Check for updates

Original Article

Journal of Family Issues
2026, Vol. 0(0) 1–25
© The Author(s) 2026

Article reuse guidelines:
sagepub.com/journals-permissions
DOI: 10.1177/0192513X251414627
journals.sagepub.com/home/jfi


A Life Without Children: Unpacking the Relationship Between Childlessness and Loneliness in Adulthood

Jasper De Witte[1,2] and Hannelore Stegen[3]

Abstract

Research on the relation between childlessness and loneliness is limited and inconclusive. While some studies link childlessness to higher loneliness, others find no association. Few studies distinguish between distinct loneliness types (social, emotional, and existential) or life stages. This article explores how childlessness relates to various loneliness types across adult life stages, using cross-sectional data from the 2024 "A Lonely Planet" survey (N = 3,756) in Flanders, Belgium. Results show that childless adults are lonelier (for all loneliness types) than parents, also when controlling for socio-demographic variables. However, this relationship depends on age and loneliness type: younger childless adults (18–34) face more social and existential loneliness than parents; middle-aged (35–64) childless adults experience all types more; older adults (65–74) experience more emotional and overall loneliness; no loneliness differences were found between childless adults and parents (75+). These findings underscore the need for a nuanced understanding of childlessness and loneliness.

Keywords

loneliness, adults, adulthood, childlessness, children

[1]HIVA, University of Leuven, Leuven, Belgium
[2]Faculty of Social Sciences, University of Leuven, Leuven, Belgium
[3]Thomas More University of Applied Sciences, Geel, Belgium

Corresponding Author:
Jasper De Witte, HIVA KU Leuven, Parkstraat 47, Leuven 3000, Belgium.
Email: jasper.dewitte@kuleuven.be

Introduction

Since the second half of the 20th century, an increasing part of the population in Europe and worldwide remains childless (Albertini & Kohli, 2009; Antczak et al., 2023; Křenková, 2018), whether voluntary (due to increased education of women, and contraceptive methods which allow women to develop their careers) or involuntary (due to infertility, divorce of delayed partnership) (Leocádio, 2022; Penning et al., 2024). The number of childless women of the cohort born around 1965 already forms 10% to 20% of the population in Europe (Tanturri et al., 2015). This evolution whereby an increasing part of the population is childless gave rise to a new area of research that investigates the impact of childlessness on psychological well-being (Křenková, 2018), including feelings of loneliness (Penning et al., 2024).

Loneliness can be defined as *"the unpleasant experience that occurs when a person's network of social relations is deficient in some important way, either quantitatively or qualitatively"* (Perlman & Peplau, 1981, p. 31). Research shows that about 36% of adults in Europe feel lonely at least some of the time, and about 13% feel lonely most or all of the time (Schnepf et al., 2024). In this regard, loneliness is increasingly considered a public health problem (Cacioppo & Cacioppo, 2018; Marquez et al., 2023; Victor & Pikhartova, 2020). Indeed, loneliness is not only associated with a 26% increase in the risk of premature mortality (Cacioppo & Cacioppo, 2018), but severe feelings of loneliness are also related to various physical and mental health problems (e.g., depression and anxiety) (Holt-Lunstad et al., 2015), unhealthy behaviors (Kobayashi & Steptoe, 2018), lower quality of life (Bruggencate et al., 2018), increased health and social care utilization (Gerst-Emerson & Jayawardhana, 2015), and expenditures (Meisters et al., 2021). Further, the societal impact of loneliness can hardly be overestimated since loneliness is associated with unemployment (Morrish & Medina-Lara, 2021) and lower voting turnout, political engagement (Langenkamp, 2021a; 2021b), and social trust (European Commission. Joint Research Centre., 2021). And contrary to the widespread misconception that loneliness is mostly related to old age, research consistently shows that loneliness is of all ages (Luhmann & Hawkley, 2016; Marquez et al., 2022) and often follows a U-shaped pattern whereby young and older adults are more confronted with loneliness than middle-aged adults (Lasgaard et al., 2016; Luhmann & Hawkley, 2016; Mund et al., 2020; Victor & Yang, 2012). The causes of loneliness can be found in the intra-individual domain (e.g., social capacities and migration background), the inter-individual domain (e.g., social network and partner status), and the societal domain (e.g., intergenerational solidarity and demographic evolutions) (De Witte & Van Regenmortel, 2022, 2023; Fokkema & van Tilburg, 2007). With

regard to the inter-individual domain, research indicates that loneliness is related to being childless, and this for both younger and older adults (Kent-Marvick et al., 2022; Vozikaki et al., 2018).

With regard to younger adults, relatively little research exists about the relationship between loneliness and childlessness or early parenthood, despite young adults having a considerable risk for loneliness (Nowland et al., 2021). Some research indicates that early parenthood is associated with higher loneliness, due to its impact on daily activities, the social network (Kent-Marvick et al., 2022), and identity (Nowland et al., 2024). Young mothers in the UK are, for example, found to be significantly lonelier than a representative sample of the population (Kantar Public, 2016). Other research also finds that young parents are lonelier than young adults without children, apart from the first year of parenthood where parents are found to be less lonely (Buecker et al., 2021). Further, parenting difficulties and having a child with mental or physical health risks significantly relate to higher loneliness levels. Despite these ascertainments, a recent literature review states that current research about this topic is scarce, since it often concentrates on specific subgroups of parents, the results are often inconsistent, and research rarely considers the different types of loneliness (Kent-Marvick et al., 2022).

With respect to older adults, some research finds that being childless is related to an increased risk of social isolation and loneliness (Heylen, 2010; Penning et al., 2024; Vozikaki et al., 2018; Wu & Penning, 2019; Zhang & Liu, 2007; Zoutewelle-Terovan & Liefbroer, 2018). Indeed, children, and also grandchildren later on, are an important part of the social network of older parents (Deindl & Brandt, 2017) and are often assumed to enhance a sense of fulfillment (Mansson, 2016). According to the social support theory, children provide important intergenerational support to their old-aged parents, which reduces the negative impact of various life events and reinforces self-confidence, a sense of control (Huang et al., 2024), and quality of life (Deindl & Brandt, 2017). In this respect, children not only offer social, emotional (Deindl & Brandt, 2017), instrumental, financial, and informational support, but they also provide care, social interactions, and companionship to their aging parents, which all relate to lower loneliness levels (Huang et al., 2024). This support allows older parents to live longer independently and enhances their emotional well-being (Mansson, 2016). The importance of children for older adults is further accentuated because parents tend to prioritize interactions with their children and other close ties (Huxhold & Fiori, 2024), due to changes in capacities, motivations, and skills (van Tilburg, 2021), and because of a declining broader social network with peers (Antonucci et al., 2011). Following this, older adults without children may have less supportive social networks (Heylen, 2010; Zoutewelle-Terovan &

Liefbroer, 2018), which could increase feelings of loneliness (Křenková, 2018). Hence, the ascertainment that an increasing amount of adults remain childless (Albertini & Kohli, 2009) may pose a public health challenge since they may need to rely more on alternative forms of care and support (outside of the nuclear family), based on community resources and public services (Kendig et al., 2007). However, although a considerable amount of research indicates that older people without children are more prone to loneliness (Heylen, 2010; Penning et al., 2024; Vozikaki et al., 2018; Zhang & Liu, 2007; Zoutewelle-Terovan & Liefbroer, 2018), other research finds no differences in loneliness between middle-aged or older adults with or without children (Gibney et al., 2017; Hansen et al., 2009; Stegen, 2024). In this regard, the so-called "empty nest period"—the period in which parents no longer have dependent children in their residence—may result in decreased interactions between parents and children, and in that way induce feelings of loneliness among older parents (Hartanto et al., 2024). Furthermore, some research shows that older childless adults have learned to accept their situation, invest more in other types of relationships (Hadley, 2021), and have more friends and extended kin (Schnettler & Wöhler, 2016), which may relate to lower loneliness levels. In sum, the data about loneliness and childlessness in middle and old age is inconclusive.

