

CHILDHOOD AND ADULT LIFE

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Is There an Association Between Childhood Conditions and Exclusion from Social Relations in Later Life?

Abstract: This study aims to explore the effects of childhood circumstances and conditions on the risk of exclusion from social relations in old age, using a life-course perspective and examining gender influence. Secondary analysis of SHARE. Weak and inconsistent consequences of the primary socialization context were found, however, in many cases, the expected effect is missing or contradictory. No impacts on the structure of the family of origin were found. For men, we often found a small, but significant effect of physical aspects of childhood living. For women, the cultural capital of family of origin and the quality of relations with parents seem to have a greater effect. Findings suggest that life-long resilience factors play an important role in the process of counterbalancing childhood living conditions. Early socialization consequences will not necessarily lead to ESR at old age.

Keywords: gender, older adults, SHARE, exclusion from social relations

Introduction

Social exclusion, defined as the process in which people are, or become separated from mainstream society (Moffatt and Glasgow 2009; Walsh, Scharf and Keating 2017), is a concept increasingly used in academic and policymaking areas to study and improve the quality of life for (ageing) individuals and societies (Scharf and Keating 2012). Although the primary focus has been on poverty and material deprivation, over recent decades, growing attention has been paid to the multidimensional nature of social exclusion and deprivations in areas such as basic services and amenities, civic activities, mobility, and social relations (Walsh et al. 2017).

This latter dimension is the focus of the present study, whose main research question focuses on exploring the relationship between exclusion from social relationships in older age and childhood living conditions. It, therefore, asks whether the conditions in early life,

which in many ways are considered a determinant of later life chances, can still influence the situation in old age after several decades of life, across the span of the life course.

Exclusion from social relations (ESR) has increasingly become a major public health concern and a social policy priority (Holt-Lunstad 2017). The vast literature shows important adverse impacts of social isolation and loneliness on older adults' mortality risk (Holt-Lunstad *et al.* 2015), health conditions (Tomaka, Thompson and Palacios 2006), cognitive function (Shankar *et al.* 2013), life satisfaction (Bai, Yang and Knapp 2018) and self-esteem (Masi *et al.* 2011). This means that older adults have a high risk of ESR.

However, most studies on social relations in later life have been designed in a cross-sectional way, using just older samples (e.g. Cornwell and Waite 2009) or comparing samples from different ages (and generations) at a single time (e.g. Child and Lawton 2019). The lack of longitudinal or retrospective analysis prevents the adoption of a life-course perspective (Dewilde 2003; Elder, Johnson and Crosnoe 2003), by which ESR is rooted in conditions and events in earlier life stages and engendered by the accumulation of (dis)advantages throughout life which reinforce inequalities in old age (Dannefer 2003; Ferraro and Shippee 2009). Although many studies deal with ESR or its aspects longitudinally (Dykstra, Van Tilburg and Gierveld 2005; Victor and Bowling 2012), helping to shed light on life-course issues, they generally do not include early life stages, where experiences could impact the way people construct their social relations during the rest of their lives (Bourdieu 1977; Dannefer 2003), including later life.

Besides, this impact could be influenced by many factors, among which gender could be particularly important since childhood experiences and expectations concerning social relations have traditionally been quite different for boys and girls (e.g. Koenig 2018; Rose and Rudolph 2006), particularly in the generations currently entering old age.

This study aims to fill these gaps by trying to ascertain how ERS in later life is affected by childhood conditions and to what extent gender may moderate such impacts. Being aware of the immense number of influences and the accumulation of their effects that occur throughout life, we focused on only two time points in childhood and at the current old age. We are interested in the effects of childhood conditions on ESR in old age.

The definition of ESR

In the ageing literature, two concepts have been widely used to study social connection deficits in later life: social isolation and loneliness (De Jong Gierveld, van Tilburg and Dykstra 2016). While social isolation refers to an objective situation in which the person has few social ties on which he/she can rely for practical and emotional support and is reflected in reduced social networks, loneliness refers to the subjective assessment of social deficit. Loneliness is an unpleasant or unacceptable feeling that arises when, regardless of their objective aspects, a person would like to have more and/or better social relations than the ones they have (Perlman and Peplau 1982).

ESR is a concept that tries to connect objective and subjective qualities of social connectivity, i.e. such experiences of lack of social contact with other forms of exclusion, which is a fundamentally multidimensional concept that goes beyond deficits in financial or material resources. Like other forms of social exclusion, ESR tries to do so by adding

more complexity to the study of social relations. Thus, interpersonal connections have a diverse degree of closeness (from intimate relations to other more superficial ones), functions (e.g. emotional support, instrumental help) and structural characteristics (size, composition, frequency of contact) that are enacted in different ‘spheres of sociability,’ including the household, social networks and participation in the wider society (Gallie, Paugam and Jacobs 2003).

ESR is thus conceptualized as an intrinsically multidimensional concept including micro-and macro-level domains of sociability, enabling the study of reciprocal relations between the situation of the individuals and the societal opportunities in which they are embedded, including a certain context of public policies and cultural factors (Huisman and Van Tilburg 2021). Recognizing that various domains of ESR may have unique predictors and consequences may allow for more nuanced explorations and interventions regarding social ties and connectivity. Unlike loneliness, ESR can be measured using objective measures, and the feeling of being lonely might be understood as an outcome produced by a situation in which the person is excluded, totally or in some specific dimension, from social relations. So, according to Aartsen et al. (2021: 6), ESR can be defined as “a situation in which people are socially and emotionally disconnected from adequate levels of intimate relationships, social networks, social support, and/or social opportunities.”

ESR in a life course perspective and the impacts of childhood

ESR is conditioned by cultural and time aspects. Norms, values, and policies influence ESR and help to create differences between societies and generations in this aspect (Dewilde 2003; Elder 1994). Besides, ERS seems to be constructed across the life course, normative and non-normative transitions and life events people experience from early stages could influence the extent of their levels of ERS in subsequent periods of life (Buecker et al. 2020). In this sense, ESR in later life could be, at least partially, the result of experiences accumulated throughout life. For instance, it is well-known that transitions such as retirement (Shin et al. 2020), widowhood (Štípková 2021) or the presence of certain health conditions (Hajek and König 2020) or mobility problems (Hilberink, van der Slot and Klem 2017) can disrupt social ties and reduce the quantity and quality of contacts in later life. The effect of those transitions may also be indirect since many of them imply a reduction of resources (e.g. material, financial), which in turn may negatively affect social relations. On the other hand, resilience could decrease or obviate the negative consequences of life transitions and events and contribute to overcoming adverse or traumatic events (Lakomý and Petrová Kafková 2017; Shmotkin et al. 2011; Shrira et al. 2010; Walter-Ginzburg et al. 2005).

From a life-course perspective, the impact of early-life opportunities and conditions on late-life social exclusion could follow at least two pathways (Dahlberg 2020; Miller, Chen and Parker 2011; Umberson et al. 2014). Firstly, adversity in childhood could initiate a long chain of detrimental conditions lasting and extending to subsequent life stages, producing a cumulative disadvantage over time (Ejlskov et al. 2020). Secondly, childhood could be a particularly sensitive period of life, in which exposure to adversity could have profound and prolonged effects on personality development, lifestyles, and social relations (Bourdieu 1977; Ermisch and Francesconi 2001; Kamiya et al. 2014; Wilson et al. 2006).

