

Perceived Social Exclusion and Loneliness: Two Distinct but Related Phenomena

Oliver Huxhold,^a Bianca Suanet,^b Martin Wetzel^c

a) German Centre of Gerontology; b) Vrije Universiteit Amsterdam; c) Martin-Luther-Universität

Abstract: Perceived social exclusion refers to the subjective feeling of not being part of the macro-level society. Loneliness arises if existing social relationships at the micro level are either quantitatively or qualitatively perceived as deficient. Here, we conceptualize and empirically demonstrate that both experiences are distinct but related constructs and investigate how they interact over time. The data set consists of 6,002 community-dwelling adults 40 to 85 years of age living in Germany assessed at two time points in 2014 and in 2017. Structural equation modeling analyses revealed that perceived social exclusion and loneliness are highly correlated. They share risks factors (i.e., socioeconomic factors, opportunities for social participation, and social network characteristics) but display different patterns of associations. In addition, loneliness may over time induce feelings of social exclusion but not vice versa. Overall, our findings underline that people get strong cues about their worth in society from their social relationships.

Keywords: social inequality; social relationships; longitudinal modeling; deprivation

HUMANS are a highly social species. Thus, a lack of belonging is detrimental to both the society and the individual. At the individual level, experiencing a prolonged lack of connection to others has been shown to result in lower psychological well-being, lower quality of life, health problems, and even a decreased life expectancy (Courtin and Knapp 2017; Hawkey and Cacioppo 2010). In addition, perceived estrangements at the societal level might result in deepened cleavages in society and eventually less social trust and cohesion as people experience vastly differing realities in the conditions in which they live (Daly and Silver 2008; Schnepf et al. 2021).

Feelings of connectedness or a lack thereof, therefore, can refer to two distinct but related levels of social structure. On the interpersonal level (micro level of society), individuals experience *loneliness* when there is a discrepancy between the actual and the desired quality and quantity of their social relationships (Tesch-Roemer and Huxhold 2019). On a societal level (macro level of society), individuals experience *perceived social exclusion* if they don't see themselves as being part of society and able to participate in societally valued activities (MacLeod et al. 2019). Although they refer to different levels of the social structure and have theoretically different backgrounds, both concepts describe a subjective feeling that indicates a lack of belonging.

Accordingly, we argue that in addition to potentially sharing common risk factors—such as socioeconomic deprivation—perceived social exclusion and loneliness are distinct but related constructs. Moreover, as related concepts they can potentially reinforce each other over time: feeling a lack of belonging to a personal

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network of social relationships may harm the perception of belonging to the society at large. Thus, not being integrated interpersonally could detrimentally affect social cohesion at the meso and macro levels, as some people or groups might be unable to engage in socially valued activities and be unable to form or even lose their connections to organizations and society's institutions. Next to declining social capital in individual's social networks, such a disengagement from organizations and society's institutions can result in lower social and institutional trust in the society at large (Putnam 2002). Conversely, not being able to feel as a part of society could result in withdrawal from social relations interpersonally (Hommerich 2015). Individuals who experience themselves as being unable to meet societal norms may also feel estranged from their immediate social environment (Abrutyn 2019). Therefore, experiencing loneliness or perceived social exclusion may potentially set off a vicious mutually reinforcing cycle.

To our knowledge, there have been no prior studies that have investigated (1) how perceived social exclusion and loneliness relate to each other, (2) whether or not they are influenced by the same risk factors, and (3) whether they reinforce each other over time. The scarce studies looking at loneliness and social exclusion (e.g., Allen et al. 2020; Kearns et al. 2015) either have been cross-sectional in nature or have seen a (perceived) lack of social relations as a part of social exclusion (MacLeod et al. 2019). Answering our research questions can increase conceptual clarity, which is important as both phenomena negatively affect people's health and well-being.

In particular, during the COVID-19 pandemic as a societal-level stressor, which has amplified feelings of loneliness through social distancing, lockdowns, and perceived societal threats (van Tilburg et al. 2020), it is more urgent to understand feelings of social exclusion and loneliness as distinct but related constructs that can potentially reinforce each other over time. The social distancing rules of institutions that directly influenced people's interpersonal networks, which in turn affected their feelings toward governments and society, made the link between interpersonal and societal belonging very visible. But also in non-pandemic times, the degree to which the subjective lack of integration in society and feeling subjectively excluded from interpersonal networks influence each other is of vital importance if one wants to understand the process by which people experience unmet social needs. To gain a general understanding of this potential dynamic, we employ a longitudinal design based on data from the German Ageing Survey assessed in 2014 and 2017.

Social Exclusion

In recent decades the concept of social exclusion has been successfully used to further the understanding of the antecedents and consequences of poverty, deprivation, and social inequality (Brady 2003; MacLeod et al. 2019; Marlier and Atkinson 2010; Sealey 2015; Sen 2000; Silver 1994; Walsh, Scharf, and Keating 2017). Although definitions vary slightly in the literature, social exclusion most commonly denotes the exclusion of individuals and groups from economic, cultural, and political domains and indicates a lack of capabilities to participate in societally valued activities.

In contrast to related constructs such as poverty and social inequality, social exclusion features three characteristics. First, social exclusion is a multidimensional

construct and acknowledges the simultaneous co-occurrence of multiple types of deprivation in various life domains such as income, education, health, housing, citizenship, and social relationships (e.g., Bailey, Fahmy, and Bradshaw 2017; Brady 2003; Sen 2000; Silver 1994). Second, Social exclusion does not only refer to unequal distributions of societally valued goods, but in its core describes a relational concept (Brady 2003). Being socially excluded is associated with feelings of powerlessness, being subjected to adverse factors outside one's own control, and being disrespected (De Haan 2000; Sealey 2015). Third, social exclusion is embedded in a dynamic process. Different dimensions of deprivation overlap and interact with each other over time (Brady 2003; De Haan 2000; Sen 2000). For example, people who have low incomes or bad health and who also live in disadvantaged or unsafe neighborhoods could be particularly vulnerable with respect to participating in societally valued activities (Schüz et al. 2012). Also, in more deprived neighborhoods, services, safety, and transport options are scarcer, making residents more vulnerable to social exclusion (Ma, Kent, and Mulley 2018). Most importantly, dynamic interactions between different dimensions of social exclusion (e.g., between unemployment and health problems) can form vicious cycles causing cumulative disadvantages over the life course (Dannefer 2020; Sealey 2015). Thus, social exclusion is not only a state of deprivation at a given point in time but is potentially highly indicative of reduced future prospects.

Perceived Social Exclusion

Perceived social exclusion indicates if people consider themselves as being excluded from society. This is in particular important for the consequences of social exclusion. For instance, research has shown that mistreatment and disadvantage are particularly harmful if they are subjectively perceived as consequences of discrimination (Schmitt et al. 2014). Relatedly, the individual's perception of being socially excluded affects well-being over and above the effects of underlying objective factors (Hommerich and Tiefenbach 2018). In addition, because social exclusion indicates a lack of capability to participate in society (e.g., MacLeod et al. 2019; Marlier and Atkinson 2010), the individual's subjective evaluation of their own capabilities can have long-term consequences. College students, for example, possess on average low financial means and are thus restricted in their opportunities for participation. At the same time, however, students may view themselves as a valued part of society because of their anticipated future contributions. In contrast, people who perceive themselves as unnecessary for the society as a whole will most likely hold a highly pessimistic view of their future participation opportunities. Thus, the perception of being socially excluded may act as a self-fulfilling prophecy that hinders individuals from using even those opportunities to participate that are available to them (Hommerich 2015) in addition to being offered fewer opportunities to feel included.

