated with low levels of subjective well-being, serious mental and physical health problems, and all-cause mortality (Böger & Huxhold, 2018c; Courtin & Knapp, 2017; Hawkey & Cacioppo, 2010; Rico-Uribe et al., 2018). In view of these findings, the prevention of loneliness has become a major topic in public and political discourse around the globe.

In the ongoing debate, it is commonly assumed that older adults have a particularly high risk of becoming lonely. This belief is probably fueled by the fact that more objective indicators of social integration such as network sizes and frequencies of social contact tend to decline with advancing age

(Sander et al., 2017; Wrzus et al., 2013). The empirical evidence regarding this popular assumption is, however, rather mixed. Although some studies demonstrated an increase in loneliness scores in late adulthood (e.g., Suanet & van Tilburg, 2019), others only found stability (e.g., Böger & Huxhold, 2018a). Moreover, a recent meta-analysis concluded that there is essentially no association between loneliness and age across adulthood (Mund et al., 2020).

The divergence between the developmental trajectories of more objective indicators of social integration and the development of loneliness across middle and late adulthood could be caused by differential change. Some groups of older adults may experience less loneliness with age, for example, because of increases in the quality of their relationships (Luong et al., 2011). Others may suffer an increase in loneliness, for example, if they are unable to compensate for losses in their closest network (Cornwell et al., 2021). On average, these differential changes in different groups may cancel each other out at the mean level despite a higher percentage of adults experiencing severe loneliness. Thus, we will focus exclusively on the risk of experiencing severe loneliness in this study.

A second explanation for the divergent age trajectories of objective measures of social integration and loneliness may be that associations between different facets of objective social integration and loneliness can change across the life span

(Böger & Huxhold, 2018a, 2018b, 2018c; Hutten et al., 2022; Luhmann & Hawkey, 2016). For example, although having a romantic partner is probably the most important protective factor against loneliness, older adults are on average more satisfied with living as a single than younger adults and tend to be less prone to experience loneliness as a consequence of living without a partner (Böger & Huxhold, 2018b). In contrast, losses in the number of social activities seem to be unrelated to loneliness in middle adulthood but may increase the risk of becoming lonely in late adulthood (Böger & Huxhold, 2018c). Again, differential changes in the potential impact of different risk factors for loneliness—here losses in different facets of social integration—may cancel each other out across the adult life span and may lead to stability at the mean level. Here, we will focus on one of the most important but at the same time probably most overlooked risk factor in loneliness research—namely, earlier experiences of loneliness.

Why Are Earlier Experiences of Loneliness Strong Risk Factors for Future Loneliness?

Experiences of loneliness have a high risk of becoming chronic because long episodes of being lonely may impair the individual's ability to form and maintain social bonds (Cacioppo et al., 2006; Hawkey & Cacioppo, 2010). Severe loneliness can trigger feelings of insecurity and threat in those affected. Thus, lonely people may perceive their social environment increasingly as hostile. As a consequence, the individual's motivation to interact with other people further decreases and the lonely adult withdraws from the community of their own accord. A vicious cycle develops. In line with this prediction, longitudinal studies have shown that experiences of loneliness may lead to decreased social activity among older adults across days (Zhaoyang et al., 2022) and across years (Böger & Huxhold, 2018c). Here, we predict that the impact of earlier experiences of loneliness increases with advancing age.

Why Are Experiences of Loneliness Particularly Harmful for Older Adults?

The Differential Investment of Resources Model (DIRM Model) centers around the assumption that forming and maintaining any social tie is not free of charge but requires the investment of time and energy (Huxhold et al., 2022). Specifically, the investment process is conceptualized as a dynamic interaction between individual characteristics and the contextual opportunity structure. At the individual level *capacities*—such as the individual's health—influence the amount of time and energy available. *Motivations*—such as the individual's perception of their own aging—determine how much time and energy are invested in specific ties, and *skills* affect the efficiency of the investment. The contextual *opportunity structure* is determined by those people in the individual's environment that are accessible and in principle open to bonding.