Empirically, it is well-known that health is strongly influenced by conditions during childhood (Aartsen et al. 2019). Similarly, knowledge of the long-term negative effects of risk factors at birth (e.g. low birth weight) is robust (Almond et al. 2018). According to Van der Linden et al. (2020), it can be stated that the worse the conditions in childhood (the more disadvantaged respondents in terms of childhood misfortune and adult-life socioeconomic conditions), the worse the health status respondents also report in old age. Beyond its influence on health, there is some evidence confirming that deprived conditions in childhood have negative effects on the quality of life in old age, also due to negative effects on the labour market position in adulthood (Wahrendorf and Blane 2015). However, the long-term impacts vary considerably between countries, at least in the case of the socio-economic situation of the family during childhood (Mazzonna 2014). According to Peruzzi (2015), the riskiest conditions in childhood leading potentially to social exclusion in old age are institutional care at an early age and birth by a single mother. On the positive side, education is a markedly protective feature (Peruzzi 2015), but this is greatly influenced by childhood conditions (Kendig et al. 2016; Wahrendorf and Blane 2015). In general, the cultural capital of the family of origin seems to have a strong impact on the quality of life in later years (Ajrouch, Blandon and Antonucci 2005).

However, other authors point out persuasively that there is no straightforward relation between childhood disadvantage and social exclusion in old age, as many personal and structural factors intervene in this relation (Falkingham et al. 2020; Ferraro and Shippee 2009). Inequalities in childhood affect how individuals and groups are exposed later in life to the risk factors that condition social exclusion. At the same time, it is important to realize that the disadvantages and advantages of childhood do not simply work in the opposite direction. The effects of advantages are not reversible to the effects of disadvantages. According to Vanhoutte and Nazroo (2016), the socio-economic status of parents has little effect on well-being in old age, the extent of this influence is culturally conditioned, and the authors have found greater influence in the United States than in the United Kingdom.

Although still scarcer than those taking health, quality of life or well-being as outcome variables, the long-term impact of childhood conditions on social relations has recently begun to be studied. Some studies, both using quantitative (e.g. Kamiya et al. 2014; Savikko et al. 2006) or qualitative (e.g. Merz and Gierveld 2014; Tiilikainen and Seppänen 2017) approaches, have focused on loneliness, finding that adverse childhood socioeconomic status or life events predict loneliness in later life. Other studies demonstrate the negative effect of traumatic events, including childhood abuse, on the closeness of social relations (Savla et al. 2013) and the tendency towards lower social engagement (Wilson et al. 2006) in later life.

Furthermore, Ferraro and Shippee (2009) showed how experiencing childhood deprivation, or poverty has a detrimental impact on the quality of social networks in later life (Ferraro and Shippee 2009). Similarly, Ejlskov et al. (2020), in their study of the risk of loneliness in old age based on data from the United Kingdom environment, showed that the earlier the experience with social relations adversities, the stronger the effects on both loneliness and social isolation in old age. However, such relations seem not to be straightforward since they further state there were only weak relations between the quality of social relations at the age of 68 years and problematic social relations in childhood and middle age.

Our understanding of the relations between experienced conditions in early stages and social connections in later life would benefit from taking into account the multidomain approach that characterizes ESR, as well as from including factors that could mediate such potential relations. One of them is gender since it is one of the more powerful predictive variables and an organizing factor of social relations throughout the life span.

The gendered construction of ESR

Gender plays a crucial role in the formation and maintenance of social relations over the life course, and gender differences in social relations among older adults seem to be marked and universal in the European context (Ajrouch et al. 2005). Women tend to have wider, more supportive, and broader non-family social networks (Liebler and Sandefur 2002) and also with more members that they consider very close (Antonucci, Akiyama and Lansford 1998). Women are typically those who are more actively involved in maintaining social ties and, for example, have more frequent contact with their adult children (Greenwell and Bengtson 1997). In their analysis of social network changes with age based on SHARE data, Schwartz and Litwin (2018) found that old men and women did not differ in the number of contacts they lost. What makes them different, however, is the number of new contacts, where women have a greater increase in close ties, not necessarily new contacts, but also the strengthening of the importance of hitherto more distant relations. For example, to include important friends in their closest contacts. For women, social networks increased overall with age, and the number of non-family relations increased.

However, qualitative studies show that loneliness itself could be reported by women significantly more often because men perceive loneliness as disrupting their masculine identity (Ratcliffe, Wigfield and Alden 2019). The cultural picture of loneliness in old age usually depicts a widow, i.e. a woman, because their experience with widowhood is significantly more frequent. In English, it is even one of the few words whose basis refers to the feminine rather than the masculine case (Hoonard 2009). Likewise, ageing itself is a challenge to masculine identity. In situations where the couple ages together, they tend to take care of each other, and male activities move from the workplace and community home towards the family and marital relationship (Jackson 2016).

From the above, it is clear that gender plays a crucial role in the configuration of social relations throughout the life course and thus in the risk of late-life ESR. Such gendered construction of social relations may influence the exposure and vulnerability to childhood adversity and its effects on late-life ESR. For instance, childhood expectations concerning social relations have traditionally been quite different for boys and girls (e.g. Rose and Rudolph 2006). While cooperation or emotionality are expected for women, culturally gendered expressions of masculinity stress autonomy, independence and control of emotions (e.g. Connell and Messerschmidt 2005), which could make it more difficult to have intimate relationships and availability of people who they can trust and seek emotional support (Rosenfield, Lennon and White 2005; Taylor et al. 2000), particularly in the case of adversity experienced in early stages of life (Umberson et al. 2014). In contrast, other evidence suggests that women are more sensitive to disadvantages in childhood than men, at least in the field of mental health (Falkingham et al. 2020). The impact of gender on the

long-term effect of childhood conditions in later life, and particularly on ESR in later life, is still an issue in need of further research.

To fill this gap, we explore the impact of childhood conditions for late-life ESR among men and women separately, using the SHARE data for 15 European countries and Israel. More precisely, we monitor how social networks in old age (age 60+) are affected by specific conditions in childhood and which factors in childhood play the most critical role. Our research question is as follows: How have the living conditions of men and women in childhood contributed to exclusion from social relations in their old age in European countries?

Methods

Our data are derived from the Survey of Health, Ageing and Retirement in Europe (SHARE) (Börsch-Supan et al. 2013).¹ Although we do not use the longitudinal dimension of the data (we are not looking for a change between waves), thanks to the panel design of this survey, we can merge the necessary information from different waves of SHARE, when the questions indicating the concepts of our interest were asked (to reduce the proportion of missing data). In particular, we used the data from the sixth wave (the year 2015) to indicate the exclusion from social relations (ESR) and the data from the seventh (the year 2017) or third (the year 2009) wave to gather information on the childhood living conditions of the respondent. We only included countries that participated in two of these three rounds, resulting in the inclusion of sixteen of the twenty-seven countries participating in the SHARE project². We also excluded the individuals with a baseline age lower than sixty as our focus is on later life. As a result, we obtained a dataset of size between 26 to 40 thousand of unique observations valid for our analysis³. Technically speaking, besides the

¹ This paper uses data from SHARE Waves 3, 6 and 7 (DOIs: [10.6103/SHARE.w1.710](https://doi.org/10.6103/SHARE.w1.710), [10.6103/SHARE.w3.710](https://doi.org/10.6103/SHARE.w3.710), [10.6103/SHARE.w4.710](https://doi.org/10.6103/SHARE.w4.710), [10.6103/SHARE.w5.710](https://doi.org/10.6103/SHARE.w5.710), [10.6103/SHARE.w6.710](https://doi.org/10.6103/SHARE.w6.710), [10.6103/SHARE.w7.711](https://doi.org/10.6103/SHARE.w7.711), [10.6103/SHARE.w8calpha.001](https://doi.org/10.6103/SHARE.w8calpha.001)), see Börsch-Supan et al. (2013) for methodological details.

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More information about the SHARE project available on the website: <http://www.share-project.org/home0.html>.

² Data available from: Austria, Belgium, Croatia, Czech Republic, Denmark, Estonia, France, Germany, Greece, Israel, Italy, Luxembourg, Slovenia, Spain, Sweden and Switzerland. No data from: Bulgaria, Cyprus, Finland, Hungary, Ireland, Latvia, Lithuania, Malta, Netherlands, Poland, Portugal, Romania and Slovakia.

