Cultural and Material Resources of Parents and Grandparents and the Educational Outcome of Grandchildren in Europe

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MEA DISCUSSION PAPERS

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Zusammenfassung:

Der Bildungserfolg von Kindern hängt in vielen Fällen von den materiellen und kulturellen Ressourcen der Eltern ab. In vielen Familien stellen jedoch auch Großeltern Ressourcen zur Verfügung, die direkt und indirekt die Bildungslaufbahn ihrer Enkelkinder unterstützen. Im vorliegenden Papier untersuchen wir aus einer Drei-Generationenperspektive, welchen Einfluss Großeltern auf den Bildungsabschluss ihrer Enkelkinder in verschiedenen europäischen Ländern haben.

Mithilfe der Daten des Survey of Health, Ageing and Retirement in Europe (SHARE) ist es möglich, die Bildungsweitergabe in einem Drei-Generationenkontext im internationalen Vergleich zu untersuchen. Die Ergebnisse zeigen, dass der eigenständige Einfluss der Großeltern nicht zu vernachlässigen ist: Besonders wenn Eltern geringe Ressourcen haben und in Ländern mit geringen Bildungsausgaben, gleichen Großeltern diese Mängel aus.

Abstract:

Educational attainment depends on parent's material and cultural resources. In many families, the grandparents may also provide resources that directly or indirectly support their children's educational careers. That is why we applied a „multigenerational view" and tested under what conditions the resources of the grandparents are relevant for the educational careers of the grandchildren.

Using life-history data from the third wave of the Survey of Health, Ageing and Retirement (SHARE) in Europe, we linked the educational outcomes of children with the cultural and material resources of their parents and grandparents. The results show that the impact of grandparental resources is not negligible. Especially when parents lack resources, the resources of the grandparents can be used as insurance and as a substitute for a lack of parental resources. Grandparents also act as an insurance against economic deficits in the country, specifically grandparental resources can compensate for missing public investments in education.

Cultural and Material Resources of Parents and Grandparents and the Educational Outcome of Grandchildren in Europe

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Abstract

Educational attainment depends on parent's material and cultural resources. In many families, the grandparents may also provide resources that directly or indirectly support their children's educational careers. That is why we applied a "multigenerational view" and tested under what conditions the resources of the grandparents are relevant for the educational careers of the grandchildren.

Using life-history data from the third wave of the Survey of Health, Ageing and Retirement (SHARE) in Europe, we linked the educational outcomes of children with the cultural and material resources of their parents and grandparents. The results show that the impact of grandparental resources is not negligible. Especially when parents lack resources, the resources of the grandparents can be used as insurance and as a substitute for a lack of parental resources. Grandparents also act as an insurance against economic deficits in the country, specifically grandparental resources can compensate for missing public investments in education.

Keywords: Education, grandparents, international comparison
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1 Introduction

It is well-established that social origins have a strong influence on educational outcomes and social destinations. Several theories argue that social class is linked to specific stocks of resources, which can be helpful in education. Bourdieu (1971) specifically identified the cultural and material resources of the family of origin as relevant for school success. Therefore, researchers examined the effects of parental material and cultural resources on educational attainment and found that they do indeed lead to better educational outcomes (Aschaffenburg & Maas, 1997; De Graaf, 1988; DiMaggio, 1982; Kalmijn & Kraaykamp, 1996). Resources, however, can also be provided by persons other than the person's own parents or by welfares state institutions.

The most prevalent providers of resources and support outside of the nuclear family may be the grandparents and thus it seems plausible to assume that the resources of grandparents have an influence on the educational success of the grandchildren. We acknowledge, however, that individuals primarily invest in their own children and that grandparental resources are likely to work indirectly via the parents to some degree. We nevertheless argue that under certain conditions, namely when parents are not able to provide sufficient resources themselves, those of the grandparents are used as "insurance". This insurance function of grandparental resources might be particularly important where welfare state arrangements are not geared towards a replacement of insufficient parental resources. As it is likely that such context conditions have an influence on the intergenerational exchange patterns, we also aim to clarify the role of national welfare arrangements in the transmission of educational inequality across generations. We therefore propose the following research question: To what extent and under which conditions are the resources of grandparents influential for the educational outcomes of children?

With this paper we aim to extend the existing research in three ways. First, we include resources provided by grandparents into models of intergenerational educational reproduction, second, we do not restrict our analyses to the direct main effect of resources of grandparents on children's outcomes but also test for possible interactions between parents' and grandparents' resources. Third, we also consider the influence of social policy on grandparental influence, since grandparents might be important not only if the parental resources are missing, but also if the country of origin is not supportive towards helping its citizens achieve their educational goals. This approach enables us to gain more insight about the conditions under which the resources of grandparents are important for grandchildren.

2 Effects of parental resources

Parents invest material resources and transmit cultural resources to their children in order to secure the social status of the family. These two types of family resources have distinct functions in the educational attainment process of the children. Material means are used to cover the direct and indirect costs of education, like tuition fees and learning material, but also the "opportunity costs" of foregone earnings when an individual decided to remain in education for a longer time. The availability of material means is therefore relevant in the choice between educational options with differential costs. The cultural resources directly affect the cognitive ability of the child and the school success as such. In educational systems where entry restrictions are applicable for the most prestigious educational tracks, the successful transmission of cultural resources can have an influence on a child's educational career options, whereas the available material resources influence the decision if the more costly pathways are actually chosen or not.

3 Reproduction or mobility?

The effects of parent's background on their children's educational success are fairly well examined (e.g. Shavit & Blossfeld, 1993). Previous research shows that both the cultural and material resources of the parents have an effect on the educational outcome of the children, but the effects of the material resources are considerably smaller than the effects of the cultural resources (Blau, 1999; De Graaf, 1986, 1988; T. Schneider, 2004). In general, this leads to a reproduction of social advantage as social status and the availability of resources within the family of origin tend to be highly correlated. However, the association between social status, education and available resources however is not perfect (Hartman, 1974). We can therefore assume that children from low status families can use resources as a vehicle for educational mobility when they have access to these. Unlike Bourdieu, who proposes the cultural reproduction hypotheses, DiMaggio (1982) for instance could show that rather a cultural mobility mechanism applies and that cultural capital is especially beneficial for children from lower status backgrounds. However, not only cultural resources, but also material resources have been proven to be beneficial for the educational attainment of disadvantaged children. Among families with particularly low incomes, the available financial resources may be highly decisive. Duncan, Yeung, Brooks-Gunn, and Smith (1998) research on the effects of childhood poverty reveals that especially among children from low income families, an increase of family income has

large effects on the transition probability to higher education. T. Schneider (2004) observed similar effects of parental income in Germany. He reported that additional income shows particularly strong effects in the 2nd and 3rd income quartile, but also that parental incomes in the lowest quartile may prevent transitions to more prestigious educational tracks in Germany. What is paradoxical about these "mobility"-hypotheses is that "low status" is intrinsically tied to "low level of resources" and that it may only be a small minority of all disadvantaged children who have access to this kind of reserves via their own parents. Jæger (2012), however, finds that in addition to the resources of the immediate family, the resources of the extended family can promote their children's educational success (see also Hällsten, 2014). It is therefore not sufficient to only look at the impact of parents on their offspring's educational outcome, but it may also be worthwhile to devote more attention to the resources that are provided by people outside of the nuclear family like the grandparents.