Loneliness

Loneliness describes the highly aversive feeling that arises when the individual's interpersonal social needs are not met by existing social relationships (Tesch-Roemer

and Huxhold 2019). Aspects of social relationships that may affect loneliness can broadly be categorized into structure (e.g., network size, partner status), function (e.g., social support), and quality (e.g., quality of friendships, quality of family relations; see Antonucci, Ajrouch, and Birditt 2013). However, loneliness cannot be equated with objective isolation. Whether or not an individual experiences a lack in their social network depends on their individual social standards (Tesch-Roemer and Huxhold 2019). Some people require, for example, large networks to feel integrated, whereas others are happy with a few selected social contacts. Thus, loneliness can arise from perceived deficiencies in either relationship structure, function, or quality (Böger and Huxhold 2018a,b). In recent years, loneliness has been increasingly identified as an important issue to be addressed in national social policies. One motivation behind this development is the increasing public awareness about the tremendous impact of loneliness on health. As meta-analyses have demonstrated, loneliness not only decreases subjective well-being but also increases the risks of severe physical illnesses and of all-cause mortality (Courtin and Knapp 2017; Hawkey and Cacioppo 2010).

Are Loneliness and Perceived Social Exclusion Related?

In some multidimensional approaches, deficient social relationships are seen as one important dimension of social exclusion (Van Regenmortel et al. 2016; Walsh et al. 2017). This has the benefit of showing how other dimensions of social exclusion—such as exclusion from material resources—also affect exclusion from social relations. In our view, however, additional conceptual clarity is gained if the feeling of not belonging to society is differentiated from the feeling of being excluded from satisfying social relationships (Daly and Silver 2008). In our conceptualization, perceived social exclusion and exclusion from social relations refer to different levels of the social structure. By treating them as such in the current study, we gain a deeper understanding about the mechanisms by which perceived social exclusion and perceived exclusion from social relations (here measured as loneliness) come about and interact with each other.

In particular, we believe that perceived social exclusion and loneliness are interrelated but distinct concepts for at least three reasons. Firstly, loneliness as well as perceived social exclusion exist because of *unsatisfied social needs*. Secondly, both experiences of social deficiencies share common *risk factors*. Finally, and most importantly, loneliness and perceived social exclusion may form a *vicious cycle*, in which one form of feeling excluded continually reinforces the other over time.

Unsatisfied social needs. Humans are a social species with an ingrained need to belong (Baumeister and Leary 1995). This need to belong is often meant to refer only to close personal relationships. We believe, however, that for individuals to thrive in modern societies they must form and maintain attachments to different levels of the social structure (Cacioppo et al. 2015; Lin, Ye, and Ensel 1999). From this perspective, perceived social exclusion and loneliness are related because both arise when fundamental social needs are not met. At the same time, both subjective experiences of social deficiencies are distinct because they pertain to different needs. Specifically, loneliness results from perceived deficiencies at the micro and meso

levels of the social structure (e.g., lack of confidants or lack of a larger social network; Cacioppo et al. 2015), whereas perceived social exclusion denotes the feeling of being estranged from the macro-level societal structure (Bude and Lantermann 2006).

The distinction between social needs that pertain to the personal social network and social needs pertaining to the integration into society as a whole has a long tradition in sociological thinking. For example, based on Tönnies's distinction between "Gemeinschaft (i.e., community)" and "Gesellschaft (i.e., society)," Durkheim ([1893] 1965) developed his conception of solidarity. From his perspective, with the increasing division of labor in the process of early modernization, solidarity became increasingly less based on concrete personal relationships—such as family ties—and increasingly more dependent on the individual's abstract contribution to the society. As a consequence, when people today are socially excluded—meaning they are not sufficiently able to participate in activities that bind them to their societies and do not feel like they can attain socially valued goals—they are likely to experience what Durkheim termed "anomie." Recent theoretical perspectives define anomie as the social pain felt by the individual occurring when solidarity is threatened (Abrutyn 2019). As Abrutyn (2019) pointed out, anomie can be either a result of disintegration of bonds between individuals or an individual and a group (dissolution), a consequence of detachment from the physical and social environment in which the individual's identity is anchored (dislocation), or due to a mismatch between the standards of the society and the values, achievements, and opportunities of the individual (disjunction).

Risk factors. Given that both perceived social exclusion and loneliness arise because of unmet social needs, it could be that they have similar risk factors. However, as those needs refer to different societal levels (i.e., integration into the society at large vs. integration into an individual social network), it is likely that these factors differ slightly with respect to their impact on the respective constructs. As laid out above, the perception of social exclusion depends on the individual's evaluation of their own capabilities to participate in societally valued activities (Bude and Lantermann 2006). In particular, socioeconomic disadvantages and the lack of other opportunities for participation are strongly factored into this evaluation (Brady 2003; Hommerich 2015; Hommerich and Tiefenbach 2018). However, shared activities also provide opportunities to form and maintain social relationships and are thus not exclusively linked to social exclusion. Social participation has also been shown to reduce levels of loneliness across middle age and late adulthood (Böger and Huxhold 2018b). Similarly, socioeconomic disadvantages negatively affect not only structural aspects but also functional and qualitative aspects of social relationships (Berkman et al. 2000; Conger and Donnellan 2007). Therefore, it is no surprise that socioeconomic disadvantages such as low education or low income have been identified as important risk factors not only for perceived social exclusion but also for loneliness, albeit to a lesser degree (Tesch-Roemer and Huxhold 2019).

A vicious cycle between perceived social exclusion and loneliness? Finally, and most importantly, loneliness and perceived social exclusion may form a *vicious cycle*, in which one form of feeling excluded continually reinforces the other over time. This

dynamic interaction may lead to accumulating disadvantages in the quality of life across the life course.

We assume that loneliness can induce perceived social exclusion because people make sense of the larger world and learn about societal norms detailing what is socially appropriate or valued through their interactions with others. For instance, individuals tend to base their judgement about their self-worth on characteristics that they assume determine the likelihood of being accepted by others (Baumeister and Leary 1995). Relatedly, individuals derive their beliefs about their own self-worth to a large degree from instances of acceptance or rejection by significant others (Leary 1999; Wesselmann and Williams 2017). In addition, lonely individuals often demonstrate lower levels of self-esteem and tend to evaluate their social environment as more unfriendly and hostile than individuals who perceive themselves as well integrated (Hawkley and Cacioppo 2010). Thus, loneliness can contribute to what Abrutyn (2019) called disjunction, that is, the feeling of a mismatch between societal standards and the individual's own values, achievements, and opportunities. Experiencing loneliness may thus result in individuals doubting their own worth for the society at large and may deprive them of opportunities to gather appreciation and accolades that could reinforce their status as valuable members of society.

