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Does moving in childhood and adolescence affect residential mobility in adulthood? An analysis of long-term individual residential trajectories in 11 European countries

Aude Bernard, 1 | Sergi Vidal, 2

1 Queensland Centre for Population Research, The University of Queensland, Australia

2 Centre for Demographic Studies & CERCA, Spain

The impact of childhood mobility on a diverse range of life outcomes has been examined, but its influence on the likelihood to move in adulthood remains largely unknown. The paper examines the impact of changing residence in childhood on mobility levels in early and mid-adulthood in 11 European countries**.** Drawing on nationally representative retrospective residential histories from the Study of Health, Ageing and Retirement in Europe (SHARE), the paper uses negative binomial regression to assess how the number and timing of moves from birth to age 17 affect the likelihood to change residence between the ages of 18 to 50 for individuals born between 1918 and 1957 in Europe. While the level and timing of childhood moves vary significantly from one country to another, childhood moves significantly increase the likelihood to move in adulthood in all our sample countries but Austria. The effect is particularly pronounced in low mobility countries in the south, east and centre of Europe where moving as a child is less common. While changing residence in adolescence is particularly influential, in some countries pre-school relocations also have a long-lasting effect on subsequent mobility. Conceptually, these results demonstrate the importance of viewing mobility as a cumulative process that takes place over the entire life-course of individuals. Drawing on key migration and mobility concepts, we formulate a schematic decision making framework that traces the relationship between past and future changes of residence. We conclude that the impact of changing residence in childhood on mobility behaviour later in life could contribute to reinforcing diverging trends in mobility levels across Europe.

1. Introduction

Internal migration and residential mobility have long been recognised to be beneficial at societal and individual levels. Population movement is essential for the functioning of the economy by enhancing labour market flexibility and allowing skills to go where they are needed. It is an essential mechanism for individuals to meet their needs and aspirations by adjusting their housing, neighbourhood and location consumption (Mulder 2018; Mulder and Hooimeijer 1999). Changes of place of residence can thus be viewed as a response to shifts in individual and household needs and preferences triggered by status changes that occur at key stages of the life-course, including education completion, labour market entry, household and family formation (Kulu and Milewski 2007). Within the life-course perspective, migration and residential mobility have been conceptualised as a long-term trajectory that unfolds over the lives of individuals rather than a series of discrete events (Coulter, Van Ham and Feijten 2011). However, because of data requirements and methodological challenges, most empirical studies have focused on year-to-year changes in place of residence and their intersection with life-course transitions using event-history analysis.

In recent years, increasing attempts have been made to situate migration and residential mobility decisions within the wider life-course trajectories of individuals by examining mobility behaviour over sustained periods. Examples of such work include sequence analysis of migrations in early adulthood and their intersection with life-course transitions for cohorts born between 1941 and 1971 in Germany (Vidal and Lutz 2018) sequence analysis of desired and realised moves in the United Kingdom (Coulter and Van Ham 2013; Coulter et al. 2011) and analysis of the level, timing and distribution of moves in early and mid-adulthood for early baby-boomers in European countries (Bernard 2017b; Falkingham et al. 2016). By following migration behaviour over prolonged periods, these studies have highlighted the heterogeneity of migration experiences within and between cohorts that are missed in year-to-year analysis. They have showed that particular sequences of migrations vary by socio-economic status and are contingent on how young individuals started out their migratory career. In particular,

the number of adult migrations has been found to decrease with the age at first adult migration (Bernard 2017a). In other words, the earlier young adults start migrating, the more they will migrate throughout their adult lives and vice versa. While these studies did not examine the mechanisms through which the onset of adult migration shape subsequent moves, they suggest a path dependency in individual migration trajectories by which past migration experiences influence future migration behaviour. For example, in a longitudinal study of residential relocations in the United States, Clark and Lioswki (2018) demonstrated the positive role of previous moves in adulthood on intentions to move in the future. Together, these results suggest that childhood migrations and residential moves may have an influence on mobility in adulthood.

A growing literature on child development has shown that migration and residential mobility can affect cognitive and behavioural development in childhood, with consequences on well-being later in life (Astone and McLanahan 1994; DeWit 1998; Fowler et al. 2014; Myers 1999a; Rumbold et al. 2012; Tønnessen, Telle and Syse 2013; Tseliou et al. 2016; Tucker, Marx and Long 1998). However, it is unclear from this literature whether childhood relocations should enhance or detract mobility in adulthood. The hypothesis that childhood relocations could detract from moving later in life is linked to the disruption argument. The general idea from the psychology literature is that moving interferes with children's learning and cuts friendship ties. Extending this argument to migration, it is reasonable to assume that if migrating is disruptive to a child's life, it will have long-lasting consequences for prospective migrants who might then view migration negatively and be less inclined, in turn, to migrate as adults. This process is, however, less likely to be relevant to residential mobility, which might not disrupt social ties. On the other hand, moving to a new location can provide new opportunities, especially if a change of location removes a child from a detrimental environment, whether it is a house, school or neighbourhood (Myers 1999a). Not only children may be moving to a better house, have access to better amenities and services, but their parents may also benefit from better employment opportunities, which in turn will be favourable for the children. Thus, short-term

difficulties should be in part compensated by long-term gains. In addition, individual who moved as children may learn how to negotiate the complexity of leaving and entering social contexts. Taken into adulthood, these skills should benefit individuals who then may be more willing to migrate and change residence.

Myers (1999b) provides the only empirical assessment of these links by showing for the United States that individuals who moved more often as children and adolescents move more as young adults. What is now needed is to systematically ascertain the impact of childhood relocations on mobility later in life in a wider range of countries. This is particularly important as an increasing number of countries in Europe and beyond, such as Australia and the United States, have recorded a decline in levels of internal migration and residential mobility, including among children (Champion et al. 2018). Understanding the impact of childhood relocations on mobility decisions later in life could contribute to enhance our understanding of this decline and potentially provide insights into strategies to sustaining labour force mobility, which has emerged a concern to policy makers (Kaplan and Schulhofer-Wohl 2017).

This paper aims to provide a more comprehensive understanding of mobility behaviour by taking the first step in examining the extent to which timing and number of changes of residence in childhood shape adult mobility behaviour in 11 European countries. It does not, however, seek to test and establish the mechanisms through which childhood mobility affects adulthood mobility. The paper extends our knowledge of mobility in two principal ways. First, it aims to gain insights into mobility processes by examining long-term residential trajectories from birth to age 50. In doing so, we explicitly recognise that the association between childhood and adulthood mobility may be moulded by individuals' prior experiences and family contexts and we therefore control for a range of socio-demographic characteristics that have been shown to shape mobility behaviour. Second, the study aims to develop our understanding of cross-national variations in mobility behaviour by estimating

the impact of childhood moves in 11 European countries, namely Australia, Belgium, the Czech Republic, Denmark, France, Germany, Italy, the Netherlands, Spain, Sweden and Switzerland. These countries differ markedly in their overall migration and residential mobility levels, with northern and western European countries reporting high levels of migration while countries in the south, east and centre of Europe report moderate to low mobility levels (Bell et al. 2015; Esipova, Pugliese and Ray 2013; Rees and Kupiszewski 1999; Sánchez and Andrews 2011). These countries also differ widely in their family systems (Reher 1998), welfare arrangements (Esping-Andersen 1990) and housing markets (Balchin 2013), which in turn may modulate the impact of childhood mobility on subsequent residential relocations. By establishing whether the impact of changes of residence in childhood is the same in different national contexts, the paper seeks to contribute to our understanding of the factors underpinning mobility differentials across Europe.

The paper begins with a brief synthesis of empirical evidence on the impact of childhood relocations on life outcomes. It then introduces survey data from the Study of Health, Ageing and Retirement in Europe (SHARE), which retrospectively collected in 2007 complete residential histories of individuals aged 50 and over, and presents the negative binomial regression models employed. Section 4 reports a series of descriptive statistics on the levels and timing of childhood relocations and highlights the extent of cross-national variations in overall levels and age patterns of childhood mobility. Section 5 reports results from our models, which explore the impact of the timing and the number of child relocations on adult mobility. Drawing on Mulder and Hooimeijer (1999), Section 6 proposes a schematic theoretical framework that outlines the possible mechanisms by which past moves may influence future moves. Section 7 concludes by discussing our findings in the context of diverging trends in the level of internal migration and residential mobility in Europe and how the impact of childhood relocations on subsequent mobility may contribute to perpetuating and reinforcing these trends.