In this article, we investigate the relationship between childlessness and loneliness among adults of all ages in Flanders, Belgium. For this, we do not only take into account different age groups since the relationship between loneliness and childlessness presumably depends on the specific life stage people are in, but we also include different loneliness types (social, emotional, and existential loneliness). Whereas social loneliness refers to the lack of an adequate, broad social network of friends and acquaintances, emotional loneliness refers to the absence of a meaningful, intimate, and exclusive relationship (e.g., with a partner) (Weiss, 1975). Bolmsjö et al. (2019, p. 5) define existential loneliness as *"the immediate awareness of being fundamentally separated from other people and from the universe, and typically, because of this awareness, experiencing negative feelings, that is, moods and emotions."* The distinction between these three types of loneliness is important to determine which interventions are most effective for a distinct loneliness type (De Witte & Van Regenmortel, 2023), and also because the relation between childlessness and loneliness presumably depends on the specific type of loneliness (Stegen, 2024). Indeed, childlessness could be more related to social loneliness since children form a crucial part of the social network of parents and may enhance their social engagement and participation. Nevertheless, only few studies included different loneliness types when studying the relation between childlessness and loneliness (Heylen,

2010; Penning et al., 2024; Stegen, 2024). In this respect, Stegen (2024) finds no significant relationship between childlessness and any of the loneliness types among older adults, and both Heylen (2010) and Penning et al. (2024) conclude that having children relates to lower social loneliness among older adults, but not to emotional loneliness. In terms of existential loneliness, even less research has been conducted.

In this article, we answer the following research questions:

- Is there a relationship between childlessness and the different types of loneliness among adults of all ages in Flanders, Belgium?
- Does the relationship between childlessness and the different types of loneliness among adults of all ages in Flanders, Belgium, differ according to age?

Methodology

Data

This article is based on data from the representative "A Lonely Planet" survey, conducted in 2024 among 3,756 adults of all ages in Flanders, Belgium. This survey is part of a large research project about the impact of the neighborhood where people live on feelings of loneliness, funded by the Research Foundation Flanders. The survey contains individual-level data about loneliness and various possible determinants of loneliness such as the characteristics of the living environment, mobility, housing, education, work, health, family situation, social network, social participation, and social exclusion. This cross-sectional survey was conducted in the period May–July 2024 among a representative sample of adults (18+) residing in Flanders, Belgium. Respondents were able to fill out the survey either online (through a QR-code or website link) or on paper, and in Dutch (Flanders' official language), English, or French. We added the survey questionnaire in attachment.

A survey company organized the field work, whereby it contacted 15,000 adults residing in Flanders. The Belgian Statistical Office randomly selected the gross sample from the National Register, after having obtained necessary approvals (which we add in attachment). In this respect, the Belgian Statistical Office applied a disproportionate sample by overrepresenting older adults of 80 years and older, given their small proportion in the total population and their presumed lower response rate. After a first invitation (through a letter) to participate to the survey online, two follow-up letters were sent to all persons of the gross sample who at that time did not yet fill out the survey. The paper questionnaire was added to the second follow-up letter, together

with a stamped envelope which allowed respondents to send it back to the survey company free of charge. After the data collection period, the survey company provided the researchers with the anonymized individual-level data.

After data cleaning, we withhold 3,756 questionnaires who were filled out for at least 90%, which implies a response rate of 25.1%. In total, 2700 questionnaires were filled out online (71.9%) and 1056 on paper (28.1%).

Measures

Dependent Variables

Overall loneliness was measured by the validated 11-item de Jong Gierveld loneliness scale, which can be used as an overall loneliness measure, but also consists of two separate loneliness measures, namely, social and emotional loneliness (de Jong-Gierveld & van Tilburg, 1999). Whereas social loneliness refers to the lack of an adequate, broad social network of friends and acquaintances, emotional loneliness refers to the absence of a meaningful, intimate, and exclusive relationship (e.g., with a partner) (Weiss, 1975). For all items, respondents could answer one out of five categories: no!, no, more or less, yes, or yes!. In this respect, we gave the category "more or less" two different scores based on the positive or negative formulation of the question, in order to add nuance to the scale. This leads to an additive overall loneliness scale between 11 (not lonely) and 66 (very lonely). Based on a factor analysis, we find a satisfying Cronbach's alpha of 0.92 as indicator of the internal consistency. We also calculated the additive social loneliness scale (based on 6 of the 11 items), which ranges between 6 (not socially lonely) and 36 (very socially lonely) with a Cronbach's alpha of 0.87, and the additive emotional loneliness scale (based on 5 of the 11 items) which ranges between 6 (not emotionally lonely) and 30 (very emotionally lonely) with a Cronbach's alpha of 0.91. The two sub-scales also correlate with each other, with $r = 0.67$; $p < 0.05$.

Existential loneliness refers to the awareness of being fundamentally separated of others (van Tilburg, 2021) and is accompanied by negative feelings, moods, emotions, and the lack of purpose or meaning in life (Bolmsjö et al., 2019). Existential loneliness is distinct from social and emotional loneliness because it is less related to (meaningful) social relationships (van Tilburg, 2021). Based on van Tilburgs' interpretation (van Tilburg, 2021) of "existential loneliness: meaninglessness in life," we measured existential loneliness through seven items from the Existential Loneliness Questionnaire (Mayers et al., 2002), on which respondents were able to

answer one out of five categories: no!, no, more or less, yes, or yes!. In this respect, we gave the category "more or less" two different scores, based on the positive or negative formulation of the question, again, to add nuance to the scale. This leads to an additive existential loneliness scale between 7 (not existentially lonely) and 42 (very existentially lonely), with a satisfying Cronbach's alpha of 0.83.

In our analysis, we make use of the overall, social, emotional, and existential loneliness measure, by using their distinct mean scores (higher scores refer to higher loneliness levels).

Independent Variables

Childlessness was defined as not having biological, step-, or adopted children at the time of data collection and contrasted with adults who had at least one biological, step-, or adopted child.

Age refers to a categorical variable with four categories: 18–34; 35–65; 65–74; 75+.

Control Variables

Gender is a dummy variable referring to women (1) or men (0).

Educational level is a categorical variable distinguishing between no education; elementary education; secondary education; higher not-university education; higher university education.