Similarly, perceived social exclusion can potentially induce loneliness. As depicted in the concept of anomie, individuals who feel estranged from the standards of society may also feel disconnected from their social relationships and their immediate social environment (Abrutyn 2019). A few recent qualitative studies demonstrated that minorities such as older gay men in England and Asian immigrants in New Zealand partly view their experiences of loneliness as consequences of being excluded from social participation because they feel unable to meet the common norms governing many social activities (Morgan et al. 2020; Willis, Vickery, and Jessiman 2020). Furthermore, as laid out above, perceived social exclusion may act as a self-fulfilling prophecy preventing socially excluded individuals from using even those reduced opportunities that are available to them (Hommerich 2015). Relatedly, Sen (2000) pointed out that socially excluded individuals can experience shame due to being deprived of what others would consider "normal" belongings, resources, or statuses, in turn resulting in self-withdrawal from social relationships and activities. For example, people lacking financial means may refrain from attending social gatherings because they do not possess "appropriate" clothing or cannot afford anticipated gifts. Unemployed individuals may avoid talking to strangers at parties because of the fear of needing to divulge their employment status. Thus, self-inflicted reclusion from social participation of socially excluded individuals could be driven by fear of embarrassing themselves in the eyes of others. Taken together, the feeling of being unable to meet perceived social standards, not using available opportunities, and the fear of embarrassment may lead to more and more reclusion from social relationships and activities over time, resulting in increased risks of feeling lonely.

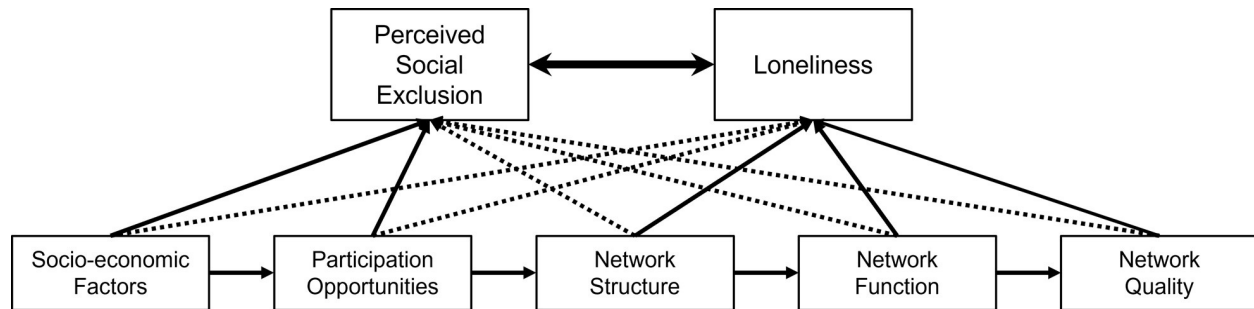


Figure 1: Conceptual model of shared risk factors of perceived social exclusion and loneliness. *Notes:* Solid lines indicate strong associations. Dotted lines indicate weaker associations.

The Current Study

The aim of the current study is to examine perceived social exclusion and loneliness in a joint approach to facilitate the understanding of the antecedents and consequences of both constructs and their relatedness.

First, the hypothesis that perceived social exclusion and loneliness are distinct but highly related constructs (Hypothesis 1) is studied. To this end, a confirmatory factor analysis is run on two-item batteries that measure perceived social exclusion and loneliness respectively. Given that loneliness and social exclusion are feelings of not belonging located at different social levels, it is predicted that a two-factor solution including a high correlation between both factors provides the best fit to the data.

Secondly, we assume that perceived social exclusion and loneliness share common risk factors (Hypothesis 2). To avoid prediction biases (Lindenberger and Pötter 1998) as well as to avoid multicollinearity, we use a theory-guided hierarchical approach to the analysis. As depicted in Figure 1, the underlying conceptual model is informed by the seminal article of Berkman and colleagues (2000) about cascading causal processes linking macro-level factors to psycho-biological processes. In the model, we first hypothesize that socioeconomic conditions give rise to (a lack of) opportunities to participate socially. By expanding this model with ideas of the convoy model (Antonucci et al. 2013), the interrelationship between network structure, network function, and network quality becomes highlighted. Opportunities for participation are in turn associated with possibilities to form and maintain social ties and are thus related to the social network structure (e.g., network size). Social ties can in turn provide social support in times of need. And finally, the availability of social support determines in part the quality of the network. Following this model, we subsequently enter indicators of socioeconomic conditions, participation opportunities, network structure, network function, and finally network quality. In particular, we predict that socioeconomic conditions and opportunities for participation are more strongly associated with perceived social exclusion (Hypotheses 2a and 2b) and that network size, network function, and network quality are more strongly linked to loneliness (Hypothesis 2c).

Third, as outlined above, we expect a dynamic interrelationship (i.e., a vicious cycle) between loneliness and social exclusion, as feelings of not belonging to society

and experiencing loneliness likely interact over time. In order to test this, we use a dual change score cross-lagged model using 2014 and 2017 data from Germany to determine whether or not loneliness drives perceived social exclusion (Hypothesis 3a), whether or not perceived social exclusion drives loneliness (Hypothesis 3b), or both.

Data and Method

Sample

The data used in our analyses were from the German Ageing Survey (DEAS), provided by the German Centre of Gerontology (DZA). DEAS is a population-based survey of adults between 40 and 85 years of age living in private households in Germany. The survey has been ongoing since 1996 and is funded by the German Federal Ministry for Family Affairs, Senior Citizens, Women, and Youth (Klaus et al. 2017). The DEAS features a cohort-sequential design combining consecutive representative sampling every six years with longitudinal follow-ups every three years. The current study used data from the new baseline assessment of 6,002 participants in 2014; 3,101 (51.66 percent) of these were reinterviewed in 2017. Selectivity analyses revealed that participants providing longitudinal data were on average better socially integrated, had a higher socioeconomic status, and were healthier and younger than participants who were assessed only once. Sample attrition effect sizes, however, never exceeded a medium effect size of Cohen's d greater than 0.5 (average sample selectivity effect $d = 0.17$; range of selectivity effects $d = 0.02$ to $d = 0.32$). To reduce selective attrition biases, information from all participants ($N = 6,002$) was included in the analyses irrespective of the number of data points they provided (Newman 2003). Full information maximum likelihood estimation was used to account for missing data. This method has been shown to successfully compensate for selective attrition biases in parameter estimates as long as variables in the model are predictive of dropout (Graham 2009), which is the case in our study. The analysis sample was on average 62.2 years of age ($SD = 11.7$ years), 48.9 percent were female, and 39.4 percent had obtained a college education.

Measures

In order to be able to run analyses comparing the associations between variables and to ease convergence in the structural equation models, continuous variables were transformed to the T-metric (i.e., mean = 50; $SD = 10$). The means and standard deviations estimated with data from the 2014 assessment are used as a basis for calculation to preserve changes and variability in changes across time points. Dummy variables were centered on sample means.