Fighting loneliness requires a substantial investment in social relationships. Becoming less lonely most likely involves new ties being formed or deepening the emotional closeness of existing ties. In line with this view, one of the rare studies that investigated factors predictive for the transition out of loneliness found that changing from a lonely to a not-lonely state was associated with high levels of socializing (Hawkey

& Kocherginsky, 2018). However, forming and deepening of ties are social processes that are particularly resource-intensive (Huxhold et al., 2022).

Older adults are in this regard probably at a specific disadvantage. First, their capacities needed for investment in social ties tend to be more limited. The increasing likelihood of health limitations and illnesses with age may, for example, limit their abilities for social engagement (Huxhold et al., 2013; Luo et al., 2012). Feeling ill (i.e., experiencing low self-rated health) and managing chronic illnesses (i.e., having a high number of illnesses) may reduce the amount of time and energy that can be invested in social ties. Thus, with increasing age lower subjective health as well as a higher number of chronic illnesses may become ever greater burdens for overcoming loneliness.

Second, the social motivations of older adults may not be particularly suited to foster investments into new or weaker ties. Potentially important in this regard are individual views on aging (Diehl et al., 2021), which are known to predict the development of health and well-being in late adulthood (Tully-Wilson et al., 2021). A positive view on aging in old age has been associated with a greater likelihood of making new friends (Menkin et al., 2017), a higher probability of engaging in social activities (Huxhold, 2019), and a more positive disposition toward volunteering as well as providing informal help (Schwartz et al., 2021). In contrast, negative views on aging—such as perceiving old age as a time with few opportunities for new developments and viewing old age as inevitably linked to social loss—may act as self-fulfilling prophecies that impair the motivation to invest in social ties. Moreover, the individual's view on their own aging process tends to become increasingly negative with age (Diehl et al., 2021). Consequently, negative views on aging may become ever greater barriers to reintegration with advancing age.

Finally, the contextual opportunity structure (i.e., the number of people available for bonding) may also decrease with age because older adults may hold fewer social roles than middle-aged adults that provide contact to other people (Fuller et al., 2020). However, the availability of social contacts in the environment of older persons is difficult to survey, because no standard measures have been developed. Here, we will use two proxy measures—namely, partner status and social activities—that may capture vital aspects of the opportunity structure. For example, although a partnership is one of the most important factors for avoiding loneliness (Böger & Huxhold, 2018b), it may render overcoming loneliness more difficult. Older people with partners tend to engage less with friends and neighbors (Reynolds et al., 2020) and have on average less bridging potential in their social networks than older adults without a partner (Cornwell, 2011). Thus, it can be assumed that people who became lonely despite being in a partnership have more difficulties when they try to reach out to new contacts. Therefore, they have a harder time overcoming loneliness in comparison to adults without a partner. In contrast, people who have a high level of social activities should have a comparatively large number of potential contacts that could be intensified in times of need. High levels of social activities should, therefore, be positively related to overcoming loneliness. However, the level of social activities decreases with age (Huxhold et al., 2013) and thus losses in activities may create barriers to overcoming loneliness with advancing age.

The Current Study

In the current study, we differentiate between the risk of becoming lonely and the risk of remaining lonely and investigate the respective age gradients of these risks across middle age and late adulthood. Considering the specific old age disadvantages mentioned earlier we hypothesize specifically: The association of earlier experiences of loneliness with later episodes of being lonely is higher in late adulthood than in middle adulthood.

In addition, we will explore whether age-related changes in individual characteristics and contextual conditions may explain why older adults face more difficulties in overcoming loneliness than middle-aged adults. We will explore whether accounting for age differences in capacities (i.e., self-rated health and a number of illnesses), motivations (i.e., viewing aging as personal growth and viewing aging as associated with social loss), and opportunities for social interaction (i.e., social activities and partner status) may weaken the link between earlier and later episodes of loneliness.