Employment status is a categorical variable distinguishing between full-time employed; part-time employed; independent; job seeker; pensioned; houseman or woman; student; unfit for work.

Subjective household income is a categorical variable distinguishing between difficult; not difficult, not easy; easy.

Self-rated health is a categorical variable distinguishing between bad, reasonable; good; very good, excellent.

Partner status is a categorical variable distinguishing between de facto cohabitation; married; divorced; not married/single; widowed.

Analyses

We present descriptive characteristics of both adults with and without children. Subsequently, we conduct multivariate regression analyses (ordinary least squares), whereby we study the relationship between childlessness and the different loneliness outcomes while controlling for age, gender, education

level, employment status, subjective household income, self-rated health, and partner status.

After excluding all cases with one or more missing values on the dependent, independent, or control variables used in our analyses, we retain 3,407 respondents. For our analyses, we make use of a weight factor, which was calculated to remedy over- and underrepresentation of certain groups in our sample with regard to both age and gender.

Ethics Statement

Ethical approval for this study was obtained on 25 March 2024 from the Social and Societal Ethics Committee of KU Leuven, Belgium (G-2023-6404-R4-AMD). In this approved application, we described in detail how the study was conducted: the study objectives, funding instances, ethical justification, used techniques, instruments and methodology, the respondents, informed consent, collection, and sharing of data.

Results

In Table 1, we present descriptive statistics of adults with and without children in Flanders, Belgium. Overall, 33.8% of the sample was childless. In this regard, we find that older adults and women are less likely to be childless then younger adults and men. Parents are more likely to be pensioned (36%) and less likely to be fulltime employed (34%) than childless adults (15% and 44%, respectively). We find no difference between adults with or without children with regard to household income, and childless adults have a better self-rated health than parents. Last, two-thirds of the parents are married, in comparison to only 21% among those without children. In this respect, variables such as education level, employment status, self-rated health, and childlessness are strongly related to the age of the respondents.

From Table 2, we deduct that adults without children are significantly lonelier than parents, and this for all four loneliness variables (overall, emotional, social, and existential loneliness). However, Table 3 shows that for the age group of 18–34 years, this difference is only significant for social and existential loneliness ($p < 0.05$). For the age group 35–64 years, this difference is significant for all loneliness variables ($p < 0.01$). For the age group 65–74 years, this difference is only significant for overall and emotional loneliness ($p < 0.05$) and for adults of 75+ this difference is not significant for any of the loneliness types.

In sum, being childless is significantly related to higher loneliness levels, and this for all loneliness types. However, childlessness does not seem to be

Table 1. Descriptive Statistics of Study Sample (N = 3,407)

	Childless	Parents	
	Mean (SD) %	Mean (SD) %	Chi-square
Age group			1125.18 ***
18–34	59.5	7.2	
35–64	28.8	60.1	
65–74	7.7	18.2	
75+	4.1	14.5	
Gender			7.92 ***
Women	47.2	52.3	
Men	52.8	47.7	
Education level			43.73 ***
No education	1.6	2.3	
Elementary	4.2	7.0	
Secondary	43.6	36.9	
Higher, not-university	27.5	35.4	
Higher, university	23.1	18.3	
Employment status			688.89 ***
Fulltime employed	43.5	33.9	
Part-time employed	6.2	12.1	
Independent	5.7	9.3	
Job seeker	3.6	0.7	
Pensioned	14.8	36.0	
Houseman or woman	0.6	3.0	
Student	21.1	0.3	
Unfit for work (illness, invalidity)	4.6	4.8	
Household income			2.20 ns
Difficult	12.1	11.2	
Not difficult, not easy	31.2	33.6	
Easy	56.7	55.1	
Self-rated health			29.74 ***
Bad, reasonable	21.4	26.3	
Good	38.2	42.6	
Very good, excellent	40.4	31.2	
Partner status			1357.20 ***
De facto cohabitation	15.2	14.3	
Married	21.2	67.4	
Divorced	2.4	7.4	
Not married/single	59.1	4.7	
Widowed	1.8	6.2	

X^2-test: ***$p < 0.01$ (ns = not significant).

Table 2. Comparisons of Loneliness Scores Between Childless Adults and Parents (18+) (N = 3,407)

	Childless	Parents	
	Mean (SD)	Mean (SD)	T-test
Overall loneliness	30.08 (13.00)	27.51 (10.22)	1.62***
Emotional loneliness	16.22 (7.95)	14.45 (6.35)	1.57***
Social loneliness	13.86 (6.23)	13.06 (4.84)	1.66***
Existential loneliness	16.40 (6.62)	14.97 (5.00)	1.76***

T-test: ***$p < 0.01$.

Table 3. Comparisons of Loneliness Scores Between Childless Adults and Parents (18+), Divided by Age Groups (N = 3,407)

	Childless	Parents	
	Mean (SD)	Mean (SD)	T-test
Overall loneliness			
18–34	29.58 (14.44)	28.18 (13.50)	1.14 ns
35–64	30.95 (11.96)	27.01 (10.47)	1.31 ***
65–74	29.79 (9.76)	27.72 (8.45)	1.33 **
75+	31.76 (10.19)	28.99 (10.22)	1.01 ns
Emotional loneliness			
18–34	16.24 (8.85)	15.31 (8.53)	1.08 ns
35–64	16.34 (7.19)	14.06 (13.72)	1.28 ***
65–74	15.39 (6.11)	14.40 (5.32)	1.32 **
75+	16.64 (6.65)	15.74 (6.65)	1.00 ns
Social loneliness			
18–34	13.34 (6.74)	12.87 (5.81)	1.35 **
35–64	14.61 (5.86)	12.95 (5.05)	1.35 ***
65–74	14.40 (4.61)	13.33 (4.02)	1.31 ns
75+	15.12 (5.61)	13.25 (4.71)	1.42 ns
Existential loneliness			
18–34	16.06 (7.45)	14.69 (6.41)	1.35 **
35–64	17.04 (5.98)	14.53 (5.02)	1.42 ***
65–74	16.43 (4.66)	15.42 (4.15)	1.26 ns
75+	16.67 (4.97)	16.39 (5.18)	1.08 ns

T-test: **$p < 0.05$; ***$p < 0.01$ (ns = not significant).

more related to social loneliness than other types of loneliness: instead it is related to social, emotional, and existential loneliness, with a difference between the different age groups. Further, young parents are not lonelier than young childless adults. On the contrary, young parents are socially and existentially less lonely than young childless adults. Last, although we find that older parents (65–74 years) are less confronted with overall and emotional loneliness than their childless counterparts, we find no significant loneliness difference between older adults of 75+ with or without children.

In what follows, we conduct multiple linear regression analyses to examine the association between childlessness and loneliness, after controlling for age, gender, education level, employment status, subjective household income, self-rated health, and partner status. Subsequently, we also study how childlessness and age interact to explain the variation in loneliness.