Covariates consisted of demographic characteristics and measures of health. *Demographic variables* included in the analysis consist of *age* (measured in decades), *gender* (0 = male; 1 = female), and *place of living* (0 = former West Germany; 1 = former East Germany). *Health* was indicated with *self-rated health*, *functional health*, and *physical health*. *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). *Functional health* was assessed using the physical functioning subscale of the SF-36 (Ware and Sherbourne 1992). Impairments in 10 everyday activities (e.g., climbing stairs, carrying shopping bags) were rated on a three-point scale, with higher values indicating less impairment, and summed up. *Physical health* was assessed by summing up positive answers about the existence of 11 typical health problems (e.g., cardiovascular diseases, diabetes, gastrointestinal diseases).

Socioeconomic factors were assessed with four variables. Regarding *education*, participants reported their highest degree of school and further education with reference to the German education scheme. On this basis, an individual's education was classified into three categories (i.e., low to high) according to ISCED (International Standard Classification of Education; UNESCO 2012). *Income* was indexed with the net equivalized household income (OECD 2011). *Poverty* was indicated by an income that was at 60 percent or less than the median equivalent income in the German population. *Occupational prestige* was based on couple data and used the SIOPS classification (Standard International Occupational Prestige Scale; Ganzeboom and Treiman 1996).

Participation opportunities were indexed by five measures. Labor market participation was indicated with two dummy variables (*unemployed*: 0 = no, 1 = yes; *retired*: 0 = no, 1 = yes). Formal participation in cultural, social, and political life domains was indexed by two variables. Participants could indicate whether or not they were members in different types of groups, for example, political parties, churches, or sport clubs. The number of active memberships was summed up to provide a *membership* index. If participants indicated that they were a member in a group, they were asked whether or not they would hold a volunteer position. The variable *volunteering* (0 = no, 1 = yes) indexed whether or not participants provided at least one positive answer to this question. Informal participation was assessed with social activities. The variable *social activities* was derived from a series of nine items asking for participation in specific 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 a specific activity together with others. *Time spent on social activities* was measured with a question asking, "How often have you performed this activity in the last year?" Answers were given on a scale ranging from 1 (less than once per month) to 6 (daily). An index was built summing up the frequency for all social activities.

Network structure was indicated with three variables. Existence of particularly important social ties was assessed with *partner status* (0 = no partner; 1 = partner) and *parental status* (0 = no living child; 1 = at least one living child). *Network size* was assessed by asking participants to report the number of people whom they considered important and with whom they had regular contact (up to a maximum of eight). The DEAS interview also asked with whom the participant was living. If co-residents were not mentioned previously, their count was added to the network size variable.

Network function was assessed with two variables indicating different forms of intangible social support. Participants could name up to six persons from whom

they would likely obtain advice and up to six people from whom they would likely obtain solace. The sum scores derived from these two questions indexed *informational support* (i.e., potential for advice) and *emotional support* (i.e., potential for solace).

Network quality is operationalized with three variables assessing *partnership satisfaction*, *satisfaction with friends*, and *satisfaction with family*. First, participants were asked to indicate their satisfaction with their partnership on a scale ranging from 1 (very bad) to 5 (very good). Second, participants were asked to rate their present relations with friends and acquaintances on the same scale. The final question assessed an equivalent rating for family relations.

Loneliness was assessed with a modified version of the six-item De Jong Gierveld loneliness scale (De Jong Gierveld and van Tilburg 2006). The scale consisted of six statements indicating an individual's subjective view about their social integration: (1) "I miss having people around among which I feel comfortable." (2) "There are plenty of people I can rely on when I have problems." (3) "I often feel rejected." (4) "There are many people I can trust completely." (5) "I miss emotional security and warmth." (6) "There are enough people I feel close to." 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. The items were translated from the Dutch version of the scale to German, which limits translation bias. Thus, the English translation of the statements deviate slightly from the official English scale. To model loneliness as a latent variable in path analytic models (but not in the confirmatory factors analysis), three parcels with two items each were created to improve model convergence. Items were assigned to parcels in accordance with their loadings to ensure the best balance of discriminatory power over parcels (Little et al. 2002).

Perceived social exclusion (PSE) was assessed with four items from a scale developed by Bude and Lantermann (2006) indicating the individual's evaluation of being included in society: (1) "I am worried about being left behind." (2) "I feel like I do not really belong to society." (3) "I feel that I am left out." (4) "I feel excluded from society." Participants could indicate their agreement with these statements on a scale from 1 (strongly agree) to 4 (strongly disagree). These scores were rotated, so that higher mean scores across all four items indexed greater PSE.

Results

We used structural equation modeling with Mplus 8 (Muthén and Muthén 2017) to study the associations between PSE and loneliness. *PSE* and *loneliness* were modeled as latent factors. Overall model fit was evaluated with the comparative fit index (CFI) and the root mean square error of approximation (RMSEA). A CFI of 0.90 or higher and an RMSEA of 0.08 or lower indicated an acceptable fit to the data (Marsh, Hau, and Wen 2004). Measurement invariance was established across time points following the recommendations of Cheung and Rensvold (2002). Measurement invariance was assumed if the CFI decreased by less than 0.010 and RMSEA increased by less than 0.015 after freely estimating factor loadings (i.e.,

