Does Grandparenting Pay off for the Next Generations? Intergenerational Effects of Grandparental Care

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ABSTRACT

Does Grandparenting Pay off for the Next Generations? Intergenerational Effects of Grandparental Care*

Grandparents act as the third largest caregiver after parental care and daycare in Germany, as in many Western societies. Adopting a double-generation perspective, we investigate the causal impact of this care mode on children's health, socio-emotional behavior, and school outcomes, as well as parental well-being. Based on representative German panel data sets, and exploiting arguably exogenous variations in geographical distance to grandparents, we analyze age-specific effects, taking into account counterfactual care modes. Our results suggest null or negative effects on children's outcomes: If children three years and older are in full-time daycare or school and, in addition, cared for by grandparents, they have more health and socio-emotional problems, in particular conduct problems. In contrast, our results point to positive effects on parental satisfaction with the childcare situation and leisure. The effects for mothers correspond to an increase of 11 percent in satisfaction with the childcare situation and 14 percent in satisfaction with leisure, compared to the mean, although the results differ by child age. While the increase in paternal satisfaction with the childcare situation is, at 21 percent, even higher, we do not find an effect on paternal satisfaction with leisure.

JEL Classification:	D1, I21, I31, J13, J14
Keywords:	grandparental childcare, socio-emotional outcomes, cognitive outcomes, parental well-being, instrumental variable

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1 Introduction

In light of the increase in longevity, parents today are more likely than in the past to live for many years while their children are adults and parents themselves. Thus, Western societies are experiencing an increase in grandparent-grandchild exposure (e.g. Lowenstein and Bengtson, 2003; Song and Mare, 2019. As a result, today's grandparents are in a better position than previous generations to play an important role in the lives of their children and grandchildren (e.g Chapman et al., 2018). On the one hand, grandparents are the most important source of emotional and material support for adult children. On the other hand, grandparents often represent the most affordable and flexible source of informal childcare for their grandchildren (Fergusson et al., 2008).

In many OECD countries, grandparents act as the third largest caregiver after parental care and daycare (OECD, 2019).[1] This is the case in the US but also in continental European countries (Hank and Buber, 2009), although there are significant variations given country-specific differences in the childcare setting and female labor force participation.[2] In Germany, a country with traditionally low maternal employment and a universal daycare system, every fourth child below the age of eleven is cared for by the grandparents on a regular basis (section 3). Although daycare arrangements have expanded over the past decades in Germany as in many other industrialized countries, the relevance of grandparents as informal caregivers has remained relatively stable over the years. The continuously high importance of grandparental care can be attributed to the need to reconcile childcare, (full-time) employment, longer commutes, and non-flexible opening hours of daycare centers, as well as parental preferences for this kind of care. Thus, many studies with different foci (for a summary see e.g. Hank and Buber, 2009, section 2) have analyzed the relevance of grandparental care in the "care puzzle" of many families, based mainly on US data. However, only a few have a double-generation perspective, looking at both child and parental outcomes – the focus of our paper.

Why is such a perspective interesting? Compared to other caregivers, grandparents might have more time to focus solely on the child. Their greater life experience and emotional closeness might affect children positively in various dimensions. However, if grandparents consider themselves less of a teacher and more of a friend, we might find different effects on socio-emotional skills and school outcomes (e.g. Dunifon et al., 2018). In terms of parental outcomes,

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[1]The term daycare describes all forms of formal childcare provided by professionals outside the family. The term parental childcare describes all childcare provided by the mother or the father of the child. Grandparental care describes the situation in which grandparents take care of their grandchildren, the children in our setting.

[2]Apart from this, more than one third of Europeans see informal care by grandparents or other relatives as the most preferred non-parental care mode (Eurostat, 2012).

grandparental care could provide parents with more time for themselves, leading to improved satisfaction with their leisure time use. In contrast, grandparental care might be accompanied by emotional stress between the grandparents and parents, as inter-familial relationships are more prone to emotional conflicts than those with caregivers outside the family. Compared to other care modes, grandparental care might also be a less stable and continuous care option, for instance, due to sickness or other obligations of the grandparents, which, in turn, could lead to more stress. In general, the intensity of grandparental care might not be high enough to substantially affect child and parent outcomes, as this care might be too similar to the counterfactual care mode. Therefore, it remains an empirical question whether grandparental care pays off. In this paper, we focus on children's health, socio-emotional skills, and school-related outcomes, as well as parental well-being. Both parental and child outcomes are important in the short and medium term, as well as for educational, health, and labor market outcomes at later ages.

While ours is not the only study analyzing such outcomes, it is – to the best of our knowledge – one of the few studies estimating the *causal impact* of grandparental care on the above-mentioned outcomes. Hereby, we make several contributions. First, we add to the literature on the effects of grandparental care on child outcomes,[3] particularly that on causal effects. The study by Del Boca et al. (2018) focuses exclusively on cognitive outcomes, while Ao et al. (2021) analyze the influence of grandparental care on children's locus of control, based on a sample of three-generation households. While both causal studies focus on one particular child outcome, we focus on a variety of child outcomes.

Secondly, we add to the literature that evaluates the causal impact of grandparental care on parental well-being. The study by Chen and Zhang (2018) is one of the few that analyze the causal effect on parental well-being. In comparison, we consider a range of parental well-being outcomes in order to capture potential heterogeneous effects.

Third, we give further evidence of these effects based on data for a country with almost no three-generation households and an increasing share of children in highly subsidized daycare. Thus, we add to the literature, which focuses mainly on the US context or (other) European countries, with different childcare settings and also counterfactual care modes. Fourth, we account for age-dependent counterfactual care modes by conducting various subgroup analyses.

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[3]Sadruddin et al. (2019) survey 206 studies from more than 50 countries and regions that globally and comprehensively review the impacts of grandparental care on children's outcomes, including physical and mental health, behaviors, cognitive skills, and education. For instance, Fergusson et al. (2008) found that grandparental care was associated with some elevated rates of hyperactivity and peer difficulties at age 4, but these were largely attributable to variations in the types of families using grandparental care. However, they do not claim to find causal relationships.

While for younger children, grandparental care mainly comes on top of sole parental care, for older children, grandparental care is combined with daycare or school visits and parental care (section 3). Fifth, our analysis is based on rich micro-data sets which allow a deeper understanding of the grandparents' role in children's and parents' outcomes. Thus, it gives hints on the role of intergenerational transfers to the next generations on social mobility (e.g Song and Mare, 2019). We investigate effect heterogeneity and provide some suggestive evidence for the plausible mechanisms behind the effects.

The identification of a causal relationship between grandparental care and child and parental outcomes is difficult because the care decision made by parents and grandparents is endogenous and thus also affects child outcomes. In order to overcome this endogeneity problem, we employ an instrumental variable approach. We use the distance to grandparents as an instrument for grandparental care. Our analysis is based on two representative panel data sets for Germany: *pairfam* and *SOEP*. We use samples of 6,771 and 5,085 families and observe them over a 12-year period (2009-2020) and an 8-year period (2010-2017), respectively. Our analysis relates to children who are usually considered to require some kind of care, namely, children up to the age of ten.

We focus on important outcomes for the next two generations. Cognitive and, to a smaller degree, socio-emotional skills are largely determined early in life (e.g Cunha and Heckman, 2008). Thus, input provided by carers plays a significant role in child development. Early skills and child health are important preconditions for an effective production of skills in following periods. Moreover, socio-emotional skills promote the formation of school-related outcomes (e.g Cunha and Heckman, 2007). Child health is equally as important for child development as school outcomes and socio-emotional skills (e.g Currie, 2020). Parental well-being can be used to measure the utility parents derive from care arrangements and can act as a well-being measure *per se*. Additionally, the well-being of parents affects child development (e.g. Berger and Spiess, 2011; Dahlen, 2016). Parental well-being also influences other important parental outcomes, such as maternal labor supply and fertility (e.g Sandner, 2019).

Overall, our results provide evidence that, on average, grandparental care does not affect child outcomes; at least, the effects on most of the outcomes we capture are not statistically significant. However, we find that grandparental care negatively affects elementary school children's health, which is mostly driven by children cared for by less healthy grandparents. Concerning parental outcomes, the picture is different, as we find more outcomes to be statistically significantly affected, particularly for maternal well-being. We provide evidence that grandparental care

increases maternal and paternal satisfaction with the childcare situation and exhibits positive effects on maternal satisfaction with leisure. We show that our results are robust to an extensive set of robustness checks concerning the validity of our instrument.

2 Contribution to Literature

There is increasing literature on grandparental care in social science, taking different perspectives and approaches, mainly based on US data or European countries other than Germany. Our study contributes to at least three literature strands focusing on the causal relationships[4] of grandparental care: studies exploring i) the effects of grandparental care on various outcomes of the grandparents themselves; ii) the effects of various care modes, including grandparental care, on child outcomes; and (iii) the effects of various care modes, again including grandparental care, on parental outcomes.

Causal estimates on the effects of grandparental care on grandparental outcomes, such as health, well-being, and cognitive functioning, are rare and find only limited evidence for a causal association. Danielsbacka et al. (2019) show that positive associations between grandparental care and health and well-being are due only to between-person differences and do not hold in within-person analyses. Arpino and Bordone (2014), however, find positive effects on the verbal fluency of the grandparents but no effects on other cognitive tests. A number of studies have shown negative effects of grandparenthood on grandparental labor supply (e.g. Backhaus and Barslund, 2021; Frimmel et al., 2020; Rupert and Zanella, 2018). The effects can be attributed to caring grandmothers who are less attached to the labor market – at least for the cohorts studied so far. We contribute to this literature by focusing on the effects of grandparental care on the care-receiving generations, namely the children and their parents.

The effects of various care modes on child outcomes have been studied extensively in recent years, with a focus on the effects of daycare,[5] while there is hardly any causal research on the effects of informal care on children. The study by Del Boca et al. (2018) uses UK data to evaluate the effect of grandparental care, instrumented with the distance between the parental and grandparental homes, on cognitive child outcomes at ages 3 to 7, which serve as predictors of school outcomes. Their results suggest that there is no difference in outcomes between children in grandparental care and parental care. However, they find children in grandparental care to

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[4]For a recent overview of various studies that mostly analyze these questions as associations, see Hank et al. (2018).

[5]For Germany, see e.g. Bach et al., 2019; Cornelissen et al., 2018; Felfe and Lalive, 2018, who all show positive effects for children from lower socio-economic background in particular, while Kuehnle and Oberfichtner (2020) do not find such effects.

be better at naming objects but worse at other skills. Ao et al. (2021) examine the effect of grandparental care on the locus of control of children aged 10 to 15. They use the number of parents' siblings as instrumental variables. With Chinese panel data (CFPS), they find that grandparental care significantly raises children's external locus of control by approximately 1 standard deviation. Thus, children in the care of their grandparents tend to attribute individual success to external factors, such as luck and fate, more than children in parental care. Another study finds that an Austrian parental leave reform crowded out informal care (mostly offered by grandparents) and increased children's cognitive and later labor market outcomes. Danzer et al. (2020) conclude that care provided by mothers is superior to informal care arrangements.[6] We add to this literature by estimating the causal effect of grandparental care on health, socio-emotional, and school outcomes[7] and compare outcomes between children who are in daycare and those who are not, in addition to grandparental care.

The literature on the effects of various care modes, again largely covering daycare, on parental outcomes is huge and focuses mainly on the effects on maternal employment (for a recent overview, see Müller and Wrohlich, 2020), but also other outcomes such as fertility (e.g. Bauernschuster and Schlotter, 2015) or maternal well-being.[8] We focus on parental well-being as an outcome that has been studied less extensively.[9] Based on Chinese data, Chen and Zhang (2018) evaluate the causal impact of grandparental retirement (resulting in more potential time for the care of grandchildren) on parental well-being. They find no effect on mothers' subjective health or life satisfaction. We extend this strand of the literature by estimating the effect of grandparental care on parental well-being separately for mothers and fathers.

3 Institutional setting

In Germany, grandparental care has played a significant role for many years (see Figure A.1). Figure 1 demonstrates that in 2018/19 across age groups, grandparents cared for about 20 to 30 percent of children below the age of eleven.

Over the past decades, maternal employment in Germany has been increasing (e.g. OECD,

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[6]A study by Milovanska-Farrington (2021) analyzes the relative effects of grandparental supervision compared to parental care time, using Scottish data. Grandparental care time has a positive impact on the observed cognitive skills. However, the causal approach they use applies only to very specific institutional settings.

[7]We use the term "school outcomes" to indicate that the covered measures are not only the results of cognitive skills but non-cognitive skills as well.

[8]While the latter outcome is less investigated, evidence of the effects of daycare in Germany on parental well-being shows mixed but generally positive results (e.g. Kröll and Borck, 2013; Schmitz, 2019; Schober and Stahl, 2016; Schober and Schmitt, 2017)

[9]The effects of grandparental care on maternal employment have already been studied quite extensively, showing an increase in maternal employment following grandparental care (e.g. Bratti et al., 2018; Compton and Pollak, 2014; Fenoll, 2020; Kanji, 2018).

2020). This was made possible through a policy that has led to a significant increase in the supply of publicly funded daycare since the 1990s (e.g Müller and Wrohlich, 2020). The proportion of children below the age of three in daycare has seen a substantial increase, from below 5 percent in 1990 to about 29.4 percent in 2018 (Statistisches Bundesamt, 2019). Still, daycare coverage varies by children's age. Many families with children aged three years and younger do not have a daycare slot, despite the demand (e.g. Jessen et al., 2020). For older children, enrolment has been almost universal (95 percent) since the year 2000 (Statistisches Bundesamt, 2019). However, there are not enough slots offering full-time care to match parental preferences (Autorengruppe Bildungsberichterstattung, 2020). Daycare fees are relatively low, and some states have even abolished them (e.g. Huebener et al., 2020; Schmitz et al., 2017). The share of for-profit providers is low at about 2 percent (Statistisches Bundesamt, 2018). Most daycare centers are operated by non-profit organizations or municipalities. Other forms of childcare that have seen a large increase in usage in recent years are all-day schools or after-school care programs. The share of children in all-day schools or related programs increased from 28 percent in 2005/06 to 68 percent in 2018/19. Nevertheless, there is also an excess demand for these slots (Autorengruppe Bildungsberichterstattung, 2020).

Next to formal care arrangements, grandparents play an important role in the "care puzzle." Figure 2 shows the share of different combinations of care modes for different child age groups pooled over the period 2009-2020. Panel (a) represents overall care use, taking morning and/or afternoon together, panel (b) shows care use in the morning, and panel (c) care use in the afternoon. The majority of young children (0-2 years) are cared for only by their parents (almost 60 percent). In the morning, the second most frequently used option is a combination of parental and daycare, which applies to about 25 percent of children, followed by a mixture of parental and grandparental care (about 15 percent). Thus, the most common counterfactual of grandparental care at this age is parental care. In the afternoon, the combination of parental and grandparental care is the second most frequently used option (20 percent), while only about 10 percent of children are cared for by parents and daycare in the afternoon.

Older children (3-5.5 years and 5.5-10 years, elementary school children) are most frequently cared for by a combination of parents and daycare/school (70-80 percent). Here we observe and expect large differences between morning and afternoon: in the morning, 90-95 percent of children are cared for by either daycare or school, while in the afternoon, only about 30 percent of children are cared for by daycare or school. Here the majority of children are cared for by their parents only (about 50 percent). A substantial number of older children are also cared for by their grandparents in the afternoon: almost 20 percent are cared for by parents and

grandparents, and about 10 percent by parents, daycare/school, and grandparents.

When comparing the care patterns for employed and not-employed mothers, it becomes apparent that grandparental care plays a particularly important role in families with employed mothers (see Figure A.2 in the Appendix). For families with very young children, this is most visible, as in the afternoon, grandparents are involved in childcare for almost 40 percent of young children. This proportion is less than 20 percent of children of not-employed mothers.

In conclusion, the most common counterfactual of grandparental care for older children, who are mostly in daycare or school in the morning, is either sole parental care or parental care together with daycare or a school program in the afternoon.

4 Data

For the analysis, we use two representative survey datasets. The first dataset, which is used to analyze the effects of grandparental care on parental well-being, children's socio-emotional outcomes, and children's health, is the "Panel Analysis of Intimate Relationships and Family Dynamics" (*pairfam*). Participants are surveyed annually (Huinink et al., 2011). We use the *pairfam* data for the information on child health, children's socio-emotional skills, and parental satisfaction measures. To analyze children's school outcomes, we use a second data set. This is the German Socio-Economic Panel *(SOEP)*. The *SOEP* is a representative household survey that has been conducted every year since 1984 (Goebel et al., 2019). For more information on the data sets and their comparability, see Appendix B. Both data sets also include information on the geographical distance between the adults in the household and all four grandparents (if they are still alive) in several waves. In *pairfam*, we measure this by comparing families that live 30 minutes or less from the grandparents to those living further away, while in the *SOEP*, the instrument compares living in the same city to living in another city. We restrict our analysis to families in which both parents were born in Germany. If they were born outside Germany, it is highly likely that all four grandparents do not live in Germany and are therefore not available for regular childcare (e.g. Gambaro et al., 2018).

Grandparental Care Variable. The main explanatory variable in our analysis is the grandparental care variable. In *pairfam*, respondents are questioned about the childcare situation for each child individually. We have information on grandparental care for each child separately for both morning and afternoon, but the data does not allow us to differentiate between grandmothers and grandfathers as caregivers. In the *SOEP*, grandparental care is measured in hours per week, information which is given mostly by the mothers. For the *pairfam*-based analysis,

we employ a binary variable that indicates whether a child is cared for by its grandparents in the morning or afternoon or both. To analyze all other parental outcomes, we use a binary variable, which equals one, if at least one child of the parent in question is cared for by the grandparents in the morning or afternoon or both.[10] In the *SOEP*-based analysis, we employ a binary variable, which equals one, if the child is cared for by the grandparents for at least one hour per week. Here we cannot differentiate between morning and afternoon hours.

Child Outcome Variables. We analyze the effects of grandparental care on children's health and developmental skills. To assess the effect on children's health, we consider children's *general health problems.* The *general health* variable is an ordinal variable ranging from 1 (very good health) to 5 (bad health). To estimate the effects of grandparental care on socio-emotional skills, we consider an index variable measuring children's *socio-emotional problems.* This variable in the *pairfam* data is very similar to the internationally widely used SDQ Scale (Strengths and Difficulties Questionnaire, Goodman, 1997). In more detail, we analyze the impact of grandparental care on three indices (conduct problems, hyperactivity, and emotional problems). Summing up the values from these three variables forms the variable *socio-emotional problems.* These questions are asked only for children between 3 and 5 years.