In this respect, the assumptions of linear regression were met for all four loneliness outcomes. First, based on a scatterplot of the residual and predicted values, our analysis shows that the assumption of linearity is met, which means that the relationship between the independent variables (predictors) and the dependent variables is linear. Second, the data comply with the assumption of independence of the residuals of each other, with a Durbin Watson score between 1,972 and 2,052. Third, the variance of the residuals is constant across all levels of the independent variables, since the plot of predicted and residual values shows no clear pattern, and the variance of the residuals is constant around zero. Four, the residuals follow a normal distribution, as displayed by their straight line in Q-Q plots. Five, we verified the multicollinearity of the independent variables by calculating the Variance Inflation Factor for each distinct variable, which is for all variables well below 10, except for two response categories of the variable education level (which are at 11), but still within acceptable limits. Finally, we ensured that the data do not contain outliers or highly influential points, by calculating and presenting the cook's Distance for each value, which are all lower than 1.

Table 4 shows that being childless is significantly related to higher levels of overall, emotional, social, and existential loneliness, also when controlling for age, gender, education level, employment status, subjective household income, self-rated health, and partner status. Further, age is not significantly related to any type of loneliness, except the younger age group (18–34 years) which is significantly more confronted with emotional loneliness in comparison to the age group of 35–64 years. Next, women are significantly less overall and socially lonely than men, and education level is not significantly related to any loneliness type. With respect to employment, adults who work part-time are more existentially lonely than full-time employed adults. Adults who work as an independent are less overall and emotionally lonely than full-

Table 4. Multiple Linear Regression of Childlessness on Loneliness (N = 3,407)

	Overall loneliness			Emotional loneliness			Social loneliness			Existential loneliness		
	Coefficient	Sign	SE	Coefficient	Sign	SE	Coefficient	Sign	SE	Coefficient	Sign	SE
Intercept	31.310	***	1.43	16.650	***	0.879	14.660	***	0.692	16.216	***	0.669
Childless (1 = yes)	1.765	***	0.517	0.940	***	0.319	0.825	***	0.251	1.090	***	0.242
Age group (ref. = 35–64)												
18–34	0.864	ns	0.586	1.152	***	0.361	−0.288	ns	0.284	0.504	ns	0.275
65–75	0.464	ns	0.871	0.443	ns	0.537	0.021	ns	0.423	0.220	ns	0.408
75+	0.553	ns	0.943	0.682	ns	0.581	−0.129	ns	0.457	0.175	ns	0.442
Female (1 = yes)	−1.003	***	0.378	−0.041	ns	0.233	−0.962	***	0.184	0.023	ns	0.177
Education (ref. = No education)												
Elementary	−1.051	ns	1.440	−0.746	ns	0.887	−0.305	ns	0.698	1.005	ns	0.675
Secondary	−0.901	ns	1.285	−0.793	ns	0.792	−0.108	ns	0.624	0.087	ns	0.602
Higher non-university	−1.026	ns	1.302	−0.881	ns	0.802	−0.144	ns	0.632	−0.590	ns	0.610
Higher university	0.185	ns	1.341	−0.037	ns	0.826	0.222	ns	0.651	−0.652	ns	0.629
Employment (ref. = full-time)												
Part-time	0.030	ns	0.660	−0.160	ns	0.407	0.190	ns	0.320	0.719	**	0.309
Independent	−1.660	**	0.704	−0.995	**	0.433	−0.664	ns	0.341	0.115	ns	0.330
Pensioned	−0.438	ns	0.850	−0.710	ns	0.524	0.272	ns	0.412	0.265	ns	0.398
Job seeker	3.015	**	1.432	1.880	**	0.882	1.135	ns	0.695	1.373	**	0.671
Houseman/women	2.871	**	1.310	1.76	**	0.807	1.112	ns	0.635	0.943	ns	0.614
Student	−1.455	ns	0.850	−1.103	**	0.524	−0.352	ns	0.412	−0.511	ns	0.398
Unable (invalidity or illness)	2.561	***	0.933	1.438	**	0.575	1.123	**	0.453	1.597	***	0.437

(continued)

Table 4. (continued)

	Overall loneliness			Emotional loneliness			Social loneliness			Existential loneliness		
	Coefficient	Sign	SE	Coefficient	Sign	SE	Coefficient	Sign	SE	Coefficient	Sign	SE
Income (ref. = Not difficult/easy)												
Difficult	4.285	***	0.620	2.660	***	0.382	1.625	***	0.301	2.078	***	0.291
Easy	−2.240	***	0.408	−1.253	***	0.251	−0.986	***	0.198	−0.956	***	0.191
Self-rated health (ref. = good)												
Bad, reasonable	3.060	***	0.472	1.958	***	0.291	1.103	***	0.229	2.511	***	0.221
Very good, excellent	−3.373	***	0.429	−1.875	***	0.265	−1.498	***	0.208	−2.300	***	0.201
Partner status (ref. = single)												
Married	−2.190	***	0.629	−1.486	***	0.388	−0.704	**	0.305	−1.382	***	0.295
De facto cohabitation	−1.978	***	0.682	−1.368	***	0.420	−0.609	ns	0.331	−0.921	***	0.320
Divorced	0.634	ns	0.939	0.413	ns	0.578	0.221	ns	0.455	0.061	ns	0.440
Widowed	0.421	ns	1.096	1.454	**	0.675	−1.033	ns	0.532	−0.471	ns	0.514
R^2	0.148			0.153			0.107			0.243		

The coefficients are not standardized. SE = standard error. Ref = reference category.
x^2-test or T-test: **$p < 0.05$; ***$p < 0.01$ (ns = not significant).

Table 5. Multiple linear regression of childlessness on loneliness, with interaction terms (N = 3,407)

	Overall loneliness			Emotional loneliness			Social loneliness			Existential loneliness		
	Coefficient	Sign	SE	Coefficient	Sign	SE	Coefficient	Sign	SE	Coefficient	Sign	SE
Intercept	31.204	***	1.437	16.554	***	0.885	14.650	***	0.697	16.041	***	0.673
Childless (1 = yes)	2.312	***	0.678	1.285	***	0.418	1.027	***	0.329	1.505	***	0.318
Age group (ref. = 35–64)												
18–34	1.856	**	0.879	1.597	***	0.541	0.260	ns	0.426	0.711	ns	0.412
65–74	0.723	ns	0.907	0.619	ns	0.559	0.104	ns	0.440	0.419	ns	00.425
75+	0.533	ns	0.973	0.725	ns	0.600	−0.192	ns	0.472	0.375	ns	0.456
Female (1 = yes)	−1.007	***	0.378	−0.044	ns	0.233	−0.963	***	0.184	0.017	ns	0.177
Education (ref. = No education)												
Elementary	−1.026	ns	1.440	−0.725	ns	0.887	−0.301	ns	0.699	1.044	ns	0.675
Secondary	−0.876	ns	1.286	−0.767	ns	0.793	−0.109	ns	0.624	0.142	ns	0.603
Higher non-university	−0.997	ns	1.303	−0.853	ns	0.803	−0.144	ns	0.632	−0.534	ns	0.611
Higher university	0.258	ns	1.343	0.011	ns	0.828	0.246	ns	0.651	−0.588	ns	0.629
Employment (ref. = full-time)												
Part-time	0.025	ns	0.660	−0.157	ns	0.407	0.182	ns	0.320	0.735	**	0.309
Independent	−1.667	**	0.704	−0.996	**	0.434	−0.670	**	0.341	0.122	ns	0.330
Pensioned	−0.462	ns	0.850	−0.717	ns	0.524	0.256	ns	0.412	0.273	ns	0.398
Job seeker	3.095	**	1.434	1.905	**	0.883	1.890	ns	0.695	1.359	**	0.672
Houseman/women	2.867	**	1.310	1.753	**	0.807	1.114	ns	0.635	0.925	ns	0.614
Student	−1.185	ns	0.868	−0.983	ns	0.535	−0.202	ns	0.421	−0.458	ns	0.407
Unable (invalidity or illness)	2.550	***	0.933	.431	**	0.575	1.119	**	0.453	1.590	***	0.437