³ The exact size of the final dataset varies depending on the combination of the used variables, so it is a reduced fraction of the original SHARE database. Firstly, we used the data only from countries participating in waves 3 and 6 or 6 and 7, because of the need to merge the information about childhood, asked in W3 and W7, with the information on the ESR, present in wave 6. This resulted in reducing the sample size to 91,040. Dropping the individuals younger than sixty reduced the sample to 65,224 from which 40,008 respondents provided the

descriptives, our analysis was done by means of binary and multinomial logistic regression modelling, and we discuss the details of the models within the results section. We used the data as provided by the SHARE database, no additional weighting was used.

Measurement of the exclusion from social relations: The dependent variables

To assess the multidimensional concept of ESR we used three constructed variables representing the different spheres of sociability: (1) The current respondent's household composition, (2) the type of respondent's social network, and (3) the number of social activities in the last week. This operationalization of the ESR is based on Aartsen et al. (2021) who provides the conceptual background and Hansen et al. (2021), where the technical aspects of the operationalization is explained.

Household composition, representing the primary sphere of sociability, is measured by the binary variable distinguishing whether the respondent lives in a single-person household (code 1) or with someone else (coded 2).⁴ Code 1 is indicative of ESR in the primary sphere.

The second dimension of ESR indicates the type of respondent's social network as a sphere of close network sociability. It can be understood as the collection of interpersonal ties that people maintain in varying contexts (Litwin 2001). This nominal variable is based on the results of latent class analysis with six indicators, i.e., network size, proximity, contact frequency, network satisfaction, felt closeness and proportion of the part of the network based on family members (for details about the operationalization and the latent class analysis see Hansen et al. 2021).⁵ Network Type I represents a very small network with a very low frequency of contacts, indicative of ESR. The second type of network is characterized as a small network, and contacts are more frequent. Network type III is a medium-sized network, including both family members and other types of relations.

information about ESR. For the descriptive analyses the effective sample size varies between 40,008 and 26,393 (see also table 2 and 3), most of the missing values are present within the variable *childhood health status*. The regression models are based on the listwise deletion method, resulting in an effective sample of 6,929–7,123 men and 8,391–8,618 women. Unique observations of individuals are used, not necessarily the repeated observations within the panel design. For participants who took part in all three waves of the survey, ESR indicators from wave 6 and information on childhood conditions from the most recent wave (7) are used. Participants who participated in Waves 3 and 6 enter the analysis with childhood conditions data from Wave 3. Participants who did not participate in Wave 6 are excluded from the analysis because ESR indicators are not available for them.

⁴ We use this dichotomization because of the uneven distribution of cases resulting in very small numbers in some categories.

⁵ Network size reflects the number of people with whom important things are discussed in the last 12 months, with a maximum of seven people (range 0–7); Proximity is the number of network members living within a radius of 25 km; Contact frequency with network members reflects the average contact frequency with the network members (0 = no network members, 1 = never, 2 = less than once a month, 3 = about once a month, 4 = about every two weeks, 5 = about once a week, 6 = several times a week, 7 = daily); Network satisfaction reflects how satisfied people are with their social network, on a scale from 0 (completely dissatisfied) to 10 (completely satisfied); Felt closeness reflects the average of felt closeness among the network members. It is assessed by asking for each network member how close the respondent felt to, with four answering categories (1) not very close (2) somewhat close, (3) very close, and (4) extremely close; Proportion of family members is the number of family members outside the household (brothers, sisters, in-laws, parents, children and grandchildren, uncles, aunts, niece, nephew and other relatives) divided by the network size. Due to high skewness, this variable was categorized into 0 (no family members), 1 (less than half of the network are family members) and 2 (more than half of the network are family members).

Network type IV is the largest network, with 5 to 6 people, consisting of mainly family members living in proximity (Aartsen et al. 2021). Network type I is indicative of ESR in the second sphere.

The third dimension of ESR indicating the wider context of social opportunities, is based on the self-reported number of social activities performed weekly or more often.⁶ The overall number of weekly performed activities was categorized into no activities (code 1), one weekly activity (code 2), two and more weekly performed activities (code 3). Code 1 is indicative of ESR in the third sphere. As the individual variables represent different dimensions of ESR, their mutual correlations are relatively weak (the highest $R = 0.150$). Therefore, we do not use their combination as one dependent variable for the regression analysis, but we decided to construct separate models for each dimension.

Measurement of childhood experience: the independent variables

To explore the relevance of childhood conditions on ESR in later life, we use information from the respondent's situation at the age of 10, available in ShareLife (wave 3 and 7). To maximize the number of valid cases, we merged the data from wave 3 and 7. Since the retrospective information about the respondents' childhood refers to the past, it should be almost invariant, and we can use the information collected across different waves of SHARE. There are methodological issues concerning the use of the asynchronous indicators measured at different points of time. Havari and Mazzonna (2015) affirmed the internal and external consistency of measurements of childhood health and socio-economic status using ShareLife. Theoretically the information can be biased by the present situation of respondents, but the direction of the bias could be twofold—during bad times, some respondents can remember times of childhood warmly while in other cases a present hard time can bring up the memories of childhood resulting in negative bias. We assume these mechanisms would be present randomly, balancing each other.⁷ In summary, we use eleven variables, indicating five different aspects of the childhood experience of the respondents. The family structure and status during childhood is indicated by two dichotomous variables indicating a single-parent family and financial difficulties, a categorical variable indicating the estimated number of books in the parental household and two composite indexes. The index measuring the features of housing is based on the list of five items and a higher value indicates a higher quality of housing.⁸ The overcrowding index is computed as the ratio of people in the household to the number of available rooms.

⁶ The list of activities includes volunteering/charity work, caring for a sick/disabled adult, helping family/friends/ neighbours, attending an educational/training course, taking part in a sport/social/other club, taking part in a religious organization, and taking part in a political/community-religious organization.

⁷ The subjective mechanisms shaping the information about the past and relatively distant reality can vary across the waves and, covariate with the present circumstances. Unfortunately, there is no opportunity to check the reliability of the retrospective information within the “childhood circumstances” module of SHARE, because respondents who provided the answers in wave 3 were not asked in wave 7 again.

⁸ The battery consists of the items: fixed bath, cold running water supply, hot running water supply, inside toilet, central heating.

Indexes covering the dimension of quality of family life use a set of four questions retrospectively reporting on the relationship with the mother and father⁹ and three questions asking about experience of physical harm during childhood.¹⁰ These two sets of questions form the different factors of the quality of family life at childhood (Bergmann, Scherpenzeel and Börsch-Supan 2019: 37), therefore we measure it by two indexes. Two indicators measuring the relative position in language and mathematics are used to indicate subjective peer status during the school years. Another important aspect of childhood circumstances is subjective health status, which is measured on a five-point scale. The last dimension indicating subjective loneliness during childhood is measured by one dichotomous variable based on the question of whether the respondent felt lonely as a child.

Table 1
Overview of the variables indicating the childhood experience

Dimension	Variable	Measurement
Family structure and status indicators	Family structure when ten	Both parents/Other
	Features of housing (material deprivation)	Index (0–5: lower values indicate deprivation)
	Overcrowding	Index (number of people in hh / number of rooms)
	Financial difficulties of family when child	No/Yes
Quality of family life	Number of books when ten	0–10/11–25/26–100/101–200/>200
	Quality of relationship with parents	Index (4–18: lower values indicate good quality)
	Physical harm experience	Index (3–12: lower values indicate frequent accidents)
Peer status	Relative position to others when ten: language	Much better/Better/About the same/Worse /Much worse
	Relative position to others when ten: mathematically	Much better/Better/About the same/Worse /Much worse
Health status	Childhood health status	Excellent/Very good/Good/Fair/Poor
Subjective loneliness	Felt lonely when child	No/Yes

Control variables

Considering the complex nature of the measurement of our independent variables, we use age, education of the respondent and his/her subjective health during wave six, to adjust the model estimates for the supposed principal sources of heterogeneity. Higher age is associated with a higher risk of ESR and these relations strengthen within the oldest age categories. As the educational level shapes the numerous aspects of life chances in modern societies, we use it as a proxy for the stratification position of the respondent.¹¹ Subjective health is used to control the physical and psychological obstacles to participate in social

⁹ How much did your mother/father understand your problems and worries, (A lot, Some, Little, Not at all)

How would you rate the relationship with your mother/father, (Excellent, Very good, Good, Fair, Poor).