2. Impact of childhood migration on life outcomes: A review

Empirical evidence on the impact of childhood migration and residential mobility is diverse, with a literature emanating from different disciplinary perspectives that have examined a wide range of life outcomes, including school performance (Tucker et al. 1998), school dropout (Astone and McLanahan 1994; Tønnessen et al. 2013), mental health (Fowler et al. 2014; Rumbold et al. 2012; Tseliou et al. 2016), social integration (Myers 1999a) and drug and alcohol use (DeWit 1998). While these studies broadly point to negative but weak associations between early migrations and life outcomes, some studies have found not statistically significant relationships (Anderson et al. 2014; Gambaro, Joshi and Studies 2016; Pettit and McLanahan 2003) and others have observed a positive impact (Swanson and Schneider 1999).

The impact of migration is strongly conditioned by the frequency and timing of moves. Only very frequent moves - eight and above by age 12 - have been found to affect school performance (Tucker et al. 1998). Similarly, childhood moves negatively affects early adulthood mental health only after three moves (Tseliou et al. 2016). Thus, it is the cumulative effect of repeated moves over a sustained period time that lead to poorer outcomes in adolescence (Pribesh and Downey 1999). Not only the number of moves matters, but also the ages at which they occur. Changes of address before the age of two have been shown to increase internalising behaviour at age nine, whereas subsequent moves do not seem to be significant (Rumbold et al. 2012). Mobility during adolescence have been found to be particularly detrimental to social integration, whereas mobility in childhood and post-adolescence do not have a significant impact (Myers 1999a). Similarly, behavioural issues among at-risk youth are enhanced when mobility coincides with key developmental periods (Fowler et al. 2014). In terms of school performance, moving in middle school (13-15) is particular detrimental, whereas moving in elementary school does not appear to have long-term adverse consequences, and this effect is greater when short-distance moves are accompanied by a change of school (Swanson and Schneider 1999). However, most studies have drawn on data from the United States, which stand out from other

advanced economies because of its high level of social inequality and children poverty. While some studies are based on other Anglo-Saxon countries, including the UK and Australia, existing findings cannot be generalised to countries that offer more institutional support to children and their families, particularly countries in Scandinavia and Western Europe.

The strength of these effects is moderated, however, by a number of socio-demographic characteristics including sex, family structure and socio-economic status. The relationship between mobility and drug problems has been primarily observed among men (Myers 1999a) and underlying personality traits are also thought to moderate the consequences of mobility in childhood. For example, the negative relationship between the number of moves in childhood and well-being appears to hold only for introverts and not for extraverts (Oishi and Schimmack 2010). Short-distance moves associated with changes in family structures, such as parental separation, have the strongest negative effects on school performance because of the stressors associated with changes in family structure, whereas children who reside with both biological parents do not appear to be affected frequent relocations (Tucker et al. 1998) or to a much lesser extent (Pribesh and Downey 1999). In addition, households from lower socio-economic backgrounds are more likely to move frequently because of insecure house tenure and periods of unemployment, which contributes to lower life outcomes among children who moved (Swanson and Schneider 1999; Tucker et al. 1998). Thus, the extent of negative consequences of frequent mobility for children strongly depends on socio-economic disadvantage (Ziol-Guest and McKenna 2014) and pre-existing differences between movers and non-movers in family structures and socio-economic backgrounds (Pribesh and Downey 1999). As a result, most negative associations do not hold after adjusting for family stressor and indicators of persistent socio-economic disadvtantage such as poversty, residential insecurity and family instability (Vidal and Baxter 2018).

A number of mechanisms have been proposed to explain the effect of mobility on children's functioning and well-being. The disruption argument from the physiology literature is that mobility interferes with children's learning, cuts friendship ties and reduces social relationships (Myers 1999a; Pribesh and Downey 1999). Moving to a new environment generate stressors, including adaptation to a new home, school, peers and neighbourhood (Cornille and Brotherton 1993). This process may also be disruptive to parents' social ties and integration, which in turn may affect children by decreasing connections to extremal resources (Myers 1999a). The disruption argument applies to migration more so than residential mobility, which does not affect social networks to the same extent. Some of these short-term difficulties should be in part compensated by long-term gains of moving, except when moves are frequent and associated with persistent socio-economic disadvantage. Moving to a new location can provide new opportunities, especially if a change of location removes a child from a detrimental environment, whether it is a house, school or neighbourhood (Myers 1999a), and this equally applies to residential mobility. Parents may also benefit from better employment opportunities, which in turn will be favourable for children. Despite an extensive body of sociological and psychological work suggesting that migrating affects children's functioning and well-being, its impact of subsequent migration behaviour has been not been explicitly considered and it cannot be safely deduced from existing studies whether child migration should detract or enhance adult migration. Residential mobility, on the other hand, is more likely to have a positive impact as individuals learn from their past experiences without facing the disruption caused by long-distance relocations.

More generally, few attempts have been made in the literature to consider the extent to which past moves may affect future mobility decisions. In an early study, Morrison (1971) showed for employed individuals in the United States that the probability to migrate is greater for those who migrated in the past and Bailey (1989) reached the same conclusion for young adults. More recently, Bernard (2017b) and Bernard et al. (2017) showed for 16 OECD countries that the earlier the first moves in

adulthood the more likely young adults are to move at least a second time, while Clark and Lisowski (2018) found that past residential moves in adulthood have a positive effect on intentions to move in the future in the United States. The fact that the likelihood to move increases with the number of previous moves is thought to be the result of information costs and location-specific capital (DaVanzo 1981; DaVanzo 1983; DaVanzo and Morrison 1981), which contribute to return migration particularly when migration is associated with negative labour market outcomes and dissatisfaction (Lin, Liaw and Tsay 1999; Niedomysl and Amcoff 2011). It has also been suggested that prior migration experiences lower perceived constrains and costs of migration, which in turn increases willingness to move (Huinink, Vidal and Kley 2014) and a similar process may explain the impact of childhood migration and residential mobility. The only study we are aware of on the impact of childhood relocations on future mobility found that those who moved more often as children and adolescents in the United States moved more as adults young adults (Myers 1999b). Using the socialisation theory, the author argued that children learn from their mobility experience and replicate these behaviours in adulthood, concluding that 'residential mobility as a lifestyle is transmitted from parent to child, similarly to how gender, political and religious behaviours are transmitted' (Myers 1999b:871). At the same time, the author acknowledged that parent-adult child similarity in mobility behaviour may also be the result of common characteristics associated with mobility such as level of educational attainment. In this paper, we extend the line of enquiry by considering the impact of migrations in childhood in a wide range of European countries.

3. Data and Methods

3.1. Study of Health and Ageing and Retirement in Europe (SHARE)

To estimate the impact of childhood relocations on adult mobility behaviour we use retrospective residential mobility histories collected in wave 3 in 2007 in 11 European countries, namely Austria, Belgium, the Czech Republic, Denmark, France, Germany, Italy, the Netherlands, Spain, Sweden and

Switzerland[1]. SHARE is a nationally representative longitudinal survey of the population ages 50 and over in each country. Lifetime residential mobility histories were collected using a life–history grid, which involved showing respondents a schematic form that depicts the years in their life, from birth to the present, alongside national and world events to help them recall past moves (Blane 1996). Respondents were asked to report the start and end dates of residence for up to 30 dwellings in which they had lived for more than six months since birth. The address of each residence was collected but, to ensure confidentiality, an annual indicator of change of residence was constructed and geographic information was released at a regional level. Thus, to ensure comparability between countries and over time, the paper uses all changes of address, independent of administrative units, in measuring mobility. This means that the distinction between short- and long-distance migrations cannot be made and that the majority of moves captured in this study occurred over short distances. This approach has the advantage of the results not being affected by differences across countries and over time in the number and shape of spatial units. This is particularly important because measures of migration levels are known to increase with the number of spatial units (Courgeau 1973), which can bias cross-national comparisons.