4   Effects of grandparental resources

Research about the resources of grandparents is scarce and mainly examines the effects of socio-economic status indicators rather than more direct measures of resources. Existing research reveals little evidence regarding the effects of grandparental socio-economic status on grandchildren's educational outcome. Warren and Hauser (1997) include schooling, income, and occupational status of the grandparents in their analysis of educational attainment and make a distinction between the "direct" and "indirect effects" of grandparental status. Direct effects are all effects that persist when controlling for parental status and the indirect effects work via the parents' characteristics. The authors report that the direct effects of grandparents' status diminish controlling for parental status. The lack of a direct effect of grandparental resources seems to be plausible as it would be the most efficient strategy to invest resources into the own children and not into the grandchildren (cf. Albertini & Radl, 2012). Especially when this investment has led to a high status of their own children, the grandchildren can rely on the resources of their own parents and do not have a large additional benefit from grandparental resources. We may therefore conclude that the direct transmission of parental resources is the most efficient channel to maintain the family's social status and, in cases where the reproduction between two generations has been successful, the resources of the grandparents are unlikely to have a large additional effect on the status attainment process of the grandchildren. Erola and Moisio (2007) approached the question of whether this "Markov-

chain" explanation is applicable in the status transmission between grandparents, parents, and children in Finland and observed that the social class of grandchildren and grandparents are indeed almost conditionally independent. Chan and Boliver (2013), to the contrary, refer to the discussion of Erola and Moisio, but report for three British-born cohorts that effects of grandparents persists under control of parents' social class. Hence, they reject the assumption that status transmission across three generation is always following the Markovian logic and instead propose that grandparental resources may actually have a direct effect under certain conditions. Theoretical approaches to explain the existence or non-existence of multi-generational effects, however, are meagre and rather orbit around the question of whether the "effects" of grandparents' social status or class go beyond a mere Markov-chain explanation. For this reason, we briefly outline which mechanisms underlie the concept of Markov chains and which may possibly go beyond this principle.

Regarding material resources, we argue that grandparents have incentives to invest their resources not only in their own children but also in grandchildren. Studies dealing with intergenerational relationships and family transfers of resources, like money and care, have a certain tradition within family sociology and we can derive some implications for the intergenerational transmission of resources directly related to children's education. Höpflinger, Hummel, and Hugentobler (2006) observe in a survey of Swiss elderly that especially the middle and higher educated and those with higher incomes give financial help to their grandchildren. Igel (2011) observes that in most European countries the majority of grandparents feel a responsibility for the material security of grandchildren and their families (Attias-Donfut, Ogg, & Wolff, 2005; Igel, 2011). In this context grandparents are sometimes also seen as "family watchdogs" (Troll, 1983) or as "being there" grandparents (Hagestad, 1985) who provide services to the family if they are needed.

Material resources can be used to cover the costs of education and have an impact on the decision of whether educational tracks should be chosen that involve high direct or indirect costs. They have little or no direct effect on the actual school performance of children but they can be transferred between generations quite easily.

Cultural resources, on the other hand, work directly on the cognitive competences of children and can be translated into better school performance and educational advantage. The transmission of cultural resources, however, requires contact between those who give and those who receive - a direct transmission of cultural resources from grandparents to grandchildren, therefore, is only possible when they have regular contact. Höpflinger et al. (2006) report that increasing life expectancy has led to a growing proportion of children who grew up with alive grandparents and that only 2% of the

15-year olds do not have at least one grandparent alive. Although it is not common practice to share a household with one's grandparents, the majority of the 12-16 year old teenagers do have contact with their grandparents at least once a week. Hank and Buber (2009) report that on average 55% of European grandparents even provide care for their grandchildren on a regular basis. The contact between grandparents and grandchildren is thus not negligible and may therefore be an important channel for the transmission of cultural resources.

We outlined above that the transmission of resources is most effective between two consecutive generations and therefore the primary interest of parents should be the status maintenance of their own children. For this reason, the findings of Erola and Moisio (2007) and Warren and Hauser (1997) appear plausible and we may assume a Markovian process. Nevertheless, we argue that the intergenerational status transmission is not successful in all cases and we know that upward and downward intergenerational mobility occurs. Therefore, investing resources into grandchildren may serve to secure the social status across more than two generations and secure the family against the risk of sustained downward mobility. Research examining the effect of parental mobility on children's outcomes consistently reveals that mobility tends not to be persistent across generations and that the sons of mobile fathers have an increased probability to return to the grandfathers' status (Allingham, 1967; Mukherjee, 1954; Parkin, 1971; Svalastoga, 1959). Although these researchers report that grandparents' social class contributes only little to predicting the class outcome of their grandchildren, this contradicts the finding of Warren and Hauser (1997) that resources of the grandparents do not have a direct effect on children's outcomes at all. Erola and Moisio (2007) tested the hypotheses of "lagged inheritance" and "lagged barriers of mobility" and found that especially the grandchildren with grandparents who were in the service class, selfemployed, or self-employed farmers were likely to "inherit" grandparental status independently of parental status and that the grandchildren of grandparents with a particularly low socioeconomic status are less likely to experience upward mobility. Fuchs and Sixt (2007) extended this approach by including grandparents' education and examined the "persistence" of educational mobility across three generations. They found that grandparents' education has an influence on the educational outcome in Germany and that the children of parents who are upwardly mobile have considerably lower chances to maintain the parental status than the children of those who stem from traditionally educated families. Brandt and Deindl (2013) examined the occurrence of intergenerational transfers and could show that parents are most inclined to give financial help to their children when they encounter economic hardship. A necessary

condition for this type of parental/grandparental support is, however, that parents themselves have the means to give financial help. The patterns of "lagged inheritance" thus may be well explained with an "insurance" function of the grandparental resources in case of downward mobility in the parental generation.

Regarding these considerations on the intergenerational transmission of resources and their effect on the educational outcomes of children we may derive that the resources of grandparents are particularly helpful when parents are not able to provide resources for their offspring themselves. Besides, transfers of resources from grandparents are particularly likely when they actually have resources to spare and when their own children are actually in need. This is most likely in families that encountered downward mobility. In these cases grandparents probably have a high interest to invest directly into their grandchildren in order to maintain the family status. Whereas the primary mechanism of reproduction can be seen in the intergenerational transmission of resources between parents and their children (and thus indeed follow the logic of Markov-chain processes), the resources of the grandparents can be used as a multi-generational backup and protect families that experienced downward social mobility from a sustainable status demotion.