¹⁰ Mother/Father/Anybody else physical harm (Often, Sometimes, Rarely, Never).

¹¹ We also considered the use of an income variable or subjective economic hardship, but we suppose the income of being invalid status proxy because of its fundamentally different sources and levels during the time around retirement transition. The use of subjective economic hardship does not provide enough valid cases.

relations at a later age.¹² Health issues can significantly differentiate the level of ESR between older adults of the same age and therefore we need to control for this heterogeneity (Aartsen et al. 2021). Last, but most important, the mechanisms which prolongate the consequences of the childhood experience up until the later age can significantly vary between men and women. As gender differences are one of our main focuses of interest, we decided to build separate models for subsamples of men and women, to be able to capture the different structure of effects of the given identical set of variables. Due to a rather extensive list of independent and control variables, we checked for multicollinearity to avoid problems with specification of the regression models. The correlation matrix identified only four correlations reaching the absolute value between 0.300 to 0.490, and the VIF levels reached between 1.044 and 1.437, which suggests the data are suitable for multivariate regression analysis (the highest correlation was found between peer status in language and peer status in mathematics and with education. The number of books correlated with the education of the respondent and the features of the housing index). We used logistic regression models, which will be fully described in the results section.

Although the SHARE dataset is international, we decided to leave out the comparative aspect of the analysis and to focus on exploration of the general nature of relations between the childhood experience and ESR at a later age, therefore we do not analyse the country differences in this paper. There are several reasons for this decision. Firstly, our research question looks rather for the complex structure of the associations between three dimensions of ESR and numerous indicators of childhood experience, rather than the comparative aspects of the strength or structure of these relations. Because of the unusual time span between the dependent and independent variable, this analytical approach may resemble aerial archaeology and therefore we need to use a large dataset, which has an opportunity to detect even the weakest indices of the scattered and almost vanished effects of the early factors. Secondly, the structure of the used variables and relations between them is too complex to allow for adding the comparative dimension of the analysis comprehensively. We considered and performed a few ways of analysis to treat the cross-country variance within the models, but no one suits perfectly for our purposes and we had to seek a compromise between the interpretation possibilities of the parameters, the ability to comprehensively present the results and the logic of the country differences in our data.¹³ However, the results of various approaches did not differ substantially. To keep the results readable, we chose to compute the logistic regression models estimating the main effects of the used variables and controlling for the cross-country variance in the dependent variable. Therefore, the parameters in each model used, express the average effect of the given

¹² We use the data from wave six here to record subjective health at the same time point as the indicators of ESR.

¹³ We considered four other options: a) computing the model without country variable—this would be the simplest way, but it neglects substantial source of variability caused by the cross-country differences in the dependent variable. b) Interactions with country -this approach would be meaningful only if we had small number of the independent variables of interest (how its effect varies with country). This is not our case—we have relatively long list of independent variables and if we use the interactions, the models will be overparametrized. c) Multilevel model—this approach would be meaningful only if we had the hierarchical structure of data (variables at the country level associated with the outcome) Also the number of countries is too low for this approach. d) Separate models for each country—this approach will result in high number of tables impossible to present in a conventional paper.

variable across the countries where the data is available and the country parameter shows the cross-country difference only in the dependent variable. The comparative analysis of the variability within the effects of the childhood variables across the countries can be then the next step to elaborate on our results.

Results

Table 2 shows the distributions of the three dimensions of ESR and their differences across the independent and control variables. In the case of the scale level of measurement of the independent variables, we show the comparison of the mean and median values (see **Table 3**).¹⁴ The proportion of older adults living in a single-person household vary greatly according to the control variables, rather than childhood living conditions. There is a slightly higher proportion of single-person household among those who were raised in other than a two-parent family and it seems that the child health status and peer status (relative position in language) could have far reaching consequences affecting the household composition at a later age. Concerning the second dimension of ESR, the riskiest type I network is represented by 24 per cent in sum. Noticeable differences across the independent variables can be found in the case of the number of books in childhood. The proportion of Type I network drops with the rising cultural capital in the family of origin and contrary to the household composition, this smaller network type is less frequent among women. The third dimension of ESR is represented by the number of activities. Only one-fourth of the respondents reported any activity every week. The activity rises with the educational level of the respondents and therefore it is probable that childhood living conditions associated with the concept of cultural capital play a role here (number of books, relative position in language). The descriptive results also confirm the importance of controlling for subjective health particularly in this dimension of ESR.

To describe the relations between childhood experience and ESR in later life we use also several constructed index variables. Exploring the mean values of the interval-level variables used to measure childhood circumstances, we found almost no difference across the different categories of ESR indicators. The respondent's age of 60 and older living in a single person household do not differ in any aspect from those living with other people. The higher number of weekly activities corresponds to the slightly lower quality of housing at childhood and there is practically no difference in the indexes compared among respondents with the different types of social network.

Modelling the associations between childhood living conditions and the three dimensions of ESR

To capture how living conditions of men and women in childhood contributed to exclusion from social relations in their old age, separate regression models for each of the three outcomes, were estimated. We estimated (1) a binary logistic regression model to explore the effect of childhood conditions on later life household composition, (2) a multinomial

¹⁴ These variables consist of additive indexes constructed from the batteries of appropriate items available in the questionnaire (see **table 1**).

Table 2

Descriptive statistics for the used categorical variables (row percentages for each ESR dimension)