Because retrospective data are based on survivors only, results may be biased if residential mobility and mortality are correlated or if a large proportion of a cohort died before reaching the end of the age range over which the analysis is conducted. Although survivor bias is expected to be small, mortality regimes vary between countries and differences in mobility level should be interpreted, strictly speaking, as the average number of moves undertaken by members of a cohort conditional on surviving to the date of the survey. Recall bias is another potential limitation, particularly given that recall is more accurate for recent relocations than distant ones (Smith and Thomas 2003). It is therefore likely that some childhood relocations have been forgotten, but differences between

[1] While Poland and Hungary did also collect residential histories in SHARE, the two countries did not collect parents' highest level of educational attainment and were therefore excluded from our study.

countries in recall errors are expected to be minimal. To avoid censoring bias, the analysis restricted to individuals who were born in each case study country, who account for about 95 per cent of the original sample. SHARE respondents were between 50 and 89 years old at the time of the survey, so in order to obtain life-courses of comparable lengths the analysis is restricted to mobility histories up to age 50. We define moves from birth to the age of 17 as childhood moves and subsequent moves from the ages 18 to 50 as adult moves. We complement residential histories with a range of socio-demographic characteristics that have been shown to influence mobility as listed in the next section.

3.2. Methods

To estimate the impact of childhood relocations on the number of moves in early and mid-adulthood, we use negative binomial regression models controlling for respondent's characteristics of the individual and those of their parents. Model 1 examines the impact of the number of childhood moves in a continuous scale, while model 2 classifies moves categorically (no moves, one, two, three, four or more) to assess whether each move is of equal impact. Model 3 explores the timing of moves by distinguishing between key developmental periods, namely early childhood (0 to 5 years), middle-childhood (6 to 11 years), and adolescence (12 to 17 years). All models are adjusted for individual's sex, birth cohort (1918-1931, 1932-1945, 1946-1957), whether they had been in foster care or in a child institution at some point in childhood, their highest level of educational attainment, their main occupation[2], whether they ever married and ever had children by age 50. We also include parental socio-economic background, as measured by the highest level of educational attainment of the mother and the father, which has been shown to have a long-lasting impact on a range of life outcomes including migration in adulthood (Myers 1999b).Descriptive statistics for all variables can be found in Appendix A. We run each model for all countries jointly and include a dummy variable for each country and we then run regressions separately for each country to assess whether the effect of

[2] This correspondents to respondents' main occupation during the course of their career as reported by respondents, which is not necessary their last occupation. Individuals who were not economically active fall in the category no occupation.

childhood mobility varies depending on the national context. In all models, we use robust standard errors for the parameter estimates as recommended by Cameron and Trivedi (2009) to control for mild violations of underlying assumptions. While models are run on all birth cohorts, descriptive statistics are restricted to the most recent cohort born between 1946 and 1957 to provide a contemporary picture.

4. Descriptive statistics: Level and timing of childhood moves

Figure 1 reports the average number of lifetime moves from birth to age 50, distinguishing between moves before the age of 18 and subsequent moves in adulthood. A marked north-south and east-west gradient is apparent, with high levels of lifetime mobility in Denmark, Sweden, France and the Netherlands, moderating southwards and eastwards reaching low levels in Italy, Spain, the Czech Republic and Austria. These results conform closely to the spatial patterns identified in previous comparative studies (Bell et al. 2015; Esipova et al. 2013; Rees and Kupiszewski 1999; Sánchez and Andrews 2011), which have reported regional variations within Europe that have persisted across successive cohorts, reflecting long-lasting behavioural differences (Bernard 2017b). Not surprisingly, because relocations in childhood are tied to parents, in countries where adulthood mobility is low so is the mobility of children. Pearson correlation between the average number of childhood relocations and the average number of adulthood relocations returns a correlation coefficient of 0.95. Thus, in the Czech Republic and Austria, children move on average less than 0.5 times, whereas in Sweden, Denmark and the Netherlands the average number of childhood moves is greater than one.

[FIGURE 1]

To obtain a more fine-grained understanding of variations in childhood mobility, Figure 2 depicts the actual range of mobility experiences by decomposing populations according to the exact number of times individuals moved as children. It shows that in seven of eleven countries, more than 50 per cent of the population moved in childhood. In Austria and the Czech Republic, the proportion of child non-

movers is above 70 per cent. In contrast, countries at upper intermediate levels of mobility, such as the Netherlands and France, about 40 percent remained immobile, while in the two most mobile countries, Denmark and Sweden, only about a third of children did not move. In all countries, the majority of individuals who moved in childhood did so only once. The proportion of individuals who moved once as children ranges from 15 per cent in the Czech Republic, to about 25 per cent Germany, Spain and Switzerland, up to one third in France, Sweden and the Netherland. In all countries, repeat movement is less common, particularly for moves of order three and higher, yet important variations from one country to another are apparent. About 20 per cent of the population in Denmark and Sweden moved three times or more during childhood, compared to 10 per cent in the Netherlands and France, down to less than five per cent or less in Italy, Spain the Czech Republic and Austria. Thus, high levels of childhood mobility in Denmark and Sweden can be attributed to the combination of low percentages of non-movers and higher proportion of repeat movers, whereas the reverse characterises low mobility countries.

[FIGURE 2]

Table 1 explores variations the timing of childhood mobility by reporting mean ages by move order and for all moves jointly. While children moved on average at 9.3 years of age, important variations are apparent by move order and between countries. In all countries, the first move typically takes place during early primary school years, at 7.8 years on average, whereas moves of order three typically take place toward the end of primary school or even early into secondary education, with a mean age of 12.3 years. Overall, children tend to move earlier in Belgium and the Netherlands where the first move takes place on average at about age six, whereas in Spain and Austria the first move takes place on average after the age of nine.

[TABLE 1]

Further detail on the timing of childhood mobility can be found in Appendix B, which reports the percentage distribution of moves by age and move order. Collectively, these results highlight marked variations between European countries in the incidence of childhood mobility. In high mobility

countries in the north and west of Europe moving in childhood is common – the majority of children move at least once and a significant proportion move multiple times, often early in life. In contrast, in southern, eastern and central parts of Europe where overall mobility levels are lower, the majority of children do not move and those who do typically move only once. What is now needed is to understand the extent to which childhood relocations affect adult mobility in each of these countries.

5. Impact of childhood relocations on the number of adulthood moves

To quantify the impact of childhood moves, this section reports results from a series of regression models that explore the impact of the number of times children moved (models 1 and 2) and timing of these moves (model 3) on the number of moves in adulthood. For each model, full results can be found in Table 2, which shows that all control variables have the expected sign and are consistent across the three models. In line with prior research, the number of moves in adulthood increases with the level of education and is higher for individuals in highly skilled occupations and those in the armed forces. Younger cohorts report higher levels of mobility, which is consistent with recent evidence from European countries (Bernard 2017b; Falkingham et al. 2016). With regard to early life conditions, individuals who have been in foster care or child institutions are more likely to move in adulthood. Parental socio-economic background also seems to play a role. Individuals with a tertiary-educated father are more likely to move in adulthood, which suggests that parental attitudes and resources continue to affect their children's attitudes and behaviour in adulthood. The fact that maternal education is not significant may be due to the traditional male breadwinner regime that dominated the early lives of cohorts born before 1957. Sex is the only other explanatory variable that is not statistically significant.

Turning our attention to the impact of childhood moves, Figure 3 reports results from model 1 and displays the incidence rate ratios (IRR) of having moved in childhood for all countries modelled together and separately. The IRR is the ratios of two incidence rates, the incidence rate among the

population who moved in childhood divided by the incidence rate of the population who did not move in childhood; the incidence rate being defined at the number of events divided by the person-year at risk. Figure 3 shows that when all countries are modelled jointly, for each successive childhood move the rate of adult mobility increases by 8.14 percent. When models are ran separately for each country, the coefficients remain statistically significant in all countries, except Austria, and cross-national variations start to emerge. While the impact of each childhood move is below 8 per cent in Sweden, Denmark, France and Netherlands, it sits between 9 and 10 per cent in Spain, Italy, Belgium and Switzerland and it is equal to 13 per cent in Germany and 26 per cent in the Czech Republic, although the confidence interval is very large for the latter. To determine whether differences between countries in the impact of childhood relocations are statistically significant, we then ran a model with all countries jointly and included interaction terms between the number of moves in childhood and each country, using Sweden as the reference category. Only in Spain, Switzerland, Belgium, the Czech Republic and Germany is the impact of childhood moves significantly higher than in Sweden. These results suggest that the impact of childhood relocations on subsequent moves is greater in low mobility countries located in the south, east and centre of Europe than it is in high mobility countries in the northern and western parts of Europe.