5   Context conditions

We outlined above that in some countries no direct effects of grandparental resources is observed (USA: Warren and Hauser 1997; Finland: Erola and Moisio 2007) whereas in other countries (Britain: Chan and Boliver 2014) direct effects are present. As Chan and Boliver point out "these findings must be taken seriously. It is certainly possible that a twogeneration, Markovian mobility process operates in some contexts but not in others" [p. 3]. In the same vein Mare discusses the "null-findings" of Warren and Hauser (1997) and proposes that "we should still give further consideration to multigenerational effects. The conclusions of these studies may not be invariant across time and place; that is, they may depend on the particular institutional arrangements, samples, or populations on which they are based." (Mare, 2011, 3)).

We argue that welfare states may also work as providers of educational resources and therefore the institutional setting of the country should determine to some degree the extent children have to rely on family resources for their educational success. van Doorn, Pop, and Wolbers (2011) show that countries' higher educational expenditure decreases the effect of parental education on children's educational outcome considerably. This can be explained with the fact that a country's investment in the educational system reduces

the educational costs of the individual family, thus affecting the direct costs, for example a reduction or abolishment of tuition fees, but also the indirect costs like student grants and free transportation. One could argue that welfare state investment in education is beneficial for all families and that a high level of educational expenditure, therefore, is not likely to decrease the effect of family resources on individual educational outcomes. There are reasons to assume, however, that a reduction of educational costs is not equally beneficial for all families but that it is particularly beneficial for low income families. Low income families may face severe financial barriers to send their children to higher education no matter if the children have the cognitive potential to succeed. Higher income families to the contrary, do not have financial constraints which prevent them from educational investments; they are prone to send their children to institutions of higher education no matter the cost and therefore are most likely to make maximum use of the cognitive ability of their children. This creates a "ceiling effect" so that low-income families have more potential for participation growth than higher income families when the costs of education are reduced. Educational expenditures can also be invested into the quality of the educational system, or rather into the provision of high quality education that is available and affordable for all social classes. This could mean, for example, that schools provide full-time attendance, homework-support, and extra-curricular activities. All of these measures can supplement or replace family support and decrease the influence of social background on educational attainment.

In sum, we argue that welfare state provisions that reduce the financial burden of educational investments for children, like higher educational expenditures, serve to reduce the impact of family resources. Following the logic from above that resources of grandparents gain importance where the nuclear family does not provide sufficient resources, we may conclude that in an institutional setting where the responsibility for educational expenditures is largely shifted to the welfare state, the importance of grandparents' resources also should be reduced.

6 Summary and hypotheses

We discussed above that children use available material and cultural resources from the family of origin for educational success. Since the transmission of resources is most efficient between parents and their own children, parents are the primary providers of supportive resources. For this reason, we suggest that parental social status has a stronger effect on children's educational outcome than grandparents' social status. (H1)

Grandparents, nevertheless, have an interest to invest their resources in their grandchildren. Particularly in cases where the status transmission between two generations has not been successful, the grandparents serve as family insurance and provide resources that directly support the educational success of the grandchildren. This serves to maintain the family status across several generations and is a very effective mechanism of social closure. Even when downward mobility occurs in one generation, the grandparental generation provides resources that facilitate the return of grandchildren to the status of the grandparents.

Grandparents thus invest in the education of their grandchildren and have an interest to do so, but when the reproduction of the family status has been successful, children rather draw on the resources of their parents. Effects of grandparental resources thus are strongest when parental status is low. (H2)

Welfare states can provide resources that support the educational attainment of children. If welfares state provisions aim at reducing educational costs, improve access to and quality of education, or aim to provide financial support for families, the education of children is less dependent on family resources. Higher educational expenditures of the welfare state can thus replace the role of grandparents as "insurance" in cases of downward intergenerational mobility and reduce the direct effect of grandparental status on children's education. (H3)

7 Data and Variables

We used the first wave of the Survey of Health, Ageing and Retirement in Europe (SHARE) for our analyses. SHARE has a representative sample of the elderly population (50 years or older) in 11 countries within Europe. It is designed as a longitudinal dataset with one wave every two years. SHARE started 2004 in 11 countries (Börsch-Supan et al., 2013). The sample consists of primary respondents and their partners so we have information at the household level. The individual response rate for the first wave was on average 85.3 % with the lowest response rate in Spain (73.7 %) and the highest response rate in France (93.3 %). The third wave of SHARE collected life-history data (SHARELIFE). Thus, for different important life domain (employment, family, childhood, health, etc.) information about the whole life course is available. In SHARELIFE 26,836 respondents were interviewed. Certain information about family background (e.g. socioeconomic background of grandparents) was only asked in the first wave; therefore, we combined the first wave of SHARE with childhood data from SHARELIFE.

The primary respondents (G2) gave proxy-information about their own parents (G1) and about their children (G3). The dependent variable is the educational attainment of the children (G3), and because the units of analysis are not the primary respondents but their children instead, we rearranged the data accordingly. In a first step we constructed parent-child dyads. In a dyadic data set each parent has one row for each child. Where information about both parents was available, the "mother" and "father" information was assigned to each of their children. Redundant information (on the household level) was removed from the data. In the remainder of this paper, the three generations are referred to as "children" (children of SHARE primary respondents or G3), "parents" (SHARE primary respondents or G2), and "grandparents" (parents of SHARE primary respondents or G1). We acknowledge that proxy interviews are not ideal, but the variables we are using are not particularly sensible to a possible bias by proxy and recall interviews (Krieger, Okamoto, & Selby, 1998), and the uniqueness of SHARE outweighs this possible shortcoming. SHARE not only offers information about three generations, which is rare, but this information is also provided for 11 European countries.

The dependent variable is the educational attainment of a child. We distinguish between low, medium, and high levels of education defined by ISCED codes of 0-2 (low), 3 or 4 (medium) and 5 or higher (high) (see Table 1 for the distribution of this variable). There are different ways to analyze education. Our operationalization keeps the ordinal information of the original variable without causing the usual problems of ordered logistic regressions analyses (parallel odds assumption, etc.). Nonetheless, we did additional analyses with a binary (high education) and an ordinal indicator and received nearly identical results. We removed all children under the age of 25 from the data to make sure that the educational attainment process is completed. Comparing education across countries can be a challenging endeavor (S. L. Schneider, 2010). Nonetheless, the data quality of SHARE is high and there is no evidence that education is systematically biased across the different countries (for methodological details on SHARE see Börsch-Supan & Jürges, 2005; Schröder, 2011).

In SHARE the occupational status of parents and grandparents is measured by ISEI, derived from ISCO codes provided by parents. Respondents were asked about the number of books at home in their childhood ranging from "none or very few (0-10 books)" to "enough to fill two or more bookcases (more than 200)". Although the variable 'number of books' is ordinal in scale, additional analyses showed that results remained stable if the variable was treated as metric. Since this variable indicates the cultural resources of grandparents, but at the same time has an influence on the cultural re-

Table 1: Descriptive Statistics

	Mean / %	SD	Min	Max
Dependent variable				
Education child (low)	19.84			
Education child (medium)	42.87			
Education child (high)	37.29			
Resources of the child				
Birthyear (child)	1966.56	8.46	1937	1980
Sex (male)	.50			
Number of siblings	2.86	1.30	1	17
Grandparental resources				
ISEI	39.85	16.01	16	90
Books in Household	2.22	1.27	1 5	
Parental resources				
Cognition (language)	3.35	.86	1	5
Education (low)	.46			
Education (moderate)	.30			
Education (high)	.24			
ISEI	44.78	17.36	16	90
Wealth (in ppp adjusted Euros, log)	11.74	1.68	1.63	16.75

Note: SHARE Wave 1; n= 14726

sources of parents, we controlled for education and cognitive competences of the parents in order to isolate the direct effect of grandparent's cultural resources. For this, we used information about the language competence during childhood (Respondents were asked about their grades in language relative to their classmates: "worse", "same" "better") and the highest educational attainment of both parents. Parental education is categorized similar to children's education as low (ISCED=0, 1, 2), medium (ISCED=3, 4) and high (ISCED=5, 6).