For our analysis of children's school outcomes, we use variables measuring the *Maths* and *German grades* of children between 9 and 10 years. Secondly, the *SOEP* questions mothers about the extent to which the following statements are true: *The child likes going to school* and *The child likes learning.* Both variables are measured on a scale from 1 (strongly agree) to 4 (strongly disagree).[11]

Sample averages of all our outcome measures are shown in Table B.1 in the appendix. On average, parents rate their children's health as very good: the mean is 1.58, which is close to 1 (very good health). Overall, parents assess the socio-emotional skills of their children as quite high. This is reflected by the relatively low sample mean of the socio-emotional problems variable. Socio-emotional problems are quite evenly distributed across the three components of the socio-emotional problems variable (conduct problems, hyperactivity, and emotional problems). Children in elementary school have, on average, quite good Maths and German grades (2.3) and tend to enjoy going to school and studying. We standardize all child outcomes in our regression analysis in such a way that they have a zero mean and a standard deviation of one.

Parental Outcome Variables. We use several variables on subjective parental satisfaction.

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[10]This approximation is valid since in 97 percent of households in our sample, either no or all children are cared for by the grandparents.

[11]All four variables are surveyed from 2012 onwards.

We consider six variables, which are all ordinal variables on an 11-point Likert scale ranging from 0 (very dissatisfied) to 10 (very satisfied). The first variable captures the general satisfaction with life. In addition, *pairfam* contains several variables on domain-specific satisfaction. First, we consider the satisfaction with school, education, or career. Secondly, respondents are asked about their satisfaction with leisure activities, hobbies, and interests. Thirdly, they are asked to rate their satisfaction with the relationship with their partner. And from 2013 onwards, they are also asked about their satisfaction with their work-life balance. Furthermore, parents are asked about their satisfaction with the childcare situation for each of their children. Thus, we can analyze the effect on the child level.

Sample means pooled across age groups are shown in Table B.1 in the appendix. For most outcomes, mothers and fathers depict similar levels of satisfaction. Interestingly, the levels of satisfaction are also similar across the various domains. Overall, individuals in our sample show quite high levels of satisfaction ranging between 5.9 and 8.5.

Control Variables. To account for other observable factors that might confound the effect of grandparental care on child outcomes and family well-being, our models include extensive sets of control variables on the (grand-)parental, child, and household level. Generally, we include socio-economic characteristics of the parents, such as education, age, income, labor force status, gender, federal state of residence, and migration background. Additionally, we include detailed information about the situation of the household (e.g. number of children in the household and age of the youngest child). An overview of the set of control variables for each outcome variable is given in Table B.2 in the appendix.

Samples. We conduct analyses on the child and parent level. To evaluate the effects on child outcomes and parental satisfaction with the childcare situation, each child constitutes one observation. The analysis sample for all other parental outcomes is restricted to all individuals who have at least one child in the appropriate age group. These analyses are conducted at the parent level. We observe both *pairfam* samples from 2009 to 2020[12] and the *SOEP* sample from 2010 to 2012 and 2015 to 2017. Our final sample to analyze socio-emotional and child health outcomes includes 44,339 observations, which corresponds to 11,714 children. The sample to analyze school outcomes includes 34,904 observations, which corresponds to 9,047 children. The analysis sample for parental outcomes, using *pairfam*, includes 16,056 observations for fathers (corresponding to 4,043 fathers) and 19,844 observations for mothers (corresponding to 4,788 mothers).

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[12]For 2020, we include only households that were surveyed before March 15 and thus before the beginning of the COVID pandemic in Germany.

5 Empirical strategy

In order to identify the causal effect of grandparental care on the various outcomes under study, we apply an instrumental variable (IV) strategy. In a simple OLS setting, the regression model would look like this:

$$y_{it} = \beta_1 + \beta_2 GPC_{it} + X'_{it}\beta_3 + \mu_{it} \tag{1}$$

where y_{it} are the different child and parent outcome variables. The variable of interest, grandparental care (GPC_{it}), is a binary variable, and X'_{it} is our vector of control variables, as described in section 4. However, employing the OLS model in Equation 1 does not necessarily produce estimates that can be interpreted causally. The identification of a causal effect of grandparental care on child and parental outcomes faces potential endogeneity threats. The choice for grandparental care is endogenous as it is made by parents and grandparents and might be influenced by unobserved characteristics that also influence the outcome variables, causing an omitted variable bias. One example of such an unobserved variable is a grandparent's preferences for taking care of their grandchild. These likely influence the amount of support grandparents offer and might also directly affect our outcomes. Another threat could be reverse causality; for example, parental well-being might influence how much support from the grandparents they need and thus demand. Similarly, children's health or socio-emotional problems are likely to affect the decision to ask grandparents for help. For example, parents with children who suffer from bad health might fear that taking care of these children would be too much of a burden for grandparents or they really need the grandparents as no other non-parental care mode is feasible.

Thus, estimating Equation 1 might lead to a biased and inconsistent estimator of grandparental care and would not reflect a causal effect. There are reasons to expect both upward biased and downward biased OLS estimators. For example, if only healthy and socio-emotionally stable children are in grandparental care, we expect the OLS estimator to be upward biased. Alternatively, if we expect that parents with low subjective well-being are more likely to ask grandparents for childcare assistance because they are more in need of help, the OLS estimator would be downward biased. We cannot account for the endogeneity issues by including all confounding factors as control variables as some of them are not observed in the data at hand or might be unknown.

To overcome the endogeneity problem, we use an instrumental variable, applying a two-stage

least-squares (2SLS) approach. We can predict the variation in grandparental care using an instrument that determines the endogenous regressor (GPC_{it}) but only affects the dependent variables (y_{it}) through its effect on this independent variable (grandparental care). For that purpose, we use the distance to the grandparents as an instrument. This instrument was also used by Del Boca et al. (2018) and Compton and Pollak (2014).

Validity of the instrument. In order for the distance to grandparents to qualify as a valid instrument, it needs to fulfill a number of conditions. Particularly important are the relevance and the exogeneity assumptions of the instrument. Relevance means that the instrument needs to be sufficiently correlated with the endogenous regressor grandparental care. Arguably, the distance to the grandparents satisfies the relevance condition as a smaller distance facilitates grandparental care. The correlation between our instrument and grandparental care can be seen in Figure C.3 in Appendix C. This figure shows the share of children who are in grandparental care by the minimum distance of the child to the grandparents. It can be seen that most children live close to at least one grandparent. Additionally, it can be seen that the share of households that use grandparental care increases non-linearly with decreasing distance. The correlation between the instrument and the endogenous regressor is also tested in the first stage regression where the endogenous variable is regressed on the instruments and the exogenous covariates (Table 1). The robust first stage F-statistics displayed in the main regression tables in section 6 are all at least 55 but far exceed this value in most regressions. This supports our argument.

The more critical assumption is the exogeneity assumption of the instrument, which requires that the instrument is not correlated with the error term and thus influences the outcome variable only through the endogenous regressor. It seems plausible that distance affects child outcomes only through grandparental care. It can be argued, however, that living close to the grandparents affects parental well-being not only through grandparental care but also through the relationship to the grandparents and the amount of time parents and grandparents can spend together. To ensure that distance only affects parental outcomes through the grandparental care provided, we control for the emotional closeness between parents and grandparents in a robustness check. Furthermore, it can be argued that childcare demand increases the probability of families living closer to the grandparents (e.g. Chen and Zhang, 2018). To further test the exogeneity of the distance to the grandparents, we investigate whether distance between parents and grandparents decreases around birth, which would indicate that either parents moved closer to the grandparents or grandparents moved closer to the parents. The reason for a systematic moving behavior could be the facilitation of grandparental childcare, which would make distance an endogenous variable. Investigations of the moving behavior in the year before and after the

birth of the first-born or any child show no systematic movement towards the grandparents (see Table E.13). We further restrict the sample to households that did not move during the observation period, thus excluding any households that might have moved closer to the grandparents in order to facilitate childcare. However, the results did not change (see Tables E.14 and E.15). For more details on the measurement and the validity of the instrument, see Appendices C and E.

Two-Stage Least Squares. In the first stage of our 2SLS approach, we regress the grandparental care variable that we assume to be endogenous on our instrument and the exogenous control variables:

$$GPC_{it} = \gamma_1 + \gamma_2 D_{it} + X'_{it}\gamma_4 + \varepsilon_{it} \tag{2}$$

where D_{it} equals one if the household lives less than 30 minutes away from at least one grandparent and 0 otherwise[13] and X'_{it} is the same vector of control variables as in Equation 1. The dependent variable GPC_{it} is the binary grandparental care variable from Equation 1. The first stage regression is estimated using OLS. Since the dependent variable is binary, this corresponds to a linear probability model (LPM, see Appendix C). In a further robustness check, we also conduct a probit estimation (called a "garden variety") as suggested by Angrist and Pischke (2008) (see Appendix E). In the second stage, the fitted values of the linear probability model from the first stage $\widehat{GPC}_{it}$ are included as the main explanatory variable:

$$y_{it} = \beta_1 + \beta_2\widehat{GPC}_{it} + X'_{it}\beta_3 + \mu_{it} \tag{3}$$

In this regression, y_{it} are the different child and parental outcome variables described in section 4. X'_{it} is again our vector of control variables that is the same as in the first stage regression. β_2 is our coefficient of interest and reflects the 2SLS estimator. It estimates the local average treatment effect (LATE)[14] and thus depicts the effect of grandparental care on our outcomes.[15]

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[13]For the analyses based on the *SOEP*, this is defined as 1 for households living in the same city as the grandparents and 0 otherwise.

[14]It measures the effect on the compliers, i.e., those families whose utilization of grandparental care is induced by a small distance to the grandparents.

[15]The robust standard errors μ_{it} are clustered at the household level for all regressions using child outcomes and the parental satisfaction with the childcare situation because the observations of different children in one household might be correlated with each other and, as a result, the i.i.d. assumption would not hold. Clustering at the household level allows individuals to be correlated within households and across time. Robust standard errors are used for all other parental outcomes.

6 Empirical Results

We start the discussion on the effects of grandparental care with a discussion on the first-stage effects. For all outcomes, the effects of distance on grandparental care are highly significant and of similar magnitude (Table 1). Living at a maximum of half an hour from at least one grandparent leads to an increase in the probability of grandparental care by about 23 percentage points (depending on the outcome). This suggests that our instrument is very relevant, i.e., there is a high correlation between instrument (distance) and the endogenous variable (grandparental care).[16]

Next, we discuss the effects of grandparental care on child outcomes.

Child Outcomes. The upper panel of Table 2 displays the effects on children's health and socio-emotional behavior. General health problems are analyzed for four different age groups. Remember that the counterfactual to grandparental care varies by age group. While for the majority of children younger than three years of age, the counterfactual is sole parental care, this is different for older children. For them, the counterfactual is either half-daycare or school and sole parental care in the afternoon or full-time daycare and school combined with parental care.

As high values in the general health variable correspond to bad health, the coefficient for health problems (all children, row one in the upper panel) suggests that grandparental care has a negative effect on the health of children below the age of 11 (column 2). The effect is statistically significant on the 5 percent level: grandparental care increases children's health problems by 0.46 standard deviations. This corresponds to a 21 percent increase compared to the sample mean. The effect seems to be mostly driven by children of elementary school age as the coefficient of this subsample estimation is of similar magnitude and significance to the coefficient for all children. For children in the other age groups, the coefficient is not significant.

Table 2 also allows the comparison of the OLS and IV estimates. We note that the OLS estimate (column 1) underestimates the effect of grandparental care on health for all age groups. While not significant and very small in magnitude, the OLS estimates indicate smaller negative effects (or even positive effects) on health for children in grandparental care than the IV estimator. This finding supports our hypothesis that parents with children with bad health tend not to ask grandparents for help.

The effects of grandparental care on children's socio-emotional problems are displayed in rows

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[16]The first-stage results are not sensitive regarding the choice of control variables as shown in Tables E.11 and E.12 in the Appendix.

five to eight in the upper panel of Table 2. The direction of the IV estimates suggests that grandparental care increases socio-emotional problems of children aged 3–5 (the only age group for which we have this measure). However, all effects are statistically not significant. A comparison with the OLS estimates shows that the pure correlations are positive and statistically significant, meaning that grandparental care is associated with a decrease in the socio-emotional problems of children. This hints that there might be a bias in the way that parents of more socio-emotionally stable children use grandparental care more often.

The lower panel of Table 2 depicts the effects of grandparental care on children's school outcomes. Although the IV estimates suggest a deterioration in the Math grade, an improvement in the German grade, an increase in the willingness to go to school, and a decrease in the willingness to study following grandparental care, all effects are statistically not significant. This is also true for the OLS estimates, which all suggest positive associations of grandparental care and school-related skills. We can conclude that grandparental care has no impact on the children's school-related skills, at least the ones we capture.

If we further differentiate by (all-)daycare status, to account for differences in the counterfactual care modes, Table 3 shows a slightly different picture. If children three years and older are in daycare or school full time and, in addition, cared for by grandparents, they have more health and socio-emotional problems, in particular, conduct problems. This might be related to a greater instability of caregivers in the afternoon, which might be too stressful for some children as they have to deal with various caregivers in various care settings during one afternoon (e.g. Bratsch-Hines et al., 2015). Additionally, these children like studying less than those who are not in additional grandparental care. Comparably, children who are in half-daycare show more health problems once they are in grandparental care in the afternoon, but no difference in socio-emotional problems, which underlines our hypothesis that too many care modes might increase behavioral problems.

Parental Outcomes. The effects of grandparental care on parental satisfaction are shown in Table 4. The results for mothers are summarized in the upper panel and for fathers in the lower panel. The IV estimates (column 2) of grandparental care on the maternal satisfaction outcomes displayed are all positive, suggesting that grandparental care increases maternal satisfaction. More precisely, the table depicts statistically significant effects for maternal satisfaction with both the childcare situation and leisure time. The effects correspond to an increase of 11 percent for satisfaction with the childcare situation and 14 percent for satisfaction with leisure compared to the mean (column 4). A comparison of the IV and OLS estimates shows that for all maternal

satisfaction outcomes, the OLS estimator underestimates the effects of grandparental care. One explanation for this could be that parents with generally low well-being require help and thus make more use of grandparental care.

Finally, we analyze how grandparental care affects paternal satisfaction, measured with the same variables as maternal satisfaction. As for mothers, grandparental care increases fathers' satisfaction with the childcare situation statistically significantly, while the effect is substantially larger in magnitude. The increase corresponds to approximately 21 percent compared to the mean. Additionally, childcare provided by the grandparents decreases fathers' satisfaction with their career and education by 7 percent in comparison to the mean. However, this effect is only significant at the 10 percent significance level. The remaining well-being measures are not significantly affected by grandparental care.

We further estimate effects for different child age groups and different counterfactual care modes to get a more precise picture of the driving forces of the effects. The estimates for satisfaction with the childcare situation are significant at the 10 percent significance level for mothers with children aged 3-5.5 years (Table D.4, panel (b)). The estimates suggest an increase that corresponds to 15 percent compared to the mean. The effect on satisfaction with leisure is largely due to mothers with children of elementary school age (5.5 to 10 years, panel (c)) and very young children (0 to 2 years, panel (a)). The first effect is highly statistically significant and corresponds to a 24 percent increase compared to the sample mean.

For fathers, we find more statistically significant effects by child age (Table D.5). The estimates for satisfaction with the childcare situation are at least significant on the 10% significance level across all age groups (panel (a) - (c)) and especially large in magnitude for children below the age of 3. Fathers with very young children are also more satisfied with their life once grandparents support. We find a negative effect of grandparental care on the satisfaction with work-life balance and education and career for fathers with children 3-5.5. years of age (10 and 21 percent decreases, respectively). However, these effects are not robust (see Appendix E).

If we further differentiate by (all-)daycare status, to account for differences in the counterfactual care modes, Tables 5 and 6 show the following. The increase in satisfaction with leisure mainly stems from mothers whose infants are not in daycare or whose older children are not in full-time daycare/school. Once older children are in full-time care/school and additional grandparental care, mothers are even less satisfied with their life and their relationship to their partner – maybe because this also produces more stress for them as well as for the children (see above). This is different if their children are only in half-daycare. This leads to an increase in satisfaction with

both the care situation and leisure. For fathers, the results differ: the increase in life satisfaction and satisfaction with the childcare situation of infants comes from fathers of infants who are in daycare.

We did further subsample analyses by parental education, gender of the child, and grandparental health and discuss how these could reflect potential mechanisms through which grandparental care has an impact on children and parents (see Appendix D). For instance, the results show that the effect on health stems from children cared for by less healthy grandparents, who might not be as physically active anymore. Moreover, extensive robustness checks show that most of our results are robust to various specifications (see Appendix E). Overall, the results on parental satisfaction with childcare and maternal satisfaction with leisure are most robust, while those on health and paternal satisfaction with career should be interpreted with caution, at least for the overall sample.

7   Conclusion

With our analysis, we contribute to the literature on the intergenerational effects of grandparental care on outcomes of parents and children. Our results are of particular interest as grandparental care continues to play an important role in the "care puzzle". This development will probably not change as the overlap of lifetimes of the child, parent, and grandparent generations is increasing with increasing longevity. We extend the literature on grandparental care by estimating the causal effects on health, socio-emotional and school-related outcomes of children and parental well-being. To overcome endogeneity between grandparental care and our outcomes, we employ an instrumental variable approach instrumenting grandparental care with the distance to the grandparents. We show various robustness checks supporting the validity of our instrument.

Using two representative panel data sets, our results for the overall sample provide evidence for mainly null and a few negative effects on children and mainly positive effects on different aspects of parental satisfaction. However, the results differ widely according to child age. Regarding the average null effects on socio-emotional and school outcomes of children, one might argue that grandparental care is neither beneficial nor costly for the grandchildren generation. Regarding health and older children, it is partly costly, although we focus only on short-term effects. This is different for the generation of parents. Here, grandparenting is beneficial at least for maternal well-being. Thus, it might also be beneficial for the child's development in the longer run, as maternal well-being has been found to positively impact child outcomes. This might be an

indirect effect on the grandchildren generation and thus might affect overall social mobility.