Method

Sample

The data used in the analysis were taken from the German Ageing Survey (DEAS), a population-based survey of adults between 40 and 85 years of age living in private households in Germany (Klaus et al., 2017). The survey was first conducted in 1996; additional waves followed in 2002, 2008, 2011, 2014, and 2017. In 2002, 2008, and 2014, new representative samples were added to the panel. The current study encompassed data from all these waves. Participants needed to provide at least one measurement of loneliness to be included in the sample. Age gradients were modeled from 40 to 90 years of age. Beyond the age of 90, data points were too sparse to provide reliable estimates. With these restrictions, the data consisted of 25,963 data points drawn from 15,408 participants. The sample was on average 61.35 years of age at the first measurement occasion ($SD = 11.99$ years). About 49% of the participants were female; 34% were highly educated and 54.7% obtained a middle level of education according to international classification standards.

Attritions analyses revealed that participants providing longitudinal data were on average younger, healthier, had more positive views of their own aging, were socially more active, and more likely to have a partner. Sample attrition effect sizes, however, never exceeded a medium effect size of Cohen's $d > 0.5$ (average sample selectivity effect $d = 0.23$; range of selectivity effects $d = 0.07$ to $d = 0.35$). Full information maximum likelihood estimation (FIML) was used to address selective attrition and other sources of missing data. As long as variables in the model are predictive of drop-out and nonresponse, which is the case in our study, FIML can successfully compensate for biases in parameter estimates (Graham, 2009).

Measures

To ease the convergence in the complex lagged logistic models used in the analysis, continuous variables were first transformed to the T-metric (i.e., mean = 50; $SD = 10$). All predictor variables were centered on sample means.

Loneliness

Loneliness was assessed with a modified version of the six-item De Jong Gierveld loneliness scale (de Jong Gierveld & van Tilburg, 2006). The scale consisted of six statements indicating an individual's subjective view about their social integration (e.g., "I miss having people around among which I feel comfortable"). Participants reported on a scale from 1 (*strongly agree*) to 4 (*strongly disagree*) how much a statement applied to their social lives. Whenever necessary, agreement scores for single items were recoded so that a higher score indicated a higher level of loneliness. A mean score of 2.5 indicated that the participant was on average in agreement across all six items. This cutoff score was used to create a dummy variable (0 = *not lonely*; 1 = *lonely*; cf. van Tilburg & de Jong Gierveld, 1999). Such a categorization identifies very severe experiences of loneliness and categorizes a relatively low percentage of adults as lonely (see [Supplementary Material](#) for further information).

Covariates

Covariates included *gender* (0 = male; 1 = female) and *place of origin* (0 = former West Germany; 1 = former East Germany) because men and participants from former East Germany were oversampled in the DEAS. *Education* was included because people with lower education tend to show worse health and higher rates of loneliness than adults with higher education. Participants reported their highest degree of school and further education with reference to the German education scheme. An individual's *education* was then classified into three categories (i.e., low to high) according to International Standard Classification of Education (ISCED; [UNESCO, 2012]). In addition, dummies for assessment in 1996, 2002, and 2014 (0 = *no*; 1 = *yes*) were included in order to control for potential cohort effects.

Age.

Age was centered around 61 years and measured in decades. Linear, quadratic, and cubic age variables were included in the analysis.

Capacities.

Capacities were indexed by *self-rated health* and *number of illnesses*. *Self-rated health* was measured with the question: "How would you rate your present state of health?" Answers were indicated on a scale from 1 (*very bad*) to 5 (*very good*). A *number of illnesses* was assessed by summing up positive answers about the existence of 11 typical health problems (e.g., cardiovascular diseases, diabetes, gastrointestinal diseases).

Motivations.

Motivations were assessed with two views on aging—viewing aging as personal growth (*aging as growth*; e.g., "Aging means to me that I can still realize new ideas") and viewing aging as being associated with social losses (*aging as social loss*; e.g., "Aging means to me that I feel less needed"). Each facet was measured with four items. The participants rated their agreement with the four respective items of each facet on a scale ranging from 1 (*definitely false*) to 4 (*definitely true*). All ratings were averaged across the four items. Higher values implied a more positive view on aging with respect to *aging*

as growth and a more negative view on aging with regard to aging as a social loss.

Opportunity structure.