Additionally we also controlled for parental wealth. Wealth has the advantage over alternative measures, like income, because wealth indicates, especially in old age, the culmination of lifetime earnings and hence offers a better proxy for financial abilities. Studies that examine the effects of family wealth, instead of parental income, find substantial effects of wealth on the educational outcomes of children. Conley (2001) showed that in the United States family wealth effects on years of schooling and college entry are large and exceed the effects of parental education. He reports that income effects

Table 2: Educational expenditures

	Geometric mean of educational expenses (1950-2009)	Expenditures for education (percentage of GDP)	Terciles of expenditures for education
Sweden	6.55	6.0	High
Denmark	6.46	7.0	High
Belgium	4.82	5.3	High
Netherlands	5.66	4.9	Medium
France	4.68	4.9	Medium
Austria	4.95	5.0	Medium
Switzerland	4.86	4.9	Medium
Germany	3.80	4.0	Low
Spain	2.88	3.8	Low
Italy	4.25	3.8	Low
Greece	2.14	4.1	Low

Note: OECD 2007, Unesco 1996

are negligible when controlling for wealth. Pfeffer (2011) also found strong effects of family wealth in the U.S. and Germany, supporting the argument that wealth, rather than income, is an adequate indicator of material resources. Since wealth has a wide range and is potentially vulnerable to outliers, the logarithm of the purchase power parity adjusted wealth-values was taken. A number of control variables were considered in our models, namely the features of the child: year of birth, gender, and number of siblings.

7.1 Country level influences

As argued above, family resources can be substituted or complemented by welfare state provisions. Therefore, we examined the effect of educational expenditures on educational outcomes. Educational expenditures were measured as percentage of GDP based on OECD data (http://stats.oecd.org). We divided countries into three percentiles (low, medium, and high) according to their educational expenditures in 2007.

The children of the respondents were born between 1937 and 1980, so most of them finished their education and left the educational system before SHARE measured educational expenditures. It would be ideal to control for educational expenses during the time children were still in school. Unfortu-

Figure 1: Expenditures for education (% of GDP) over time (1950-2009)
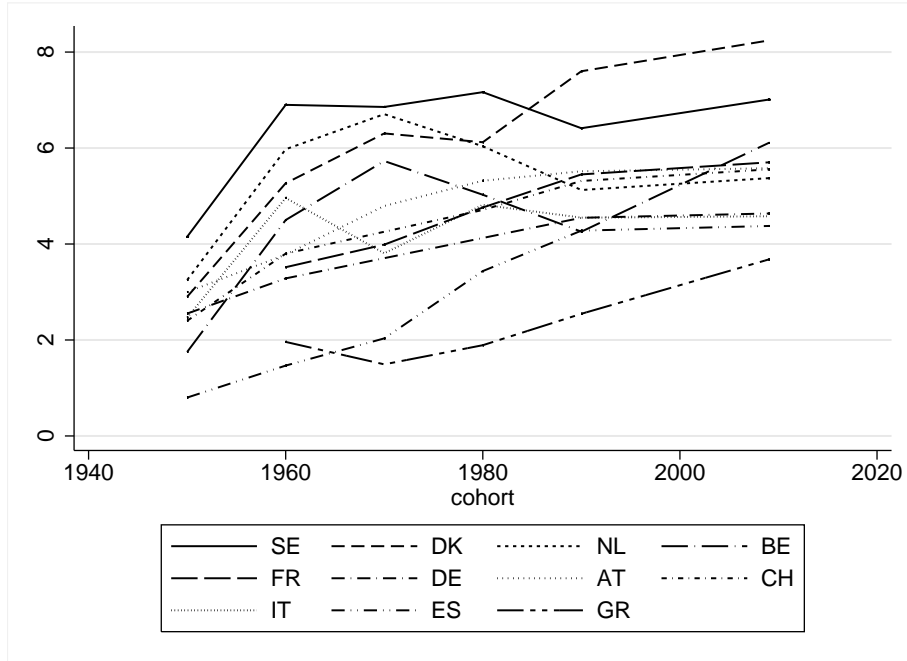
Note: Unesco 1996

nately, this was not possible due to missing comparative macrodata over the whole time period.

We therefore applied a different strategy. Figure 1 displays the educational expenditures (in % of GDP) from 1950 to 2009 (UNESCO 1996). Since there are a lot of missing data, especially in the earlier years, we present the mean of each decade. It can be clearly seen that the differences between the countries are more or less constant over time. The Nordic countries (Sweden and Denmark) invested more in education than other countries over the entire time period. On the other side, Greece constantly invested less than others. All other European countries lie somewhere between these extremes. The only real change can be seen for Spain which moved from last place in 1950 to third place in 2009. Since we are interested in the differences between countries regarding their educational expenses, and not so much in a certain value, we can assume that today's expenditures for education reflect those of earlier years, therefore justifying our approach to use a contemporary measure of educational expenses. Therefore, we also control for country level influences on parents education.

7.2 Analytic strategy

We estimated multinomial-logistic regression models with country fixed effects (countrydummies). We used a three-category measurement of children's educational attainment as dependent variable and contrasted medium education versus low education and higher education versus low education in order to determine the impact of family resources on educational outcomes. The first model includes resources of parents and grandparents as well as child control variables and country dummies. In a second step, we estimated two-way interactions between grandparental and parental resources. We restricted our analyses to the interaction between ISEI and cultural resources (books) of the grandparents and ISEI and cultural resources (education) of the parents. Interaction effects were introduced to investigate whether the resources of the grandparents become important if the resources of the parents are low. In a third step the interaction-effects were estimated for countries with low, medium, or high expenditures for education in order to test if the influence of parental and grandparental resources and their interaction is influenced by resources on the country level.

Multinomial and logistic regression models and interaction effects in such models differ from linear models and are more challenging to interpret (see for a detailed discussion: Ai & Norton, 2003; Allison, 1999; Breen, Karlson, & Holm, 2012; Mood, 2010; Winship & Mare, 1984). One possible difficulty with logistic regression models is that the results are sometimes not comparable across groups and across models (Allison, 1999; Mood, 2010). Similar problems should apply to multinomial regression models. Therefore, we checked our models carefully and found that all results remain stable for the various solutions of this problem as discussed by Mood (2010) and by Breen et al. (2012). For this reason, we report the usual multinomial-logistic regression coefficients and supplement the tables with graphical representations of marginal effects (probabilities) derived from the coefficients. We display the marginal effects of the interaction between parental (education) and grandparental cultural resources (number of books) and parental and grandparental status (ISEI) on education of children while all other independent variables were kept at their mean values. The graphs show the predicted probabilities for children having a low, medium, or higher education dependent on grandparental characteristics and on the interaction between grandparental and parental resources (see Bauer, 2014, for details about this method). The differences between countries were estimated by plotting the probabilities separately for low, medium, and higher educational expenses on the country level. In doing so, we can also determine if grandparents

have an insurance effect with regard to welfare state orientation and public expenditures.