[FIGURE 3]

While childhood moves appear to exert a positive impact on the number of moves recorded in early and mid-adulthood, model 1 assumes that each additional move in childhood is of equal impact. It is, however, possible that not all moves are equally important in shaping future mobility. It might be the case, for instance, that the first move in childhood exerts a particularly significant influence by exposing a child for the first time to the intricacy of moving. It is also possible to envisage the relationship between childhood and adult moves to be non-linear in a way that the impact of moves in childhood reduces after a certain number of moves or even become negative. Thus, to get a more fine-grained understanding of the impact of childhood moves, we explore these possible processes by categorising the number of childhood moves – no moves, one, two, three, four moves or more. Results

are reported in Figure 4, which shows that in the majority countries moves of all orders have a positive impact on adult migration, with IRRs greater than one, indicating that there is not a threshold after which the impact of residential relocations on childhood become negative. The only exceptions are moves of order 2 in Austria, moves of order 3 in Sweden and moves of order 4 and above in Spain and the Czech Republic, with IRRs are lower than 1 but not statistically significant. In four countries - France, Netherlands, Belgium and Switzerland - moves of all orders are statistically significant and IRRs increase with the number of moves in a broadly linear fashion, suggesting that each additional move in childhood increases the likely to move as an adult. In Belgium, for instance, the IRR of having moved once is 1.13., it goes up to 1.26 for two moves, 1.34 for three moves and 1.60 for four moves and above. In Germany, however, IRRs progressively increase up to three moves, but decreases thereafter, suggesting that moves of order 4 and above contribute to adult mobility at a slower rate. Similarly, in the Czech Republic the first three moves have a positive impact on adult mobility, whereas the fourth move and these that follow are not statistically significant, suggesting a possible threshold effect after which additional moves in childhood do not have an impact on future mobility in adulthood. The inverse is found in Italy and Denmark where it is only after three and four moves, respectively that a statistically significant impact on the number of adult moves is observed. Mixed results are found in the remaining countries, Sweden and Spain. Caution is however needed in interpreting these results because of the very small proportion of children moving multiple times in low mobility countries, which is reflected in the large confidence intervals found in Italy, Spain, Germany, the Czech Republic and Austria.

[FIGURE 4]

Next, we examine the timing of moves to assess whether moves at particular ages have greater bearing on adult mobility than others. We distinguish moves from birth to age 5 from those from 6 to 11 years and those from 12 to 17 years, which broadly correspond to distinct school periods and developmental stages. Results are reported in Table 3, which show that in all countries, expect Austria, Spain and France, moves during secondary school years have a positive, statistically significant impact

on adulthood mobility. Compared with children who never moved, those who moved once between the ages 12 and 17 are 9 per cent more likely to move as adults in the Netherlands, 14 in Belgium and 23 per cent in Italy. Averaged across all countries, the impact of having moved once as a teenager is 13 per cent. In all countries having moved twice or more in adolescence has a greater effect than having moved once, which confirms the incremental effect of successive moves. This is in contrast to moves during primary school years, which are found to have an impact on adult mobility only in Belgium and Netherlands, and thus do not appear to play an important role in subsequent mobility choices. However, in five countries, relocations in pre-school years have a long-lasting effect on adult mobility, namely in Denmark, Spain, France, Switzerland and the Czech Republic. Averaged across all countries, the impact of having moved once before the age of five, increase the odds of moving in adulthood by 16 per cent. In Spain and Switzerland having moved once is statistically significant but twice or more is not. This is most likely due to the very small number of children moving multiple times in pre-school years as shown in Appendix B. In the three countries where moves both at pre-school and secondary school ages have an impact, the latter have a slightly greater impact on adult mobility as indicated by IRRs. The fact that adolescents are more aware than young children of changes in their environment and their consequences is a possible explanation for adolescent relocations having a greater bearing on adult mobility than those earlier in life. Additionally, part of the overall effect of moved in early childhood on mobility in adulthood might be indirect and mediated by moves in adolescence.

[TABLE 3]

6. Implications for understanding the mobility decision making process

While revealing an overall positive effect, our study does not permit identifying the causal mechanisms underpinning the association between child and adult mobility behaviour, which are probably multifactorial. Yet, it provides avenues for thinking about the mobility decision process and formulating hypotheses on the possible pathways through which childhood relocations shape

subsequent moves. While the location-specific capital hypothesis (Davanzo 1981, 1983) is valuable in explaining repeat and return migration among adults by arguing that tangible and intangible assets such as property ownership and social networks reduce the costs of return, it does not provide insights into the role of childhood and adolescent moves. Drawing on our findings and those of previous studies, we build on Mulder and Hooimeijer (1999)'s residential relocation model and extend it to formulate a schematic theoretical framework that traces the relationship between past and future moves.

As outlined by Mulder and Hooimeijer (1999) and supported by De Jong (2000), the existence of a trigger or motive for moving is a necessary but not sufficient condition for a move to take place. Realised mobility behaviour is shaped by a set of individual characteristics and by the broader socio-economic context in which individual's lives are embedded, some of which facilitate mobility while other limit it. Following Mulder and Hooimeijer (1999)'s terminology we refer to micro-factors as resources and restrictions (e.g. income, marital and family statuses) and macro-factors as opportunities and constraints (e.g. housing and labour market structures and economic conditions). The trigger to move is often caused by key life-course transitions, such as education completion, labour market entry, family and household formation (Mulder 1993), which can create a mismatch between actual and desired place of residence as individuals form particular preferences in terms of where they would like to live. Resources needed at an individual-level for a desired move to become a realised move are also linked to the stage of life-course and include income and housing tenure among others. At the same time, the socialisation theory suggests that moves earlier in life shapes attitudes toward migration later in life in a way that children who moved more are highly mobile as adults. Rather than contributing to a 'residential mobility as a lifestyle' (Myers 1999b), we argue that the association between past and future moves suggests that moves is a learned behaviour and we adhere to Huinink et al. (2014)'s suggestion that prior migration experiences influence future migration decisions by lowering the perceived costs and constraints of moving. The fact that in the

majority of our sample countries each additional migration during childhood and adolescence increases the number of moves in adulthood suggests that perhaps skills and attitudes toward migration are formed progressively and acquired from one move to the next to cumulatively contribute to developing the *ability to migrate* or 'know-how'. Thus, if past moves have an influence on future moves, it is the cumulative effect of repeated moves over the life-course of individuals that shape probably both the willingness and the ability to move, which are required for moves to be realised (Carling 2002; Carling and Schewel 2018; Coulter et al. 2011).

These links are encapsulated in Figure 5, which depicts the influence of past moves on subsequent mobility decisions by shaping preferences, constraints and resources as shown by dotted lines, which is our addition to Mulder and Hooimeijer (1999)'s model. Interpreted through a sociological lens, this model suggests that past moves are likely to shape the varied of forms of capital that movers and migrants draw upon to succeed at destination (Ryan et al. 2015; Kaufmann et al. 2004). While our research is confined to mobility in childhood and adolescent, a growing body of literature has accumulated on the positive impact of adult mobility on subsequent moves (Morrison 1971; Bailey 1989; Lin et al 1999, Niedomysl and Amcoff 2011; Clark and Lisowski 2018). Thus, the links outlined above can probably be extended to adulthood in a way that the capabilities and attitudes toward moving are not fixed but evolve constantly in response to mobility experiences throughout the life-course, in a recursive manner. Central to these processes is the notion that mobility is a cumulative process that takes place over the entire life-course of individuals rather than a series of discrete events independent from one another.

[FIGURE 5]

While empirical evidence gathered in this study indicates that moving in childhood accustom individuals to mobility in a way that rises their likelihood to move later in life, important variations are apparent that modulate the strength of this relationship. In particular, the timing of moves s (e.g. whether they take place in early childhood or adolescence) and their relative order (e.g. whether it is

the first of move or the n^{th} move) appear to affect the extent to which past moves influence future moves in a way that not all moves exert the same influence on the likelihood to move later in life. In addition, while the impact of childhood moves on the likelihood to move as an adult increases in a broadly linear fashion, in some countries, including Germany and the Czech Republic, it plateaus after a certain number of moves. This suggests that there may be a threshold after which the feedback loop we have sketched out may diminish or perhaps even stop. It is also possible that the extent to which past moves inform future mobility decisions vary depending on the distance moved, although this could not be empirically tested in the present paper. Long-distance moves sever social ties to a greater extent than short-distance moves and are therefore likely to have a greater influence in shaping individuals' perceptions of mobility. However, it is unclear from the psychology literature whether long-distance migration should enhance or detract moves in adulthood.