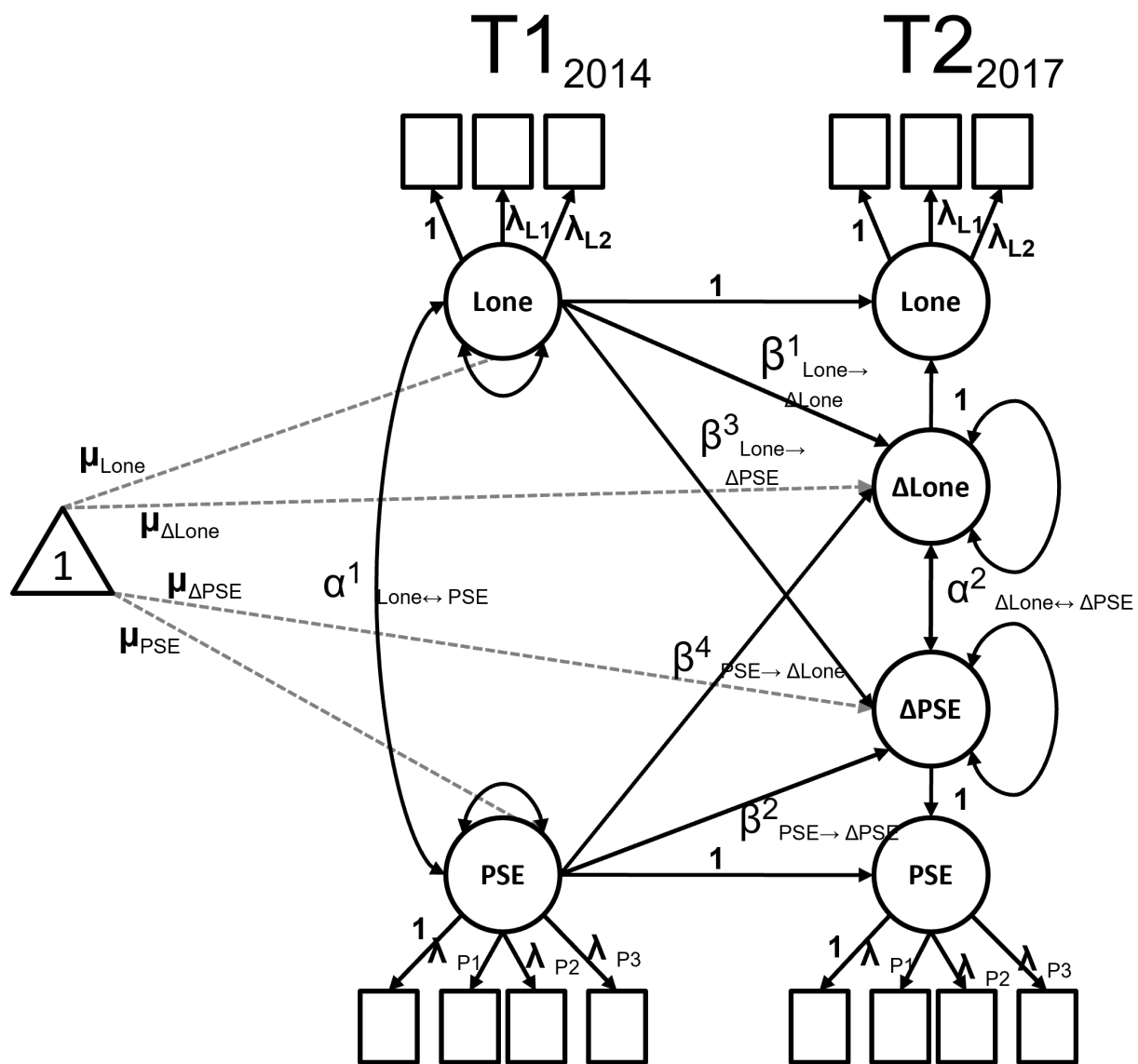


Figure 2: Dual change score model linking changes in PSE and loneliness. *Notes:* Lone = loneliness; Δ = change; α = covariations; β = path coefficients; λ = factor loadings; μ = intercepts; T1₂₀₁₄ = first assessment in 2014; T2₂₀₁₇ = second assessment in 2017.

indicating weak invariance) and item intercepts (i.e., indicating strong invariance) across time points.

The longitudinal associations between PSE and loneliness were examined with dual change score models (McArdle 2009; see Figure 2). In these models, measurements at two time points are separated in a baseline score at T1 (here 2014) and a difference score from T1 to T2 (here from 2014 to 2017). The differentiation and the inclusion of an additional autoregressive parameter controlled for unobserved heterogeneity to some degree. Moreover, it allowed us to examine whether or not a

baseline score at T1 in one variable was predictive of difference between T1 and T2 in another variable. A significant relationship between these two scores provides some evidence that one construct (e.g., loneliness) is the driver of change in the other (e.g., PSE). Testing of hypotheses was done using preplanned chi-square model contrasts.

PSE and Loneliness Are Distinct but Highly Related

A single-factor model that combined all three parcels of the loneliness scale and all four items of the PSE scale into a single factor provided a bad model fit (chi-square [χ^2] = 3,547.00, degrees of freedom [df] = 14; CFI = 0.79; RMSEA = 0.24). The model fit of a two-factor solution estimating one factor for loneliness and another for PSE was significantly better ($\Delta\chi^2 = 3,413.84$, $df = 1$; $p < 0.01$) and provided a very satisfactory fit ($\chi^2 = 133.16$, $df = 13$; CFI = 0.99; RMSEA = 0.05). The correlation between the latent loneliness factor and the latent PSE factor was rather high ($r = 0.56$, $SE_r = 0.01$, $p < 0.01$). Thus, the confirmatory factor analysis provides evidence for Hypothesis 1: PSE and loneliness are distinct but related constructs.

Differential Associations of Risk Factors

The examination of the differential associations of risk factors with loneliness and PSE followed the conceptual model introduced in the Current Study section. All models included the sociodemographic variables (age, gender, place of living) as well as health variables (self-rated, functional, and physical health). In the following, variables indicating socioeconomic factors (model 1), participation opportunities (model 2), network structure (model 3), network function (model 4), and finally network quality (model 5) were successively added (see Table 1). At first the associations of every predictor with loneliness and PSE were constrained to be of equal strength. A significant difference between the equal strength model and a null model (i.e., both pathways set to zero) indicated that the particular risk factor under observation was significantly associated with the constructs. In a second modeling step, the two associations of the predictor and the two constructs were freely estimated. If freeing the two parameters increased the model fit significantly, it was indicated that the predictor was more strongly associated with one construct (e.g., loneliness) than the other (e.g., PSE).

Covariates. Gender was differentially related to loneliness and PSE ($\Delta\chi^2 = 33.19$, $\Delta df = 1$; $p < 0.01$). Specifically, gender was significantly related to loneliness (i.e., men scored higher on average than women) but not to PSE (i.e., no gender differences). *Place of living* was differentially related to loneliness and PSE ($\Delta\chi^2 = 36.68$, $\Delta df = 1$; $p < 0.01$). People living in the former East of Germany scored higher on PSE and lower on loneliness than people living in the former West. *Age* was differentially related to loneliness and PSE ($\Delta\chi^2 = 41.73$, $\Delta df = 1$; $p < 0.01$). The older people were, the lower they scored on loneliness and the higher they scored on PSE. *Subjective health* predicted loneliness and PSE significantly but not differentially ($\Delta\chi^2 = 303.37$, $\Delta df = 1$; $p < 0.01$). This implied that low subjective health was equally associated with high levels of loneliness and high levels of

Table 1: Regression weights linking risk factors to PSE and loneliness in five successive models

	Model 1				Model 2			
	PSE		Loneliness		PSE		Loneliness	
	b	β	b	β	b	β	b	β
Socioeconomic factors								
Education	-0.44*	-0.03*	0.13	0.01	-0.11	-0.01	0.51 [†]	0.04 [†]
Poverty	3.09 [†]	0.12 [†]	1.93 [†]	0.08 [†]	2.63 [†]	0.11 [†]	1.45 [†]	0.06 [†]
Income	-0.05 [†]	-0.06 [†]	-0.05 [†]	-0.06 [†]	-0.05 [†]	-0.06 [†]	-0.05 [†]	-0.06 [†]
Occupational prestige	-0.06 [†]	-0.07 [†]	-0.06 [†]	-0.07 [†]	-0.04 [†]	-0.05 [†]	-0.04 [†]	-0.05 [†]
Participation opportunities								
Retired					∅	∅	∅	∅
Unemployed					∅	∅	∅	∅
Membership					-0.03 [†]	-0.04 [†]	-0.03 [†]	-0.04 [†]
Volunteering					-0.44	-0.02	-0.44	-0.02
Social activities					-0.07 [†]	-0.08 [†]	-0.11 [†]	-0.13 [†]
Network structure								
Partner								
Child								
Network size								
Network function								
Emotional support								
Informational support								
Network quality								
Partnership satisfaction								
Satisfaction with family								
Satisfaction with friends								