8   Analyses

Table 3 shows the results of two multinomial logistic regression models. Model 1 is our baseline model without any interaction effects and Model 2 specifies interactions between parents' and grandparents' resources. In Model 1, we find that the ISEI of grandparents has a significant direct effect on the educational outcome of the children for the contrast of higher education versus low education. Cultural resources of grandparents have a substantial and significant effect in both contrasts, even when controlling for the cultural resources of the parents. As expected, parental resources are more important for the educational success of the children, but they are not crowding out the influence of grandparents regarding the educational success of their grandchildren.

These results are relatively robust with regard to country level influences. We observe that Germany and Austria have better educational outcomes than Sweden (our reference category). The Netherlands, Switzerland, Spain, and Italy are doing worse with regard to the educational attainment of the children, whereas children in Belgium, France, and Denmark are performing especially well with regard to higher education.

Table 3: Multinomial logistic regression: Educational level of children

	Model 1: Medium vs. Low	Baseline High vs. Low	Model 2: Medium vs. Low	Interaction High vs. Low
Grandparental resources				
ISEI-G	-.01	.04*	-.01	.05*
	(-0.40)	(1.99)	(-0.52)	(2.39)
Books in Household	.06*	.17**	.13**	.28**
	(2.33)	(6.00)	(3.49)	(6.98)
Parental resources				
Language skills	.18**	.26**	.17**	.25**
	(5.73)	(7.80)	(5.65)	(7.69)
Education (medium)	.76**	.89**	.74**	.87**
	(11.00)	(12.22)	(10.61)	(11.77)
Education (high)	.56**	1.47**	.62**	1.51**
	(5.39)	(14.08)	(5.29)	(12.99)
ISEI-P	.07**	.21**	.07**	.21**
	(3.82)	(10.31)	(3.60)	(10.18)
Wealth	.09**	.18**	.10**	.19**

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	Model 1:	Baseline	Model 2:	Interaction
	Medium vs.	High vs.	Medium vs.	High vs.
	Low	Low	Low	Low
	(6.61)	(11.09)	(6.70)	(11.24)
Child control variables				
Birthyear (child)	.04**	.03**	.04**	.03**
	(13.37)	(9.49)	(13.15)	(9.16)
Sex (male)	-.01	-.19**	-.02	-.19**
	(-0.30)	(-3.62)	(-0.35)	(-3.69)
Number of siblings	-.13**	-.20**	-.12**	-.20**
	(-6.96)	(-10.04)	(-6.93)	(-9.90)
Interactions (grandparents * parents)				
ISEI-G * ISEI-P			-.01	-.03*
			(-1.22)	(-2.36)
Books in Household*Education (moderate)			-.16**	-.23**
			(-2.86)	(-3.94)
Books in Household*Education (high)			-.13+	-.17*
			(-1.80)	(-2.32)
Countries				
Sweden (ref.)				
Denmark	.04	.35*	.052	.37**
	(0.31)	(2.46)	(0.39)	(2.62)
Netherlands	-.97**	-.34**	-.97**	-.34**
	(-9.66)	(-3.13)	(-9.65)	(-3.14)
Belgium	-.36**	.45**	-.35**	.47**
	(-3.62)	(4.25)	(-3.52)	(4.42)
France	-.52**	.27*	-.52**	.27*
	(-4.12)	(2.08)	(-4.14)	(2.05)
Germany	1.10**	1.05**	1.10**	1.05**
	(6.43)	(5.82)	(6.40)	(5.83)
Austria	.43**	.75**	.43**	.77**
	(2.77)	(4.54)	(2.80)	(4.62)
Switzerland	-2.11**	-1.36**	-2.10**	-1.35**
	(-15.94)	(-9.95)	(-15.90)	(-9.92)
Spain	-1.43**	-.48**	-1.41**	-.45**
	(-12.93)	(-4.01)	(-12.71)	(-3.70)
Italy	-1.07**	-1.06**	-1.03**	-1.00**
	(-10.46)	(-8.70)	(-10.09)	(-8.17)
Greece	-.38**	.09	-.35**	.13
	(-3.30)	(0.69)	(-3.11)	(0.99)
N	14726		14726	

Note: SHARE Wave 1; absolute value of z statistics in parentheses; * significant at 5%; **significant at 1%

We have seen so far that there is a direct influence of the grandparents on the children, but that the influence of the parents on the children's edu-

cational attainment is stronger. We also proposed that the resources of the grandparents may be more relevant when parents cannot provide resources themselves ("insurance-hypothesis"). We tested this hypothesis by introducing interactions between parental and grandparental resources. Model 2 of Table 3 shows the results of these interactions. We observe a significant interaction of ISEI parents and grandparents in the contrast higher versus low education. This interaction indicates that the occupational status of the grandparents is somewhat more important for children from lower status families and is not particularly decisive for children who stem from high ISEI parents. Since the interpretation of interactions is not straightforward, we present marginal effects plots in order to give a comprehensible overview of the effects. The lower panels of Figure 2 show how the probability to enter higher education converges for different classes when the ISEI of the grandparents increases. The occupational status of the grandparents is not relevant for the probability to enter medium education. The lower panels of Figure 3 show similar results for the cultural resources of the grandparents. Children from lower educated parents seem to profit particularly from the cultural resources of their grandparents.

These results clearly suggest that having grandparents with a higher occupational status is positive for the children and the resources of the grandparents have a certain direct or "net" effect. However, we argued that the resources of grandparents gain importance when the parental generation does not provide sufficient resources and we found that the effects of grandparents' resources are indeed larger for children from parents with low education or low occupational status.

The analyses shown in Table 3 only included country-dummies. Using these, we are able to detect the influence of parental and grandparental resources on children's education but we are not able to pin down the role of country specific characteristics. In the following, we assess the effect of parental and grandparental resources on children's education in relation to countries' educational expenditures. In doing so, we test whether the resources of grandparents may be particularly relevant when the welfare state does not provide for educational costs. We categorized countries with low, medium, and high expenditures for education (see also Table 2) and ran the above analyses separately for each of the expenditure levels. Country dummies are included in the models to control for additional specific country level characteristics. The graphical representation of our results is presented in Figures 4 and 5.