Finally, moves in childhood and adolescence appear to have a stronger impact in low mobility countries, particularly in the south, east and centre of Europe, where individuals encounter more constrains and do not have that same impetus for moving as in northern and western Europe. Cross-national variations in the overall intensity of migration have been linked to differences in the structure of housing and labour markets, policy frameworks (Sánchez and Andrews 2011; Van Der Gaag and Van Wissen 2008) and cultural practices, including differences in family systems (Reher 1998) and regional variations in the timing and patterns of transitions to adulthood (Iacovou 2002) and these forces are likely to interact with the formation of capabilities and attitudes toward mobility.

7. Conclusion and discussion

Internal migration and residential mobility are increasingly conceptualised as a long-term trajectory that unfolds over the life-course of individuals rather than a series of discrete events independent from one another. Thanks to advances in research methods, such as sequence analysis, combined with

greater availability of longitudinal and retrospective survey data, empirical progress has been made in recent years that have highlighted interdependencies between migrations (Clark and Lisowski 2018). Despite recent advances in understanding how individuals progress from one move to the next, no studies have systematically considered the extent to which residential relocations in childhood and adolescence may influence mobility behaviour in adulthood. We have sought to address this deficiency by assessing the extent to which moves in childhood have an effect on adult mobility by establishing how the number and timing of child moves affect the number of moves in adulthood up to age 50.

Our comparison of 11 European countries has revealed important variations in the incidence of childhood mobility, which reflects a well-established spatial gradient of high mobility in the north and west of Europe moderating to the south, east and central Europe where countries record significant lower overall mobility level. Because children are tied movers who migrate with their parents, this spatial pattern is reflected in the level and patterns of childhood mobility. In high mobility countries, such as Sweden, Denmark and the Netherlands, moving in childhood is common. The majority of children move at least once before reaching 18 years and a significant proportion move multiple times, often early in life. In contrast, in countries where overall mobility levels are lower, the majority of children do not move and those who do typically move so only once, particularly in Austria and the Czech Republic.

After controlling for some key observable characteristics, we have found that in all countries, expect Austria, moving in childhood has a positive, statistically significant impact on the number of moves recorded in early- and mid-adulthood, although the strength of this association is weaker in high mobility countries such as Sweden, Denmark and France and it is stronger in countries with low or moderate mobility level, such as Spain, Belgium, Switzerland, Germany and the Czech Republic. In all countries, except France and Spain, the impact of moves in adolescence is greater than moves in

childhood, which can partly be due to adolescents being more aware of changes in their environment and their consequences than young children. It may also be the case that more recent moves have great bearing on future moves. At the same time, in five countries moves before the age of five has a positive, statistically significant impact on adult mobility, which suggests that the very first move in life may exert a particular influence by exposing a child for the first time to the intricacy of moving and the social disruption that it creates, thus having long-term consequences on mobility behaviour.

The fact that moves in childhood accustom individuals to moving in a way that raises their likelihood to move later in life suggests that mobility is a learned behaviour. Combined with prior studies on the impact of past adult moves on future mobility, our results suggest that capabilities and attitudes toward mobility are not fixed but evolve continuously in response to past experiences. Thus, we argue that mobility is a cumulative process that takes place over the entire life-course of individuals rather than a series of discrete events independent from one another, while recognising that the strength of the relationship between past and future moves is variable and depends on the national context, the timing of moves, their relative order, presumably the distance moved. While we have proposed that past moves may have an impact on both the capability and attitude toward moving, further research is required to empirically test these mechanisms and understand how they operate. There is also a need to establish how much these mechanisms are enhanced or undermined by the context of socio-economic privilege or disadvantage in which childhood moves take place. Future research can potentially address this question by distinguishing between child moves caused by adverse life-course events (e.g. parental separation, poverty-related residential instability) and those linked to positive experiences (e.g. parental upward occupational mobility and house upgrades).

While promising the results reported here face a number of limitations. First, only observed characteristics of the individuals and those of their parents were controlled for and thus the omitted variable bias may affect the results. In an analysis of the effect of child mobility on high school dropout,

adult income and early parenthood, Tønnessen et al. (2013) applied a sibling fixed-effect model to Norwegian register data to control for any omitted variables capturing time-invariant family-specific characteristics, but results were similar to those from traditional regression models. Controlling for potentially confounding unobserved factors require individual-level register data, which are available mainly in Scandinavia, but these countries display similar migration regimes and family structures. Such datasets could, however, be employed to distinguish between short and long-distance migrations, which could not achieved in this paper or to control of the degree of disadvantage in childhood, which may mediate some of the links found in this paper. Advances could also be made from long-running panel surveys such as the Panel Study of Income Dynamics (PSID), which has been running in the United States since 1968 and the British Household Panel Survey (BHPS) since 1991. Such datasets should permit understanding the impact of parental dissolution, which has been an increasing cause of migration and residential relocations in childhood (Boyle et al. 2008) and is likely to contribute to shaping the migration trajectory of individuals born in the second half of the 20th century and beyond.

Bearing these limitations in mind, our results indicate that moves in childhood accustom individuals to residential mobility in a way that raises their likelihood to move later in life, while showing that the strength of this relationship varies depending on the timing of moves, their relative order and the national context. Conversely, as individuals move less in childhood the number of times they move as adults decreases, everything else being equal. As a long-term decline in levels of internal migration have been observed in a number of advanced economies in Europe, North America and Australasia (Champion, Cooke and Shuttleworth 2018), our findings have important implications for future migration trends. This downward trend means that a decreasing proportion of children are migrating with their parents, with consequences not only in bringing down current migration levels but also potentially in disaccustoming future cohorts to migration in a way that might decrease their likelihood to migrate later in life, thus perpetuating a decline in levels of internal migration. This evolution is

likely to be particularly pronounced in low mobility countries which are currently experiencing a migration decline, such as Hungary, Germany and the Russian Federation (Bell et al. 2018), whereas the impact of a downward trends is expected to be weaker in highly mobile countries, such as the Netherlands and Iceland, as our results show that the impact of childhood mobility on subsequent moves is weaker in high mobility countries. This downward trend is by no means universal as some European countries have registered an upswing in their levels of internal migration, both high mobility countries such as Ireland, Norway and Finland, and low mobility countries such as Austria, Belarus, the Czech Republic, Greece and Estonia (Bell et al. 2018). Increased migration among children in these countries could have long-term consequences by accustoming future cohorts to moving in a way that might rise their likelihood to migrate later in life, leading to further increase in migration level in the future, which in turn could reinforce diverging trends in levels of internal migration among European countries.

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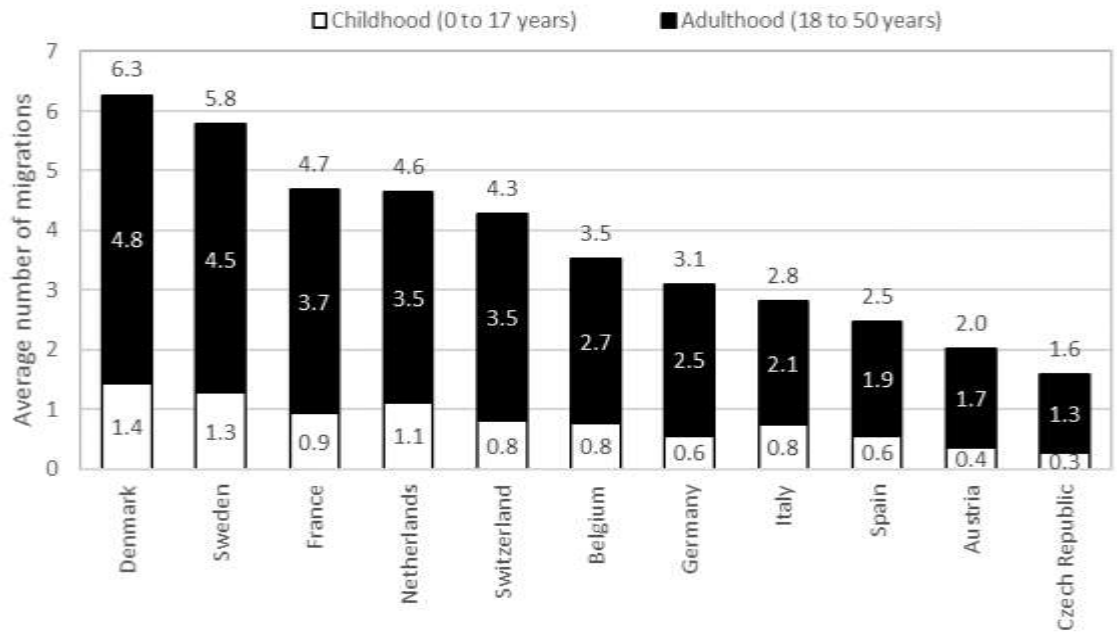


Figure 1 Average number of movess in childhood and adulthood

Source: SHARE, wave 3, authors' calculations

Note: Cohort born 1946-1957. Labels at the top indicate the average number of lifetime moves from birth to age 50. Countries are ranked in order of decreasing average number of lifetime moves.