		ESR: HH composition		ESR: network type				ESR: activities			Total valid N*
		single	spouse/children	Type I	Type II	Type III	Type IV	none	one	two or more	
Family structure when ten	Other: single/step-parent	37.5%	62.5%	21.9%	43.6%	21.0%	13.4%	75.6%	19.2%	5.2%	5,412
	Both biological parents	30.5%	69.5%	24.1%	44.0%	18.4%	13.4%	73.9%	20.1%	6.0%	34,212
Financial difficulties of family when child	No	31.0%	69.0%	23.2%	43.8%	19.2%	13.7%	72.8%	21.0%	6.3%	31,601
	Yes	33.7%	66.3%	26.6%	44.2%	17.0%	12.2%	79.6%	16.0%	4.4%	8,407
Felt lonely when child	No	30.9%	69.1%	23.3%	44.5%	18.5%	13.7%	74.3%	19.8%	5.9%	32,762
	Yes	34.3%	65.7%	26.8%	41.0%	20.1%	12.0%	73.9%	20.5%	5.7%	7,246
Number of books when ten	0–10	32.1%	67.9%	26.0%	47.8%	14.5%	11.7%	82.3%	14.5%	3.2%	16,158
	11–25	30.0%	70.0%	24.6%	44.4%	18.2%	12.8%	73.9%	20.4%	5.6%	9,038
	26–100	30.5%	69.5%	21.2%	40.8%	23.4%	14.6%	66.6%	25.2%	8.1%	8,633
	101–200	31.5%	68.5%	20.1%	37.5%	24.9%	17.5%	61.8%	27.6%	10.7%	2,802
	>200	33.3%	66.7%	18.6%	37.4%	25.7%	18.3%	60.0%	28.3%	11.7%	2,625
Relative position to others when ten: mathematically	Much better	34.6%	65.4%	19.0%	40.1%	23.0%	18.0%	64.1%	25.9%	10.0%	4,558
	Better	32.2%	67.8%	19.7%	42.5%	22.0%	15.8%	69.0%	23.4%	7.6%	10,307
	About the same	30.1%	69.9%	25.8%	45.3%	17.1%	11.8%	77.0%	18.3%	4.7%	19,734
	Worse	30.2%	69.8%	27.2%	44.6%	17.0%	11.2%	79.4%	16.4%	4.1%	3,629
Relative position to others when ten: language	Much better	30.1%	69.9%	22.3%	40.1%	22.4%	15.3%	66.2%	25.3%	8.5%	4,178
	Better	29.0%	71.0%	21.9%	42.1%	21.7%	14.2%	69.0%	23.0%	8.0%	9,208
	About the same	31.3%	68.7%	24.1%	45.1%	17.6%	13.3%	75.5%	19.3%	5.2%	20,185
	Worse	34.9%	65.1%	25.4%	44.7%	17.9%	12.0%	79.8%	16.5%	3.7%	4,302
Childhood health status	Much worse	41.2%	58.8%	24.2%	47.1%	17.4%	11.3%	83.0%	13.4%	3.5%	780
	Excellent	28.4%	71.6%	27.3%	43.7%	16.2%	12.7%	71.5%	21.9%	6.6%	7,593
	Very good	30.5%	69.5%	25.9%	43.1%	17.6%	13.3%	74.6%	19.6%	5.8%	8,083
	Good	32.3%	67.7%	27.6%	41.9%	18.7%	11.8%	77.3%	18.2%	4.5%	7,456
Subjective health	Fair	36.1%	63.9%	22.8%	42.9%	21.4%	12.9%	77.3%	18.2%	4.5%	2,414
	Poor	40.4%	59.6%	22.4%	45.3%	18.8%	13.6%	79.4%	15.3%	5.3%	847
	Excellent	26.6%	73.4%	22.8%	39.8%	22.7%	14.8%	54.2%	33.3%	12.4%	2,402
	Very good	26.1%	73.9%	21.7%	40.7%	21.9%	15.7%	60.3%	28.9%	10.8%	6,452
Education respondent	Good	29.1%	70.9%	23.6%	43.5%	19.2%	13.7%	71.5%	22.2%	6.3%	14,665
	Fair	35.2%	64.8%	22.6%	47.1%	17.4%	12.9%	82.4%	14.4%	3.2%	12,128
	Poor	40.4%	59.6%	32.6%	43.5%	14.2%	9.7%	91.9%	6.8%	1.3%	4,324
Sex of respondent	Primary	36.1%	63.9%	26.7%	50.1%	11.9%	11.3%	86.5%	11.4%	2.0%	9,974
	Lower secondary	32.5%	67.5%	26.0%	47.5%	14.9%	11.6%	81.2%	15.9%	2.9%	7,098
	Upper secondary	30.2%	69.8%	22.9%	42.5%	20.6%	13.9%	72.1%	21.3%	6.6%	14,189
Education respondent	Tertiary	27.4%	72.6%	20.4%	36.0%	27.0%	16.5%	57.4%	30.9%	11.7%	8,586
	Men	19.7%	80.3%	32.2%	38.9%	18.8%	10.1%	74.1%	19.9%	6.0%	31,003
Sex of respondent	Women	40.9%	59.1%	17.3%	47.9%	18.8%	16.0%	74.3%	19.9%	5.8%	39,019

* Number of valid cases is based on the pairwise deletion if the ESR (wave 6) or childhood living conditions (data merged from wave 3 and 7) is missing. Total counts shown only for the combination with ESR household composition, the use of other ESR indicators provide almost the same number of valid cases.

logistic regression model for the type of social network as a nominal outcome and finally, (3) a multinomial logistic regression model for the number of activities (as a categorical outcome).¹⁵ In addition, each of these three models was computed twice—separately for men and women, using an identical set of explanatory variables. As a result, we obtained

¹⁵ Alternatively, we used ordinal regression model (PLUM) but the multinomial variant provides better insight into the differences between categories *none* and *one* activity. Moreover we also modelled the un-categorized version of this variable using the Poisson regression for the extremely skewed distributions. The results are very similar, but because of the small numbers in higher categories, we decided to use the categorized version.

Table 3
Descriptive statistics for the used interval variables

			Features of housing— number of selected (0–5: lower values indicate deprivation)	Overcrowding (number of people in hh / number of rooms)	Quality of relationship with parents (lower values = good)	Physical harm experience (lower = more often)	Age	
ESR household composition	single person household	mean	2.80	2.02	8.65	10.63	74.00	
		median	3.00	1.67	8.00	11.00	73.00	
		SD	<i>1.49</i>	<i>1.49</i>	3.29	<i>1.69</i>	8.90	
	lives with spouse/children	mean	2.88	1.96	8.37	10.60	70.40	
		median	3.00	1.60	8.00	11.00	69.00	
		SD	<i>1.48</i>	<i>1.37</i>	<i>3.06</i>	<i>1.65</i>	7.38	
ESR: Number of activities	none	mean	2.73	2.09	8.43	10.61	72.11	
		median	3.00	1.67	8.00	11.00	71.00	
		SD	<i>1.45</i>	<i>1.57</i>	<i>3.12</i>	<i>1.68</i>	8.35	
	one	mean	3.12	1.70	8.54	10.62	70.01	
		median	3.00	1.33	8.00	11.00	69.00	
		SD	<i>1.51</i>	<i>1.26</i>	<i>3.16</i>	<i>1.63</i>	7.04	
	two or more	mean	3.27	1.52	8.55	10.59	69.43	
		median	4.00	1.29	8.00	11.00	69.00	
		SD	<i>1.51</i>	<i>0.96</i>	<i>3.21</i>	<i>1.62</i>	6.44	
	ESR: Network type	Type I	mean	2.81	2.08	8.50	10.49	71.41
			median	3.00	1.67	8.00	11.00	70.00
			SD	<i>1.46</i>	<i>1.78</i>	<i>3.05</i>	<i>1.77</i>	8.21
Type II		mean	2.73	2.07	8.26	10.69	71.82	
		median	3.00	1.67	8.00	11.00	71.00	
		SD	<i>1.45</i>	<i>1.44</i>	<i>3.13</i>	<i>1.63</i>	8.21	
Type III		mean	3.10	1.73	8.83	10.59	71.09	
		median	3.00	1.40	9.00	11.00	70.00	
		SD	<i>1.54</i>	<i>1.23</i>	<i>3.20</i>	<i>1.63</i>	7.64	
Type IV		mean	2.95	1.86	8.50	10.61	71.44	
		median	3.00	1.50	8.00	11.00	70.00	
		SD	<i>1.50</i>	<i>1.38</i>	<i>3.21</i>	<i>1.61</i>	7.82	

six sets of parameters (see [Tables 4, 5, 6](#). Within the tables, we present the odds ratios and their 95% confidence intervals. In bold, we highlight the parameters statistically significant at the 0.01 level). The information on model fitting criteria is available in [Table 7](#).

A brief comparison of the model-fitting information shows that the models for the subsample of women yield better explanation power than those for men (which is most pronounced in the case of the model estimating the household composition as the outcome). At the same time, this is partly due to the higher variance of ESR among women across the control variables.

The first model estimates the odds of currently being in a single-person household predicted by the set of variables on the childhood circumstances and the control variables (see [Table 4](#)). The control variables of age, education, and current health status are

measured at wave six (at the same time as the ESR is measured) and they are included to adjust the models for general sources of heterogeneity. According to the expectations, this risky household composition is associated with higher age (in the case of women) and worse subjective health (in the case of men). The odds of living in a one-person household also decline with increasing education, with this relationship being substantively important for men. The country-specific odds ratios show very different proportions of respondents living in single-person households. These proportions also vary substantially by gender. Most men in single-person households are found in Belgium, Austria or Denmark, while women in single-person households are more common in Estonia, the Czech Republic or France. The extent of these variations confirms the usefulness of controlling for heterogeneity between countries.

Beyond these control variables, we observe the effect of relative peer position in the case of men. Surprisingly, the model estimates the opposite direction of the effect of both indicators of peer position (presence of the same pattern in the model for men and women gives us a reason to dismiss the explanation due to the random noise in the data). The worse peer position in mathematics raises the odds of living in a single household, but the peer-position in language has an opposite effect. Other variables that measure early childhood circumstances have a negligible effect. This means that childhood circumstances are virtually not reflected in the risk of this structural dimension of ESR.