Specifically, we find evidence for a negative effect of grandparental care on the health of elementary school children (20 percent)[17]. The health effect is particularly pronounced for the sample cared for by less healthy grandparents. Results of studies on the health effects of other care modes, such as daycare, are mixed. Cornelissen et al. (2018) find positive health effects of daycare that are similar in magnitude to our effects. Namely, they depict a 25 percent decrease in "compensatory sports needed" at school entry. Baker et al. (2008) find negative health effects of a major daycare expansion in Canada, which amount to 9 percent compared to the mean.

We do not find overall effects of grandparental care on socio-emotional skills of children. However, once the sample is restricted to older children in full-time daycare or school, we find that additional grandparental care increases socio-emotional problems. Baker et al. (2008) also find that daycare increases children's anxiety-related emotional disorder score by 12 percent. Gupta and Simonsen (2010) find enrollment into family homecare in Denmark increases the SDQ index by 28 percent, which corresponds to an increase in adverse behavior, while Peter et al. (2016) find a decrease in the SDQ when children in the UK visit daycare early.

Our results on school outcomes show hardly any significant and causal relationship, with the exception that 9-10-year-olds who are cared for by their grandparents in the afternoon, in addition to full-time schooling, like studying less than those without additional grandparental care. The insignificance of the effects on school grades is in line with the findings of Del Boca et al. (2018): while they find some effects on school-related outcomes of children below school age, they find no effects for children once they have entered elementary school.

The positive effects of grandparental care on parents' satisfaction with childcare, as well as mothers' satisfaction with leisure, are very robust to different specifications, sample restrictions, and instruments. The negative effects found for fathers' satisfaction with their education and career turn out to be less robust and thus should be interpreted with caution. Comparing our effects with the effects of daycare attendance on maternal life satisfaction as, for instance, depicted by Schmitz (2019), shows that our effects (11-14 percent) are larger in magnitude. Schmitz (2019) finds an 8 percent increase in comparison to the mean.

Overall, our results show that not only parental care and daycare affect child and family outcomes, but that childcare provided by other informal caregivers, such as grandparents, also has causal impacts on children and parents and thus the family as a whole. However, we also have

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[17]However, as our estimate turns out to be less significant in some of our robustness checks, we interpret this effect with some caution.

only suggestive evidence on the mechanisms behind these effects. To investigate them, data that cover the activities grandparents do with their grandchildren would be needed (e.g. Sadruddin et al., 2019). Moreover, as with other care modes, more information on the quality of the care time would be needed (Milovanska-Farrington, 2021). And finally, longer-term effects should be investigated to analyze whether the positive effects on maternal satisfaction increase child outcomes and other maternal outcomes and thus grandparental care has additional indirect effects.

From a policy perspective, it should be clear that a focus not only on daycare but also on informal care is needed. For instance, there could be discussions on national insurance credits for grandparents who take care of dependent children, contributing to their retirement income, as implemented in the UK. Another measure to support grandparental care might be the introduction of grandparental leave and benefits[18] as in Portugal (Milovanska-Farrington, 2021), or "grandparenting allowances" (e.g. Wheelock and Jones, 2002). Nevertheless, our results also suggest that the combination of too many care modes might have negative effects on children and parents. Politicians might address this by policies that are in favor of longer daycare hours or other measures to reduce the "child penalty" employed parents might have if the opening hours of daycare centers do not support their working schedules (e.g. Jessen, 2021).

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[18]Since 2008, in particular circumstances, grandparents of children, for instance with mothers younger than 18, can apply for parental leave in Germany.

Table 1: First stage results

Health & Socio-emotional skills:	Health	Socio-emot. problems	Conduct	Hyperactivity	Emotional	
Distance	0.254***	0.239***	0.239***	0.239***	0.239***	
	(0.0180)	(0.0285)	(0.0285)	(0.0285)	(0.0285)	
R-squared	0.130	0.161	0.161	0.161	0.161	
Observations	11069	2171	2172	2173	2172	

School outcomes:	Math grade	German grade	Child likes going to school	Child likes studying		
Distance	0.320***	0.320***	0.289***	0.289***		
	(0.0376)	(0.0375)	(0.0305)	(0.0305)		
Observations	1475	1476	2278	2261		
R-Squared	0.207	0.207	0.187	0.188		

Parental Satisfaction:	General	Educ./ career	Leisure	Relationship	Work-life balance	Child care
Distance: Maternal Sat.	0.233***	0.236***	0.238***	0.236***	0.242***	0.285***
	(0.0235)	(0.0130)	(0.0132)	(0.0130)	(0.0134)	(0.0197)
Observations	5838	6182	6061	6182	5742	2514
R-Squared	0.147	0.149	0.149	0.149	0.152	0.200
Distance: Paternal Sat.	0.245***	0.239***	0.239***	0.239***	0.239***	0.269***
	(0.0329)	(0.0161)	(0.0161)	(0.0161)	(0.0161)	(0.0226)
	4011	4495	4490	4494	4491	2510
R-Squared	0.183	0.159	0.159	0.159	0.160	0.188
	4,481	4,476	4,480	4,477	2,504	4,011

Note: Standard errors in parentheses. *Source:* Pairfam (2010-2020), SOEP (2010-2017), weighted, own calculation. Conditional on no missings in the outcome and control variables (see Table B.2)

Table 2: Results: Child outcomes

| | Grandparental Care | | | | |
	OLS	IV	F-Statistic	Sample Mean	Obs.
Health					
Health problems: 0-10 y.	0.0168 (0.0392)	0.464* (0.183)	198.819	1.574	11069
Health problems: 0-2 years	-0.0137 (0.0676)	0.484 (0.348)	68.817	1.546	1828
Health problems: 3-5.5 y.	-0.0393 (0.0535)	0.254 (0.194)	118.187	1.579	3006
Health problems: 5.5-10 y.	0.0567 (0.0513)	0.438* (0.194)	155.568	1.573	5132
Socio-emotional behavior					
Socio-emotional problems: 3-5 y.	-0.142** (0.0493)	0.365 (0.275)	70.350	2.943	2171
Conduct problems: 3-5 y.	-0.0299 (0.0529)	0.217 (0.303)	70.490	1.064	2172
Hyperactivity: 3-5 y.	-0.161** (0.0562)	0.275 (0.251)	70.690	1.002	2173
Emotional problems: 3-5 y.	-0.132* (0.0526)	0.331 (0.279)	70.690	0.878	2172
School outcomes					
Math grade: 9-10 y.	-0.138 (0.0917)	0.0459 (0.188)	77.930	2.264	1476
German grade: 9-10 y.	-0.136 (0.0925)	-0.124 (0.220)	78.127	2.300	1477
Child likes going to school: 9-10 y.	0.0784 (0.0648)	-0.0138 (0.208)	98.428	1.556	2262
Child likes studying: 9-10 y.	0.105 (0.0710)	0.183 (0.199)	98.371	1.924	2245

Note: $^+ p < 0.10$, $^* p < 0.05$, $^{**} p < 0.01$, $^{***} p < 0.001$. Robust standard errors clustered at the household level in parentheses. All outcome variables are standardized with mean 0 and standard deviation of 1. The original general health problems variable is an ordinal variable on a scale from 1 (good health) to 5 (bad health). The original outcome variables conduct problems, hyperactivity and emotional problems are ordinal variables on a scale from 0 (does not apply) to 5 (fully applies). The outcome variable socio-emotional problems is constructed summing up the three other indices, resulting in a variable that ranges from 0 (does not apply) to 12 (fully applies). The original outcome variables for math and German grade measure the school grades in these two subjects from 1 (very good) to 6 (very bad). The original variables "the child likes going to schoool" and "the child likes learning" range on a scale from 1 (strongly agree) to 4 (strongly disagree). The regressions include the control variables listed in table B.2 column (a) for health problems, (b) for socio-emotional problems and (c) for school outcomes in the appendix. *Source:* Pairfam (2010-2020), SOEP (2010-2017), weighted, own calculation.

Table 3: Results: Child outcomes by daycare status

Outcomes	IV: GPC	F-Statistic	Sample Mean	Obs.
(a) 0-2 years: Child in daycare				
Health problems: 0-2 y.	0.190 (0.522)	29.347	1.651	587
(b) 0-2 years: Child not in daycare				
Health problems: 0-2 y.	0.430 (0.402)	44.533	1.503	1241
(c) 3-10 years: Child in daycare/school full-time				
Health problems: 3-10 y.	0.550^{+} (0.307)	71.919	1.583	2762
Socio-emotional problems: 3-5 y.	1.061^{+} (0.551)	32.981	2.966	971
Conduct problems: 3-5 y.	1.170^{*} (0.586)	33.183	1.146	972
Hyperactivity: 3-5 y.	0.805 (0.496)	33.183	0.989	972
Emotional problems: 3-5 y.	0.357 (0.437)	32.981	0.832	971
Math grade: 9-10 y.	0.463 (0.351)	31.177	2.294	405
German grade: 9-10 y.	0.301 (0.347)	31.177	2.286	405
Child likes going to school: 9-10 y.	-0.334 (0.380)	27.569	1.502	631
Child likes studying: 9-10 y.	0.911^{*} (0.413)	25.280	1.889	627
(d) 3-10 years: Child in daycare/school part-time				
Health problems: 3-10 y.	0.346^{+} (0.202)	145.495	1.572	5295
Socio-emotional problems: 3-5 y.	0.205 (0.292)	35.359	2.928	1200
Conduct problems: 3-5 y.	0.0853 (0.342)	35.359	1.012	1200
Hyperactivity: 3-5 y.	0.162 (0.281)	35.569	1.010	1201
Emotional problems: 3-5 y.	0.215 (0.344)	35.569	0.907	1201
Math grade: 9-10 y.	-0.133 (0.201)	51.274	2.263	1040
German grade: 9-10 y.	-0.222 (0.230)	51.425	2.314	1041
Child likes going to school: 9-10 y.	-0.0354 (0.247)	68.942	1.587	1591
Child likes studying: 9-10 y.	-0.125 (0.223)	70.355	1.953	1578

Note: $^{+}$ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. Robust standard errors clustered at the household level in parentheses. All outcome variables are standardized with mean 0 and standard deviation of 1. The original general health problems variable is an ordinal variable on a scale from 1 (good health) to 5 (bad health). The original outcome variables conduct problems, hyperactivity and emotional problems are ordinal variables on a scale from 0 (does not apply) to 5 (fully applies). The outcome variable socio-emotional problems is constructed summing up the three other indices, resulting in a variable that ranges from 0 (does not apply) to 12 (fully applies). The original outcome variables for math and German grade measure the school grades in these two subjects from 1 (very good) to 6 (very bad). The original variables "the child likes going to schoool" and "the child likes learning" range on a scale from 1 (strongly agree) to 4 (strongly disagree). The regressions include the control variables listed in table B.2 column (a) for health problems, (b) for socio-emotional problems and (c) for school outcomes in the appendix. *Source:* Pairfam (2010-2020), SOEP (2010-2017), weighted, own calculation.

Table 4: Effects of Grandparental Care on Parental Satisfaction

Outcomes	Grandparental Care OLS	IV	F-Statistic	Sample Mean	Obs.
Mother's Satisfaction with:					
Child care situation	0.118 (0.0939)	0.922* (0.463)	98.205	8.481	5838
Life	0.0152 (0.0466)	0.0413 (0.212)	328.912	7.759	6182
Education, Career	0.0879 (0.0668)	0.396 (0.293)	324.348	7.171	6061
Leisure, Hobbies	0.0347 (0.0700)	0.892** (0.308)	328.769	6.325	6182
Relationship to Partner	0.116 (0.0710)	0.214 (0.313)	327.011	7.561	5742
Work-life Balance	-0.242* (0.108)	0.130 (0.383)	208.277	6.429	2514
Father's Satisfaction with:					
Child care situation	0.334** (0.109)	1.761*** (0.527)	55.698	8.496	4011
Life	0.0252 (0.0478)	0.198 (0.203)	220.800	7.802	4495
Education, Career	0.0515 (0.0599)	-0.511+ (0.275)	220.158	7.494	4490
Leisure, Hobbies	-0.101 (0.0714)	-0.0658 (0.316)	221.138	6.451	4494
Relationship to Partner	-0.00643 (0.0775)	-0.252 (0.354)	220.281	7.681	4491
Work-life Balance	-0.0987 (0.107)	-0.374 (0.426)	141.937	5.903	2510

Note: $^+$ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. Robust standard errors in parentheses. For the outcome "Child care", robust standard errors clustered at the household level. The outcome variables are all ordinal variables on a scale from 0 (very dissatisfied) to 10 (very satisfied). Child care: satisfaction with the child care situation (on child level, all other outcomes on parental level), General: general life satisfaction, Educ./career: Satisfaction with education and career, Leisure: satisfaction with leisure and hobbies, Relationship: satisfaction with the relationship with the current partner, Work-life balance: satisfaction with the proportion of time that individuals spend on the job or for vocational training or university education relative to the time that individuals spend on personal life. The regressions include the control variables listed in table B.2 column (d) for the outcome "Child care" and (e) for all other outcomes in the appendix. *Source:* Pairfam (2010-2020), weighted, own calculation.

Table 5: Results: Mother's Satisfaction by daycare status

| Mother's Satisfaction with:	IV: GPC	F-Statistic	Sample Mean	Obs.
(a) 0-2 years: Child in daycare				
Child care situation	1.666 (1.285)	9.482	8.484	244
Life	-0.539 (0.561)	31.314	7.753	665
Education, Career	0.142 (0.755)	31.762	7.142	654
Leisure, Hobbies	-0.198 (0.765)	31.314	5.897	665
Relationship to Partner	-0.178 (0.862)	29.472	7.562	634
Work-life Balance	-1.482^{+} (0.860)	22.470	6.256	295
(b) 0-2 years: Child not in daycare				
Child care situation	1.295 (1.065)	19.917	8.691	536
Life	0.579 (0.445)	63.583	8.002	1453
Education, Career	1.062 (0.711)	59.292	7.059	1381
Leisure, Hobbies	1.853* (0.788)	63.583	6.158	1453
Relationship to Partner	0.610 (0.639)	63.588	7.794	1397
Work-life Balance	-0.292 (1.244)	14.080	6.408	233
(c) 3-10 years: Child in daycare/school full-time				
Child care situation	-0.00548 (0.866)	33.256	8.354	1448
Life	-0.784* (0.396)	95.172	7.468	1761
Education, Career	0.520 (0.507)	96.641	7.128	1744
Leisure, Hobbies	0.369 (0.517)	95.172	6.050	1761
Relationship to Partner	-1.651** (0.586)	93.804	7.301	1608
Work-life Balance	0.441 (0.703)	61.780	6.054	909
(d) 3-10 years: Child in daycare/school part-time				
Child care situation	1.139* (0.524)	86.117	8.512	2929
Life	0.459 (0.310)	153.166	7.778	3109
Education, Career	0.195 (0.430)	152.277	7.204	3049
Leisure, Hobbies	1.107* (0.443)	153.043	6.391	3109
Relationship to Partner	0.476 (0.443)	161.240	7.572	2909
Work-life Balance	-0.339 (0.671)	60.229	6.636	1187

Note: $^{+}$ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. Robust standard errors in parentheses. For the outcome "Child care", robust standard errors clustered at the household level. The outcome variables are all ordinal variables on a scale from 0 (very dissatisfied) to 10 (very satisfied). Child care: satisfaction with the child care situation (on child level, all other outcomes on parental level), General: general life satisfaction, Educ./career: Satisfaction with education and career, Leisure: satisfaction with leisure and hobbies, Relationship: satisfaction with the relationship with the current partner, Work-life balance: satisfaction with the proportion of time that individuals spend on the job or for vocational training or university education relative to the time that individuals spend on personal life. The regressions include the control variables listed in table B.2 column (d) for the outcome "Child care" and (e) for all other outcomes in the appendix. *Source:* Pairfam (2010-2020), weighted, own calculation.

Table 6: Results: Father's Satisfaction by daycare status

Father's Satisfaction with:	IV: GPC	F-Statistic	Sample Mean	Obs.
(a) 0-2 years: Child in daycare				
Child care situation	3.166$^+$ (1.865)	4.693	8.341	192
Life	1.787* (0.808)	19.288	7.823	612
Education, Career	-0.551 (0.750)	19.341	7.580	610
Leisure, Hobbies	0.783 (1.017)	19.288	6.359	612
Relationship to Partner	-0.279 (0.861)	19.081	7.679	611
Work-life Balance	-1.338 (2.138)	5.618	5.719	357
(b) 0-2 years: Child not in daycare				
Child care situation	2.963 (2.885)	5.131	8.849	379
Life	0.247 (0.361)	62.492	7.969	1244
Education, Career	-0.314 (0.495)	62.514	7.496	1244
Leisure, Hobbies	0.159 (0.603)	62.462	6.274	1244
Relationship to Partner	-0.502 (0.619)	62.469	7.856	1244
Work-life Balance	1.405 (0.899)	31.197	5.928	670
(c) 3-10 years: Child in daycare/school full-time				
Child care situation	2.256* (0.972)	15.278	8.197	1045
Life	0.253 (0.486)	36.147	7.742	1273
Education, Career	-0.164 (0.612)	35.512	7.456	1272
Leisure, Hobbies	-0.823 (0.706)	36.147	6.394	1273
Relationship to Partner	-1.080 (0.836)	36.432	7.555	1269
Work-life Balance	-2.978* (1.178)	23.392	5.904	745
(d) 3-10 years: Child in daycare/school part-time				
Child care situation	1.242* (0.593)	51.841	8.587	1937
Life	0.246 (0.285)	132.069	7.713	2182
Education, Career	-0.0862 (0.381)	131.863	7.468	2180
Leisure, Hobbies	0.0540 (0.432)	132.398	6.460	2181
Relationship to Partner	0.375 (0.493)	131.979	7.670	2179
Work-life Balance	-0.520 (0.547)	111.363	5.863	1147

Note: $^+$ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. Robust standard errors in parentheses. For the outcome "Child care", robust standard errors clustered at the household level. The outcome variables are all ordinal variables on a scale from 0 (very dissatisfied) to 10 (very satisfied). Child care: satisfaction with the child care situation (on child level, all other outcomes on parental level), General: general life satisfaction, Educ./career: Satisfaction with education and career, Leisure: satisfaction with leisure and hobbies, Relationship: satisfaction with the relationship with the current partner, Work-life balance: satisfaction with the proportion of time that individuals spend on the job or for vocational training or university education relative to the time that individuals spend on personal life. The regressions include the control variables listed in table B.2 column (d) for the outcome "Child care" and (e) for all other outcomes in the appendix.
*Source:* Pairfam (2010-2020), weighted, own calculation.