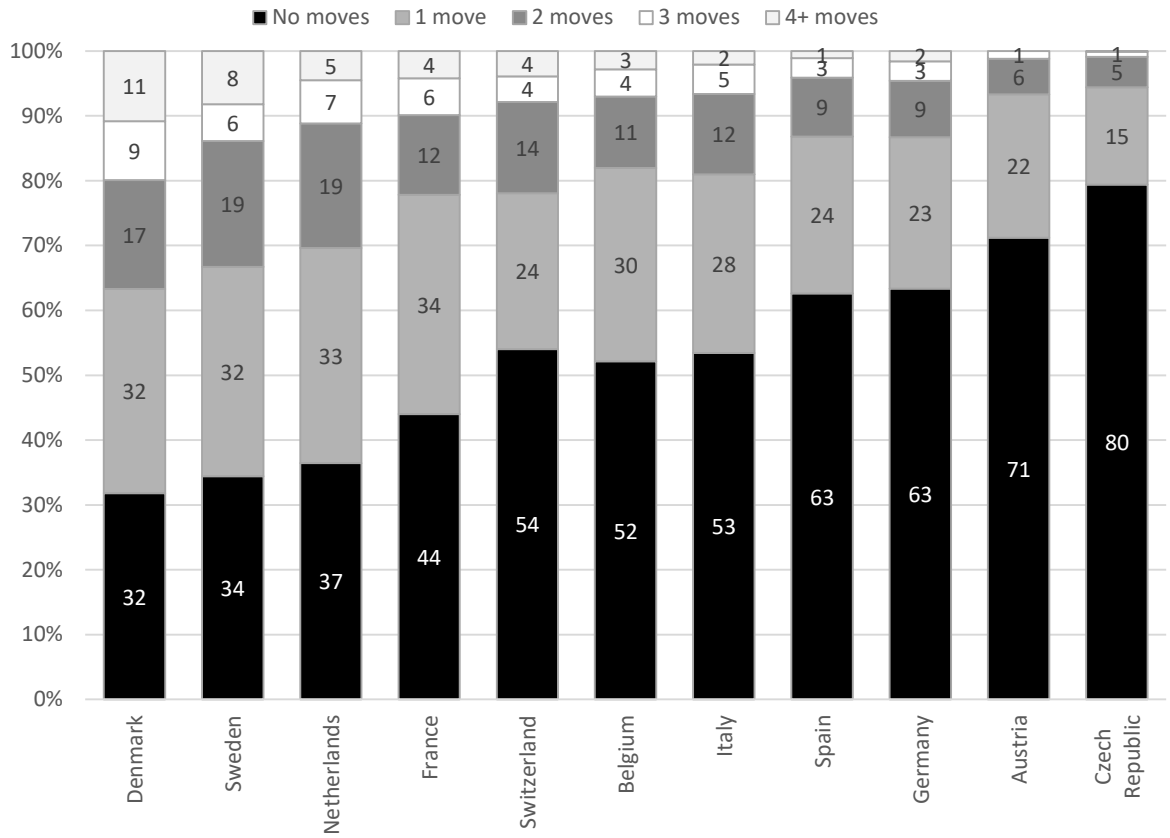


Figure 2 Percentage distribution of moves in childhood

Source: SHARE, wave 3, authors' calculations

Note: Cohort born 1946-1957. Countries are ranked in order of decreasing order of average number of childhood moves

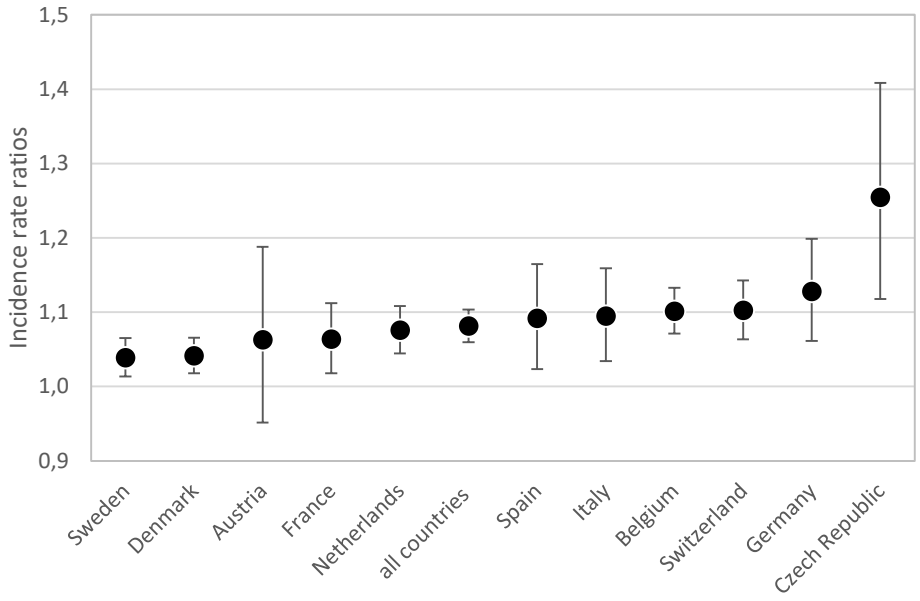


Figure 3 Incidence rate ratios of the number of moves in childhood

Source: SHARE, wave 3, authors' calculations

Note: Results of model 1. Incidence rate ratios are statistically significant at the 0.001 level in all countries except Austria and are reported with a 95 per cent confidence interval.