(continued)

Table 5. (continued)

	Overall loneliness			Emotional loneliness			Social loneliness			Existential loneliness		
	Coefficient	Sign	SE	Coefficient	Sign	SE	Coefficient	Sign	SE	Coefficient	Sign	SE
Income (ref. = not difficult/easy)												
Difficult	4.270	***	0.621	2.655	***	0.382	1.615	***	0.301	2.082	***	0.291
Easy	−2.236	***	0.408	−1.252	***	0.251	−0.984	***	0.198	−0.952	***	0.191
Self-rated health (ref. = good)												
Bad, reasonable	3.077	***	0.472	1.968	***	0.291	1.109	***	0.229	2.522	***	0.221
Very good, excellent	−3.345	***	0.430	−1.860	***	0.265	−1.485	***	0.208	−2.287	***	0.201
Partner status (ref. = single)												
Married	−2.236	***	2.236	−1.492	***	0.390	−0.744	**	0.307	−1.349	***	0.297
De facto cohabitation	−2.074	***	2.074	−1.398	***	0.424	−0.676	**	0.334	−0.898	***	0.322
Divorced	0.617	ns	0.617	0.420	ns	0.580	0.196	ns	0.457	0.097	ns	0.441
Widowed	0.412	ns	0.412	1.455	**	0.676	−1.043	ns	0.532	−0.469	ns	0.514
Childless*18–34	−1.1778	ns	1.144	−0.862	ns	0.705	−0.916	ns	0.555	−0.568	ns	0.536
Childless*65–74	−1.283	ns	1.376	−0.915	ns	0.848	−0.368	ns	0.668	−10100	ns	0.645
Childless*75+	0.618	ns	1.750	−0.075	ns	1.078	0.693	ns	0.849	−1.301	ns	0.820
R^2	0.149			0.153			0.108			0.244		

The coefficients are not standardized. SE = standard error. Ref = reference category.
x^2-test or T-test: **$p < 0.05$; ***$p < 0.01$ (ns = not significant).

time employed adults. We find no differences in loneliness levels between pensioned adults and full-time employed, but job seekers feel significantly more overall, emotionally and existentially lonely than full-time employed. Housemen and -women are also more overall and emotionally lonely than full-time employed. Finally, students are less emotionally lonely than full-time employed, and adults who are unable to work are more confronted with all loneliness types than full-time employed adults. With regard to income and health, we find that adults who have more difficulties getting by with their household income and those with bad self-rated health are significantly more confronted with all loneliness types. Last, adults who are married and who officially live together are less confronted with all loneliness types than adults who are single or not married, except with respect to social loneliness among adults who officially live together. Finally, widowed adults are significantly more emotionally lonely than adults who are single or not married.

Table 5 shows that there is no significant effect of childlessness on loneliness depending on the specific age group, since none of the two-way interaction terms between the age groups and loneliness are significant.

Discussion

It is a widely held belief that having children forms some kind of insurance for (old age) well-being and could help to avoid feelings of loneliness. In this respect, the social support theory not only states that children give informational, emotional, social, and financial support for their aging parents but also provide them with social interactions (Huang et al., 2024). Further, older persons prioritize interactions with close ties, often vertical ties, which accentuates the importance of children (and grandchildren) in old age (Deindl & Brandt, 2017; Huang et al., 2024). However, other mechanisms are simultaneously at play, such as the empty nest period—the period in which parents no longer have dependent children in their residence—which may result in a decrease of social interactions between children and their aging parents, and in increased loneliness among the latter (Hartanto et al., 2024). Also, childless older adults presumably learn to accept their situation and invest more in other relationships, which may result in a broader social network with more friends and extended kin, and in less loneliness (Hadley, 2021). Further, the relationship between childlessness and loneliness among young adults is equally inconclusive. While some research finds that early parenthood is related to more loneliness (due to changes in daily activities, the social network, and identity) (Kent-Marvick et al., 2022), other research finds that parents are less lonely during the first year of parenthood than their childless counterparts (Buecker et al., 2021). However, it has been established that parents with children with a mental or physical health risk are more likely to experience

feelings of loneliness (Kent-Marvick et al., 2022). Nevertheless, with respect to the relationship between childlessness and loneliness among young adults, and loneliness, research appears to be scarce, results are inconsistent, and they seldomly include different loneliness types (Kent-Marvick et al., 2022). Therefore, we draw on data from the representative "A Lonely Planet" survey of 2024, to empirically investigate the relationship between childlessness and the different loneliness types among adults of all ages in Flanders, Belgium.

Our analyses allow us to positively answer our first research question, since we established a clear positive relationship between childlessness among adults of all ages in Flanders and all loneliness types, also after controlling for gender, education level, employment status, subjective household income, self-rated health, and partner status. Hence, in line with other research (Vozikaki et al., 2018), we find that children may help to prevent loneliness among adults of all ages. Further, the results also allow us to answer our second research question, by showing that this relationship depends on age and the specific type of loneliness (Figure 1). While childless younger adults (18–34) are more socially and existentially lonely than younger parents, middle-aged childless adults (35–64) are more confronted with all loneliness

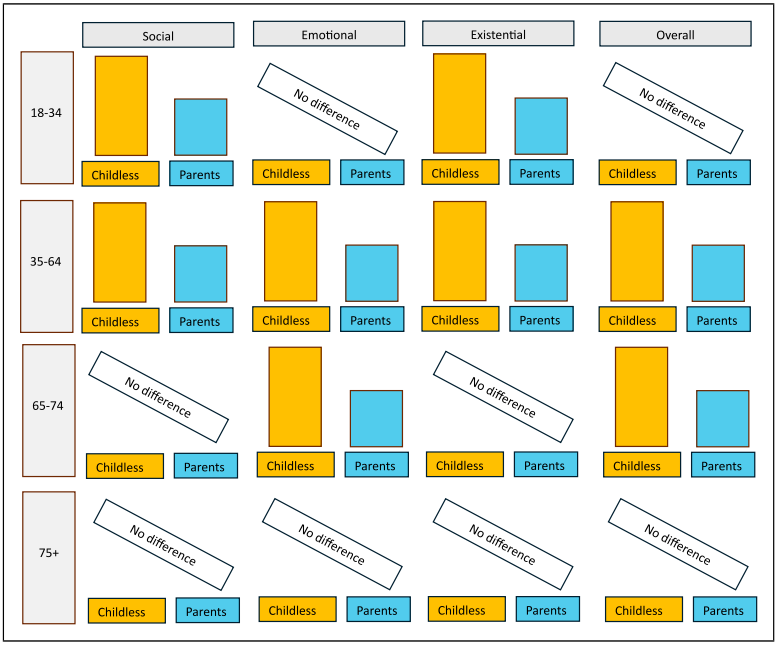


Figure 1. Loneliness according to parental status and age group

types than their counterparts with children. Older childless adults of 65–74 years are more affected by overall and emotional loneliness than their counterparts with children, but not by social or existential loneliness. Last, in line with some other research (Stegen, 2024), we find no difference in loneliness levels between older adults (75+) with or without children.