We used the number of social activities and partnership status as proxy indicators for the opportunity structure. Partner status was included in the analysis as a dummy variable (0 = no partner; 1 = partner). The variable social activities was computed as a sum score of nine items asking for engagement in typical activities in the last year (e.g., meeting with friends or going for a walk). Activities were classified as “social activities” if participants indicated in a subsequent question that they had performed this activity together with others.

Analysis

The analysis was conducted with Mplus 8 (Muthén & Muthén, 1998–2017). The study used a time-series lagged logistic regression design to examine the associations between earlier states of loneliness on the later risk of being lonely (i.e., being lonely in three years). The time span of three years between the earlier and later data points was chosen because it equaled the minimal time span between subsequent assessment waves. To account for time spans in the data that were longer than three years (e.g., six years) a control variable time span was included in the analysis that was centered around three years. The clustering of multiple observations being nested within persons was addressed by using the cluster command in MPlus.

The dependent variable was loneliness (yes/no) at t + 1. At first, we controlled for the stable demographic factors (i.e., gender, place of origin, and education) and included the time span variable. In a second step, linear, quadratic, and cubic trends for age at t0 were added to estimate the age gradient of the risk of being lonely in three years. Only significant trends were included in the following steps. Then, being lonely at t0 was added to the model, followed by including interactions of loneliness at t0 with the significant age trends as predictors of loneliness at t + 1. Finally, indicators for capacities, motivations, and the proxies for the opportunity structure at t0 were subsequently added. Significance tests were conducted using χ^2 -difference tests.

As a robustness check, we also explored whether the effects of the covariates indicating capacities, motivations, and opportunity structure were moderated by age. Thus, we added six age-by-covariate interactions as predictors into the final model. The significance of these age interactions was verified with Wald tests.

Results

Statistical Testing

The linear age trend was only marginally significant ($\Delta\chi^2 = 2.68, \Delta df = 1; p = .10$). The quadratic age trend was significant ($\Delta\chi^2 = 12.27, \Delta df = 1; p < .01$). The cubic trend failed to reach significance ($\Delta\chi^2 = 1.53, \Delta df = 1; p > .10$). Adding being lonely at t0 as a predictor increased the model fit significantly ($\Delta\chi^2 = 471.40, \Delta df = 1; p < .01$). The interaction between being lonely at t0 and the linear age trend was also significant ($\Delta\chi^2 = 4.02, \Delta df = 1; p < .05$). The interaction with the quadratic age trend was not significant ($\Delta\chi^2 = 0.93, \Delta df = 1; p > .10$).

Adding self-rated health and number of illnesses increased the model fit significantly ($\Delta\chi^2 = 49.38, \Delta df = 2; p < .01$).

Adding aging as growth and aging as social loss was also associated with a significant increase in model fit ($\Delta\chi^2 = 153.39, \Delta df = 2; p < .01$). Including social activities and partner status further increased the model fit significantly ($\Delta\chi^2 = 54.80, \Delta df = 2; p < .01$).

In Table 1, all parameter estimates of the final model are shown. In the table, odds ratios indicate effect sizes. Moreover, Wald tests showed that in the final model only self-rated health, aging as social loss, and social activities demonstrated significant associations with loneliness at t + 1 (see Table 1). Furthermore, the interaction between the linear age trend and being lonely at t0 was no longer significant.

In order to test for additional age moderations, we included six age-by-covariate interaction terms into the model and ran separate tests for each. No significant age interaction was detected. All p values were greater than .10.

Illustration of Results

The results of the analysis are difficult to interpret without visualization. To illustrate the findings, we calculated the risk of being lonely in three years in terms of percentages across the whole age range from 40 to 90 years of age. Figure 1 shows the age gradients of the risk of becoming lonely in three years for people who were not lonely at t0 (i.e., the dotted line) and the risk of remaining lonely in three years for adults who were lonely at t0 (i.e., the solid line). As can be seen, age differences were minimal with respect to becoming lonely. In fact, based on the estimates derived from our statistical model 40-year-old people and 90-year-old adults had basically the same risk of becoming lonely (approximately 6.5%).