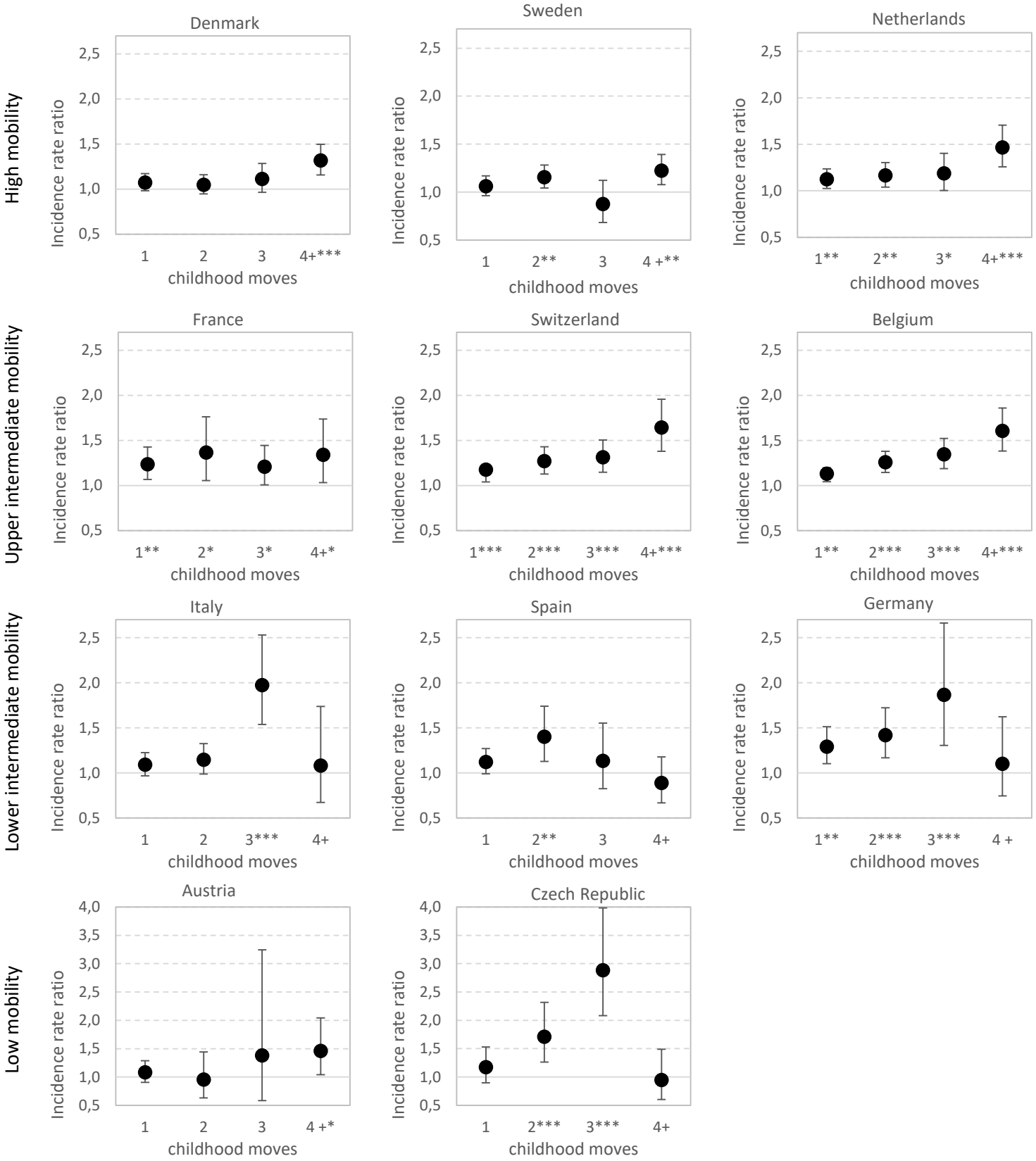


Figure 4 Impact of childhood mobility by number of moves as measured by incidence rate ratios (IRR)

*p<0.05, ** p<0.01, *** p<0.001
Source: SHARE, wave 3, authors' calculations

Note: Results from model 2 Reference category: no moves. Odds ratios are reported with a 95 per cent confidence interval.

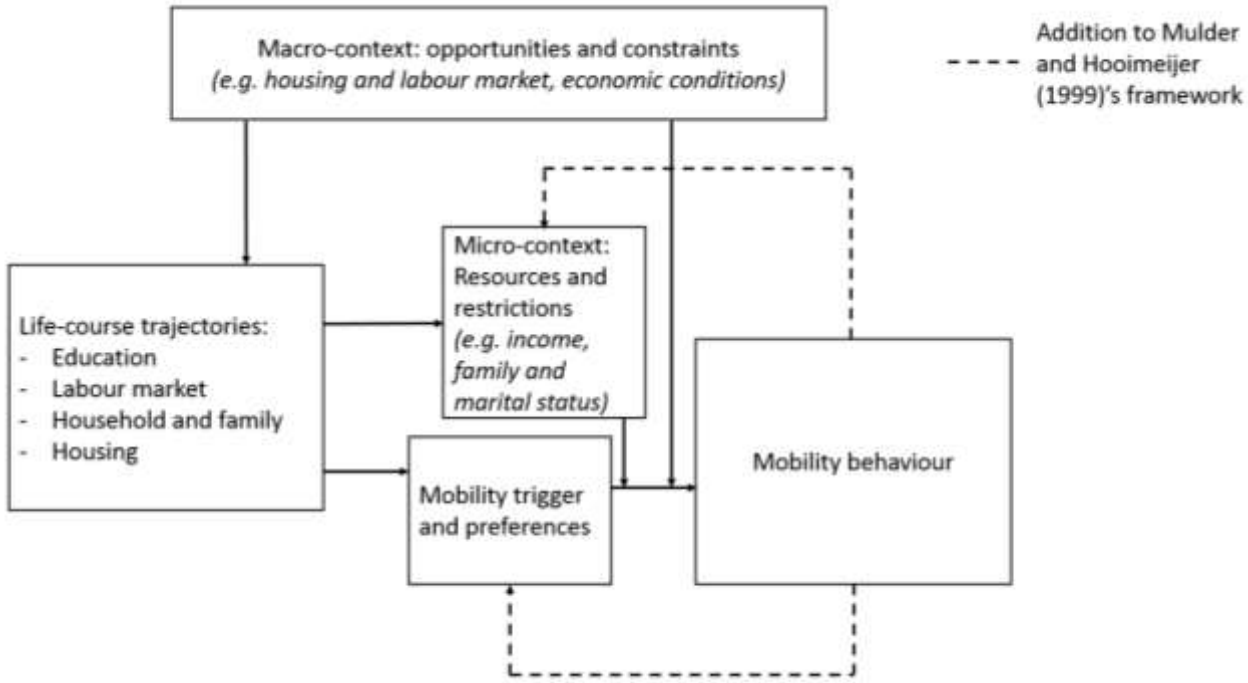


Figure 5 Mobility decision making framework linking past and future moves

Table 1 Mean ages at move in childhood by move order

		First move	Second move	Third move	All moves
High mobility	Denmark	7.0	10.1	11.8	9.4
	Sweden	6.9	9.6	10.6	8.8
	Netherlands	6.3	10.4	12.0	8.4
Upper intermediate mobility	France	7.5	9.9	12.3	9.0
	Switzerland	8.5	11.2	12.2	10.0
	Belgium	6.2	9.6	11.5	8.0
Lower intermediate mobility	Italy	8.1	10.9	12.1	9.4
	Spain	9.2	12.4	13.8	10.5
	Germany	7.6	10.9	11.7	8.9
Low mobility	Austria	11.3	13.0	15.0	11.8
	Czech Republic	7.6	11.1	12.1	8.5
Mean		**7.8**	**10.8**	**12.3**	**9.3**

Source: SHARE, wave 3, authors' calculations

Note: Cohort born 1946-1957. Countries are ranked in order of decreasing average number of childhood moves.

Table 2 Incidence rate ratios Full results for each three model (negative binomial regression) number of adult moves is the dependent variable, all countries modelled jointly

	Variables	model 1		model 2		model 3	
Moves in childhood							
	Number of moves in childhood	1.081***	(7.50)				
	No moves in childhood			1	(.)		
	One move in childhood			1.152***	(4.79)		
	Two moves in childhood			1.283***	(6.11)		
	Three moves in childhood			1.307***	(4.21)		
	Four+ moves in childhood			1.283***	(3.86)		
	No moves (early childhood)					1	(.)
	One move (early childhood)					1.155***	(4.06)
	Two+ moves (early childhood)					1.060	(0.86)
	No moves (middle childhood)					1	(.)
	One move (middle childhood)					1.041	(1.23)
	Two+ moves (middle childhood)					1.053	(0.83)
	No move (adolescence)					1	(.)
	One move (adolescence					1.130***	(3.63)
	Two+ moves (adolescence)					1.347***	(5.66)
Respondent characteristics							
	1918-1931 birth cohort	1	(.)	1	(.)	1	(.)
	1932-1945 birth cohort	1.118**	(2.66)	1.119**	(2.69)	1.124**	(2.81)
	1946-1957 birth cohort	1.123**	(2.71)	1.117*	(2.57)	1.126**	(2.79)
	Female	0.962	(-1.47)	0.961	(-1.52)	0.959	(-1.60)
	Ever been in foster care or child institution	1.219**	(2.75)	1.224**	(2.87)	1.198*	(2.56)
	Never been married	1	(.)	1	(.)	1	(.)
	Ever been married	1.340***	(4.55)	1.348***	(4.66)	1.340***	(4.57)
	Never had children	1	(.)	1	(.)	1	(.)
	Ever had children	1.169***	(3.45)	1.169***	(3.51)	1.173***	(3.55)
	Up to primary education	1	(.)	1	(.)	1	(.)
	Secondary education	1.042	(1.20)	1.042	(1.21)	1.044	(1.26)
	Tertiary education	1.259***	(5.20)	1.256***	(5.21)	1.255***	(5.22)
	No main occupation*	1	(.)	1	(.)	1	(.)
	Senior manager	1.328**	(3.18)	1.322***	(3.17)	1.344***	
	Professional	1.266***	(3.47)	1.270***	(3.54)	1.273***	
	Technical or association professional	1.262***	(3.82)	1.251***	(3.72)	1.258***	
	Clerk	1.245***	(4.08)	1.231***	(3.91)	1.240***	
	Service or shop assistant	1.287***	(4.27)	1.273***	(4.18)	1.275***	
	Skilled agricultural or fishery worker	0.899	(-1.17)	0.897	(-1.21)	0.895	
	Craft or trades workers	1.101	(1.52)	1.099	(1.49)	1.100	
	Plant/machine operator or assembler	1.104	(1.45)	1.097	(1.36)	1.104	
	Elementary occupation	1.117	(2.25)	1.109	(2.13)	1.105*	
	Armed forces	2.234***	(6.97)	2.230***	(7.01)	2.205*	
Parental education							
	Up to primary education (mother)	1	(.)	1	(.)	1	(.)
	Secondary education (mother)	0.952	(-1.21)	0.957	(-1.10)	0.964	(-0.92)
	Tertiary education (mother)	0.926	(-0.88)	0.922	(-0.95)	0.939	(-0.77)
	Up to primary education (father)	1	(.)	1	(.)	1	(.)
	Secondary education (father)	1.045	(0.95)	1.044	(0.94)	1.041	(0.88)
	Tertiary education (father)	1	(.)	1	(.)	1	(.)
Observations		12,650		12,650		12,650	
Log pseudo likelihood		-1.1E+08		-1.1E+08		-1.1E+08	
chi2		2312.3		2294.5		2426.9	
aic		2.15E+08		2.15E+08		2.14E+08	