In sum, these results suggest that children play an important role in providing certain needs for social interaction and help counteracting feelings of social and existential loneliness among their parents (18–64 years), and also stimulate emotional connectedness among their parents (35–74 years). Last, children appear to mitigate overall feelings of loneliness among parents aged 35 to 74, but not among younger (18–34) or older (75+) parents.

The ascertainment that young parents (18–34 years) are less confronted with social loneliness than their childless counterparts suggests a profound impact of children on the lives of younger parents. Indeed, children could help to meet the social needs of younger parents and may also have an indirect impact on the social network of their parents. Indeed, some research finds that the composition of a parent's social network changes towards a more diverse social network because they have children (Gemar, 2024). Further, young parents (18–34 years) are also found to be less confronted with existential loneliness than their childless counterparts, which could imply that the presence of young children may provide an important sense of connection and meaning, and counteract feelings of existential loneliness.

With respect to middle-aged parents (35–64 years), their lower social and existential loneliness levels may be explained by the same reasons as for younger parents, namely, that they have many social interactions in various life domains (personal, childcare, professional) since parenting results in more involvement in specific stable and recurring social networks (e.g., school and extra-curricular), and because children give a sense of meaning and purpose. With respect to their lower emotional loneliness levels, it could be hypothesized that their children may be old enough to fulfill the role of a meaningful, intimate, and reciprocal relationship, which leads to the development of a strong and close emotional bond and provides each other with emotional support.

With regard to old age, we find that older parents (65–74 years) are less overall and emotionally lonely than older childless adults, but we find no difference with regard to social and existential loneliness. This is contrary to some other research (Heylen, 2010; Penning et al., 2024), which found that childlessness is most strongly related to social loneliness (and not to emotional loneliness). Our results support the idea that adult children can play an important role in providing older parents with a meaningful, intimate relationship which offers them emotional connectedness. Indeed, the contact, support, and

care from adult children may fulfill the need for meaningful, deep connectedness. With regard to social loneliness, the presence of children does not automatically ensure social closeness or interactions for aging parents, since children may live far away or might be occupied with their own personal life or career. Indeed, the empty nest period whereby adult children leave the nest may decrease social interactions between children and parents. Also, older parents may not always be fulfilled by the relationship they have with their children, and childless older adults may have invested more in alternative social ties (e.g., with siblings, neighbors, and friends). Lastly, old age may make adults more aware of and concerned about the finality of life, which could result in existential loneliness, regardless of the presence of children. Indeed, the importance of having children for a feeling of connection with others and the universe may decrease and fade away, to make place for more profound life questions. In this respect, older adults may try to find meaning and purpose through other sources such as spirituality, strong friendships, or involvement in the community, and less through their children. Further, they may also have already accepted their life paths and have found a sense of peace, regardless of their parental status.

Last, the fact that we find no loneliness differences between older parents (75+) and their counterparts without children may be explained by the increased importance of other age-related factors such as health, mobility, and psychological processes regarding the acceptance of life circumstances and purpose and meaning in life.

In sum, our findings establish a positive relationship between childlessness among adults of all ages in Flanders and all distinct loneliness types, and show that this relationship depends on age and the specific loneliness type. This highlights the importance of adopting a more nuanced perspective on the relationship between childlessness and loneliness—one that considers not only specific life stages but also different types of loneliness.

With respect to methodological issues, we consider several aspects which could affect the interpretation of our research results. First, our data is cross-sectional, making causal inferences from childlessness to loneliness impossible. Hence, we can only speak of associations since it is possible that specific individual traits that relate to higher loneliness levels may directly or indirectly result in being childless. So, whereas childlessness may result in loneliness, loneliness may also result in childlessness. Second, our data stems from the Flemish context, through which cautiousness with its transferability to other cultural and geographical contexts is needed. Third, although we distinguish between adults with and without children, research (Stegen, 2024) has shown that the specific reasons for childlessness are important to assess its impact on loneliness: preferring a career to family life, having a partner who does not

want to or is not able to have a child, life circumstances, and medical issues (Stegen et al., 2021) may result in a different relation with different types of loneliness. Whereas a common definition of childlessness refers to "those who have no living biological or adoptive children" (Dykstra & Hagestad, 2007), a more refined distinction is possible between, for example, parents with biological, adoptive. and stepchildren, parents with offspring that predeceased them, and adults who remain voluntary childless and adults who are involuntary childless (Antczak et al., 2023). Indeed, since childless older adults form a heterogeneous group (Penning et al., 2024), it is important to investigate more into detail the reasons and types of childlessness when studying its impact on feelings of loneliness (Stegen, 2024).

More research is needed that takes into account these limitations, in order to provide more in-depth knowledge about the possible implications of childlessness on different loneliness types, while taking into account the distinct life stages. In this respect, our research suggests that having children is never associated with higher loneliness levels, and—depending on specific contextual factors—may be related to lower loneliness levels. And although childlessness does not per se relate to higher loneliness levels, it is never related to lower feelings of loneliness. Therefore, sufficient attention should be given to feelings of loneliness of the increasing group of childless adults. This not only becomes ever more important due to increased childlessness but also due to the aging of the population and changing family structures, which will require other types of care and support, for example, based on public services and community programs. Indeed, it is crucial to broaden our view of the traditional family model when studying well-being, the need for care and support, and loneliness, by also including the increasing amount of older childless adults in Europe and worldwide.

ORCID iDs

Jasper De Witte https://orcid.org/0000-0001-5933-5743
Hannelore Stegen https://orcid.org/0000-0001-7954-645X

Ethical Considerations

Ethical approval for this study was obtained on 25 March 2024 from the Social and Societal Ethics Committee of KU Leuven, Belgium (G-2023-6404-R4-AMD). In this approved application, we described in detail how the study was conducted: the study objectives, funding instances, ethical justification, used techniques, instruments and methodology, the respondents, informed consent, collection, and sharing of data.

Consent to Participate

Respondents gave their consent for participation to the "A Lonely Planet" survey.

Author Contributions

Jasper De Witte is responsible for the conceptualization and design of the manuscript, the collection, analysis and interpretation of the data, and for drafting, writing, and reviewing the manuscript. Hannelore Stegen critically reviewed the work.

Funding

The authors disclosed receipt of the following financial support for the research, authorship, and/or publication of this article: This research project took place within the KU Leuven research project "A Lonely Planet," which was funded by the Research Foundation Flanders (S006223N).