Figure 1: Actors and institutions involved in care of children younger than 11 in Germany
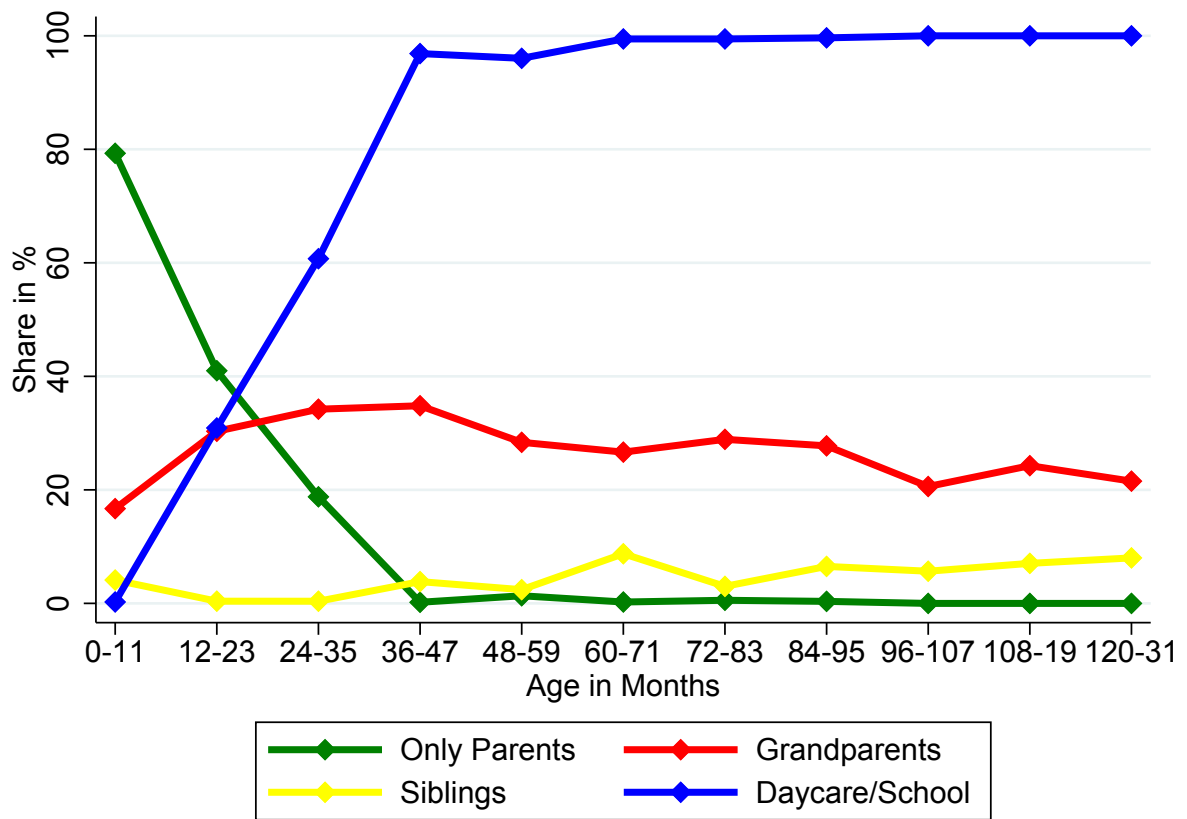

Note: The graph shows the share of children cared for by different care actors across age groups. A child is counted as cared for by the grandparents in this graph if the child is cared for by its grandparents in the morning or afternoon or both. The same applies for the other actors. *Source:* Pairfam (2018/19), weighted, own calculation.
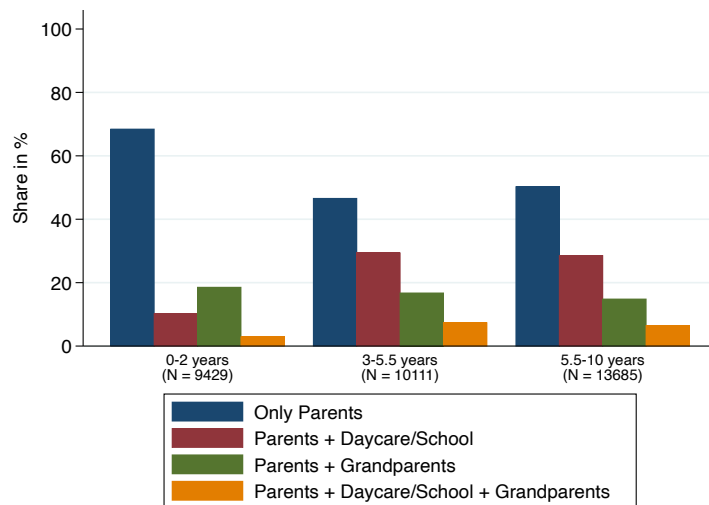
Figure 2: Care patterns

(a) Overall care use by age group
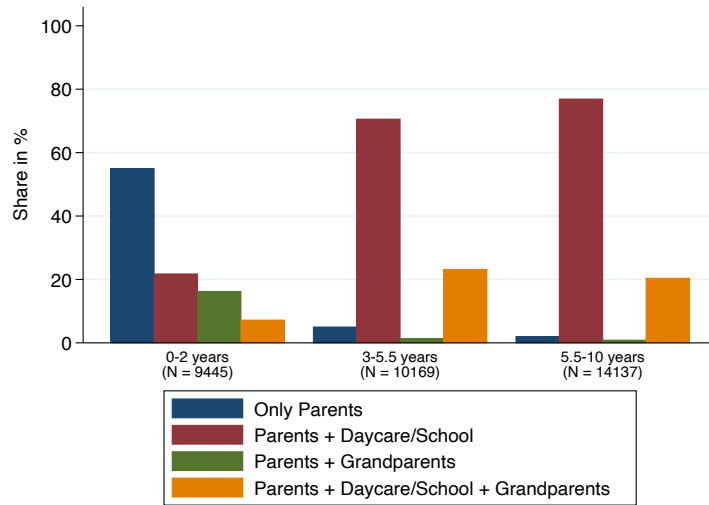
(b) Care use in the morning by age group
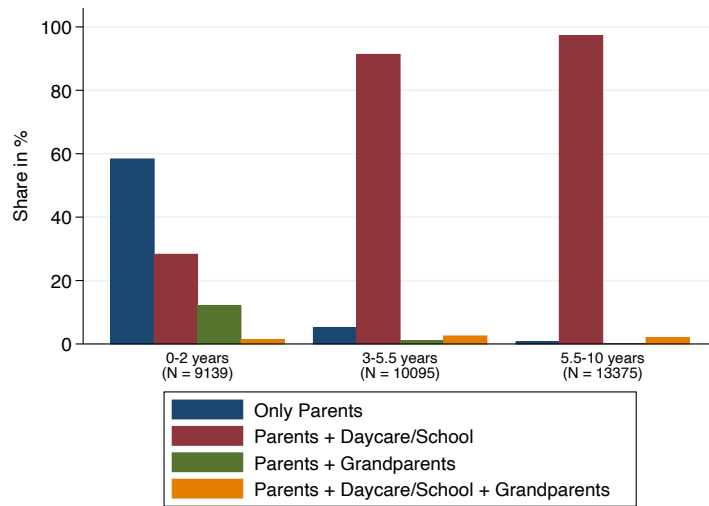
(c) Care use in the afternoon by age group

Note: The figures show the care use by age group. Overall care use takes all actors either caring for the child in the morning or afternoon or both into consideration. *Source:* Pairfam (2009-2020), weighted, own calculation.

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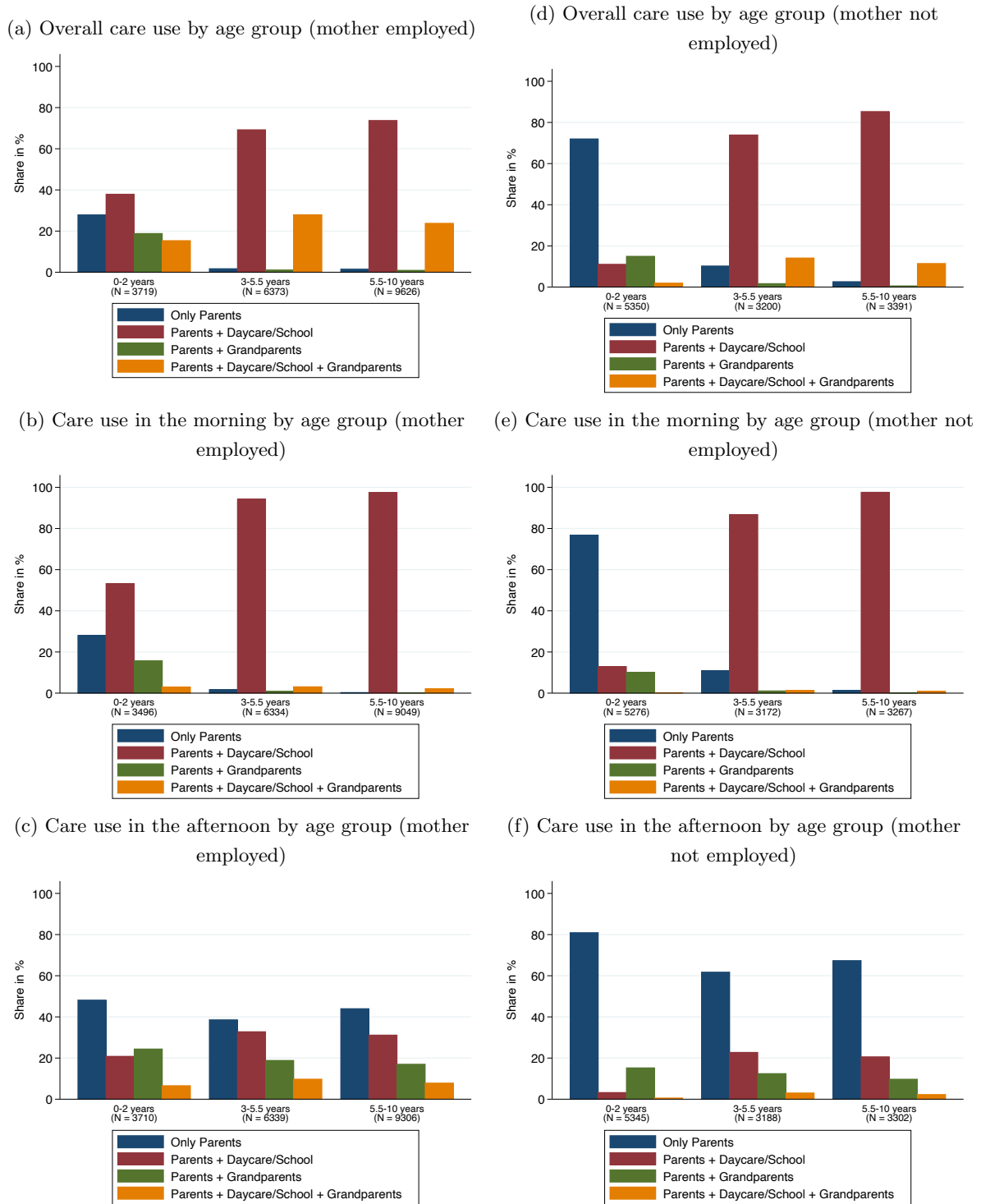
Appendices

A   Graphs on care options

Figure A.1: Development of grandparental care (2009-2020)
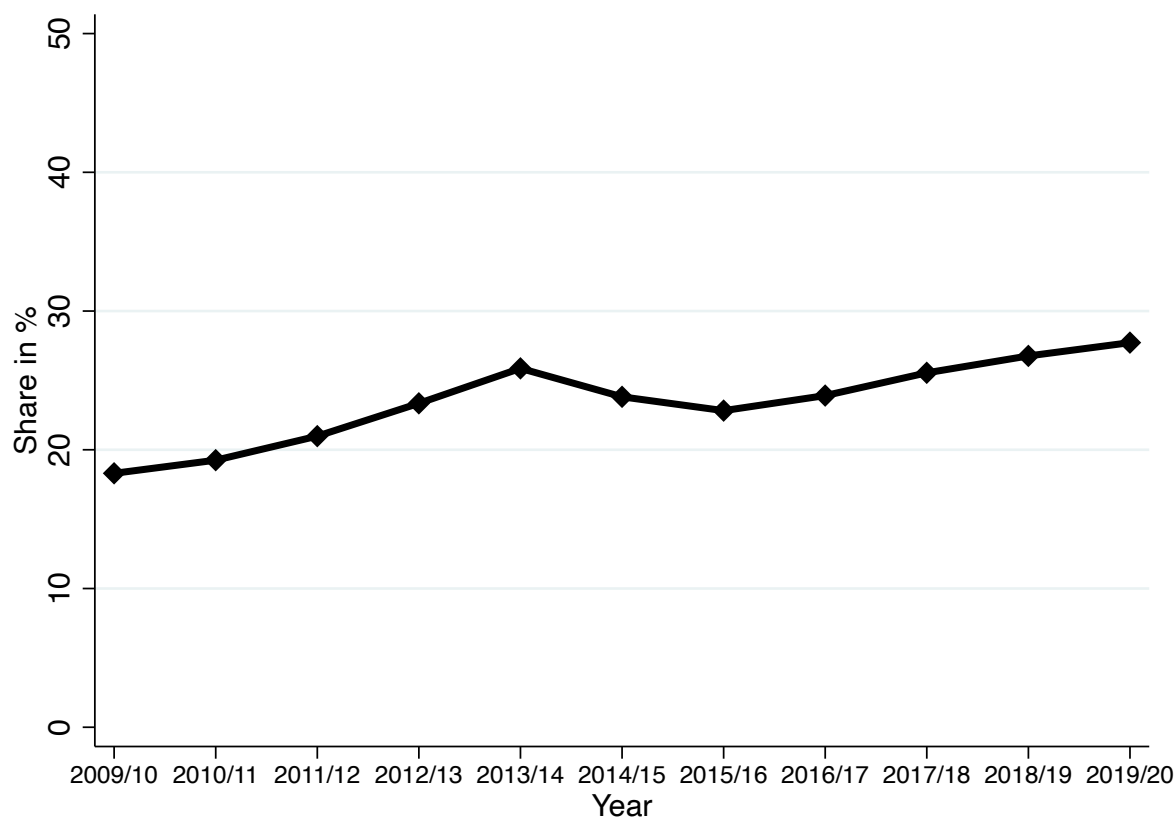
Note: The graph shows the development of grandparental care for children below the age of 6. A child is counted as cared for by the grandparents if the child is cared for by its grandparents in the morning or afternoon or both. *Source:* Pairfam (2009-2020), weighted, own calculation.

Figure A.2: Care patterns by maternal employment

(a) Overall care use by age group (mother employed)

(d) Overall care use by age group (mother not employed)

(b) Care use in the morning by age group (mother employed)

(e) Care use in the morning by age group (mother not employed)

(c) Care use in the afternoon by age group (mother employed)

(f) Care use in the afternoon by age group (mother not employed)

Note: The figures show the care use by age group for chilren of employed (a-c) and not employed mother (d-e). Overall care use takes all actors either caring for the child in the morning or afternoon or both into consideration. *Source:* Pairfam (2009-2019), weighted, own calculation.

B   Further information on the data

Pairfam. *Pairfam* respondents are equally distributed among the birth cohorts 1991–1993, 1981–1983, and 1971–1973 and the first wave of the sample consisted of 12,400 respondents (Huinink et al., 2011). These individuals are called "anchor persons." Approximately one half of the anchors are male, and the other half are female. In addition, if anchors and anchors' partners agreed, partners were surveyed from the first wave onwards. The response rate for partners lies at about 52 percent.[19] *Pairfam* is a multi-actor survey. In addition to anchors and partners, children (aged 8 to 15 years) and parents of anchors are surveyed separately. Furthermore, anchors and partners are questioned about their children (biological, adopted, foster, and stepchildren of anchors living in one household) and parents in their own questionnaires in detail (Huinink et al., 2011)). This detailed information on three generations makes *pairfam* particularly suitable for our analysis. Since the child survey only includes children above the age of 7 and the parent survey suffers from a low response rate, we focus on the information obtained from the anchor and partner questionnaires in our analysis. However, *pairfam* covers no school-related questions. For these outcomes, we use the *SOEP*.

SOEP. The *SOEP* currently surveys about 15,000 households and 30,000 individuals (Goebel et al., 2019). It includes information about all individuals living in one household. In addition to individual questionnaires filled out by all adults in the household, there is a household questionnaire that includes questions on all children living in the household and age-specific child questionnaires which are mostly answered by the mother of the child. In contrast to *pairfam*, grandparents themselves are surveyed only if they live in the same household as the family or if our "parent" used to be a child in a *SOEP* household and has now formed their own household. Thus, the sample for which detailed information on the grandparents is available is a small and very specific sample, which is why we do not use it. The analysis of the school outcomes has to be restricted to ages 7 to 10 due to data availability.

Comparability of Pairfam and SOEP. Table B.3 includes summary statistics of selected control variables for both *pairfam* (based on the sample on child level) and *SOEP*. Columns 1 *(Pairfam)* and 2 *(SOEP)* show mean and standard deviation for selected control variables across all observations. Comparing the two data sets suggests differences in socio-economic characteristics. Moreover, the share of children in grandparental care in the *SOEP* is almost

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[19]Analyses show that anchors whose partners participate and anchors whose partners do not participate do not differ systematically in most of their socio-economic characteristics. Thus, the partner sample can be considered as good as random.

twice as high as in *pairfam*.[20] This might be due to the differences in the phrasing of the question and the way grandparental care is measured (see chapter 4). The *pairfam* sample is, on average, more highly educated, as the share of households in which at least one partner holds a university degree is about 12 percentage points higher than in the *SOEP* (37 percent vs. 49 percent).[21] In terms of migration background, household income, age of children and mothers, gender of the children, and number of children in the household, the samples are quite comparable. The differences in socio-economic characteristics emphasize the importance of including our extensive set of control variables as mentioned above. Moreover, we discuss various subsample analyses to show the effect heterogeneity by child, parent, and grandparent characteristics.