	Model 3				Model 4			
	PSE		Loneliness		PSE		Loneliness	
	b	β	b	β	b	β	b	β
Socioeconomic factors								
Education	-0.16	-0.01	0.50 [†]	0.04 [†]	-0.18	-0.01	0.56 [†]	0.04 [†]
Poverty	2.57 [†]	0.10 [†]	1.18 [†]	0.05 [†]	2.57 [†]	0.10 [†]	1.07 [†]	0.05 [†]
Income	-0.05 [†]	-0.06 [†]	-0.05 [†]	-0.06 [†]	-0.04 [†]	-0.05 [†]	-0.04 [†]	-0.05 [†]
Occupational prestige	-0.04 [†]	-0.04 [†]	-0.04 [†]	-0.04 [†]	-0.03 [†]	-0.04 [†]	-0.03 [†]	-0.04 [†]
Participation opportunities								
Retired	∅	∅	∅	∅	∅	∅	∅	∅
Unemployed	∅	∅	∅	∅	∅	∅	∅	∅
Membership	-0.03 [†]	-0.04 [†]	-0.03 [†]	-0.04 [†]	-0.03 [†]	-0.03 [†]	-0.03 [†]	-0.03 [†]
Volunteering	-0.49*	-0.02*	-0.49*	-0.03*	-0.52*	-0.03*	-0.52*	-0.03*
Social activities	-0.06 [†]	-0.07 [†]	-0.08 [†]	-0.09 [†]	-0.06 [†]	-0.07 [†]	-0.07 [†]	-0.08 [†]
Network structure								
Partner	-0.61 [†]	-0.4 [†]	-1.40 [†]	-0.08 [†]	-0.59 [†]	-0.03 [†]	-1.28 [†]	-0.08 [†]
Child	∅	∅	∅	∅	∅	∅	∅	∅
Network size	∅	∅	-0.09 [†]	-0.11 [†]	∅	∅	-0.05 [†]	-0.06 [†]
Network function								
Emotional support					-0.04 [†]	-0.05 [†]	-0.09 [†]	-0.11 [†]
Informational support					∅	∅	-0.04 [†]	-0.05 [†]
Network quality								
Partnership satisfaction								
Satisfaction with family								
Satisfaction with friends								

Notes: † $p < 0.05$; * $p < 0.10$. ∅ = set to zero in the analysis. Single-parameter p value estimation used the Wald test. In all models, gender, place of living, age, and subjective, functional, and physical health are included as covariates.

Table 1 continued: Model 5

	Model 5			
	PSE		Loneliness	
	b	β	b	β
Socioeconomic factors				
Education	-0.30	-0.02	0.50 [†]	0.04 [†]
Poverty	2.56 [†]	0.10 [†]	0.91 [†]	-0.05 [†]
Income	-0.04 [†]	-0.04 [†]	-0.04 [†]	-0.05 [†]
Occupational prestige	-0.02	-0.02	-0.02	-0.02
Participation opportunities				
Retired	∅	∅	∅	∅
Unemployed	∅	∅	∅	∅
Membership	-0.03 [†]	-0.03 [†]	-0.03 [†]	-0.03 [†]
Volunteering	-0.26	-0.01	-0.26	-0.01
Social activities	-0.05 [†]	-0.05 [†]	-0.03 [†]	-0.04 [†]
Network structure				
Partner	-0.84 [†]	-0.05 [†]	-1.79 [†]	-0.11 [†]
Child	∅	∅	∅	∅
Network size	∅	∅	-0.04 [†]	-0.05 [†]
Network function				
Emotional support	-0.02 [*]	-0.03 [*]	-0.07 [†]	-0.08 [†]
Informational support	∅	∅	-0.03 [†]	-0.03 [†]
Network quality				
Partnership satisfaction	-0.07 [†]	-0.09 [†]	-0.16 [†]	-0.20 [†]
Satisfaction with family	-0.06 [†]	-0.07 [†]	-0.14 [†]	-0.17 [†]
Satisfaction with friends	-0.11 [†]	-0.13 [†]	-0.17 [†]	-0.21 [†]

Notes: † $p < 0.05$; * $p < 0.10$. ∅ = set to zero in the analysis. Single-parameter p value estimation used the Wald test. In all models, gender, place of living, age, and subjective, functional, and physical health are included as covariates.

PSE. The same result was obtained with respect to *physical health* ($\Delta\chi^2 = 93.36$, $\Delta df = 1$; $p < 0.01$). Physical health was not more strongly related to loneliness than to PSE. Functional health, however, was only related to PSE but not to loneliness ($\Delta\chi^2 = 22.30$, $\Delta df = 1$; $p < 0.01$).

Socioeconomic factors. Education, poverty, income, and occupational prestige were significantly associated with loneliness as well as PSE (i.e., all p values smaller than 0.01). Education and poverty were more strongly related to PSE than loneliness (education: $\Delta\chi^2 = 9.43$, $\Delta df = 1$; $p < 0.01$; poverty: $\Delta\chi^2 = 6.85$, $\Delta df = 1$; $p < 0.01$). Income and occupational prestige, however, were not differentially related to loneliness and PSE, meaning that they predicted PSE and loneliness equally well (income: $\Delta\chi^2 = 0.68$, $\Delta df = 1$; $p > 0.10$; occupational prestige: $\Delta\chi^2 = 0.73$, $\Delta df = 1$; $p > 0.10$). Thus, Hypothesis 2a, which predicted stronger associations of socioeconomic disadvantages with PSE than with loneliness, was only partially confirmed.

Participation opportunities. After controlling for the sociodemographic background, health, and socioeconomic factors, neither being unemployed nor being retired was significantly related to loneliness and PSE (i.e., all p values larger than 0.10). The inclusion of membership led to a significant increase in model fit ($\Delta\chi^2 = 33.98$, $\Delta df = 1$; $p < 0.01$). However, the associations between membership and loneliness and between membership and PSE were of comparable strength ($\Delta\chi^2 = 1.59$, $\Delta df = 1$; $p > 0.10$). Volunteering was associated with loneliness and PSE ($\Delta\chi^2 = 33.98$, $\Delta df = 1$; $p < 0.05$). However, the associations between vol-

unteering and loneliness and between volunteering and PSE were of comparable strength ($\Delta\chi^2 = 2.22$, $\Delta df = 1$; $p > 0.10$). *Social activities* were significantly related to loneliness and PSE ($\Delta\chi^2 = 37.61$, $\Delta df = 1$; $p < 0.01$), and the association was stronger with loneliness than with PSE ($\Delta\chi^2 = 5.66$, $\Delta df = 1$; $p < 0.05$). Thus, Hypothesis 2b, which predicted a stronger association of participation opportunities with PSE than with loneliness, could not be confirmed.

Network structure. Having a *partner* was associated with less loneliness and less PSE ($\Delta\chi^2 = 19.41$, $\Delta df = 1$; $p < 0.001$); the association with loneliness was stronger than with PSE ($\Delta\chi^2 = 8.55$, $\Delta df = 1$; $p < 0.01$). The existence of a child was neither overall nor differentially related to loneliness and PSE (both p values larger than 0.10). *Network size* was only significantly associated with loneliness but not with PSE (differential effect: $\Delta\chi^2 = 27.42$, $\Delta df = 1$; $p < 0.01$). The results provided evidence supporting Hypothesis 2c stating that network variables are more closely associated with loneliness than with PSE.