Declaration of Conflicting Interests

The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Data Availability Statement

Data and codes are available on request after termination of the KU Leuven research project "A Lonely Planet."

References

Albertini, M., & Kohli, M. (2009). What childless older people give: Is the generational link broken? *Ageing and Society*, *29*(8), 1261–1274. https://doi.org/10.1017/S0144686X0999033X

Antczak, R., Quashie, N. T., Mair, C. A., & Arpino, B. (2023). Less is (often) more: Number of children and health among older adults in 24 countries. *The Journals of Gerontology. Series B, Psychological Sciences and Social Sciences*, *78*(11), 1892–1902. https://doi.org/10.1093/geronb/gbad123

Antonucci, T. C., Birditt, K. S., Sherman, C. W., & Trinh, S. (2011). Stability and change in the intergenerational family: A convoy approach. *Ageing and Society*, *31*(7), 1084–1106. https://doi.org/10.1017/S0144686X1000098X

Bolmsjö, I., Tengland, P.-A., & Rämgård, M. (2019). Existential loneliness: An attempt at an analysis of the concept and the phenomenon. *Nursing Ethics*, *26*(5), 1310–1325. https://doi.org/10.1177/0969733017748480

Bruggencate, T. T., Luijkx, K. G., & Sturm, J. (2018). Social needs of older people: A systematic literature review. *Ageing and Society*, *38*(9), 1745–1770. https://doi.org/10.1017/S0144686X17000150

Buecker, S., Denissen, J. J., & Luhmann, M. (2021). A propensity-score matched study of changes in loneliness surrounding major life events. *Journal of Personality and Social Psychology*, *121*(3), 669.

Cacioppo, J. T., & Cacioppo, S. (2018). The growing problem of loneliness. *Lancet (London, England)*, *391*(10119), Article 426. https://doi.org/10.1016/S0140-6736(18)30142-9

Deindl, C., & Brandt, M. (2017). Support networks of childless older people: Informal and formal support in Europe. *Ageing and Society*, *37*(8), 1543–1567. https://doi.org/10.1017/S0144686X16000416

de Jong-Gierveld, J., & van Tilburg, T. G. (1999). Manual of the Loneliness Scale. *Methoden en technieken*. https://doi.org/10.17605/osf.io/u6gck

De Witte, J., & Van Regenmortel, T. (2022). The relationship between loneliness and migration among Belgian older adults. *Ageing International*, *47*(4), 672–694. https://doi.org/10.1007/s12126-021-09460-8

De Witte, J., & Van Regenmortel, T. (2023). *Silver empowerment: Fostering strengths and connections for an age-friendly society*. Universitaire Pers Leuven. https://doi.org/10.2307/j.ctv35r3v37

Dykstra, P. A., & Hagestad, G. O. (2007). Roads less taken: Developing a nuanced view of older adults without children. *Journal of Family Issues*, *28*(10), 1275–1310. https://doi.org/10.1177/0192513X07303822

European Commission. Joint Research Centre. (2021). *Loneliness & social and civic behaviours: Literature review*. Publications Office. https://doi.org/10.2760/802268

Fokkema, C. M., & van Tilburg, T. G. (2007). Zin en onzin van eenzaamheidsinterventies bij ouderen. *Tijdschrift voor Gerontologie en Geriatrie*, *38*(4), 161–177. https://doi.org/10.1007/BF03074846

Gemar, A. (2024). Parental status connection and social network variety in adulthood. *Societies*, *14*(2), 26. https://doi.org/10.3390/soc14020026

Gerst-Emerson, K., & Jayawardhana, J. (2015). Loneliness as a public health issue: The impact of loneliness on health care utilization among older adults. *American Journal of Public Health*, *105*(5), 1013–1019. https://doi.org/10.2105/AJPH.2014.302427

Gibney, S., Delaney, L., Codd, M., & Fahey, T. (2017). Lifetime childlessness, depressive mood and quality of life among older Europeans. *Social Indicators Research*, *130*(1), 305–323. https://doi.org/10.1007/s11205-015-1177-1

Hadley, R. A. (2021). 'No longer invincible': The impact of involuntary childlessness on older men. *Physical Therapy Reviews*, *26*(5), 328–343. https://doi.org/10.1080/10833196.2021.1884172

Hansen, T., Slagsvold, B., & Moum, T. (2009). Childlessness and psychological well-being in midlife and old age: An examination of parental status effects across a range of outcomes. *Social Indicators Research*, *94*(2), 343–362. https://doi.org/10.1007/s11205-008-9426-1

Hartanto, A., Sim, L., Lee, D., Majeed, N. M., & Yong, J. C. (2024). Cultural contexts differentially shape parents' loneliness and wellbeing during the empty nest period. *Communications Psychology*, *2*(1), Article 105. https://doi.org/10.1038/s44271-024-00156-8

Heylen, L. (2010). The older, the lonelier? Risk factors for social loneliness in old age. *Ageing and Society*, *30*(7), 1177–1196. https://doi.org/10.1017/S0144686X10000292

Holt-Lunstad, J., Smith, T. B., Baker, M., Harris, T., & Stephenson, D. (2015). Loneliness and social isolation as risk factors for mortality: A meta-analytic review. *Perspectives on Psychological Science: A Journal of the Association for Psychological Science*, *10*(2), 227–237. https://doi.org/10.1177/1745691614568352

Huang, R., Gong, R., Deng, Q., & Hu, Y. (2024). The effect of intergenerational support from children on loneliness among older adults-the moderating effect of internet usage and intergenerational distance. *Frontiers in Public Health*, *12*, Article 1330617. https://doi.org/10.3389/fpubh.2024.1330617

Huxhold, O., & Fiori, K. L. (2024). Understanding loneliness in late life. *Current Opinion in Psychology*, *57*, Article 101801. https://doi.org/10.1016/j.copsyc.2024.101801

Kantar Public. (2016). *Trapped in a bubble: An investigation into triggers for loneliness in the UK*. Kantar Public=.

Kendig, H., Dykstra, P. A., Van Gaalen, R. I., & Melkas, T. (2007). Health of aging parents and childless individuals. *Journal of Family Issues*, *28*(11), 1457–1486. https://doi.org/10.1177/0192513X07303896

Kent-Marvick, J., Simonsen, S., Pentecost, R., Taylor, E., & McFarland, M. M. (2022). Loneliness in pregnant and postpartum people and parents of children aged 5 years or younger: A scoping review. *Systematic Reviews*, *11*(1), Article 196. https://doi.org/10.1186/s13643-022-02065-5

Kobayashi, L. C., & Steptoe, A. (2018). Social isolation, loneliness, and health behaviors at older ages: Longitudinal cohort study. *Annals of Behavioral Medicine: A Publication of the Society of Behavioral Medicine*, *52*(7), 582–593. https://doi.org/10.1093/abm/kax033

Křenková, L. (2018). Childlessness and social support in old age: A literature review. *Finnish Yearbook of Population Research*, *53*, 25–50.