Figure 4 shows the effects of ISEI for countries with different levels of educational expenditures. The upper panels show results with no interaction effects. We conclude from the slight slopes that a higher ISEI of the

Figure 2: Effects of family resources on children's educational outcome: Occupational status of parents and grandparents
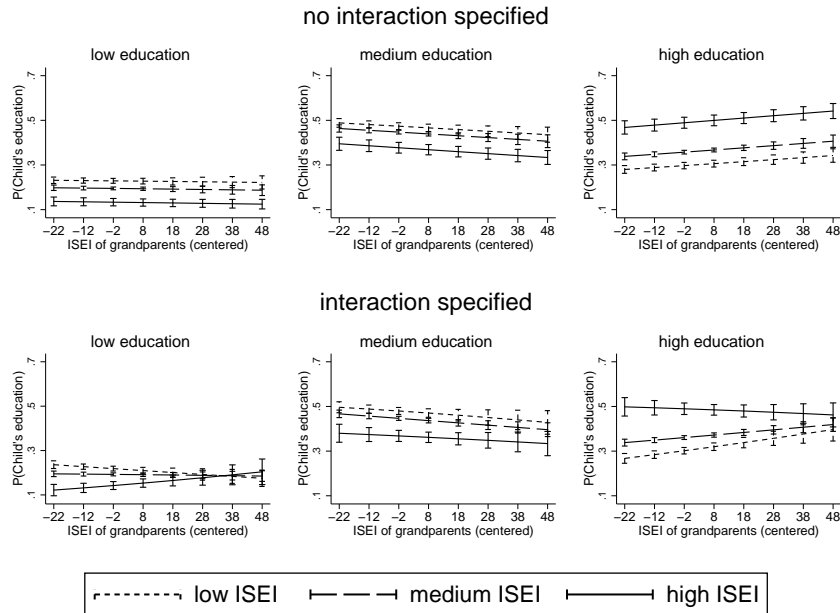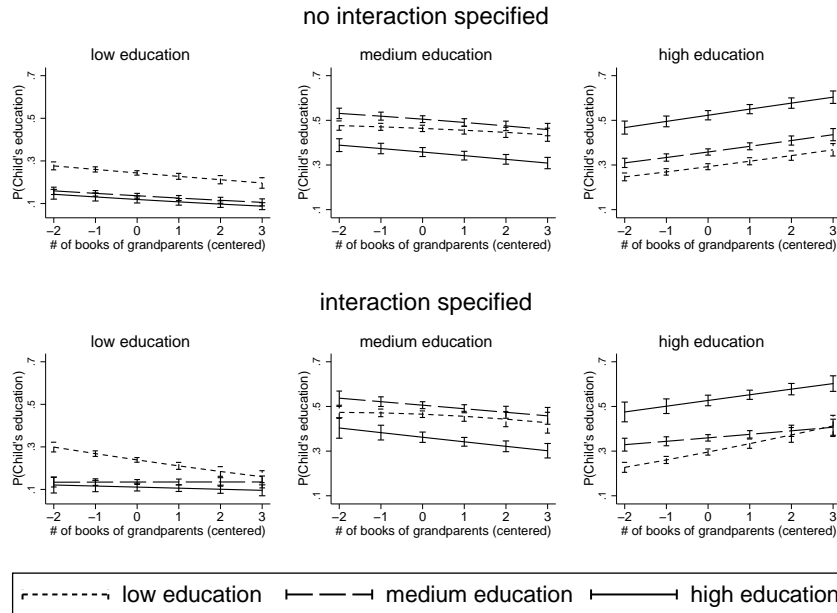

Note: SHARE Wave 1; Observations=14,726
Probabilities based on multinomial logit models, covariates (child's sex, parent's education, parent's wealth (log), language skills parents, number of books grandparents) fixed at mean

grandparents has a direct effect on the educational outcome of the child. In the lower panels, the same models are specified with interaction effects and we find that the probabilities to obtain low and high education converge for children from different backgrounds in countries with low expenditures for education. This indicates that children in countries with low educational expenses benefit from a higher occupational status of the grandparents in addition to the status of the parents. The grandparents' resources thus seem to have a certain relevance for children from lower status parents, especially to achieve a higher education.

Figure 5 shows how the effect of the cultural resources of the grandparents changes for different parental statuses. The graphs show that on top of parental education, the cultural resources of grandparents reduce the risk of the children entering low or medium education and increase the probability of entering higher education. With regard to the interaction effects, we observed that especially children with parents who have a lower education

Figure 3: Effects of family resources on children's educational outcome: Education of parents and cultural resources of grandparents

Note: SHARE Wave 1; Observations=14,726
Probabilities based on multinomial logit models, covariates (child's sex, parent's education, parent's wealth (log), language skills parents, number of books grandparents) fixed at mean

background can massively decrease their risk of obtaining only low education when grandparents provide cultural resources, while offspring from middle and highly educated parents have a low risk of obtaining low education independent of the grandparents' cultural resources. The higher two classes rather avoid medium level education when grandparents provide a high level of cultural resources. When it comes to the probability of entering higher education, all classes seem to profit from cultural resources of grandparents, with children from low and higher educated parents profiting somewhat more than children from medium educated backgrounds.

Especially for high-spending countries we find that in general the risk of obtaining only low education is low for children from any background and that the cultural resources of the grandparents do not necessarily prevent children from obtaining medium level education. Instead, a higher education level of the parents clearly seems to be decisive here, however we do not observe a large difference between children from medium and low educated

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parents. There is, however, a pronounced interaction effect for children from low educated parents: These children can clearly improve their probability of entering higher education when grandparents provide cultural resources.

9   Discussion

With this paper we set out to examine the effects of grandparental resources on the educational attainment of children. As proposed by Mare (2011) we extended previous research about intergenerational reproduction of inequality by integrating resources of the grandparents. In recent research it has been debated whether we can reasonably assume direct effects of grandparents' social status on children's outcomes or whether the transmission of social status follows a Markov-chain logic. Warren and Hauser (1997) found that the effects of grandparents in the United States diminish under control of parents, and Erola and Moisio (2007) confirm this finding in a Finnish sample. In line with Erola and Moisio (2007), Mare (2011) argues that a Markovian logic may indeed be at work which explains these "null findings", but he does acknowledge that this logic may not hold in all contexts.

Chan and Boliver (2013) and Hertel and Groh-Samberg (2014) challenge the assumption of mere Markovian processes and report direct effects of grandparents' social status on children's outcomes in Germany and the United States. We aimed to shed more light on the diverging results and argue that Markov-chains imply a quasi-perfect relationship between the status attainment of two subsequent generations, but given the fact that we observe upward and downward intergenerational mobility in societies, this assumption does not hold universally. For this reason, we tested whether the effects of grandparents' resources vary with parental status and found that the effects of grandparents' resources are stronger when parents have a lower social status. This result suggests that a counter-mobility may be in place when families encounter downward intergenerational mobility. In these cases, the resources of grandparents gain relevance and work as "family insurance" (Pfeffer, 2011) against sustained downward mobility across more than one generation.
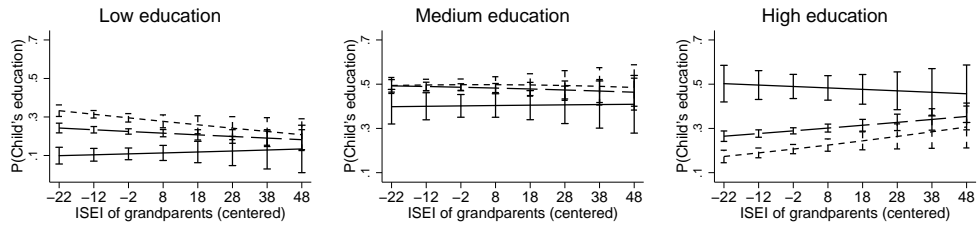
20