In contrast, age differences were pronounced with respect to the risk of remaining lonely. Even at the age of 40, people who were lonely had a risk of about 50% of remaining lonely in three years. This risk decreased slightly during middle adulthood. People in their 60s demonstrated the lowest

Table 1. Parameters of the Final Logistic Regression Model Predicting Being Lonely in Three Years

Predictor	Odds ratio	p Value
Gender	1.12	.142
Place of origin	0.78	.003
Education	1.07	.329
Age _{t0}	0.81	.000
Age ² _{t0}	1.08	.003
Age ³ _{t0}	∅	
Lonely _{t0}	11.11	.000
Age × lonely _{t0}	1.14	.102
Self-rated health _{t0}	0.86	.002
Number of illnesses _{t0}	1.04	.090
Aging as growth _{t0}	0.92	.264
Aging as social loss _{t0}	2.26	.000
Social activities _{t0}	0.85	.000
Partner status _{t0}	0.92	.366

Notes: ∅ = set o zero. Alpha level is estimated using the Wald test. Model also includes the covariates distance and cohort dummies (i.e., w1996, w2002, w2014), which were not significant. t0 = assessed at t0.

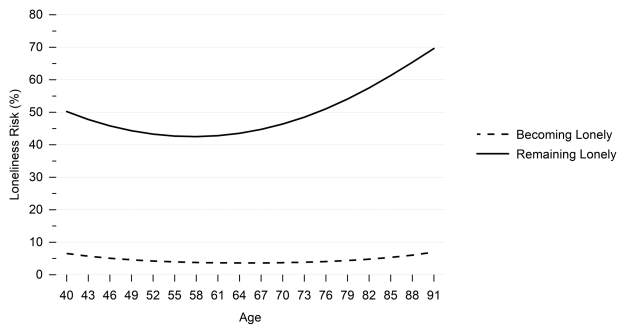


Figure 1. The risks of becoming and remaining lonely across middle age and late adulthood. Dotted line = risk of becoming lonely in three years if not lonely at t_0 ; solid line = risk of remaining lonely in three years if lonely at t_0 .

risk in the sample. However, at about the age of 75, the risk of remaining lonely increased rather dramatically. Older adults at the age of 90 had a risk of about 70% to remain lonely in three years when they were lonely at t_0 . Thus, our analysis provided supportive evidence for our hypothesis. The association of earlier experiences of loneliness with later episodes of being lonely was higher in late adulthood than in middle adulthood.

The effects of including explanatory variables indicating age differences in capacities, motivations, and opportunity structures are shown in Figure 2. The solid line represents the age gradient of the risk of remaining lonely across middle age and late adulthood without considering age differences in explanatory variables. The dark gray line illustrates the age gradient when age differences in capacities (i.e., health) were taken into account. The effect was relatively small. However, if all individuals in the sample had the same health, the risk of remaining lonely would have been slightly smaller for people who were 55 years of age or older. When individual motivations (i.e., views on aging) were taken into account (see light gray line in Figure 2) the risks of remaining lonely were much lower across midlife and late adulthood. Moreover, the effect of views on aging on remaining lonely became more pronounced with advancing age. Finally, including variables acting as proxies for the opportunity structure further diminished age differences in the risk of remaining lonely (see dotted line in Figure 2). In fact, after accounting for age differences in capacities, motivations, and opportunity structures, 40-year-old adults and 90-year-old people showed a similar risk of remaining lonely (about 41%).

Discussion

Our analysis indicates that older adults do not have a higher risk of becoming lonely than middle-aged adults. The risk of experiencing severe loneliness within three years when people were currently not lonely was approximately 6.5% across middle age and late adulthood. This finding is somewhat surprising given the negative age trends in more objective measures of social integration such as network sizes, frequency of contacts, or social activities (Huxhold et al., 2013; Sander et al., 2017; Wrzus et al., 2013). Our results suggest that older adults are on average rather successful when adapting to age-related losses in social networks. Age-related shifts in older adult's social motivations as predicted by the socio-emotional selectivity theory—such as a stronger