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[20]In the *pairfam* wave 12, parents of school children are only questioned about care arrangements in the afternoon. Thus, we defined school children in wave 12 to be cared for by grandparents only if they are cared for by them in the afternoon. This means that there is a very small share of children that are cared for by the grandparents in the morning before school that are counted as not in grandparental care if they are not also in grandparental care in the afternoon. Figure 3 shows that this is only a very small share of school children.

[21]Generally, *pairfam* includes a slightly more highly educated sample than the German population (Wetzel et al., 2021).

Table B.1: Sample means of outcome variables

Health & Socio-emotional probl.:	Health problems	Socio-emot. problems	Conduct	Hyperactivity	Emotional	
Children	1.580 (0.694)	3.280 (2.247)	1.141 (1.017)	1.133 (1.034)	1.006 (0.917)	
Observations	25,138	5,078	5,088	5,085	5,085	

School outcomes:	Math grade	German grade	Child likes going to school	Child likes studying		
Children	2.259 (0.829)	2.301 (0.828)	1.563 (0.706)	1.937 (0.816)		
Observations	1,479	1,480	2,283	2,266		

Satisfaction:	General	Educ./ career	Leisure	Relationship	Work-life balance	Child care
Mother	7.759 (1.580)	7.169 (2.142)	6.325 (2.136)	7.561 (2.124)	6.431 (2.210)	8.481 (1.878)
Observations	6,174	6,053	6,174	5,736	2,512	5,838
Father	7.802 (1.369)	7.495 (1.710)	6.449 (1.908)	7.679 (2.086)	5.898 (2.096)	8.496 (1.606)
Observations	4,481	4,476	4,480	4,477	2,504	4,011

Note: Standard deviations in parentheses. *Source:* Pairfam (2010-2020), SOEP (2010-2017), weighted, own calculation. Conditional on no missings in the control variables. Conduct problems, hyperactivity and emotional problems are each constructed by summing two variables that range between 0 (does not apply) and 2 (fully applies). Therefore, conduct problems, hyperactivity and emotional problems range between 0 and 4 and socio-emotional problems between 0 and 12. Note, the questions for socio-emotional problems and health are phrased negatively, meaning that high values correspond to negative characteristics.

Table B.2: Control variables

			To estimate effects on				
			Children's			Parents'	
Variable	Definition	Type	(a)	(b)	(c)	(d)	(e)
Parental Variables							
Post-secondary education	Highest degree in household, 1-3	Ord	✓	✓	✓		
	Individual education, 3 levels	Ord				✓	✓
Mother's labor force status	Parental level, 1-3	Ord	✓	✓	✓	✓	✓
Father's labor force status	Parental level, 1-3	Ord	✓	✓		✓	✓
Age	Mother's age	Cont	✓	✓	✓		
	Individual age	Cont				✓	✓
Religion	One parent religious	Bin	✓	✓			
	Individual religion, 1-7	Cat				✓	✓
Migration background	One parent has direct background	Bin	✓	✓	✓		
	Individual has direct background	Bin				✓	✓
Partner information	Partner answered questionnaire	Bin	✓	✓			
Parental goals	Importance nutrition and exercise, 1-10	Ord	✓				
Health	At least one parent is sick	Bin	✓	✓	✓		
	Individual health, 1-5	Ord				✓	✓

Continued on the next page

Variable	Definition	Type	Children's (a)	(b)	(c)	Parents' (d)	(e)
Obesity	At least one parent is obese	Bin	✓	✓			
	Individual is obese	Bin				✓	✓
Pregnancy	Parent is pregnant	Bin	✓	✓		✓	✓
Cohabitation	Parents live together	Bin	✓	✓	✓	✓	✓
Widowhood	One parent is widowed	Bin	✓	✓	✓	✓	
	Individual is widowed	Bin					✓
Only child	At least one parent is only child	Bin	✓	✓			
	Individual is only child	Bin				✓	✓
Satisfaction childcare	On the child level, 1-10	Ord		✓			
Child Variables							
Sex	Child's sex	Bin	✓	✓	✓	✓	
	Children in HH: male, female, mixed	Cat					✓
Child age	In months	Cont	✓	✓	✓	✓	
	Age of youngest child in months	Cont					✓
Number children in HH	Total	Cont	✓	✓	✓	✓	
	Nr. children 0-2 years	Cont					✓
	Nr. children 3-5 year	Cont					✓
	Nr. children 6-10 year	Cont					✓
	Nr. other children	Cont					✓
Birth order	Age in comparison to sibling's age	Ord	✓	✓	✓	✓	
Daycare use	Child (0-5 years) in daycare	Bin	✓	✓		✓	
	Number of children (0-5 years) in daycare	Cont					✓
Health	Child health, 1-5	Ord		✓		✓	
	Mean health children, 1-5	Ord					✓
Temperament	Child 0-6 years, 1-20	Ord		✓			
Grandparent Variables							
School education	Anchor's mother, 1-3	Ord	✓	✓		✓	✓
	Anchor's father, 1-3	Ord	✓	✓		✓	✓
	Mother's mother, 1-5	Ord			✓		
	Mother's father, 1-5	Ord			✓		
	Mother's mother, 1-5	Ord			✓		
	Mother's father, 1-5	Ord			✓		

Continued on the next page

Variable	Definition	Type	Children's (a)	(b)	(c)	Parents' (d)	(e)
			To estimate effects on				
Age	Mean of all available grandparents	Cont	✓	✓	✓	✓	✓
Household (HH) Variables							
Household income	logarithmic, in 1000 €	Cont	✓	✓	✓	✓	✓
Year	number according to wave number	Cont	✓	✓	✓	✓	✓
Federal state	1-16	Cat	✓	✓	✓	✓	✓
Community size	1-7	Ord	✓	✓	✓	✓	✓

Source: Pairfam, 2009-2019 (columns a, b, d, e). SOEP, 2010-2012 and 2015-2017 (column c). This table shows which variables are used to estimate the effect of grandparental care on: (a) Child's health problems (b) child's socio-emotional behavior (c) child's school outcomes (d) Parental satisfaction with childcare (e) Other parental satisfaction outcomes. Types: Bin (binary), Cat (categorical), Cont (continuous), Ord (Ordinal).

Table B.3: Summary Statistics

	Pairfam: Mean (SD) Year: 2009-2020	SOEP: Mean (SD) Year: 2005-2017
Grandparent care	23.323 %	45.860 %
Grandparent live 30 min or closer/ in the same city or closer	68.852 %	51.856 %
Mother's labour force status (in percent)		
Mother not working	36.332 %	43.159 %
Mother working part-time	42.669 %	43.472 %
Mother working full-time	18.879 %	13.369 %
Household's highest parental school degree (in percent)		
No/ lower secondary degree	5.923 %	6.429 %
Upper secondary/vocational degree	45.509 %	55.933 %
University degree	48.569 %	37.639 %
One parent has migration background	11.899 %	12.304 %
Household net income (in Euro)	3416.561 (2430.786)	3298.097 (1850.606)
Age mother (in years)	34.024 (7.898)	36.286 (6.007)
Sex child: male	50.880 %	52.380 %
Number of children in household	2.043 (0.989)	1.989 (0.915)
Age child (in years)	4.904 (3.101)	4.885 (3.173)
Cohabitation with partner	91.068 %	81.816 %
Observations	29,169	12,690

Pairfam 2010-2020, SOEP (2010-2017) weighted, own calculations. Conditional on non-missing sample

C   Measurement and validity of the instrument

Measurement of the instrument. The distance to the grandparents is part of the anchor questionnaire as well as the partner questionnaire in *pairfam* and is asked in all waves with the following question: "How much time do you need to get to your mother's dwelling? (on a normal day, using normal means of transportation)". In cases in which the anchor's or partner's parents do not live in one household, they are asked the same question about the distance to the father's dwelling. The distance is measured as a categorical variable with the following six categories: "we live in one house", "less than 10 minutes", "10 minutes to less than 30 minutes", "30 minutes to less than 1 hour", "1 hour to less than 3 hours" and "3 hours or more". Based on this, we construct a binary variable which equals unity if at least one grandparent lives closer than 30 minutes and equals zero otherwise. We employ this binary variable because the relationship between the distance and the amount of grandparental care provided is unlikely to be linear. For example, the difference between living 10 or 30 minutes away should have a larger impact than the difference between 3 hours and 3 hours and 20 minutes. We use 30 minutes as the cut-off, as this is a reasonable distance that still allows commuting within one day when giving care to a grandchild.[22] The distribution of the ordinal distance variable used to construct our instrument and the grandparental care variable in *pairfam* can be seen in Figure C.3. This figure shows the share of children that are in grandparental care by the minimum distance of the child to the grandparents. It can be seen that most children live close to at least one grandparent. In the whole sample, about 69 percent of households live less than 30 minutes away from at least one grandparent.[23] Additionally, it can be seen that the share of households that use grandparental care increases non-linearly with decreasing distance.[24]

In the *SOEP*, the distance to the grandparents is surveyed in the parents' individual questionnaires using the following question: "Which and how many of the following relatives do you have? Please also state where they live." The distance is measured as a categorical variable with the following seven categories: "here in this same household", "in the same house, but in another household", "in the same neighborhood", "in the same town, but more than 15 minutes away by foot", "in another town, but within a one hour drive", "further away, but in Germany", and "abroad." This information is surveyed every five years. In our analysis, we use

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[22]In robustness checks, we test whether our results are sensitive to two different definitions of the instrument (using an ordinal instrument and using one hour as the cutoff). See Appendix D.

[23]This percentage is weighted and based on the child data set of *pairfam*. In the parental level data set, 70 percent of households live closer than 30 minutes away from at least one grandparent.

[24]It appears that of those households in our sample that live further than three hours away from all grandparents, slightly more than 5 percent still report using grandparental care on a regular basis. As this seems unlikely, we exclude those households in a robustness check, which does not change our results. The results are available from the authors upon request.

the distance obtained in 2011 and 2016. In order to use a larger sample for our analysis, we impute the distance in the year before and after it was surveyed. This means that our *SOEP* analysis is based on the years 2010-2012 as well as 2015-2017. Just as for *pairfam*, we define a binary variable of the distance which equals unity if at least one grandparent lives in the same town as the household (but more than 15 minutes away by foot) and 0 otherwise. 52 percent of households in the *SOEP* sample live in the same town as at least one of the grandparents.

We tested three further potential instruments using a pension reform in Germany, the parents' birth order, and the gender of the oldest sibling of both parents. All three instruments proved to be weak instruments (small first stage F-statistic).

LPM estimation. We argue for the use of an LPM model in our main specification as opposed to more conventional non-linear models such as the binary logistic or probit regression models because LPM generates first stage residuals that are uncorrelated with the control variable and fitted values (e.g. Angrist and Pischke, 2008). Furthermore, Hellevik (2009) and Angrist and Pischke (2008) argue that in many applications, LPM generates similar estimates to logit models. The robustness of using the LPM is shown in the discussion of the so-called "garden variety" in Appendix E .

Figure C.3: Grandparental care by distance
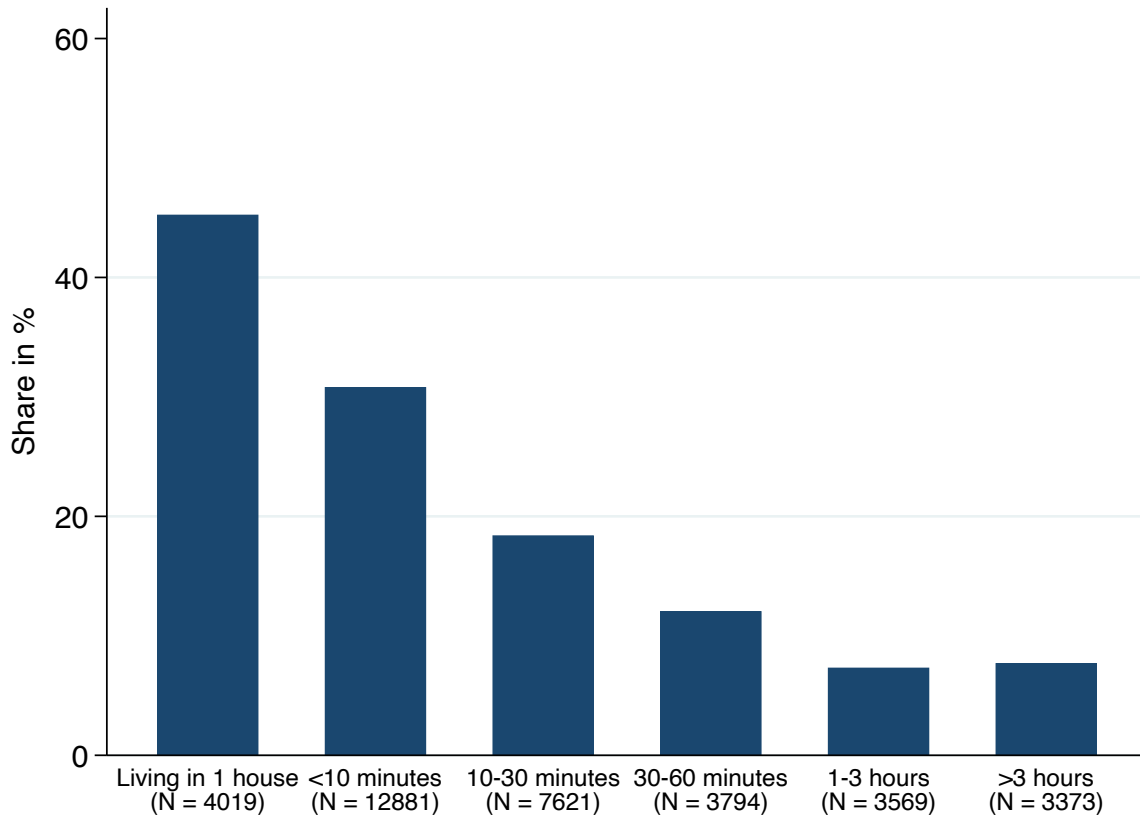
D   Further subsample analysis

We conduct further analysis for three groups of subsamples (see Tables D.4-D.10). As it is known from the literature that there are differences in child outcomes by child gender, we estimate different models for boys and girls. The negative health effects can be mostly attributed to boys as the coefficient is larger in magnitude and statistically more significant (Table D.6). In terms of school outcomes, there is a marginally significant reduction in "child likes studying" for boys who are in grandparental care.

Additionally, we evaluate the effect of grandparental care on children's health by grandparental health. In line with our prior expectations, grandparental care has a negative effect on children's health when their own health is equal to or below median health (D.10). Grandparents with worse health are likely to be physically restricted and therefore conduct fewer activities that include movement with their grandchildren (e.g. fewer walks and outdoor activities). This

could contribute to a worse health status of children.

Lastly, differentiating by parental education, the estimations reveal that the negative health effects can be mostly attributed to children of parents who hold at least one university degree. For all other child outcomes, there are no notable differences between children with parents who hold a university degree and children with parents who do not hold a university degree (Table D.7). The positive effect on mothers' satisfaction with childcare is more pronounced for mothers who hold a university degree than for mothers who do not (Table D.8). This could be explained by the fact that more highly educated mothers usually work more hours and therefore have more of a problem reconciling childcare and work duties without the help of grandparents. In contrast, the positive effect on satisfaction with leisure is about twice as large for mothers without a university degree. One reason could be that grandparents support more highly educated mothers with reconciling childcare and work while they give less educated mothers the chance to reconcile work, childcare, and leisure time. For fathers, the picture looks different. While the positive effect on satisfaction with childcare can be mostly attributed to fathers who do not hold a university degree, the negative effect on satisfaction with education and career is more significant for more educated fathers (Table D.9). One explanation could be that grandparental care is a less reliable care option than, for example, daycare, and thus more highly educated fathers feel hampered in their career development.

Table D.4: Results: Mother's Satisfaction by child age

Mother's Satisfaction with:	IV: GPC	F-Statistic	Sample Mean	Obs.
(a) Age: 0-2 years				
Child care situation	1.256 (0.923)	26.015	8.632	780
Life	0.305 (0.361)	100.176	7.929	2118
Education, Career	0.869 (0.546)	95.600	7.084	2035
Leisure, Hobbies	1.107^{+} (0.603)	100.176	6.082	2118
Relationship to Partner	0.313 (0.507)	99.883	7.727	2031
Work-life Balance	-1.024 (0.629)	53.664	6.326	528
(b) Age: 3-5.5 years				
Child care situation	1.279^{+} (0.719)	45.992	8.485	1543
Life	-0.0531 (0.340)	115.951	7.750	2341
Education, Career	0.304 (0.465)	114.736	7.235	2289
Leisure, Hobbies	0.496 (0.479)	116.202	6.175	2340
Relationship to Partner	-0.689 (0.512)	114.713	7.479	2211
Work-life Balance	1.058 (0.811)	41.232	6.252	898
(c) Age: 5.5-10 years				
Child care situation	0.637 (0.497)	86.297	8.454	2864
Life	0.246 (0.298)	166.064	7.675	3270
Education, Career	0.504 (0.410)	166.042	7.154	3221
Leisure, Hobbies	1.526^{***} (0.441)	165.696	6.358	3271
Relationship to Partner	0.155 (0.439)	172.102	7.489	3015
Work-life Balance	-0.133 (0.551)	115.585	6.519	1505

Note: $^{+}$ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. Robust standard errors in parentheses. For the outcome "Child care", robust standard errors clustered at the household level. The outcome variables are all ordinal variables on a scale from 0 (very dissatisfied) to 10 (very satisfied). Child care: satisfaction with the child care situation (on child level, all other outcomes on parental level), General: general life satisfaction, Educ./career: Satisfaction with education and career, Leisure: satisfaction with leisure and hobbies, Relationship: satisfaction with the relationship with the current partner, Work-life balance: satisfaction with the proportion of time that individuals spend on the job or for vocational training or university education relative to the time that individuals spend on personal life. The regressions include the control variables listed in table B.2 column (d) for the outcome "Child care" and (e) for all other outcomes in the appendix. *Source:* Pairfam (2010-2020), weighted, own calculation.