The second set of multinomial logistic regression models for men and women estimates the odds of having a specific type of social network. Although the network types should not be understood in an ordinal manner, we can simplify that the network types may be ranked according to their size from type I (small) to type IV (complex). The smallest network (Type I), is considered an indicator of ESR. Small network types are more often found in the case of men and women with lower education. Age and subjective health do not play a substantial role here. We do not interpret the parameters measuring the main effect of the country variable, because they have only a control function and their structure is very complex. However, it is important to consider that the different types of social networks are very heterogeneously represented in the countries studied, which also means that in some societies larger networks are more typical and in others smaller ones.

According to the models, the network type is associated mostly with retrospective information about the feelings of loneliness during childhood.¹⁶ Men and women who did not refer to feelings of loneliness in childhood have higher odds of smaller to moderate network sizes, compared to network type IV. However, this result contradicts the assumed direction of association, whereby loneliness in childhood confers a risk of loneliness in later life. Slightly stronger effect sizes can be seen among men. The worse relative position in a peer group in a language plays a role for both sexes, increasing the odds of having smaller network sizes. These are the only two systematic associations evident in the models, the other parameters are very weak, fragmented and non-significant.

Other models of multinomial logistic regression were used for the estimation of the effect of childhood experience on the number of activities (indicating the third dimension

¹⁶ Reversed causality in the case of these retrospectives is possible: the experience with exclusion from social relation in later age can bias or shape the memories in childhood, turning it into a more darkened image.

Table 4

exponential form of parameters (Odds ratios) of the models of binary logistic regression for the ESR — household type (separate models for men and women)

reference category = with spouse/children	men			women		
	OR	95% CI		OR	95% CI	
Age of respondent at wave 6	1.009	1.000	1.017	1.075	1.068	1.082
Education of respondent at wave 6	0.888	0.825	0.956	0.944	0.892	0.998
Subjective health at wave 6	1.082	1.015	1.154	1.045	0.994	1.099
Childhood health status	1.046	0.984	1.113	0.973	0.928	1.020
Features of housing—number of selected (0–5: lower values indicate deprivation)	1.057	1.006	1.111	1.052	1.012	1.094
Overcrowding (number of people in hh / number of rooms)	0.956	0.888	1.029	1.032	0.986	1.080
Quality of relationship with parents (lower values = good)	1.011	0.989	1.034	1.053	1.036	1.071
Physical harm experience (lower = more often)	0.991	0.954	1.030	0.983	0.951	1.015
Number of books when ten (1–5: lower values = less books)	0.978	0.921	1.038	1.058	1.010	1.108
Relative position to others when ten: mathematically (1–5: 1 = much better 5 = much worse)	1.166	1.075	1.264	1.045	0.980	1.113
Relative position to others when ten: language (1–5: 1 = much better 5 = much worse)	0.904	0.832	0.983	0.929	0.870	0.991
Family structure when ten*	0.999	0.796	1.254	1.002	0.849	1.183
Financial difficulties of family when child*	0.916	0.790	1.062	0.918	0.818	1.030
Felt lonely when child*	0.952	0.828	1.094	0.968	0.871	1.076
Austria	1.254	0.928	1.694	0.956	0.771	1.184
Germany	0.940	0.707	1.248	0.487	0.389	0.609
Sweden	0.897	0.665	1.209	0.452	0.360	0.567
Spain	0.572	0.415	0.789	0.376	0.298	0.475
Italy	0.414	0.297	0.579	0.354	0.279	0.450
France	1.154	0.826	1.611	0.975	0.765	1.243
Denmark	1.169	0.841	1.627	0.558	0.428	0.727
Greece	0.698	0.444	1.098	0.439	0.313	0.614
Switzerland	1.132	0.834	1.536	0.530	0.416	0.675
Belgium	1.383	1.044	1.833	0.709	0.573	0.878
Israel	0.510	0.343	0.758	0.453	0.351	0.585
Luxembourg	0.891	0.612	1.296	0.557	0.418	0.744
Slovenia	0.601	0.430	0.841	0.450	0.357	0.566
Estonia	0.890	0.618	1.280	1.077	0.852	1.362
Croatia	0.484	0.294	0.799	0.538	0.381	0.761
Czech Republic (ref.)	1.000			1.000		

According to the Bonferroni correction, we highlight in bold only the parameters significant at the level 0.004 and below (for the multiple comparisons it is recommended to use 0.05 divided by the number of variables).

* Binary variable 0/1-ref: both parents, yes, yes.

** Binary dependent: dichotomized household composition 0 = with spouse and/or children 1 = single household. The original variable was dichotomized due to the very low number of cases in particular categories.

of ESR). Here we observe the substantial effect of respondents' education and health, but age does not play a role in this case. Again, we also observe significant differences by country as a control variable. These results suggest that older populations in post-communist countries are less likely to be active compared to Western seniors (with Italy and Spain as the exceptions especially in the case of women).

Table 5

Exponential form of parameters (Odds ratios) of the models of multinomial logistic regression for the ESR—network type (separate models for men and women)