Network function. High levels of *emotional support* were associated with less loneliness and less PSE ($\Delta\chi^2 = 140.68$, $\Delta df = 1$; $p < 0.001$), and the association with loneliness was stronger than with PSE ($\Delta\chi^2 = 21.98$, $\Delta df = 1$; $p < 0.001$). *Informational support* was only significantly associated with loneliness but not with PSE (differential effect: $\Delta\chi^2 = 6.86$, $\Delta df = 1$; $p < 0.01$). The results provided further evidence supporting Hypothesis 2c.

Network quality. *Partnership satisfaction*, *satisfaction with family*, and *satisfaction with friends* were related to loneliness and PSE (partnership satisfaction: $\Delta\chi^2 = 158.83$, $\Delta df = 1$; $p < 0.01$; satisfaction with family: $\Delta\chi^2 = 139.69$, $\Delta df = 1$; $p < 0.01$; satisfaction with friends: $\Delta\chi^2 = 168.89$, $\Delta df = 1$; $p < 0.01$). Moreover, high levels of relationship quality were more strongly linked to loneliness than to PSE (partnership satisfaction: $\Delta\chi^2 = 48.71$, $\Delta df = 1$; $p < 0.01$; satisfaction with family: $\Delta\chi^2 = 46.11$, $\Delta df = 1$; $p < 0.001$; satisfaction with friends: $\Delta\chi^2 = 15.19$, $\Delta df = 1$; $p < 0.01$). Thus, Hypothesis 2c was confirmed for all three dimensions of network variables: structure, function, and quality.

The parameter estimates for the unstandardized and standardized regression weights for each successive model are reported in Table 1. Before controlling for underlying risk factors, the latent correlation between PSE and loneliness was $r = 0.56$. After controlling for 22 potential risk factors, the correlation between loneliness and PSE remained substantial but was reduced ($r = 0.43$, $SE_r = 0.02$, $p < 0.01$). In other words, approximately 41 percent of the variance shared between loneliness and PSE was also shared with underlying risk factors.

A Vicious Circle between Perceived Social Exclusion and Loneliness?

We estimated a two-variate dual change score model linking PSE and loneliness (see Figure 2). PSE and loneliness were estimated as latent factors. Both factors showed strong measurement invariance over time. In both models, PSE, loneliness and social participation were controlled for sociodemographic, health, and socioeconomic variables, as well as for changes in health and socioeconomic variables. The model provided a very satisfactory fit ($\chi^2 = 1,542.70$, $df = 275$; CFI = 0.96; RMSEA = 0.03). Initial levels of PSE and loneliness were highly correlated ($r = 0.53$;

$\Delta\chi^2 = 981.89$, $\Delta df = 1$; $p < 0.001$). Similarly, changes in PSE and loneliness showed a significant correlation ($r = 0.43$; $\Delta\chi^2 = 169.58$, $\Delta df = 1$; $p < 0.01$). That is, increases in PSE across three years were associated with increases in loneliness over the same time span. High initial levels of PSE were not predictive of changes in loneliness ($\beta = -0.01$; $\Delta\chi^2 = 0.12$, $\Delta df = 1$; $p > 0.10$). Thus, Hypothesis 3b was not supported. However, higher levels of loneliness predicted changes in PSE ($\beta = 0.18$; $\Delta\chi^2 = 39.68$, $\Delta df = 1$; $p < 0.001$). Adults with high levels of loneliness were more likely to feel more excluded after three years than people experiencing low levels of loneliness. Hypothesis 3a was supported.

Discussion

Summary of Findings

Both perceived social exclusion and loneliness were expected to represent subjective experiences stemming from a lack of satisfying the basic human need of belonging (Baumeister and Leary 1995; Lin et al. 1999), albeit at different levels of the social structure. Loneliness is assumed to arise if the individual's social networks are deficient in some way (i.e., structurally, functionally, or qualitatively) and hence refers to subjective experience of micro- or meso-level social integration. In contrast, PSE describes the individual's perception of not being part of the larger society and is most likely based on the subjective feeling of not being in tune with macro-level normative expectations (Sealey 2015). Accordingly, the current study expected to find evidence that PSE and loneliness are distinct but related constructs, a hypothesis that was supported by the confirmatory factor analysis (Hypothesis 1). The best fitting solution favored two factors, one for PSE and another for loneliness, that were rather highly correlated ($r = 0.56$).

The path analysis confirmed that PSE and loneliness share common risk factors although to different degrees. As expected, socioeconomic factors were overall more strongly related to PSE than to loneliness. In contrast, network structure, function, and quality were more strongly associated with loneliness than with PSE, as these are mostly interpersonal in nature rather than located at the societal level. In contrast to our expectations, indicators of social participation were as strongly linked to PSE as to loneliness, as these can both facilitate social integration interpersonally and give a sense of belonging to the broader society. Social activities were even more strongly related to loneliness than to PSE, indicating that it is less the personal contact that provides benefits for PSE but more the institutionalized nature of group memberships and volunteering arrangements.

Finally, dual change score models were used to determine whether initial levels of loneliness and PSE were related to changes over a three-year time period in loneliness and PSE. Initial levels of loneliness predicted PSE three years later, but the reverse was not the case. Therefore, it seems that perceived inadequacies in interpersonal relations may induce a feeling of not being part of society more than vice versa. This aligns with the idea that people experience belonging to society partly through their integration in interpersonal social relationships, as suggested,

for example, by Abrutyn (2019). Not being successful in personal social interactions may give people the sense that they are not a worthy member of society (Sen 2000).

In the following sections we further discuss our findings with a focus on (1) the role of socioeconomic risk factors, (2) social relationships as drivers of PSE, and (3) the question of why PSE does not predict changes in loneliness.

The Role of Socioeconomic Risk Factors

The results showed that loneliness and social exclusion share similar risk factors, but not all factors are equally important to both. When it comes to socioeconomic factors, the results confirmed that having higher education lowers the risk of PSE and loneliness and that poverty increases this risk, with a larger effect on PSE than on loneliness. This larger effect with respect to PSE rather than to loneliness could be expected, as socioeconomic factors indicate the (relative) position of an individual in the distribution of economic resources (e.g., money, assets) in a given society (Brady 2003). A more surprising finding was that high occupational prestige and income both lower the risks of becoming lonely and not feeling part of the society to similar degrees. One may speculate that having more prestige or higher income are not merely indicators of socioeconomic standing, but they also might serve to raise people's attractiveness in interpersonal social relations, as people with higher prestige and income might be seen as more desirable for social interactions (Lin 1999). The positive impact of higher socioeconomic standing on perceived attractiveness is widely known from studies on partner selection (Ha et al. 2012). It seems that this prestige-attractiveness effect also applies in a broader social sense, making people with more prestige more successful in obtaining satisfying social relationships, including friendships (Sprecher and Regan 2002). People in higher socioeconomic positions will, therefore, be more able to amass social capital than people with lower socioeconomic statuses (Lin 1999), which may in turn cumulatively widen existing social inequalities over the life course.