Table D.5: Results: Father's Satisfaction by child age

Father's Satisfaction with:	IV: GPC	F-Statistic	Sample Mean	Obs.
(a) Age: 0-2 years				
Child care situation	3.093^{+} (1.860)	10.128	8.698	571
Life	0.581^{*} (0.292)	100.432	7.928	1856
Education, Career	-0.512 (0.384)	101.059	7.520	1854
Leisure, Hobbies	0.398 (0.479)	100.787	6.298	1856
Relationship to Partner	-0.232 (0.459)	100.046	7.806	1855
Work-life Balance	0.662 (0.741)	48.788	5.865	1027
(b) Age: 3-5.5 years				
Child care situation	1.518^{*} (0.691)	43.082	8.410	1082
Life	0.0121 (0.295)	91.457	7.766	1835
Education, Career	-0.770^{*} (0.379)	90.816	7.511	1833
Leisure, Hobbies	-0.355 (0.467)	91.096	6.295	1833
Relationship to Partner	0.301 (0.456)	91.012	7.607	1831
Work-life Balance	-1.209^{+} (0.725)	41.097	5.827	960
(c) Age: 5.5-10 years				
Child care situation	1.629^{**} (0.577)	45.635	8.496	1926
Life	0.297 (0.318)	95.372	7.704	2200
Education, Career	0.125 (0.440)	94.822	7.454	2199
Leisure, Hobbies	-0.223 (0.455)	95.513	6.525	2200
Relationship to Partner	-0.107 (0.540)	95.074	7.653	2196
Work-life Balance	-0.830 (0.625)	65.009	5.888	1241

Note: $^{+}$ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. Robust standard errors in parentheses. For the outcome "Child care", robust standard errors clustered at the household level. The outcome variables are all ordinal variables on a scale from 0 (very dissatisfied) to 10 (very satisfied). Child care: satisfaction with the child care situation (on child level, all other outcomes on parental level), General: general life satisfaction, Educ./career: Satisfaction with education and career, Leisure: satisfaction with leisure and hobbies, Relationship: satisfaction with the relationship with the current partner, Work-life balance: satisfaction with the proportion of time that individuals spend on the job or for vocational training or university education relative to the time that individuals spend on personal life. The regressions include the control variables listed in table B.2 column (d) for the outcome "Child care" and (e) for all other outcomes in the appendix. *Source:* Pairfam (2010-2020), weighted, own calculation.

Table D.6: Results: Child outcomes by gender

Outcomes	IV: GPC	F-Statistic	Sample Mean	Obs.
(a) Boys				
Health problems: 0-10 y.	0.586* (0.250)	116.167	1.615	5616
Socio-emotional problems: 3-5 y.	0.921 (0.587)	17.492	3.013	1081
Conduct problems: 3-5 y.	0.490 (0.589)	17.578	1.111	1082
Hyperactivity: 3-5 y.	0.862 (0.543)	17.752	1.004	1083
Emotional problems: 3-5 y.	0.696 (0.563)	17.667	0.898	1082
Math grade: 9-10 y.	0.0426 (0.306)	29.709	2.153	758
German grade: 9-10 y.	-0.109 (0.343)	30.068	2.453	759
Child likes going to school: 9-10 y.	0.229 (0.355)	40.557	1.670	1151
Child likes studying: 9-10 y.	0.567^{+} (0.318)	39.906	2.046	1142
(b) Girls				
Health problems: 0-10 y.	0.389^{+} (0.208)	135.468	1.532	5453
Socio-emotional problems: 3-5 y.	0.221 (0.293)	66.442	2.874	1090
Conduct problems: 3-5 y.	0.122 (0.332)	66.442	1.017	1090
Hyperactivity: 3-5 y.	0.191 (0.262)	66.442	0.999	1090
Emotional problems: 3-5 y.	0.190 (0.285)	66.442	0.859	1090
Math grade: 9-10 y.	0.0125 (0.222)	63.421	2.380	718
German grade: 9-10 y.	-0.252 (0.230)	63.421	2.140	718
Child likes going to school: 9-10 y.	-0.119 (0.231)	75.893	1.440	1111
Child likes studying: 9-10 y.	-0.0384 (0.214)	75.798	1.796	1103

Note: $^{+}$ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. Robust standard errors clustered at the household level in parentheses. All outcome variables are standardized with mean 0 and standard deviation of 1. The original general health problems variable is an ordinal variable on a scale from 1 (good health) to 5 (bad health). The original outcome variables conduct problems, hyperactivity and emotional problems are ordinal variables on a scale from 0 (does not apply) to 5 (fully applies). The outcome variable socio-emotional problems is constructed summing up the three other indices, resulting in a variable that ranges from 0 (does not apply) to 12 (fully applies). The original outcome variables for math and German grade measure the school grades in these two subjects from 1 (very good) to 6 (very bad). The original variables "the child likes going to schoool" and "the child likes learning" range on a scale from 1 (strongly agree) to 4 (strongly disagree). The regressions include the control variables listed in table B.2 column (a) for health problems, (b) for socio-emotional problems and (c) for school outcomes in the appendix. *Source:* Pairfam (2010-2020), SOEP (2010-2017), weighted, own calculation.

Table D.7: Results: Child outcomes by education

Outcomes	IV: GPC	F-Statistic	Sample Mean	Obs.
(a) University Degree				
Health problems: 0-10 y.	0.608** (0.234)	117.091	1.522	6525
Socio-emotional problems: 3-5 y.	0.374 (0.320)	38.439	2.847	1359
Conduct problems: 3-5 y.	0.278 (0.380)	38.602	1.144	1360
Hyperactivity: 3-5 y.	0.324 (0.302)	38.602	0.922	1360
Emotional problems: 3-5 y.	0.236 (0.326)	38.439	0.782	1359
Math grade: 9-10 y.	-0.175 (0.192)	64.493	1.929	471
German grade: 9-10 y.	-0.144 (0.203)	64.493	1.948	471
Child likes going to school: 9-10 y.	0.130 (0.211)	85.061	1.499	699
Child likes studying: 9-10 y.	0.0944 (0.208)	83.823	1.800	693
(b) No University Degree				
Health problems: 0-10 y.	0.0554 (0.311)	79.387	1.638	4544
Socio-emotional problems: 3-5 y.	0.485 (0.690)	19.262	3.082	812
Conduct problems: 3-5 y.	0.715 (0.660)	19.262	0.948	812
Hyperactivity: 3-5 y.	0.201 (0.656)	19.379	1.117	813
Emotional problems: 3-5 y.	0.149 (0.676)	19.379	1.017	813
Math grade: 9-10 y.	0.201 (0.273)	41.974	2.420	1005
German grade: 9-10 y.	-0.0348 (0.316)	42.166	2.464	1006
Child likes going to school: 9-10 y.	-0.0277 (0.305)	42.379	1.581	1563
Child likes studying: 9-10 y.	0.416 (0.299)	42.539	1.977	1552

Note: $^{+}$ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. Robust standard errors clustered at the household level in parentheses. All outcome variables are standardized with mean 0 and standard deviation of 1. The original general health problems variable is an ordinal variable on a scale from 1 (good health) to 5 (bad health). The original outcome variables conduct problems, hyperactivity and emotional problems are ordinal variables on a scale from 0 (does not apply) to 5 (fully applies). The outcome variable socio-emotional problems is constructed summing up the three other indices, resulting in a variable that ranges from 0 (does not apply) to 12 (fully applies). The original outcome variables for math and German grade measure the school grades in these two subjects from 1 (very good) to 6 (very bad). The original variables "the child likes going to schoool" and "the child likes learning" range on a scale from 1 (strongly agree) to 4 (strongly disagree). The regressions include the control variables listed in table B.2 column (a) for health problems, (b) for socio-emotional problems and (c) for school outcomes in the appendix. *Source:* Pairfam (2010-2020), SOEP (2010-2017), weighted, own calculation.

Table D.8: Results: Mother's Satisfaction by education

Mother's Satisfaction with:	IV: GPC	F-Statistic	Sample Mean	Obs.
(a) University degree				
Child care situation	1.862* (0.727)	40.040	8.476	3299
Life	0.260 (0.225)	201.317	7.956	2366
Education, Career	0.573$^+$ (0.302)	200.893	7.623	2313
Leisure, Hobbies	0.735* (0.356)	201.317	6.381	2366
Relationship to Partner	0.524$^+$ (0.318)	196.732	7.847	2274
Work-life Balance	0.458 (0.452)	145.222	6.292	1092
(b) No University degree				
Child care situation	0.416 (0.713)	61.238	8.488	2539
Life	-0.148 (0.366)	121.545	7.658	3816
Education, Career	0.303 (0.536)	118.080	6.939	3748
Leisure, Hobbies	1.139* (0.527)	121.370	6.295	3816
Relationship to Partner	0.0639 (0.584)	115.828	7.408	3468
Work-life Balance	-0.419 (0.677)	59.182	6.514	1422

Note: $^+$ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. Robust standard errors in parentheses. For the outcome "Child care", robust standard errors clustered at the household level. The outcome variables are all ordinal variables on a scale from 0 (very dissatisfied) to 10 (very satisfied). Child care: satisfaction with the child care situation (on child level, all other outcomes on parental level), General: general life satisfaction, Educ./career: Satisfaction with education and career, Leisure: satisfaction with leisure and hobbies, Relationship: satisfaction with the relationship with the current partner, Work-life balance: satisfaction with the proportion of time that individuals spend on the job or for vocational training or university education relative to the time that individuals spend on personal life. The regressions include the control variables listed in table B.2 column (d) for the outcome "Child care" and (e) for all other outcomes in the appendix. *Source:* Pairfam (2010-2020), weighted, own calculation.

Table D.9: Results: Father's Satisfaction by education

Father's Satisfaction with:	IV: GPC	F-Statistic	Sample Mean	Obs.
(a) University degree				
Child care situation	1.276* (0.650)	42.755	8.487	2510
Life	0.323$^+$ (0.192)	207.703	7.919	2231
Education, Career	-0.534* (0.250)	206.808	7.756	2229
Leisure, Hobbies	-0.271 (0.306)	207.495	6.352	2230
Relationship to Partner	0.508$^+$ (0.304)	206.655	7.743	2229
Work-life Balance	-0.328 (0.437)	122.833	5.909	1314
(b) No University degree				
Child care situation	2.256$^+$ (1.348)	15.712	8.508	1501
Life	-0.176 (0.460)	46.277	7.699	2264
Education, Career	-0.732 (0.669)	46.222	7.263	2261
Leisure, Hobbies	0.623 (0.722)	46.797	6.538	2264
Relationship to Partner	-1.017 (0.795)	46.420	7.626	2262
Work-life Balance	-0.321 (0.945)	27.383	5.896	1196

Note: $^+$ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. Robust standard errors in parentheses. For the outcome "Child care", robust standard errors clustered at the household level. The outcome variables are all ordinal variables on a scale from 0 (very dissatisfied) to 10 (very satisfied). Child care: satisfaction with the child care situation (on child level, all other outcomes on parental level), General: general life satisfaction, Educ./career: Satisfaction with education and career, Leisure: satisfaction with leisure and hobbies, Relationship: satisfaction with the relationship with the current partner, Work-life balance: satisfaction with the proportion of time that individuals spend on the job or for vocational training or university education relative to the time that individuals spend on personal life. The regressions include the control variables listed in table B.2 column (d) for the outcome "Child care" and (e) for all other outcomes in the appendix. *Source:* Pairfam (2010-2020), weighted, own calculation.

Table D.10: Results: Child outcomes by grandparents' health

Outcomes	IV: GPC	F-Statistic	Sample Mean	Obs.
(a) Health better than median				
Health problems: 0-2 y.	0.680 (0.789)	4.833	1.527	182
Health problems: 3-5.5 y.	0.328 (0.433)	16.852	1.486	245
Health problems: 5.5-10 y.	0.0923 (0.576)	5.422	1.422	323
Health problems: 0-10 y.	0.220 (0.333)	30.433	1.482	806
(b) Health worse than/equal to median				
Health problems: 0-2 y.	0.241 (0.530)	16.852	1.454	264
Health problems: 3-5.5 y.	0.822 (0.574)	14.842	1.551	383
Health problems: 5.5-10 y.	0.530^{+} (0.310)	36.473	1.543	528
Health problems: 0-10 y.	0.577^{*} (0.280)	56.733	1.526	1285

Note: $^{+}$ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. Robust standard errors clustered at the household level in parentheses. All outcome variables are standardized with mean 0 and standard deviation of 1. The original general health problems variable is an ordinal variable on a scale from 1 (good health) to 5 (bad health). The regressions include the control variables listed in table B.2 column (a) for health problems in the appendix. *Source:* Pairfam (2010-2020), weighted, own calculation.

E Robustness Checks

To further corroborate our findings and test the exogeneity of the instrument used, we conduct several robustness checks. Some robustness checks concerning the validity of the instrument (e.g. analysis for childless households or using the distance to the individual's parents-in-law) we conduct only for parental outcomes. It can be argued that the distance to the grandparents likely affects child outcomes only through the time spent with the grandparents, i.e. grandparental care. For parents, this relationship is less straightforward, but we prove through several robustness checks that we are able to isolate the effect of grandparental care on parental satisfaction.

Exclusion of movers. In order to show that our results are not driven by families that (systematically) moved within the observation period, we exclude all households where the distance to grandparents changed from closer/further than 30 minutes to further/closer than 30 minutes. The results for child outcomes are shown in Table E.14 and for parental satisfaction in Table E.15. The coefficients for child health, socio-emotional problems, and school outcomes are similar to the main results. However, the results on child health problems are less statistically significant than the main results. The results for parental satisfaction are similar in magnitude and significance to the main results, which suggests that the results are not driven by (systematic) movement to or away from the grandparents.

Instrument: Distance to parents-in-law. First, we use only the distance to the individual's parents-in-law (instead of the distance to any grandparent) as an instrument when estimating the effects of grandparental care on parental outcomes. The idea behind this is that the relationship beyond childcare is usually closer to one's own parents than to one's parents-in-law (e.g. Del Boca et al., 2018). Thus, in case the distance to the own parents has some effect on parental satisfaction through some factor other than childcare that we cannot control for, this should be ruled out when using the distance to the parents-in-law. The instrument proved to be a strong instrument, measured by the first stage F-statistic. Generally, the results are similar to our main results. However, the negative effect on paternal satisfaction with education and career is no longer statistically significant (see Table E.16).

Analysis for childless households. Secondly, we estimate the same regressions as in the main analysis for childless households. With this analysis, we provide further evidence that our specification isolates the effects of grandparental care on parental well-being, i.e. we control for all other channels through which distance affects parental well-being. If this is the case, we expect no effects of distance to the "grandparents" on parents' well-being. Table E.17 shows that the point estimates are very small in magnitude and that there are no statistically significant effects of distance on well-being for both childless women and childless men.[25]

Definition of instrument. Furthermore, we check the sensitivity of our results concerning the definition of our instrument. We conduct the analyses with a different binary instrument that equals 1 for all distances shorter than 1 hour away for both *pairfam* and *SOEP*, as well as an ordinal instrument consisting of 6 categories in *pairfam* and 7 categories in the *SOEP*. The results for the alternative binary instrument are presented in Tables E.18 and E.19 and for the ordinal instrument in Tables E.20 and E.21. The results for child outcomes of both alternative specifications are, in terms of magnitude and direction of the effect, quite comparable to our main results. However, the coefficients on child health are statistically less significant. The results with the alternative binary instrument for parental satisfaction are also very similar to our main results. When using the ordinal instrument, the negative effect on paternal satisfaction with education and career is no longer statistically significant, and the effect on maternal satisfaction with the childcare situation is only significant at the 10 percent level.

Grandparental care in hours. In our main specification, we use grandparental care as a binary variable. The *SOEP* data also includes a variable that contains the number of hours

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[25]Because individuals in childless households are, on average, younger than parents in households with children in *pairfam* (the mean age of childless individuals is 29.95, and that of our baseline sample is 36.36), we exclude the youngest quartile of the sample in additional regressions in order to make the childless sample more comparable to our main sample. In these analyses, we still do not find any effects of the distance on well-being.

a child is cared for by the grandparents. When estimating the effect of grandparental care on children's school outcomes using this variable, we find similar effects to our baseline specification, namely, null effects (Table E.22).

Placebo analysis. Additionally, to further validate our instrument, we estimate the effect of grandparental care on placebo outcomes. We use birth weight (birth weight in grams and a binary variable indicating whether the birth weight is below 2500 grams) for children and the individual's birth month for parents. Both placebo outcomes should not be affected by grandparental care. We do not find any significant effects for either of the outcomes. This supports our empirical approach and the assumption that the method does not show any effects on factors that are independent of grandparental care (see Table E.23).

"Garden variety". To further corroborate our findings and the IV approach, we apply the so-called "garden variety" estimation. In this procedure, one estimates a probit model for the first stage regression and predicts the fitted values after this regression. These non-linear fitted values are then included as an additional instrument in the first stage regression using OLS. The results are presented in Table E.24 and Table E.25. The results on child outcomes are very similar to the main results in terms of magnitude, direction, and significance of the effects. The results on maternal satisfaction with leisure and paternal satisfaction with the childcare situation also match the main results. However, the effect on maternal satisfaction with the childcare situation and paternal satisfaction with education and career become slightly smaller in magnitude and insignificant.

Correction for multiple hypothesis testing. Furthermore, we correct our standard errors for multiple hypothesis testing using the Romano-Wolf Multiple Hypothesis Correction. By doing so, we account for the fact that we conduct a large number of regressions with many different outcomes as testing a large number of hypotheses increases the probability of falsely rejecting a true null hypothesis (Clarke et al., 2020). Applying the Romano-Wolf Correction[26], we obtain a p-value of 0.0640 for maternal satisfaction with leisure, a p-value of 0.0770 for paternal satisfaction with education and career, and a p-value of 0.0730 for child health problems. This means that these effects are statistically significant even when accounting for multiple hypothesis testing.[27]

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[26]We generate 999 bootstrap samples.

[27]As the multiple hypothesis testing command *rwolf* in Stata can only be conducted within one data set, we ran the test for four different groups of outcomes: children's health and socio-emotional outcomes, school outcomes, mother's satisfaction (excluding satisfaction with childcare as it is part of another data set), and father's satisfaction outcomes. Due to the construction of the command, the control variables deviate slightly from our baseline regressions.