	reference category = Type IV						men						women					
	Type I		Type II		Type III		Type I		Type II		Type III		Type I		Type II		Type III	
	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI
Age of respondent at wave 6	0.994	0.982	1.007	1.003	0.991	1.016	0.997	0.984	1.011	0.997	0.987	1.008	1.001	0.992	1.011	0.996	0.986	1.007
Education of respondent at wave 6	0.877	0.789	0.975	0.866	0.781	0.960	1.115	0.993	1.252	0.830	0.758	0.890	0.824	0.763	0.890	1.039	0.950	1.137
Subjective health at wave 6	1.019	0.931	1.116	1.018	0.933	1.112	1.015	0.922	1.118	0.987	0.910	1.070	1.035	0.968	1.108	1.046	0.968	1.130
Childhood health status	0.980	0.897	1.071	0.945	0.866	1.030	0.993	0.904	1.091	1.010	0.935	1.091	0.991	0.929	1.057	1.097	1.019	1.180
Features of housing—number of selected (0–5; lower values indicate deprivation)	1.088	1.014	1.168	1.042	0.973	1.116	1.070	0.993	1.152	1.023	0.960	1.090	1.000	0.949	1.054	0.999	0.942	1.061
Overcrowding (number of people in hh / number of rooms)	0.976	0.886	1.075	0.977	0.890	1.074	0.967	0.865	1.082	0.960	0.894	1.031	0.961	0.908	1.017	0.944	0.876	1.017
Quality of relationship with parents (lower values = good)	1.023	0.991	1.056	0.979	0.950	1.010	1.025	0.992	1.059	0.957	0.932	1.083	0.971	0.950	1.093	1.016	0.990	1.041
Physical harm experience (lower = more often)	1.058	1.002	1.117	1.054	1.000	1.112	1.033	0.975	1.095	0.984	0.936	1.036	1.062	1.017	1.110	1.009	0.960	1.061
Number of books when ten (1–5; lower values = less books)	0.987	0.907	1.074	0.972	0.895	1.055	1.062	0.972	1.160	0.926	0.860	0.998	0.888	0.836	0.944	0.942	0.879	1.009
Relative position to others when ten: mathematically (1–5; 1 = much better 5 = much worse)	0.985	0.879	1.105	0.982	0.878	1.098	1.045	0.928	1.178	0.987	0.891	1.094	0.962	0.885	1.045	0.940	0.855	1.033
Relative position to others when ten: language (1–5; 1 = much better 5 = much worse)	1.277	1.133	1.438	1.253	1.117	1.407	1.188	1.050	1.343	1.231	1.107	1.369	1.130	1.037	1.232	1.057	0.958	1.166
Family structure when ten*	0.942	0.670	1.325	1.140	0.824	1.579	1.019	0.718	1.446	1.096	0.821	1.464	1.187	0.939	1.501	1.225	0.945	1.589
Financial difficulties of family when child*	1.192	0.966	1.471	1.156	0.943	1.417	1.014	0.812	1.267	1.152	0.953	1.392	1.117	0.954	1.307	1.042	0.869	1.249
Felt lonely when child*	0.534	0.432	0.659	0.702	0.570	0.864	0.649	0.521	0.810	0.702	0.591	0.835	0.814	0.704	0.942	0.775	0.658	0.914
Austria	0.334	0.215	0.518	0.521	0.347	0.782	0.602	0.376	0.963	0.303	0.205	0.449	0.400	0.303	0.528	0.514	0.366	0.721
Germany	0.349	0.231	0.528	0.510	0.346	0.753	1.146	0.747	1.757	0.507	0.335	0.766	0.654	0.481	0.888	1.479	1.050	2.084
Sweden	0.570	0.359	0.905	0.626	0.401	0.977	2.262	1.407	3.636	0.444	0.295	0.668	0.417	0.307	0.567	1.578	1.129	2.206
Spain	1.029	0.646	1.638	1.014	0.645	1.595	0.678	0.392	1.173	1.497	1.008	2.222	1.025	0.731	1.437	0.578	0.368	0.909
Italy	3.728	2.131	6.522	1.745	0.997	3.054	0.949	0.486	1.855	5.003	3.295	7.596	1.148	0.779	1.693	0.469	0.270	0.815
France	0.314	0.189	0.523	0.461	0.287	0.739	1.272	0.764	2.116	0.292	0.179	0.477	0.445	0.318	0.621	1.301	0.899	1.882
Denmark	0.826	0.498	1.372	0.675	0.410	1.110	1.696	0.999	2.877	0.531	0.332	0.848	0.526	0.369	0.748	1.392	0.944	2.051
Greece	1.273	0.672	2.412	0.969	0.517	1.817	0.543	0.239	1.237	2.204	1.106	3.393	2.442	1.331	4.480	0.387	0.142	1.056
Switzerland	0.325	0.206	0.511	0.390	0.253	0.599	1.228	0.775	1.946	0.407	0.267	0.623	0.351	0.254	0.485	1.175	0.827	1.671
Belgium	0.615	0.409	0.925	0.345	0.230	0.519	0.836	0.534	1.310	1.078	0.773	1.503	0.290	0.217	0.388	0.614	0.437	0.862
Israel	0.490	0.314	0.767	0.417	0.269	0.646	0.284	0.162	0.498	0.798	0.553	1.150	0.430	0.317	0.583	1.198	0.123	0.320
Luxembourg	0.774	0.444	1.347	0.851	0.498	1.453	0.946	0.513	1.746	1.571	0.936	2.637	1.028	0.654	1.615	1.768	1.068	2.926
Slovenia	5.264	2.916	9.503	1.622	0.891	2.953	1.289	0.648	2.565	3.937	2.695	5.753	0.981	0.693	1.388	0.614	0.389	0.969
Estonia	1.479	0.835	2.617	1.122	0.639	1.970	1.511	0.813	2.809	0.771	0.497	1.195	0.920	0.660	1.280	0.965	0.651	1.429
Croatia	0.811	0.441	1.489	0.966	0.541	1.724	0.527	0.248	1.117	0.515	0.265	1.001	1.001	0.636	1.576	0.660	0.359	1.211
Czech Republic (ref.)	1.000			1.000			1.000			1.000			1.000			1.000		

* Binary variable 0/1-ref: both parents, yes, yes.

Table 6

Exponential form of parameters (Odds ratios) of the models of multinomial logistic regression for the ESR—number of activities (separate models for men and women)

reference category = two or more	men						women					
	none activity			one activity			none activity			one activity		
	OR	95% CI		OR	95% CI		OR	95% CI		OR	95% CI	
Age of respondent at wave 6	1.012	0.997	1.027	1.005	0.990	1.021	1.017	1.003	1.031	1.002	0.988	1.016
Education of respondent at wave 6	0.755	0.666	0.856	0.923	0.808	1.055	0.632	0.563	0.710	0.874	0.774	0.987
Subjective health at wave 6	1.525	1.378	1.689	1.169	1.050	1.301	1.497	1.361	1.647	1.094	0.991	1.208
Childhood health status	0.992	0.898	1.096	0.961	0.864	1.068	0.956	0.873	1.047	0.990	0.901	1.089
Features of housing—number of selected (0–5: lower values indicate deprivation)	0.959	0.888	1.036	1.030	0.949	1.118	0.967	0.898	1.041	0.983	0.910	1.061
Overcrowding (number of people in hh / number of rooms)	0.970	0.855	1.100	0.989	0.866	1.131	0.949	0.872	1.033	0.979	0.895	1.071
Quality of relationship with parents (lower values = good)	1.016	0.982	1.051	1.010	0.974	1.047	0.959	0.930	0.988	0.984	0.954	1.016
Physical harm experience (lower = more often)	1.085	1.022	1.152	1.033	0.970	1.100	0.991	0.931	1.054	0.997	0.934	1.063
Number of books when ten (1–5: lower values = less books)	0.885	0.810	0.968	0.891	0.811	0.979	0.868	0.799	0.943	0.874	0.802	0.952
Relative position to others when ten: mathematically (1–5: 1 = much better 5 = much worse)	1.208	1.070	1.365	1.152	1.013	1.310	1.117	0.997	1.251	1.024	0.910	1.153
Relative position to others when ten: language (1–5: 1 = much better 5 = much worse)	1.070	0.945	1.212	0.986	0.865	1.124	1.178	1.046	1.327	1.126	0.995	1.275
Family structure when ten*	1.032	0.708	1.503	0.963	0.645	1.440	1.178	0.833	1.666	1.319	0.922	1.887
Financial difficulties of family when child*	1.285	1.019	1.621	1.403	1.094	1.800	1.073	0.851	1.352	1.051	0.825	1.340
Felt lonely when child*	0.846	0.678	1.055	0.914	0.723	1.154	0.751	0.612	0.921	0.829	0.670	1.026
Austria	0.381	0.198	0.733	0.533	0.267	1.061	0.545	0.353	0.842	0.846	0.527	1.356
Germany	0.169	0.095	0.301	0.281	0.153	0.516	0.387	0.251	0.597	0.946	0.594	1.506
Sweden	0.302	0.161	0.565	0.709	0.369	1.360	0.528	0.336	0.827	1.513	0.940	2.435
Spain	0.881	0.396	1.959	0.671	0.288	1.561	1.174	0.625	2.207	1.400	0.715	2.744
Italy	0.538	0.264	1.094	0.595	0.282	1.257	2.264	1.039	4.933	2.273	1.006	5.140
France	0.118	0.062	0.223	0.234	0.119	0.461	0.232	0.146	0.368	0.710	0.434	1.161
Denmark	0.095	0.052	0.175	0.386	0.207	0.720	0.135	0.086	0.212	0.908	0.575	1.433
Switzerland	0.173	0.095	0.315	0.304	0.162	0.573	0.463	0.290	0.739	0.927	0.561	1.534
Belgium	0.121	0.068	0.217	0.301	0.164	0.554	0.339	0.223	0.516	0.858	0.547	1.345
Israel	0.276	0.143	0.533	0.469	0.235	0.936	0.262	0.171	0.401	0.598	0.377	0.949
Luxembourg	0.114	0.060	0.214	0.167	0.085	0.331	0.283	0.169	0.474	0.676	0.389	1.175
Slovenia	0.471	0.239	0.927	0.572	0.280	1.168	0.733	0.447	1.201	1.277	0.753	2.166
Estonia	1.188	0.426	3.313	0.838	0.284	2.475	2.108	1.062	4.184	2.303	1.117	4.749
Croatia	0.689	0.273	1.739	0.528	0.196	1.419	2.051	0.789	5.331	1.046	0.365	3.003
Czech Republic (ref.)	1.000			1.000			1.000			1.000		

* Binary variable 0/1-ref: both parents, yes, yes.