Langenkamp, A. (2021a). Enhancing, suppressing or something in between – Loneliness and five forms of political participation across Europe. *European Societies*, *23*(3), 311–332. https://doi.org/10.1080/14616696.2021.1916554

Langenkamp, A. (2021b). Lonely hearts, empty booths? The relationship between loneliness, reported voting behavior and voting as civic duty. *Social Science Quarterly*, *102*(4), 1239–1254. https://doi.org/10.1111/ssqu.12946

Lasgaard, M., Friis, K., & Shevlin, M. (2016). "Where are all the lonely people?" A population-based study of high-risk groups across the life span. *Social Psychiatry and Psychiatric Epidemiology*, *51*(10), 1373–1384. https://doi.org/10.1007/s00127-016-1279-3

Leocádio, V. A. (2022). Childlessness: A review of the theoretical frameworks and a proposition of general pathways. *International Journal of Population Studies*, *7*(2), Article 352. https://doi.org/10.36922/ijps.v7i2.352

Luhmann, M., & Hawkley, L. C. (2016). Age differences in loneliness from late adolescence to oldest old age. *Developmental Psychology*, *52*(6), 943–959. https://doi.org/10.1037/dev0000117

Mansson, D. H. (2016). The joy of grandparenting: A qualitative analysis of grandparents. *Journal of Intergenerational Relationships*, *14*(2), 135–145. https://doi.org/10.1080/15350770.2016.1160738

Marquez, J., Goodfellow, C., Hardoon, D., Inchley, J., Leyland, A. H., Qualter, P., Simpson, S. A., & Long, E. (2022). Loneliness in young people: A multilevel exploration of social ecological influences and geographic variation. *Journal of Public Health*, *45*(1), 109–117. https://doi.org/10.1093/pubmed/fdab402

Marquez, J., Goodfellow, C., Hardoon, D., Inchley, J., Leyland, A. H., Qualter, P., Simpson, S. A., & Long, E. (2023). Loneliness in young people: A multilevel exploration of social ecological influences and geographic variation. *Journal of Public Health*, *45*(1), 109–117. https://doi.org/10.1093/pubmed/fdab402

Mayers, A. M., Khoo, S., & Svartberg, M. (2002). The existential loneliness questionnaire: Background, development, and preliminary findings. *Journal of Clinical Psychology*, *58*(9), 1183–1193. https://doi.org/10.1002/jclp.10038

Meisters, R., Westra, D., Putrik, P., Bosma, H., Ruwaard, D., & Jansen, M. (2021). Does loneliness have a cost? A population-wide study of the association between loneliness and healthcare expenditure. *International Journal of Public Health*, *1*, Article 581286. https://doi.org/10.3389/ijph.2021.581286

Morrish, N., & Medina-Lara, A. (2021). Does unemployment lead to greater levels of loneliness? A systematic review. *Social Science & Medicine*, *287*, Article 114339. https://doi.org/10.1016/j.socscimed.2021.114339

Mund, M., Freuding, M. M., Möbius, K., Horn, N., & Neyer, F. J. (2020). The stability and change of loneliness across the life span: A meta-analysis of longitudinal studies. *Personality and social psychology review*, *24*(1), 24–52.

Nowland, R., Charles, J., & Thomson, G. (2024). Loneliness in pregnancy and parenthood: Impacts, outcomes, and costs. *The Yale Journal of Biology and Medicine*, *97*(1), 93–98. https://doi.org/10.59249/NKTK3337

Nowland, R., Thomson, G., McNally, L., Smith, T., & Whittaker, K. (2021). Experiencing loneliness in parenthood: A scoping review. *Perspectives in Public Health*, *141*(4), 214–225. https://doi.org/10.1177/17579139211018243

Penning, M. J., Wu, Z., & Hou, F. (2024). Childlessness and social and emotional loneliness in middle and later life. *Ageing and Society*, *44*(7), 1551–1578. https://doi.org/10.1017/S0144686X22000824

Perlman, D., & Peplau, L. (1981). Toward a social psychology of loneliness. In R. Gilmour, S. Duck (Eds.), *Personal Relationships in Disorder*, *3*, Academic Press, London, pp. 31–56.

Schnepf, S. V., d'Hombres, B., & Mauri, C. (Eds.), (2024). *Loneliness in Europe: Determinants, risks and interventions*. Springer Nature Switzerland. https://doi.org/10.1007/978-3-031-66582-0

Schnettler, S., & Wöhler, T. (2016). No children in later life, but more and better friends? Substitution mechanisms in the personal and support networks of parents

and the childless in Germany. *Ageing and Society*, *36*(7), 1339–1363. https://doi.org/10.1017/S0144686X15000197

Stegen, H. (2024). *Beyond the usual path: Exploring childlessness and loneliness in later life*. Vrije Universiteit Brussel.

Stegen, H., Switsers, L., & De Donder, L. (2021). Life stories of voluntarily childless older people: A retrospective view on their reasons and experiences. *Journal of Family Issues*, *42*(7), 1536–1558. https://doi.org/10.1177/0192513X20949906

Tanturri, M. L., Mills, M., Rotkirch, A., Sobotka, T., Takács, J., Miettinen, A., Faludi, C., Kantsa, V., & Nasiri, D. (2015). State-of-the-art report: Childlessness in Europe. *Families and Societies*, *32*, 1–53. http://www.familiesandsocieties.eu/wp-content/uploads/2015/03/WP32TanturriEtAl2015.pdf.

van Tilburg, T. G. (2021). Social, emotional, and existential loneliness: A test of the multidimensional concept. *The Gerontologist*, *61*(7), e335–e344. https://doi.org/10.1093/geront/gnaa082

Victor, C. R., & Pikhartova, J. (2020). Lonely places or lonely people? Investigating the relationship between loneliness and place of residence. *BMC Public Health*, *20*(1), Article 778. https://doi.org/10.1186/s12889-020-08703-8

Victor, C. R., & Yang, K. (2012). The prevalence of loneliness among adults: A case study of the United Kingdom. *The Journal of Psychology*, *146*(1–2), 85–104. https://doi.org/10.1080/00223980.2011.613875

Vozikaki, M., Papadaki, A., Linardakis, M., & Philalithis, A. (2018). Loneliness among older European adults: Results from the survey of health, aging and retirement in Europe. *Journal of Public Health*, *26*(6), 613–624. https://doi.org/10.1007/s10389-018-0916-6

Weiss, R. (1975). *Loneliness: The experience of emotional and social isolation*. MIT press. *Cambridge* (1973).

Wu, Z., & Penning, M. J. (2019). Children and the mental health of older adults in China: What matters? *Population Research and Policy Review*, *38*(1), 27–52. https://doi.org/10.1007/s11113-018-9495-z

Zhang, W., & Liu, G. (2007). Childlessness, psychological well-being, and life satisfaction among the elderly in China. *Journal of Cross-Cultural Gerontology*, *22*(2), 185–203. https://doi.org/10.1007/s10823-007-9037-3

Zoutewelle-Terovan, M., & Liefbroer, A. C. (2018). Swimming against the stream: Non-normative family transitions and loneliness in later life across 12 nations. *The Gerontologist*, *58*(6), 1096–1108.