Figure 4: Effects of occupational status of parents and grandparents on children's educational outcome in different welfare states

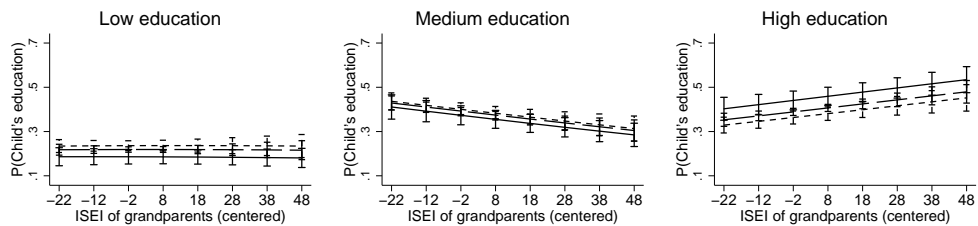## Low expenditures for education
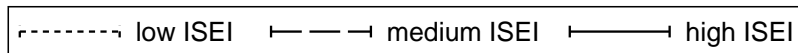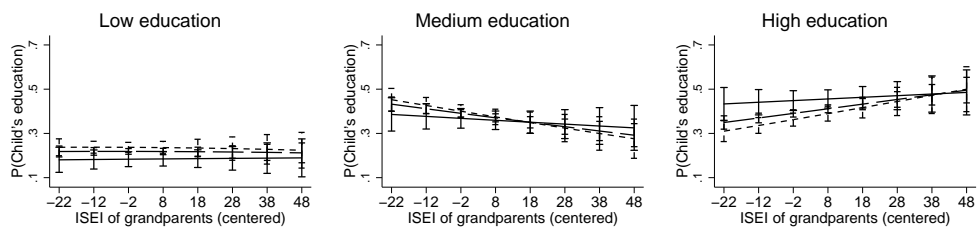
No interaction specified
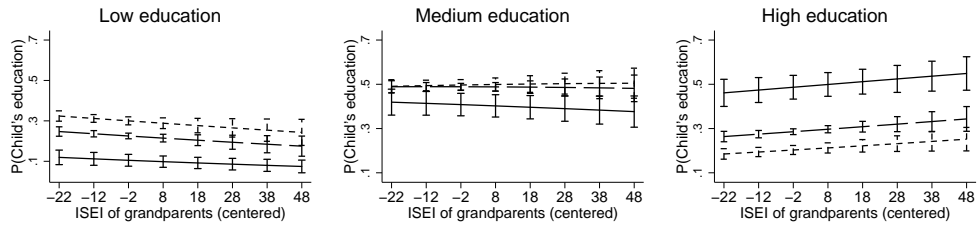
Interaction specified
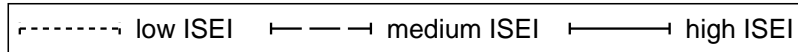
Medium expenditures for education
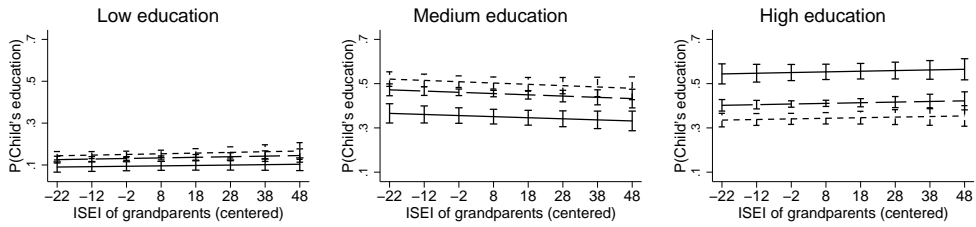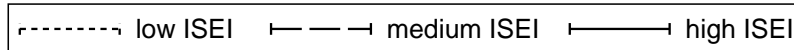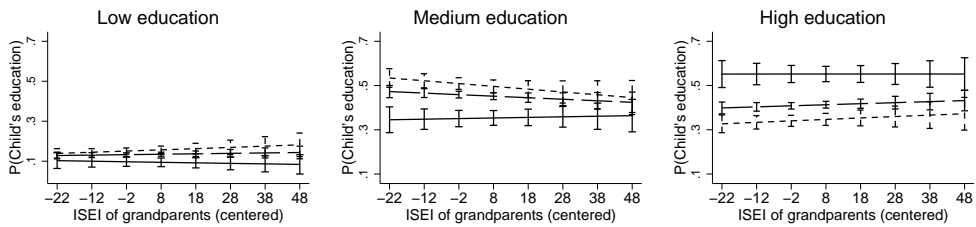
No interaction specified

Interaction specified

High expenditures for education
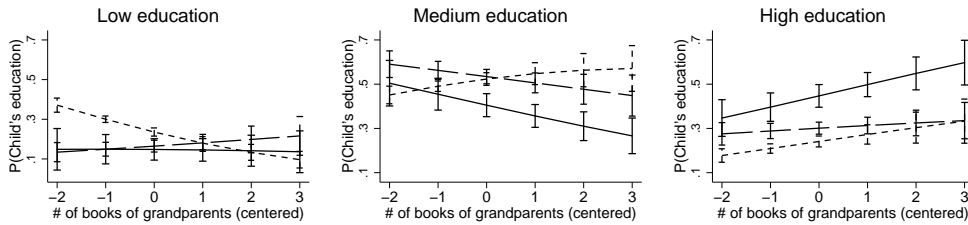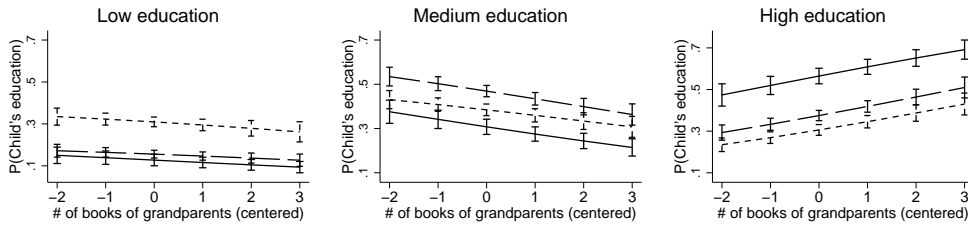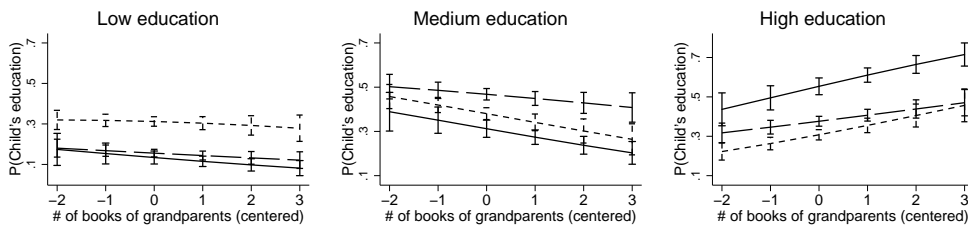
No interaction specified