Further control variables. Finally, we include further control variables, namely, emotional closeness of parents and grandparents, frequency of contact between parents and grandparents, grandparental health, and pre-birth satisfaction values of parents to prove the robustness of our results. The results are shown in Tables E.26 and E.27. We include emotional closeness (column 1) and frequency of contact (column 2) as both variables could be related to distance and affect parental satisfaction not only through grandparental childcare. However, since grandparental care could be correlated to both of these variables, they are potentially bad controls. Therefore, we exclude them from our main set of control variables and include them only in this robustness check. Including these variables does not considerably change the results on either child outcomes or parental satisfaction.

Another factor that might be a threat to the exogeneity assumption is grandparents' health because health limitations have been found to decrease the provision of grandparental care (Hank and Buber, 2009). Additionally, it is plausible that grandparents' illness might have an impact on child outcomes, parents' life satisfaction, and other satisfaction measures. And thirdly, grandparents' health might influence the instrument as families might move closer to a grandparent who is sick and needs help. To prove the robustness of the results, we include two different variables of grandparents' health in our analysis. It can be seen that the inclusion of those variables decreases the sample size considerably. The first variable included in column 3 measures the mean of grandparents' health status during the past 4 weeks. This variable has a lot of missing values because the health status of anchors' parents is surveyed only from wave 2 to wave 7 in the parent questionnaire and not in the anchor and partner questionnaire.[28] Despite the significant decrease in the sample size, the results on the child outcomes change only marginally.[29] However, the results on parental satisfaction become smaller and less significant. In an alternative specification (column 4), we include a variable that indicates whether at least one grandparent needed regular help in the last 12 months and serves as a proxy for bad grandparental health. Although this variable has fewer missing values than the first, it still decreases the sample size considerably. Also, when including this variable, the effects on parental satisfaction decrease and are less significant. In order to find out whether the results actually change because of controlling for grandparental health or whether the sample restrictions due to the many missing values in this variable drive the changes, we conduct the analysis with the restricted sample without controlling for grandparental health. This analysis

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[28]The *pairfam* parent questionnaire is answered by the grandparents. As mentioned in chapter 4, the parent questionnaire is given to anchors' parents if permitted and has a response rate of less than 30 percent (Brüderl et al., 2020).

[29]Note, this analysis is only conducted for the outcomes measured in *pairfam* as this variable is not available in the *SOEP*.

gives us very similar results to the main results including grandparental health. This suggests that grandparental health does not pose a threat to the exogeneity of our instrument.

We further include the parents' satisfaction value measured before the birth of the first child to account for any individual characteristics that might affect well-being that we haven't accounted for using our instrumental estimator. This reduces the sample size considerably since only households that were part of the survey before the birth of their first child can be considered. The results in column 5 show that the effects on the mother's satisfaction with leisure are the same size as in our baseline regression. However, the standard error is much larger due to the smaller sample size, which leads to a statistically insignificant coefficient. The negative effect on fathers' satisfaction with career is still found and still significant.[30]

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[30]This analysis cannot be conducted for satisfaction with the childcare situation because only individuals with children are questioned about their satisfaction with childcare.

Table E.11: First stage results (children): Exclusion of controls

Health & Socio-emotional skills:	Health	Socio-emot. problems	Conduct	Hyperactivity	Emotional
Exclusion of controls on parental level					
Distance	0.216***	0.232***	0.233***	0.230***	0.233***
	(0.0150)	(0.0253)	(0.0253)	(0.0254)	(0.0253)
Observations	16839	2741	2743	2745	2743
Exclusion of controls on parental and child level					
Distance	0.220***	0.233***	0.233***	0.231***	0.234***
	(0.0149)	(0.0250)	(0.0250)	(0.0250)	(0.0249)
Observations	16839	2742	2744	2746	2745
Exclusion of controls on (grand-)parental and child level					
Distance	0.198***	0.217***	0.214***	0.216***	0.215***
	(0.0117)	(0.0193)	(0.0193)	(0.0192)	(0.0194)
Observations	26547	5038	5050	5047	5045
Exclusion of all controls					
Distance	0.208***	0.225***	0.224***	0.224***	0.224***
	(0.0117)	(0.0200)	(0.0200)	(0.0199)	(0.0200)
Observations	28426	5363	5376	5374	5370
School outcomes:	Math grade	German grade	Child likes going to school	Child likes studying	
Exclusion of controls on parental level					
Distance	0.293***	0.294***	0.265***	0.265***	
	(0.0377)	(0.0377)	(0.0319)	(0.0321)	
Observations	1498	1499	2309	2293	
Exclusion of controls on parental and child level					
Distance	0.295***	0.296***	0.266***	0.266***	
	(0.0375)	(0.0375)	(0.0317)	(0.0319)	
Observations	1498	1499	2309	2293	
Exclusion of controls on (grand-)parental and child level					
Distance	0.285***	0.285***	0.265***	0.265***	
	(0.0378)	(0.0378)	(0.0318)	(0.0321)	
Observations	1613	1613	2471	2455	
Exclusion of all controls					
Distance	0.277***	0.278***	0.270***	0.269***	
	(0.0432)	(0.0432)	(0.0346)	(0.0349)	
Observations	1663	1663	2538	2522	

Note: Standard errors in parentheses. *Source:* Pairfam (2010-2020), SOEP (2010-2017), weighted, own calculation.
Conditional on no missings in the outcome and control variables (see Table B.2)

Table E.12: First stage results (parents): Exclusion of controls

Parental Satisfaction:	General	Educ./ career	Leisure	Relationship	Work-life balance	Child care
Exclusion of controls on parental level						
Distance: Maternal Sat.	0.225***	0.242***	0.243***	0.242***	0.247***	0.284***
	(0.0181)	(0.00916)	(0.00925)	(0.00914)	(0.00928)	(0.0147)
Observations	9942	11662	11533	11693	11074	4503
Exclusion of controls on parental and child level						
Distance: Maternal Sat.	0.223***	0.241***	0.242***	0.241***	0.245***	0.285***
	(0.0169)	(0.00837)	(0.00844)	(0.00835)	(0.00849)	(0.0145)
Observations	11749	13382	13238	13406	12675	4504
Exclusion of controls on (grand-)parental and child level						
Distance: Maternal Sat.	0.208***	0.227***	0.229***	0.227***	0.234***	0.281***
	(0.0132)	(0.00726)	(0.00732)	(0.00724)	(0.00741)	(0.0131)
Observations	17858	16893	16702	16916	15925	5505
Exclusion of all controls						
Distance: Maternal Sat.	0.204***	0.235***	0.237***	0.235***	0.238***	0.293***
	(0.0128)	(0.00666)	(0.00673)	(0.00665)	(0.00682)	(0.0121)
Observations	19351	18092	17872	18120	17070	5853
Exclusion of controls on parental level						
Distance: Paternal Sat.	0.219***	0.236***	0.236***	0.237***	0.253***	0.246***
	(0.0244)	(0.0107)	(0.0107)	(0.0107)	(0.0106)	(0.0164)
Observations	6857	9685	9677	9690	9376	4722
Exclusion of controls on parental and child level						
Distance: Paternal Sat.	0.208***	0.232***	0.233***	0.232***	0.245***	0.254***
	(0.0228)	(0.00992)	(0.00989)	(0.00992)	(0.00983)	(0.0164)
Observations	8067	11139	11124	11140	10783	4722
Exclusion of controls on (grand-)parental and child level						
Distance: Paternal Sat.	0.188***	0.215***	0.216***	0.215***	0.227***	0.235***
	(0.0176)	(0.00853)	(0.00854)	(0.00854)	(0.00843)	(0.0140)
Observations	12951	13874	13856	13874	13419	5742
Exclusion of all controls						
Distance: Paternal Sat.	0.201***	0.220***	0.222***	0.221***	0.232***	0.239***
	(0.0181)	(0.00797)	(0.00795)	(0.00798)	(0.00793)	(0.0131)
Observations	13756	14770	14760	14780	14284	6082

Note: Standard errors in parentheses. *Source:* Pairfam (2010-2020), weighted, own calculation. Conditional on no missings in the outcome and control variables (see Table B.2)

Table E.13: Moving behavior before and after the birth of a child

In the year before child birth	General movement	Move towards	Move away from
Any grandparents	0.0037	0.0032	-0.0098
	(0.019)	(0.017)	(0.016)
Observations	22251	22251	22251
Mother's parents	0.0182	0.0193	-0.0034
	(0.017)	(0.013)	(0.012)
Observations	22250	22250	22250
Father's parents	-0.0126	-0.0162	0.0004
	(0.016)	(0.013)	(0.012)
Observations	20904	20904	20904
In the year after child birth	General movement	Move towards	Move away from
Any grandparents	0.0033	0.0154	-0.0038
	(0.015)	(0.013)	(0.013)
Observations	22251	22251	22251
Mother's parents	0.0220	0.0099	0.0114
	(0.013)	(0.011)	(0.010)
Observations	22250	22250	22250
Father's parents	-0.0104	0.0057	-0.0136
	(0.013)	(0.011)	(0.010)
Observations	20904	20904	20904

Note: $^{+}$ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. Estimated using OLS. Standard errors in parentheses. All regressions include individual and household controls described in table B.2 column (d) except for child-level variables. *Note:* Source: Pairfam (2009-2019), own calculations.

Table E.14: Results: Child outcomes without families that moved from closer than 30 min to further or vice versa

	IV: GPC	F-Statistic	Sample Mean	Obs.
Health				
Health problems: 0-2 years	0.224 (0.374)	59.846	1.538	1338
Health problems: 3-5.5 y.	0.276 (0.260)	92.385	1.575	2185
Health problems: 5.5-10 y.	0.258 (0.193)	175.582	1.554	3897
Health problems: 0-10 y.	0.323^{+} (0.191)	192.061	1.563	8289
Socio-emotional behavior				
Socio-emotional problems: 3-5 y.	0.144 (0.284)	79.923	2.936	1596
Conduct problems: 3-5 y.	-0.0610 (0.298)	79.923	1.074	1596
Hyperactivity: 3-5 y.	0.192 (0.260)	80.205	0.987	1597
Emotional problems: 3-5 y.	0.197 (0.256)	80.205	0.874	1597
School outcomes				
Math grade: 9-10 y.	0.0237 (0.186)	79.264	2.251	1420
German grade: 9-10 y.	-0.238 (0.219)	79.463	2.284	1421
Child likes going to school: 9-10 y.	-0.0771 (0.196)	104.135	1.550	2186
Child likes studying: 9-10 y.	0.156 (0.193)	103.941	1.903	2168

Note: $^{+}$ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. Robust standard errors clustered at the household level in parentheses. All outcome variables are standardized with mean 0 and standard deviation of 1. The original general health problems variable is an ordinal variable on a scale from 1 (good health) to 5 (bad health). The original outcome variables conduct problems, hyperactivity and emotional problems are ordinal variables on a scale from 0 (does not apply) to 5 (fully applies). The outcome variable socio-emotional problems is constructed summing up the three other indices, resulting in a variable that ranges from 0 (does not apply) to 12 (fully applies). The original outcome variables for math and German grade measure the school grades in these two subjects from 1 (very good) to 6 (very bad). The original variables "the child likes going to schoool" and "the child likes learning" range on a scale from 1 (strongly agree) to 4 (strongly disagree). The original variables on educational aspirations report the probability that a child attains a certain school degree from 1 (not at all) to 7 (completely). The regressions include the control variables listed in table B.2 column (a) for health problems, (b) for socio-emotional problems and (c) for school outcomes in the appendix. *Source:* Pairfam (2010-2020), SOEP (2010-2017), weighted, own calculation.

Table E.15: Effects of Grandparental Care on Parental Satisfaction without families that moved from closer than 30 min to further or vice versa

Outcomes	IV: GPC	F-Statistic	Sample Mean	Obs.
Mother's Satisfaction with:				
Child care situation	0.843$^+$ (0.489)	92.358	8.545	4237
Life	0.408$^+$ (0.221)	346.490	7.781	4746
Education, Career	0.364 (0.290)	345.825	7.267	4654
Leisure, Hobbies	0.756* (0.320)	346.564	6.358	4746
Relationship to Partner	0.300 (0.323)	334.311	7.543	4458
Work-life Balance	0.204 (0.417)	190.153	6.462	1933
Father's Satisfaction with:				
Child care situation	1.436** (0.520)	73.370	8.540	3128
Life	0.371$^+$ (0.190)	294.787	7.822	3679
Education, Career	-0.528* (0.265)	294.311	7.524	3676
Leisure, Hobbies	-0.0184 (0.287)	294.761	6.485	3679
Relationship to Partner	-0.169 (0.360)	294.164	7.706	3676
Work-life Balance	-0.425 (0.400)	193.226	5.953	2059

Note: $^+$ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. Robust standard errors in parentheses. For the outcome "Child care", robust standard errors clustered at the household level. The outcome variables are all ordinal variables on a scale from 0 (very dissatisfied) to 10 (very satisfied). Child care: satisfaction with the child care situation (on child level, all other outcomes on parental level), General: general life satisfaction, Educ./career: Satisfaction with education and career, Leisure: satisfaction with leisure and hobbies, Relationship: satisfaction with the relationship with the current partner, Work-life balance: satisfaction with the proportion of time that individuals spend on the job or for vocational training or university education relative to the time that individuals spend on personal life. The regressions include the control variables listed in table B.2 column (d) for the outcome "Child care" and (e) for all other outcomes in the appendix. *Source:* Pairfam (2010-2020), weighted, own calculation.

Table E.16: Effects of Grandparental Care on Parental Satisfaction (using the distance to the parents-in-law)

Outcomes	IV:GPC	F-Statistic	Sample Mean	Obs.
Mother's Satisfaction with:				
Child care situation	1.558$^+$ (0.807)	32.662	8.474	2941
Life	0.207 (0.272)	146.580	7.887	3167
Education, Career	0.273 (0.394)	147.443	7.229	3106
Leisure, Hobbies	0.857* (0.425)	146.318	6.412	3168
Relationship to Partner	0.684$^+$ (0.391)	145.586	7.708	3160
Work-life Balance	0.149 (0.540)	85.048	6.553	1284
Father's Satisfaction with:				
Child care situation	1.765** (0.608)	30.243	8.490	2974
Life	0.247 (0.228)	203.211	7.801	3200
Education, Career	-0.0243 (0.264)	204.565	7.504	3198
Leisure, Hobbies	0.0201 (0.324)	203.986	6.547	3201
Relationship to Partner	0.411 (0.371)	202.544	7.713	3198
Work-life Balance	0.125 (0.448)	136.382	5.954	1787

Note: $^+$ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. Robust standard errors in parentheses. For the outcome "Child care", robust standard errors clustered at the household level. The outcome variables are all ordinal variables on a scale from 0 (very dissatisfied) to 10 (very satisfied). Child care: satisfaction with the child care situation (on child level, all other outcomes on parental level), General: general life satisfaction, Educ./career: Satisfaction with education and career, Leisure: satisfaction with leisure and hobbies, Relationship: satisfaction with the relationship with the current partner, Work-life balance: satisfaction with the proportion of time that individuals spend on the job or for vocational training or university education relative to the time that individuals spend on personal life. The regressions include the control variables listed in table B.2 column (d) for the outcome "Child care" and (e) for all other outcomes in the appendix. *Source:* Pairfam (2010-2020), weighted, own calculation.

Table E.17: Effects of Grandparental Care on Individual Satisfaction (for childless households)

Outcomes	OLS: GPC	Sample Mean	Obs.
Woman's Satisfaction with:			
Life	-0.0973 (0.107)	7.747	1266
Education, Career	-0.0443 (0.127)	7.364	1265
Leisure, Hobbies	0.108 (0.145)	7.046	1266
Relationship to Partner	-0.0498 (0.174)	8.262	1112
Work-life Balance	0.230 (0.254)	6.353	572
Man's Satisfaction with:			
Life	0.0596 (0.112)	1120	7.953
Education, Career	-0.131 (0.199)	1117	7.653
Leisure, Hobbies	0.0390 (0.169)	1118	7.061
Relationship to Partner	-0.0510 (0.149)	1113	8.273
Work-life Balance	0.296 (0.266)	511	6.080

Note: $^{+}$ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. Estimated using OLS. Robust standard errors in parentheses. The outcome variables are all ordinal variables on a scale from 0 (very dissatisfied) to 10 (very satisfied). Outcomes are on parental level. General: general life satisfaction, Educ./career: Satisfaction with education and career, Leisure: satisfaction with leisure and hobbies, Relationship: satisfaction with the relationship with the current partner, Work-life balance: satisfaction with the proportion of time that individuals spend on the job or for vocational training or university education relative to the time that individuals spend on personal life. The regressions include individual and household controls described in table B.2 column (e) in the appendix, except for child-level variables. *Source:* Pairfam (2010-2020), weighted, own calculation.

Table E.18: Results: Child outcomes with different instrument definition (<1h vs. ≥1h)

	IV: GPC	F-Statistic	Sample Mean	Obs.
Health				
Health problems: 0-2 years	0.279 (0.394)	70.558	1.546	1828
Health problems: 3-5.5 y.	0.00881 (0.321)	85.661	1.579	3006
Health problems: 5.5-10 y.	0.298 (0.231)	138.623	1.573	5132
Health problems: 0-10 y.	0.306 (0.223)	168.955	1.574	11069
Socio-emotional behavior				
Socio-emotional problems: 3-5 y.	0.306 (0.341)	45.845	2.943	2171
Conduct problems: 3-5 y.	0.0259 (0.375)	45.742	1.064	2172
Hyperactivity: 3-5 y.	0.212 (0.311)	45.949	1.002	2173
Emotional problems: 3-5 y.	0.473 (0.337)	46.053	0.878	2172
School outcomes				
Math grade: 9-10 y.	-0.429[+] (0.244)	58.469	2.264	1476
German grade: 9-10 y.	-0.433[+] (0.256)	58.516	2.300	1477
Child likes going to school: 9-10 y.	0.279 (0.201)	82.248	1.556	2262
Child likes studying: 9-10 y.	0.378[+] (0.224)	82.973	1.924	3305

Note: [+] $p < 0.10$, [*] $p < 0.05$, [**] $p < 0.01$, [***] $p < 0.001$. Robust standard errors clustered at the household level in parentheses. All outcome variables are standardized with mean 0 and standard deviation of 1. The original general health problems variable is an ordinal variable on a scale from 1 (good health) to 5 (bad health). The original outcome variables conduct problems, hyperactivity and emotional problems are ordinal variables on a scale from 0 (does not apply) to 5 (fully applies). The outcome variable socio-emotional problems is constructed summing up the three other indices, resulting in a variable that ranges from 0 (does not apply) to 12 (fully applies). The original outcome variables for math and German grade measure the school grades in these two subjects from 1 (very good) to 6 (very bad). The original variables "the child likes going to schoool" and "the child likes learning" range on a scale from 1 (strongly agree) to 4 (strongly disagree). The regressions include the control variables listed in table B.2 column (a) for health problems, (b) for socio-emotional problems and (c) for school outcomes in the appendix. *Source:* Pairfam (2010-2020), SOEP (2010-2017), weighted, own calculation.