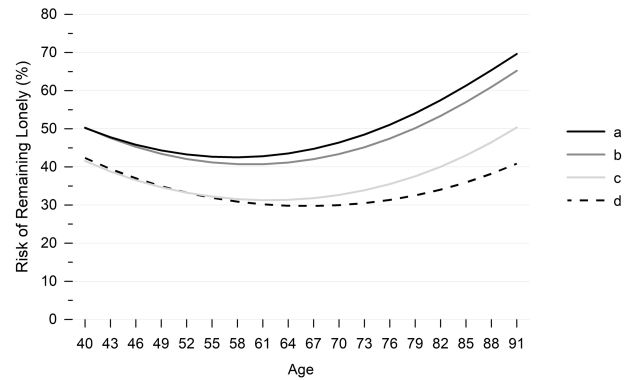


Figure 2. The risk of remaining lonely across middle age and late adulthood after considering age differences in capacities, motivations and opportunity structure. a = no age differences considered; b = loneliness risk controlled for age differences in health; c = loneliness risk controlled for age differences in health and views on aging; and d = loneliness risk controlled for age differences in health, views on aging, social activities, and partner status.

focus on close social ties—may, for example, help older adults to adapt to their shrinking number of social contacts (Lang & Carstensen, 2002). In addition, this selectivity may allow older adults to separate themselves from negative social ties (Böger & Huxhold, 2018a), which may increase the positive impact of the remaining social network. Finally, many older adults demonstrate beneficial social skills that may enhance the quality of their existing social relationships (Luong et al., 2011).

The aforementioned adaptations in late adulthood and the comparative advantages of older people in terms of social skills may fall short, however, if the individual has to fight loneliness. Based on the DIRE model (Huxhold et al., 2022), we predicted that older adults would face more difficulties with respect to overcoming loneliness than middle-aged adults because fighting loneliness may require intensive investments into new or weak social ties. In line with our hypothesis, lonely people that were approximately 75 years or older had a higher risk of remaining lonely in three years than lonely middle-aged adults or younger older adults (Figure 1). People of 90 years of age demonstrated an about 1.4 times higher risk of remaining lonely than 40-year-old adults.

Controlling for age differences in health that indicate capacities for social investment was associated with a small reduction in the risk of remaining lonely for people that were older than 50 years of age. The effect of health issues on the risk of remaining lonely increased slightly with advancing age (see the dark gray line in Figure 2). This indicates that age-related decreases in health may increasingly hamper the individual's efforts to invest in social relationships.

Individual differences in views on aging and in particular viewing age as a time of social loss (Table 1) demonstrated a strong association with the risk of remaining lonely across midlife and old age. Moreover, the strength of the association increased after the age of 60 (see light gray line in Figure 2). This finding implies that motivational characteristics of the individual play a very important role in the fight against loneliness. Earlier research has demonstrated that a negative view on aging is associated with lower levels of future social engagement (Schwartz et al., 2021). Thus, older people who view aging as inevitably linked to losses in

the social domain may invest less in new or weaker ties to counter negative changes in their network. In other words, viewing aging as being associated with social losses might act as a self-fulfilling prophecy. In a similar vein, it has been shown that older adults who view aging as being associated with losses in physical health engage in less self-regulatory behavior when adapting to a serious health event (Wurm et al., 2013).

Finally, controlling for social activities, which served as an indicator of the social opportunity structure, further reduced the risk of remaining lonely in particular for adults older than 60 years (see dotted line in Figure 2). This result is in line with earlier analyses also using the DEAS data demonstrating that losses in social activities were associated with increases in loneliness in late adulthood but not in mid-life (Böger & Huxhold, 2018c). Our finding indicates that providing opportunities to engage with other people may become particularly relevant for fighting loneliness in late adulthood because at this age. Age-related reductions in social roles may not be caused by voluntary decisions but rather by a lack of options (Bruggencate et al., 2018; Fuller et al., 2020). However, social activities only assess one aspect of the social opportunity structure of older adults. To gain a more comprehensive picture specific measurement tools need to be developed.