Interaction specified

Note: SHARE Wave 1; Observations=14,726

Probabilities based on multinomial logit models, covariates (child's sex, parent's education, parent's wealth (log), language skills parents, number of books grandparents) fixed at mean

Figure 5: Effects of cultural resources of parents and grandparents on children's educational outcome in different welfare states

Low expenditures for education

No interaction specified
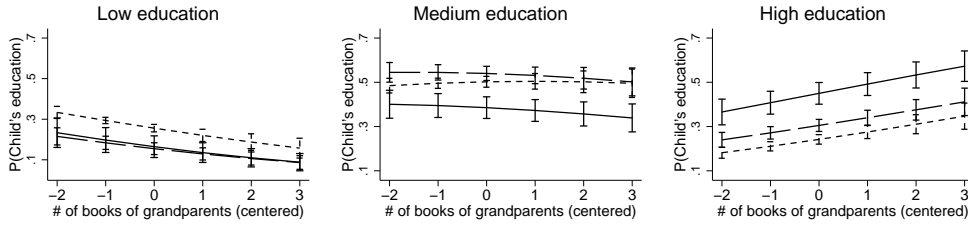
Interaction specified

r------¬ low education   ⊢ — —⊣ medium education   ⊢————⊣ high education

Medium expenditures for education
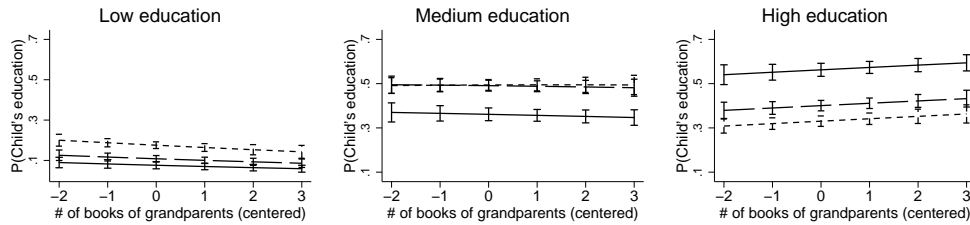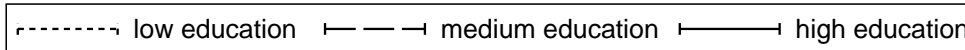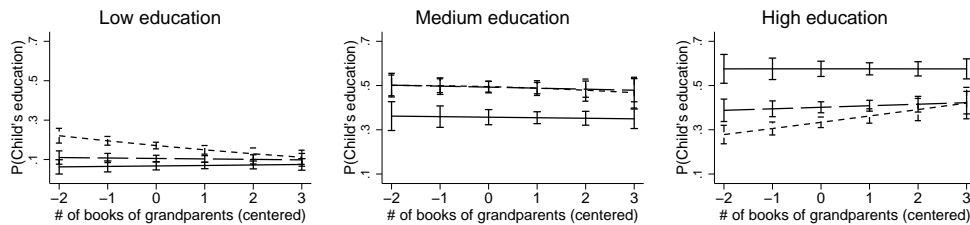
No interaction specified

Interaction specified

r------¬ low education   ⊢ — —⊣ medium education   ⊢————⊣ high education

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High expenditures for education

No interaction specified

Low education — Medium education — High education

(three plots, x-axis: # of books of grandparents (centered), y-axis: P(Child's education))

Interaction specified

Low education — Medium education — High education

(three plots, x-axis: # of books of grandparents (centered), y-axis: P(Child's education))

Legend: low education · · · · ·   medium education ⊢ — ⊣   high education ⊢———⊣

Note: SHARE Wave 1; Observations=14,726
Probabilities based on multinomial logit models, covariates (child's sex, parent's education, parent's wealth (log), language skills parents, number of books grandparents) fixed at mean

We also tested whether different types of welfare state arrangements, in terms of educational expenditures, have an influence on the relevance of grandparental resources for children's educational outcomes. We found that the influence of grandparents' occupational status is negligible in more generous welfare states, but that children can profit from grandparents with a higher ISEI when educational expenditures are low. This might explain why researchers find diverging results regarding the direct effects of grandparents' status in different countries. Scandinavian countries for instance have a high level of public expenditure on education and only very small sectors with private schooling. It therefore seems plausible that the material resources available from the family are not particularly decisive in these contexts. Thus, the "null finding" of Erola and Moisio (2007) for Finland is not surprising. In low spending countries like Germany direct effects of family resources are more likely to occur, as for example shown by Hertel and Groh-Samberg (2014). The United States and Great Britain both are countries with a higher

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education sector that, to a large degree, is privately financed, but at the same time have medium level public expenditures. We expect that in this type of setting the results in multigenerational research are more sensitive to different operationalisations of children's outcomes and social status of parents and grandparents, which may explain the diverging results of Chan and Boliver (2013), Hertel and Groh-Samberg (2014) and Warren and Hauser (1997). Unfortunately, neither Great Britain nor the Unites States participate in SHARE, but it may be worthwhile to have a closer look at the measurements of children's outcomes and focus on the educational attainment of (grand-)children rather than on social class (Chan & Boliver, 2013; Hertel & Groh-Samberg, 2014) or occupational status (Warren & Hauser, 1997).

For the cultural resources of grandparents the results are less clear: The cultural capital of grandparents has a significant positive direct effect on the probability of entering higher education for all public spending levels, but we find the largest effect in the low-expenditure countries. Grandparent's cultural resources can compensate for a lack of parent's own cultural resources, as can be concluded from the interaction effects between cultural resources and parent's education. As can be seen in the graphs, a high level of grandparent's cultural resources more or less closes the educational gap between children from low and medium level educated parents, but does not affect the clear advantage of children from highly educated parents. This suggests that the cultural resources of parents and grandparents work accumulatively to a larger degree compared with material resources. This leads to the conclusion that the cultural resources of the grandparents have an "insurance function" for children from lower educated parents but that this does not lead to a convergence of educational chances for the different classes because children from higher educated parents profit from these resources to a comparable extent. The effect of family cultural resources also does not clearly vary by expenditure level. We assume that this is the case because educational spending rather complements material resources and not cultural resources.

We conclude from our results that the role of grandparents in the status attainment and maintenance process has been unreasonably neglected. Especially regarding possible processes of social mobility, it has to be taken into account that reproduction does not only take place between two generations, but that children can profit from grandparental resources especially when the parent's generation experienced status demotion. In the long run the social structure may be even more stable than suggested by contemporary mobility research. A particular importance may be assigned to different types of welfare state arrangements because those under certain conditions ensure a redistribution of resources that can break the cycle of reproduction via the transmission of resources within the family of origin. Our results

confirm that especially educational investment can be diverted from families to the welfare state and effectively reduce the impact of family resources on individual educational outcome.

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