Table E.19: Effects of Grandparental Care on Parental Satisfaction with different instrument definition (<1h vs. ≥1h)

Outcomes	IV: GPC	F-Statistic	Sample Mean	Obs.
Mother's Satisfaction with:				
Child care situation	1.025^{+} (0.622)	82.460	8.481	5838
Life	0.490^{*} (0.248)	275.378	7.759	6182
Education, Career	0.240 (0.350)	272.964	7.171	6061
Leisure, Hobbies	0.792^{*} (0.363)	275.280	6.325	6182
Relationship to Partner	0.454 (0.378)	254.921	7.561	5742
Work-life Balance	0.820 (0.529)	128.672	6.429	2514
Father's Satisfaction with:				
Child care situation	1.690^{**} (0.610)	48.654	8.496	4011
Life	0.177 (0.211)	278.111	7.802	4495
Education, Career	-0.754^{**} (0.273)	277.011	7.494	4490
Leisure, Hobbies	-0.110 (0.337)	278.260	6 6.451	4494
Relationship to Partner	-0.0988 (0.379)	278.809	7.681	4491
Work-life Balance	-1.521^{**} (0.479)	145.997	5.903	2510

Note: $^{+}$ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. Robust standard errors in parentheses. For the outcome "Child care", robust standard errors clustered at the household level. The outcome variables are all ordinal variables on a scale from 0 (very dissatisfied) to 10 (very satisfied). Child care: satisfaction with the child care situation (on child level, all other outcomes on parental level), General: general life satisfaction, Educ./career: Satisfaction with education and career, Leisure: satisfaction with leisure and hobbies, Relationship: satisfaction with the relationship with the current partner, Work-life balance: satisfaction with the proportion of time that individuals spend on the job or for vocational training or university education relative to the time that individuals spend on personal life. The regressions include the control variables listed in table B.2 column (d) for the outcome "Child care" and (e) for all other outcomes in the appendix.
Source: Pairfam (2010-2020), weighted, own calculation.

Table E.20: Results: Child outcomes with ordinal instrument definition

	IV: GPC	F-Statistic	Sample Mean	Obs.
Health				
Health problems: 0-2 years	0.464 (0.291)	87.968	1.546	1828
Health problems: 3-5.5 y.	0.157 (0.197)	155.309	1.579	3006
Health problems: 5.5-10 y.	0.240 (0.164)	218.510	1.573	5132
Health problems: 0-10 y.	0.297$^+$ (0.152)	264.319	1.574	11069
Socio-emotional behavior				
Socio-emotional problems: 3-5 y.	0.279 (0.231)	97.350	2.943	2171
Conduct problems: 3-5 y.	0.113 (0.241)	97.414	1.064	2172
Hyperactivity: 3-5 y.	0.162 (0.198)	97.559	1.002	2173
Emotional problems: 3-5 y.	0.368 (0.224)	97.495	0.878	2172
School outcomes				
Math grade: 9-10 y.	-0.185 (0.204)	52.365	2.264	1476
German grade: 9-10 y.	-0.175 (0.254)	52.479	2.300	1477
Child likes going to school: 9-10 y.	0.106 (0.189)	76.599	1.556	2262
Child likes studying: 9-10 y.	0.115 (0.183)	76.177	1.924	3305

Note: $^+$ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. Robust standard errors clustered at the household level in parentheses. All outcome variables are standardized with mean 0 and standard deviation of 1. The original general health problems variable is an ordinal variable on a scale from 1 (good health) to 5 (bad health). The original outcome variables conduct problems, hyperactivity and emotional problems are ordinal variables on a scale from 0 (does not apply) to 5 (fully applies). The outcome variable socio-emotional problems is constructed summing up the three other indices, resulting in a variable that ranges from 0 (does not apply) to 12 (fully applies). The original outcome variables for math and German grade measure the school grades in these two subjects from 1 (very good) to 6 (very bad). The original variables "the child likes going to schoool" and "the child likes learning" range on a scale from 1 (strongly agree) to 4 (strongly disagree). The regressions include the control variables listed in table B.2 column (a) for health problems, (b) for socio-emotional problems and (c) for school outcomes in the appendix. *Source:* Pairfam (2010-2020), SOEP (2010-2017), weighted, own calculation.

Table E.21: Effects of Grandparental Care on Parental Satisfaction with ordinal instrument

Outcomes	IV:GPC	F-Statistic	Sample Mean	Obs.
Mother's Satisfaction with:				
Child care situation	0.809^+ (0.415)	143.993	8.481	5838
Life	0.237 (0.174)	471.491	7.759	6182
Education, Career	0.162 (0.246)	462.447	7.171	6061
Leisure, Hobbies	0.773^{**} (0.254)	471.494	6.325	6182
Relationship to Partner	0.380 (0.262)	443.013	7.561	5742
Work-life Balance	-0.218 (0.355)	253.774	6.429	2514
Father's Satisfaction with:				
Child care situation	1.504^{***} (0.433)	74.011	8.496	4011
Life	0.350^* (0.171)	355.295	7.802	4495
Education, Career	-0.126 (0.225)	354.859	7.494	4490
Leisure, Hobbies	-0.166 (0.264)	356.177	6 6.451	4494
Relationship to Partner	-0.0182 (0.313)	355.613	7.681	4491
Work-life Balance	-0.274 (0.350)	216.907	5.903	2510

Note: $^+$ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. Robust standard errors in parentheses. For the outcome "Child care", robust standard errors clustered at the household level. The outcome variables are all ordinal variables on a scale from 0 (very dissatisfied) to 10 (very satisfied). Child care: satisfaction with the child care situation (on child level, all other outcomes on parental level), General: general life satisfaction, Educ./career: Satisfaction with education and career, Leisure: satisfaction with leisure and hobbies, Relationship: satisfaction with the relationship with the current partner, Work-life balance: satisfaction with the proportion of time that individuals spend on the job or for vocational training or university education relative to the time that individuals spend on personal life. The regressions include the control variables listed in table B.2 column (d) for the outcome "Child care" and (e) for all other outcomes in the appendix. *Source:* Pairfam (2010-2020), weighted, own calculation.

Table E.22: Results: Child outcomes with linear grandparental care variable

	IV: GPC	F-Statistic	Sample Mean	Obs.
School outcomes				
Math grade: 9-10 y.	0.00639 (0.0281)	26.606	2.264	1475
German grade: 9-10 y.	-0.0148 (0.0302)	26.789	2.300	1476
Child likes going to school: 9-10 y.	-0.00984 (0.0216)	30.944	1.556	2278
Child likes studying: 9-10 y.	0.0237 (0.0241)	30.662	1.924	2261

Note: $^+$ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. Robust standard errors clustered at the household level in parentheses. All outcome variables are standardized with mean 0 and standard deviation of 1. The original outcome variables for math and German grade measure the school grades in these two subjects from 1 (very good) to 6 (very bad). The original variables "the child likes going to schoool" and "the child likes learning" range on a scale from 1 (strongly agree) to 4 (strongly disagree). The regressions include the control variables listed in table B.2 (c) for school outcomes in the appendix. *Source:* SOEP (2010-2017), weighted, own calculation.

Table E.23: Placebo Regressions

Outcomes	IV:Grandparental Care	F-Statistic	Sample Mean	Obs.
Child:				
Birth weight	131.8 (259.9)	115.776	3420.660	6606
Birth weight < 2500	-0,0571 (0.0976)	115.776	0.049	6606
Parents:				
Mother: Birth month	-0.436 (0.492)	328.651	6.653	6183
Father: Birth month	-0.860 (0.597)	219.983	6.459	4485

Note: $^+$ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. Robust standard errors in parentheses. For the outcome "Birth weight", robust standard errors clustered at the household level. The regressions include the control variables listed in table B.2 column (a) for the outcomes on birth weight and (e) for the outcomes on birth month in the appendix. *Source:* Pairfam (2010-2020), weighted, own calculation.

Table E.24: Results: Child outcomes (applying "Garden Variety")

	IV: GPC	F-Statistic	Sample Mean	Obs.
Health				
Health problems: 0-2 years	0.532$^+$ (0.292)	39.371	1.551	1811
Health problems: 3-5.5 y.	0.455* (0.217)	63.068	1.585	2990
Health problems: 5.5-10 y.	0.387* (0.173)	88.440	1.587	5116
Health problems: 0-10 y.	0.496** (0.163)	110.256	1.584	11040
Socio-emotional behavior				
Socio-emotional problems: 3-5 y.	0.0900 (0.231)	44.001	3.013	2164
Conduct problems: 3-5 y.	-0.0440 (0.258)	44.084	1.092	2165
Hyperactivity: 3-5 y.	0.0222 (0.223)	44.241	1.018	2166
Emotional problems: 3-5 y.	0.232 (0.238)	44.158	0.903	2165
School outcomes				
Math grade: 9-10 y.	0.0378 (0.186)	39.197	2.264	1476
German grade: 9-10 y.	-0.0897 (0.220)	39.297	2.300	1477
Child likes going to school: 9-10 y.	-0.0571 (0.205)	50.449	1.556	2262
Child likes studying: 9-10 y.	0.119 (0.197)	50.461	1.924	2245

Note: $^+$ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. Robust standard errors clustered at the household level in parentheses. All outcome variables are standardized with mean 0 and standard deviation of 1. The original general health problems variable is an ordinal variable on a scale from 1 (good health) to 5 (bad health). The original outcome variables conduct problems, hyperactivity and emotional problems are ordinal variables on a scale from 0 (does not apply) to 5 (fully applies). The outcome variable socio-emotional problems is constructed summing up the three other indices, resulting in a variable that ranges from 0 (does not apply) to 12 (fully applies). The original outcome variables for math and German grade measure the school grades in these two subjects from 1 (very good) to 6 (very bad). The original variables "the child likes going to schoool" and "the child likes learning" range on a scale from 1 (strongly agree) to 4 (strongly disagree). The original variables on educational aspirations report the probability that a child attains a certain school degree from 1 (not at all) to 7 (completely). The regressions include the control variables listed in table B.2 column (a) for health problems, (b) for socio-emotional problems and (c) for school outcomes in the appendix. *Source:* Pairfam (2010-2020), SOEP (2010-2017), weighted, own calculation.

Table E.25: Effects of Grandparental Care on Parental Satisfaction (applying "Garden Variety")

Outcomes	IV: GPC	F-Statistic	Sample Mean	Obs.
Mother's Satisfaction with:				
Child care situation	0.581 (0.420)	58.574	8.471	5834
Life	0.0294 (0.173)	212.183	7.744	6182
Education, Career	0.412^{+} (0.237)	207.308	7.163	6061
Leisure, Hobbies	1.057*** (0.268)	212.103	6.322	6182
Relationship to Partner	0.114 (0.251)	214.140	7.560	5742
Work-life Balance	0.0656 (0.343)	129.352	6.406	2514
Father's Satisfaction with:				
Child care situation	1.651*** (0.443)	41.440	8.476	3980
Life	0.157 (0.166)	169.167	7.798	4495
Education, Career	-0.229 (0.221)	168.942	7.484	4490
Leisure, Hobbies	-0.315 (0.264)	169.172	6.465	4494
Relationship to Partner	-0.266 (0.295)	168.800	7.691	4491
Work-life Balance	-0.340 (0.376)	116.856	5.919	2510

Note: $^{+}$ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. Robust standard errors in parentheses. For the outcome "Child care", robust standard errors clustered at the household level. The outcome variables are all ordinal variables on a scale from 0 (very dissatisfied) to 10 (very satisfied). Child care: satisfaction with the child care situation (on child level, all other outcomes on parental level), General: general life satisfaction, Educ./career: Satisfaction with education and career, Leisure: satisfaction with leisure and hobbies, Relationship: satisfaction with the relationship with the current partner, Work-life balance: satisfaction with the proportion of time that individuals spend on the job or for vocational training or university education relative to the time that individuals spend on personal life. The regressions include the control variables listed in table B.2 column (d) for the outcome "Child care" and (e) for all other outcomes in the appendix. *Source:* Pairfam (2010-2020), weighted, own calculation.

Table E.26: Results: Child outcomes

Outcomes *controlling for*	Emot. Closeness	IV:Grandparental Care Freq. Contact	GP Health	GP Health (Proxy)
Health				
Health prob.: 0-2 years	0.580 (0.384)	0.712 (0.490)	0.244 (0.373)	0.667 (0.413)
Observations	1828	1828	446	663
Health prob.: 3-5.5 y.	0.323 (0.241)	0.438 (0.297)	0.516$^+$ (0.294)	0.528$^+$ (0.271)
Observations	3006	3006	628	1233
Health prob.: 5.5-10 y.	0.493* (0.199)	0.615* (0.248)	0.572* (0.281)	0.609* (0.242)
Observations	5132	5132	851	1874
Health prob.: 0-10 y.	0.530** (0.190)	0.669** (0.238)	0.508* (0.227)	0.616** (0.195)
Observations	11069	11069	2091	4130
Socio-emotional behavior				
Socio-emot. prob.: 3-5 y.	0.431 (0.298)	0.533 (0.395)	0.225 (0.336)	0.443 (0.302)
Observations	2171	2171	474	742
Conduct prob.: 3-5 y.	0.273 (0.318)	0.289 (0.410)	0.310 (0.319)	0.394 (0.333)
Observations	2172	2172	474	742
Hyperactivity: 3-5 y.	0.333 (0.268)	0.498 (0.373)	0.233 (0.331)	0.192 (0.290)
Observations	2173	2173	474	742
Emotional prob.: 3-5 y.	0.363 (0.297)	0.398 (0.382)	-0.0559 (0.360)	0.424 (0.321)
Observations	2172	2172	474	742

Note: $^+$ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. Robust standard errors clustered at the household level in parentheses. All outcome variables are standardized with mean 0 and standard deviation of 1. The original general health problems variable is an ordinal variable on a scale from 1 (good health) to 5 (bad health). The original outcome variables conduct problems, hyperactivity and emotional problems are ordinal variables on a scale from 0 (does not apply) to 5 (fully applies). The outcome variable socio-emotional problems is constructed summing up the three other indices, resulting in a variable that ranges from 0 (does not apply) to 12 (fully applies). The original outcome variables for math and German grade measure the school grades in these two subjects from 1 (very good) to 6 (very bad). The original variables "the child likes going to schoool" and "the child likes learning" range on a scale from 1 (strongly agree) to 4 (strongly disagree). The regressions include the control variables listed in table B.2 column (a) for health problems, (b) for socio-emotional problems and (c) for school outcomes in the appendix. *Source:* Pairfam (2010-2020), SOEP (2010-2017), weighted, own calculation.

Table E.27: Effects of Grandparental Care on Parental Satisfaction

| Outcomes | IV:Grandparental Care | | | | |
controlling for	Emot. Closeness	Freq. Contact	GP Health	GP Health (Proxy)	Pre-birth sat.
Mother's Sat.:					
Child care	0.843^{+} (0.473)	0.949 (0.605)	1.338^{+} (0.707)	0.0862 (0.599)	
Observations	5838	5838	1120	2224	
Life	-0.136 (0.216)	-0.234 (0.255)	-0.121 (0.404)	0.152 (0.335)	-0.170 (0.420)
Observations	6174	6182	1053	2039	1903
Educ., Career	0.268 (0.299)	0.146 (0.347)	-0.422 (0.570)	0.270 (0.452)	1.347^{*} (0.601)
Observations	6053	6061	1043	1996	1845
Leisure	0.785^{*} (0.317)	0.896^{*} (0.372)	-0.263 (0.613)	0.528 (0.461)	0.818 (0.647)
Observations	6174	6182	1053	2039	1901
Relationship	0.139 (0.320)	0.249 (0.366)	-0.296 (0.559)	0.217 (0.500)	0.597 (0.503)
Observations	5736	5742	990	1892	1727
Work-life Bal.	0.0667 (0.394)	0.145 (0.456)	-0.879 (0.671)	-0.451 (0.626)	4.494 (3.470)
Observations	2512	2514	348	900	156
Father's Sat.:					
Child care	1.701^{**} (0.554)	1.709^{*} (0.682)	0.383 (0.823)	1.779^{**} (0.606)	
Observations	4011	4011	716	1532	
Life	0.0491 (0.210)	-0.102 (0.262)	-0.246 (0.305)	-0.213 (0.313)	-0.0631 (0.306)
Observations	4011	4495	664	1464	1733
Educ., Career	-0.674^{*} (0.284)	-1.030^{**} (0.359)	-0.902^{*} (0.414)	-0.110 (0.411)	-0.684^{+} (0.399)
Observations	4488	4490	664	1463	1726
Leisure	-0.119 (0.330)	-0.183 (0.408)	-0.426 (0.512)	0.116 (0.478)	-0.635 (0.492)
Observations	4492	4494	664	1463	1727
Relationship	-0.432 (0.364)	-0.643 (0.449)	0.310 (0.533)	-0.460 (0.576)	-0.715 (0.553)
Observations	4489	4491	663	1461	1672
Work-life Bal.	-0.412 (0.435)	-0.751 (0.553)	-1.363^{+} (0.794)	-0.858 (0.658)	2.374^{*} (1.191)
Observations	2509	2510	316	880	369

Note: $^{+}$ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. Robust standard errors in parentheses. For the outcome "Child care", robust standard errors clustered at the household level. The outcome variables are all ordinal variables on a scale from 0 (very dissatisfied) to 10 (very satisfied). Child care: satisfaction with the child care situation (on child level, all other outcomes on parental level), General: general life satisfaction, Educ./career: Satisfaction with education and career, Leisure: satisfaction with leisure and hobbies, Relationship: satisfaction with the relationship with the current partner, Work-life balance: satisfaction with the proportion of time that individuals spend on the job or for vocational training or university education relative to the time that individuals spend on personal life. The regressions include the control variables listed in table B.2 column (d) for the outcome "Child care" and (e) for all other outcomes in the appendix. *Source:* Pairfam (2010-2020), weighted, own calculation.