Strength and Limitations

One strength of the current study is the very large longitudinal data set representative of the German noninstitutionalized population between 40 and 85 years of age. A limitation of the analysis is, however, that we were unable to run multi-level models that included all exploratory variables (i.e., the models did not converge). Although the time-series lagged logistic regression model we used for the analysis accounts for time points nested within participants, we were unable to differentiate between between-person and within-person effects. However, because the development of loneliness across the life span is most likely the result of a complex interplay between within-person and contextual factors, this statistical vagueness may not be that important for a first step in the analysis of chronic loneliness (de Jong Gierveld & Tesch-Römer, 2012; Huxhold et al., 2022; Tesch-Römer & Huxhold, 2019). Nevertheless, future studies should integrate more assessments at the individual level in order to be able to differentiate within-person and between-person processes as well as their cross-level interactions.

In addition, with a higher number of individual assessments, it would also be possible to look at the risk of remaining lonely across different time intervals. Here, we were only able to look at the risk of remaining lonely across three years. However, as an anonymous reviewer pointed out to us: Irrespective of age the risk of remaining lonely will be high at shorter time intervals because the conditions influencing loneliness (i.e., capacities, motivations, and opportunity structure) have had less time to change. The opposite is probably true if time intervals longer than three years are considered.

Another limitation concerns the generalization potential of the study. From a theoretical perspective, macrolevel factors play important roles in the development of loneliness (de Jong Gierveld & Tesch-Römer, 2012), and empirical studies have demonstrated age differences in loneliness between countries. East European countries, for example,

show higher rates of loneliness among older adults than European countries from the North or the West of Europe (Hansen & Slagsvold, 2016). Thus, the analyses presented here need to be replicated with data from different countries and cultures.

A final limitation concerns the high levels of missingness in our data set. Specifically, there have been fewer than two data points per participant on average. Although attrition biases did not reach a medium effect size and we implemented FIML, we cannot completely rule out some influence of selectivity.

Implications

In our analysis, the risk of becoming severely lonely remained basically unchanged across middle age and late adulthood. Thus, becoming lonely is not an inevitable fate in late adulthood at least up to 90 years of age. It is important to disseminate this fact as broadly as possible because many laypeople and politicians believe that loneliness is a particular issue of late adulthood. As this belief is often and prominently featured in the public debate it might cite negative consequences for aging individuals. Stereotype embodiment theory (Levy, 2009) would, for example, predict that people integrate the belief that aging is intrinsically linked with becoming lonely in their views on their own aging processes. As our analysis indicates, this negative view of aging might in turn hamper older adult's investment in social ties.

In addition, our results imply that although experiences of severe loneliness also occur in middle age, interventions against loneliness may nevertheless prioritize older age groups. After the age of 75, it is increasingly less likely that older adults leave a state of loneliness on their own accord. Unfortunately, systematic reviews are in agreement that most currently available interventions intended to fight loneliness are not effective (Cohen-Mansfield & Perach, 2015; Gardiner et al., 2018; Masi et al., 2011). Specifically, Masi et al. (2011) deduced in their meta-analysis that only those interventions are successful that address maladaptive social cognitions. Our results are in line with this statement and imply that people with more positive views of their social aging may transit easier out of states of loneliness. Furthermore, it has been demonstrated in randomized controlled trials that older adult's negative views on aging are modifiable (Beyer et al., 2019). Thus, targeting negative views on aging may be one route by which effective loneliness interventions for older adults might be designed.

Overall, this study provided a differentiated view on age trajectories of the risk of becoming and the risk of remaining lonely across midlife and late adulthood. It also highlighted potential reasons why older adults may have particular problems with overcoming loneliness. However, the data were assessed in a specific cultural context and contained high levels of missingness. Thus, replications of this study are clearly needed.

Supplementary Material

Supplementary data are available at *The Journals of Gerontology, Series B: Psychological Sciences and Social Sciences* online.

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Conflict of Interest

None.

Data Availability

The data used in the study were from the public release of the German Ageing Survey (DEAS), which can be accessed via the Research Data Centre of the German Centre of Gerontology (DZA). The MPlus code of the analysis is added in [Supplementary Material](#). The study was not preregistered.

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