Source: SHARE, wave 3, authors' calculations

Note: countries were included as control variables as dummies but are not reported here

**Main occupation corresponds to respondents' main occupation during the course of their career as reported by respondents, which is not necessary their current or last occupation for those who were retired at the time of the interview. Individuals who never participated in the labour force fall in the category no occupation, which represents 8 per cent of the sample.*

Table 3 Impact for age at moving on the number of moves in adulthood

	Early childhood		Middle childhood		Adolescence	
	One move	**2 moves+**	**One move**	**2 moves+**	**One move**	**2 moves+**
Sweden	1.07	0.87	0.97	1.00	1.18**	1.35***
Denmark	0.97	1.15**	0.5	0.99	1.095	1.26***
France	1.21**	1.30**	1.08	0.97	0.97	1.17
Italy	1.07	1.12	1.03	1.07	1.24***	1.22*
Netherlands	1.07	1.06	1.08	1.27*	1.09***	1.21**
All countries	**1.16*** **	**1.06**	**1.04**	**1.05**	**1.13*** **	**1.35*** **
Austria	0.93	1.15	0.80	1.13	1.15	1.36
Spain	1.20*	1.07	1.13	1.17	1.09	1.04
Belgium	1.08	1.15	1.10*	1.19**	1.14**	1.32**
Italy	1.07	1.25	1.03	1.20	1.23**	1.25*
Germany	1.18	0.93	0.95	1.12	1.27*	1.78***
Switzerland	1.12**	0.98	1.08	110	1.28***	1.37***
Czech Republic	1.31*	1.65*	1.12	0.999	1.42	1.82**

*p<0.05, ** p<0.01, *** p<0.001

Source: SHARE, wave 3, authors' calculations

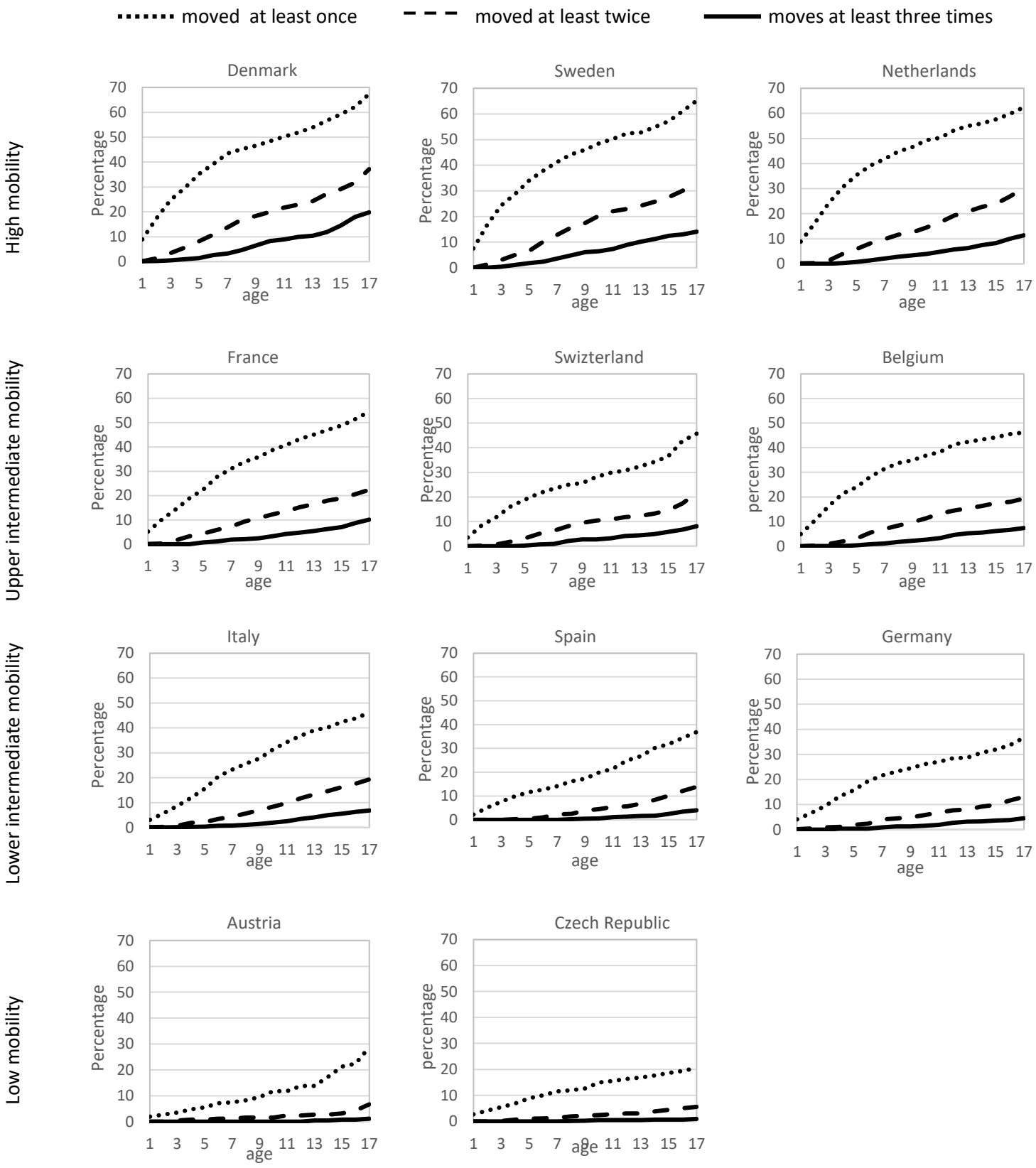
Note: Results from model 3. Reference category no moves. Countries are ranked in increasing order of IRRs obtained from model 1.

Appendix A Descriptive Statistics, all countries jointly

		Mean	Standard deviation	min	max
Number of moves in adulthood		2.56	2.05	0	18
Number of moves in childhood		0.71	1.09	0	14
Year of birth		1942	9.78	1918	1957
Females		1.54	0.49	1	2
Ever been in foster care or child institution		0.03	0.16	0	1
Ever Married by age 50		0.93	0.26	0	1
Ever had children by age 50		0.86	0.34	0	1
Educational attainment	Up to primary	0.32	0.47	0	1
	Secondary	0.47	0.50	0	1
	Tertiary	0.21	0.41	0	1
Main occupation*	No main occupation	0.08	0.27	0	1
	Senior manager	0.04	0.19	0	1
	professional	0.07	0.25	0	1
	technical or associate professional	0.08	0.27	0	1
	clerk	0.16	0.37	0	1
	service, shop or market sales worker	0.15	0.35	0	1
	skilled agricultural or fishery worker	0.05	0.23	0	1
	craft or related trades workers	0.12	0.33	0	1
	plant/machine operate or assembler	0.04	0.19	0	1
	elementary occupation	0.20	0.40	0	1
	armed forces	0.01	0.10	0	1
Mother's highest level of educational attainment	Up to primary	0.63	0.48	0	1
	Secondary	0.33	0.47	0	1
	Tertiary	0.04	0.19	0	1
Father's highest level of educational attainment	Up to primary	0.58	0.49	0	1
	Secondary	0.32	0.47	0	1
	Tertiary	0.10	0.30	0	1

**Main occupation corresponds to respondents' main occupation during the course of their career as reported by respondents, which is not necessary their current or last occupation for those who were retired at the time of the interview. Individuals who never participated in the labour force fall in the category no occupation.*
Source: SHARE, wave 3, authors' calculations

Appendix B Percentage of children who moved by age and move order



Source: SHARE, wave 3, authors' calculations
Note: Cohort born 1946-1957. Countries are ranked in order of decreasing average number of childhood moves