Considering childhood living conditions, the models for men as well as the model for women estimates systematic association of more frequent activity with higher cultural capital of the family of origin (measured by the number of books). In the case of men, the relative position among peers in childhood and the financial situation of the family of origin also play a significant role. For women, we also find the influence of peer position in childhood, but in contrast to men, where position in mathematics played a role, language is important for women. We also find inactivity in old age more often among female respondents who declared feelings of loneliness in childhood. Overall, it can again be summarised that substantially significant associations are rather exceptional and that, globally, it is evident that structural conditions in childhood (health, housing, quality of relationships with parents) do not play a role. Thus, it is clear from the models that, although the period of socialisation is usually considered as crucial for establishing life chances in

Table 7

Model fitting information

Model		model for men only					model for women only					df	
		Model Fitting Criteria		Pseudo R-square			Model Fitting Criteria		Pseudo R-square				
		AIC	BIC	Cox and Snell	Nagelkerke	McFadden	chi ²	AIC	BIC	Cox and Snell	Nagelkerke		McFadden
household composition	Intercept Only	6885	6892					11255	11262				
	Final	6766	6972	0.025	0.040	0.026	176.5	10474	10686	0.093	0.127	0.075	838.7
number of activities	Intercept Only	10993	11007					13276	13290				
	Final	10192	10589	0.123	0.155	0.083	1238.3	12026	12434	0.150	0.189	0.103	1891.7
network type	Intercept Only	18331	18351					22169	22190				
	Final	17266	17885	0.160	0.173	0.068	913.2	20452	21087	0.197	0.213	0.085	1361.3

later stages of life, we are unable to find significant traces of these effects in the risk of exclusion from social relations in later life.

Discussion

This paper explores the association between childhood circumstances and the risk of exclusion from social relations in old age. Although the nature of our analysis is cross-sectional, it works with an unusually long time between the time of reference of the independent variables and their explored correlates. Men and women undergo a lot of changes during their earlier life stages and transitions. These transitions can significantly modify the structure and the quality of social networks and thus it is challenging for the risk of exclusion from social relations. According to our theoretical starting points, these factors may be significantly modified by the childhood conditions of an individual. A key tenet of the life course approach (Elder 1994) is that primary socialization and the childhood experience are crucial influences on individual life chances. Therefore, the long reach of childhood experience is something we can expect in line with the socialization (Bourdieu 1977) and social stratification theories (Amato and Cheadle 2005; Sigle-Rushton, Hobcraft and Kiernan 2005). These issues bring us to the question of how the living conditions of men and women in childhood contribute to exclusion from social relations in their old age? This question can be also rephrased as the dichotomy between the cumulative and resilience factors during the life paths. Alongside social relations are gender-based and thus the impacts of childhood living conditions are ascertained for men and women separately. Not only the basic question of whether there is the same influence of childhood conditions at risk of ESR in later life was answered. The identification of influential factors have enabled us to answer the question of how childhood conditions affect the risk of ESR in older age.

Using binary and multinomial logistic regression on the SHARE data, we estimated the associations of childhood living conditions with three dimensions of ESR: (1) the current solo-living/other household composition, (2) the number of activities, (3) the type of respondents' social network varying in four types. The findings suggest that the effects are not as clearly visible as we expected based on arguments from the socialization and stratification theories. We found only weak and inconsistent evidence of the higher risk

of ESR in relation to the primary socialization context, but in many cases, the expected association is missing or contradictory. There is no evidence of impacts of the structure of the family of origin (although parental divorce is generally considered to have a wide range of negative consequences for the future life of a child) (Amato and Cheadle 2005). To our surprise, financial difficulties or loneliness during childhood do not play a role or particularly relate to a lower risk of having a small social network at an older age. Thus, our results support the various authors who do not show a simple and unambiguous influence of childhood conditions on life conditions in old age, but rather a complex and difficult to capture influence, which is furthermore affected by a multitude of influences throughout the life course.

ESR risks are gendered, as men and women report distinct social networks in later life. Although the time between childhood and older age can wipe away a significant part of the consequences of childhood circumstances, we have found noteworthy gendered patterns, pointing to the possibility of different mechanisms transforming the consequences of primary socialization (Bourdieu 1977) and life-course influences (Elder 1994). For men, we found a small, but significant effect of the physical aspects of childhood living conditions (e.g. financial difficulties). For women, the cultural capital of the family of origin and the quality of relations with parents seem to have a stronger association to ESR. Overall, these patterns, although rather weak and scattered, lend some support to the notion that aspects of childhood family life could have lasting consequences for the risk of late-life ESR for men and women, as proposed by the theory of cumulative disadvantages (Dannefer 2003).

We also found that the smallest network type (Type I) is less frequent among women and the largest network type IV is more frequent among them. This is particularly interesting as older women more often live in single-person households. The smaller network sizes are more frequent among older adults with lower education, consistent with previous research (Van Groenou and Van Tilburg 2003). Network type II is associated with worse subjective health. The feeling of loneliness during childhood is mostly associated with network type, with loneliness in childhood more associated with small or middle size networks in old age and these hold more for men than women. Worse relative position in a peer group increases the odds of having smaller networks. Lower quality of housing in childhood corresponds to a higher number of activities per week. The number of activities is substantially affected by older adults' education and health, both having their roots back in childhood. Across the control variables, a higher variance of ESR was found among women. We found a higher share of single-person households among those who had been raised in other than a two-parent family and child health status and peer status affects household composition in old age.

Trying to indicate the effects of childhood circumstances on later life may resemble aerial archaeology with its effort to indicate hidden or invisible patterns covered up by the layers of time. Analogically then, we pay attention even to the inconsistent and weak indices of influences. Retrospectively collected data comprise a research limitation as such, because of the difficulty of participants with remembering past events. Our respondents had to remember situations and events from at least fifty years ago, complicating the reliable identification of influential factors. At the same time, these data may reflect recall bias due to the respondent's current situation. Thus, we can also perceive the associations as a certain change in the view of childhood due to the respondents' current difficulties.

The consequences of adversities or disadvantages in childhood at later life stages are typically explored in social stratification research (Amato and Cheadle 2005; Peruzzi 2015; Sigle-Rushton et al. 2005), analysis of physical or psychological health status (Aartsen et al. 2004; Van Der Linden et al. 2020) or in the analysis of cumulative adversity of Holocaust survivors and their families (Shmotkin et al. 2011; Shrira et al. 2010; Walter-Ginzburg et al. 2005). The long-life conditionality of social networks in old age seems unquestionable. The life-course approach reminds us that early-life and life course disadvantages tend to accumulate in old age (Dannefer 2003). Moreover, these effects are partly culturally conditioned, shaped by institutionalised aspects of the life course (Dewilde 2003; Elder 1994). On the other hand, many resilience factors primarily act during later life stages (Lakomý and Petrová Kafková 2017), thus mitigating the effects of primary socialization consequences (education, partnership, work experience...) (Ferraro and Shippee 2009). Still, the number of these factors are inevitably influenced by the family of origin (e.g. educational reproduction, divorce cycle) (Bourdieu 1977; Peruzzi 2015; Vanhoutte and Nazroo 2016).

Although our research did not directly address resilience factors, its results logically lead to the conclusion that resilience factors must play a substantial role, unless we find visible differences in ESR between people who experienced very different childhoods in the data. The resilience factors could be counterbalancing the socially differentiated life starts—the childhood living conditions. Rather than cumulation and magnification of the inequalities given by the different socialization contexts, we observe only weak traces of the early socialization consequences. The social networks and support having a preventative function against exclusion from social relations are gendered (Ajrouch et al. 2005). Women seem to be more sensitive to their childhood living conditions than men, being negatively affected not only by poverty, which is typically transferred from previous life stages into old age (Arber, Fenn and Meadows 2014) but by more subtle disadvantages, such as lower cultural capital proceeds with drawbacks during the whole life course leading to their more disadvantaged position in old age.

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