Social Relationships as Drivers of PSE

In most empirical and theoretical works on social exclusion, classical indicators of social inequality such as wealth, income, education, and access to the labor market play the most prominent role in the discussion as explanatory mechanisms (e.g., Bailey et al. 2017; Brady 2003; Sen 2000; Silver 1994). In contrast, deficient social relationships have mostly been seen as an aspect of or even a consequence of social exclusion (e.g., Silver 1994; Walsh et al. 2017). Here, we aimed to disentangle loneliness, social network variables, and perceived social exclusion explicitly in order to provide more conceptual clarity and to explore potential dynamic interactions. Our study provides evidence suggesting that social relationships may be more relevant to the experience of not being part of society than previously theorized. As network variables are proximate explanations of loneliness, the substantial impact of these social network variables on loneliness is par for the course. However, the effects of network structure, function, and quality on PSE show that, indeed, a part of people's views on their belonging to society as a whole stem from their integration in interpersonal networks. One result of this study is of particular interest in

this regard: low partnership quality and low satisfaction with family as well as friendship relationships were associated with a higher likelihood of feeling socially excluded even after controlling for health, different dimensions of socioeconomic status, social participation opportunities, network structure, and function.

At the same time, no effect of having children on loneliness or PSE was found. A plausible explanation for this finding is that ties between parents and children are relatively often characterized by ambivalence: the simultaneous experience of both positive (i.e., love, affection, and closeness) and negative emotions (i.e., worry or anger) about the relationship (Birditt et al. 2009). Having such contradictory emotions might undermine the potentially protective effect of having a parent–child relationship on loneliness and PSE.

Moreover, the results suggest further that experiences of loneliness may be an important pathway of how people develop the feeling of not being part of the society. First, loneliness and PSE shared significant common variance even after controlling for a host of 22 shared risk factors and associated covariates (e.g., self-rated, functional, and physical health), which strongly hints at an underlying substantial reason for their interrelatedness. Second, the dual change score analysis showed that initial levels of loneliness were related to changes in PSE. So, initial levels of loneliness predicted PSE three years later, but the reverse was not true. Therefore, it seems that perceived inadequacies in interpersonal relations induce a feeling of not belonging to society. This finding is in line with the idea that people receive cues about their value in society through their interpersonal relationships (Abrutyn 2019). If people feel as if they are not valued by their more immediate network members, this is likely to be reflected in their self-esteem and their perceptions of their social attractiveness (Hawkley and Cacioppo 2010). Our findings suggest that these feelings in turn may lead lonely people to believe that they are unable to contribute in the context of social activities and are not part of the society as a whole.

Why Does PSE Not Predict Changes in Loneliness?

In contrast to Hypothesis 3b, initial levels of PSE did not predict changes in loneliness. However, our dual change score analyses indicated that changes in PSE and changes in loneliness were correlated ($r = 0.43$) even after controlling for initial levels of loneliness and PSE. One may speculate that this association between changes in both constructs could be caused by different mechanisms that operate on different time scales.

In fact, the effects of perceived deficiencies in social relationships (e.g., loneliness or a low relationship quality) on PSE could be rather fast-acting. Experimental studies have, for example, repeatedly demonstrated that experiences of social rejections have rather immediate consequences on the individual's sense of belongingness and self-esteem (Williams 2007). These losses may in turn lead to an immediate reevaluation of one's standing in society. In contrast, the effects of PSE on loneliness could be more indirect and slow-acting. As explained in the introduction, social exclusion describes a dynamic process that can form vicious cycles across different spheres of life, resulting in cumulative disadvantages over the life course

(Dannefer 2020; Sealey 2015). This notion implies that social exclusion may affect social participation in the long term by progressively decreasing the individual's capabilities for social engagement (Sen 2000) and by imposing structural constraints on the individual's social network (Lin 2000). Moreover, the individual's perception of being excluded from society (i.e., PSE) may actually prevent individuals from using even those opportunities for social participation that are available to them (Hommerich 2015). In light of this consideration, one may speculate that critical life events that trigger feelings of social exclusion, such as becoming unemployed, may not immediately deteriorate social activities but may hamper the participation in future social events. In the long term, this withdrawal from social activities may induce feelings of loneliness. Thus, it could be that high levels of PSE do lead to increased levels of loneliness but that our three-year time interval was too short to observe this directional influence.

Limitations

There are some limitations of this study that need to be considered. First of all, in particular the findings with respect to the differential associations of risk factors with PSE and loneliness could be specific to the Western industrialized nations because they are influenced by societal norms that differ across countries. Secondly, the associations between the construct under study may also differ across birth cohorts. For example, it has been argued that the increasing individualization in Western nations may have been accompanied by a diminished importance of traditional forms of social integration (Howard 2007). Thus, certain factors such as group memberships might be more important for the social integration of earlier-born cohorts than of later-born cohorts. Moreover, our data set contained information about individuals 40 to 85 years of age who were observed over three years. Thus, further empirical analyses are required that are able to contrast the dynamics between social exclusion and loneliness across different phases of the life course. Overall, the current study is an important step toward a greater understanding of the dynamics of social integration. However, future studies need to differentiate further between different sociocultural contexts.

Conclusion

The present study is a step forward in our understanding of how the concepts of loneliness and perceived social exclusion relate to each other, what risk factors underlie them, and whether there is a vicious cycle between these different levels of not belonging. Specifically, our results suggest that people derive cues about their worth in society from their immediate social relationships, as feelings of loneliness drive changes in PSE three years later. Also, it seems that loneliness and PSE share a common denominator given their substantial correlation even after controlling for all kinds of risk factors, as both represent a shortcoming in having one's social needs at different levels met in a satisfactory way. But that does not imply that loneliness should be considered as part of social exclusion as done in previous research. To gain more conceptual clarity, our results show that they are best treated as distinct but related concepts. Our findings suggest that relieving loneliness can

be a way to counter perceived social exclusion among those who are vulnerable to it. However, future studies need to shed more light on the long-term processes that link perceived social exclusion and loneliness in particular to explore long-term impacts of perceived social exclusion.

Given the ongoing technological, demographical, and economical changes and the impact of the COVID-19 pandemic on social relationships, the importance of increasing the scientific understanding of these dynamics cannot be underestimated. The COVID-19 crisis has led to a surge of loneliness rates in many countries around the world (e.g., van Tilburg et al. 2020). Our results may indicate that these rising levels of loneliness could be one cause of a failing social solidarity. In this context, Durkheim's classical concept of anomie may provide the crucial theoretical link for integrating societal changes and the individual's perceived position in this changing society with the impact of this perception on social behavior.

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Oliver Huxhold: German Centre of Gerontology, Berlin, Germany.

E-mail: oliver.huxhold@dza.de.

Bianca Suanet: Faculty of Social Sciences, Sociology, Vrije Universiteit Amsterdam, Netherlands. E-mail: b.a.suanet@vu.nl.

Martin Wetzel: Department of Sociology, Martin-Luther-Universität, Halle-Wittenberg, Germany. E-mail: martin.wetzel@soziologie.uni-halle.de