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Article

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Private Spending on Children's Education: Low-Income Families Pay Relatively More

By Carsten Schroeder, C. Katharina Spieß and Johanna Storck

Education is not financed solely by the taxpayer—many institutions and activities require payment of top-up fees, at the very least. This applies for instance to education and care services for children. A household's private expenditure on education depends largely on the families' available financial resources. However, to date, very little research has been conducted on the relationship between income and expenditure on education. The present study by DIW Berlin is based on data from the Socio-Economic Panel (SOEP) study and the SOEP-related study, Families in Germany (Familien in Deutschland, FiD) for 2012. The present work analyzes private spending on various educational provisions such as child daycare services, private schools, or non-formal educational programs, i.e. sports clubs or music schools. The findings of the study indicate that, of the families who actually spend money on their children's education, it is the low-income households that use a higher share of their household budget for this purpose—this applies both to overall education expenditure and to spending on individual educational services. However, if we consider all family households in Germany, higher-income families spend more on education, both in absolute and relative terms. Furthermore, it also holds true that the younger the children, the higher the share of the household's income spent on education. More progressive fee scales could help reducing expenditure burdens of low-income families and support children to make full use of their educational potentials.

In Germany, a total of 176 billion euros was spent on education in 2011.[1] Approximately 80 percent of this was from public funding, i.e., from central, *Länder*, or local governments, and the remaining 20 percent came from private sources, i.e., individual households, companies, and private non-profit organizations. These private stakeholders contribute a particularly high share of funding for early childhood education, i.e., education and care services for children not yet in compulsory schooling (around 21 percent), and for vocational education (around 41 percent). In the school sector and in tertiary education (mainly universities), on the other hand, the share of private funding is considerably lower.[2]

Official statistics do not present a particularly detailed picture of private spending[3] on education. Consequently, very little specific information is available about the types of spending by households and the relationships between this expenditure and different household characteristics. The present study examines these relationships focusing on households with children.

Families' Education Spending Matters

For various reasons, spending on education by households with children is of particular interest. First, it is relevant from the perspective of the economics of education. This is because spending, along with time spent with children—which also has an impact on children's individual life courses—is one of the key resources that parents invest in the education of their offspring. Second, spending on education is interesting from a family budget perspective because it represents part of the costs of having children that must be covered by fami-

1 German Federal Ministry of Education and Research, Bildung und Forschung in Zahlen (Berlin: 2014).

2 Federal Statistical Office, ed., Bildungsausgaben. Budget für Bildung, Forschung und Wissenschaft 2011/12 (Wiesbaden: 2014).

3 The expressions spendings, expenditures and costs are used interchangeably.

lies' household income and competes with alternative consumer choices.[4]

Because financial resources and preferences differ across households, not all families use private educational services to the same extent. Regional differences regarding access to and availability of education as well as public funding also have an impact on consumer behavior and the level of spending. This includes regional differences concerning income-based fee scales or complete fee exemption for certain age groups.

The present study conducted by DIW Berlin examines private spending on education from a distributional perspective. The study focuses in particular on how spending on education and its share of household income (relative expenditure on education) as well as the proportion of families using fee-based educational provisions varies across income groups. As a result of differences in financial resources, it can be assumed that certain groups are less likely to be able to use educational provisions for which they have to pay for. Further, the level of expenditure among families with the same level of usage varies because of income-based fees.

Currently, there are very few systematic studies on the distribution of expenditure on education in relation to family income. Among the rare exceptions are the analyses by the Federal Statistical Office based on the German Sample Survey of Income and Expenditures (EVS), a survey conducted every five years. Data from this survey can be used to analyze families' overall and educational expenditures on children.[5]

However, the official German education reporting mainly capture private spending on formal educational provisions which, in the field of pre-primary education, includes expenditure on daycare services for pre-schoolers (*Kindergarten*) and pre-school classes, for example. Non-formal educational provisions (music, sport, and various artistic activities) as well as informal education (including spending on care providers, e. g. family daycare) are not taken into consideration. This may be because it is not always possible to clearly identify the educational nature of these provisions. If a broader definition of educational processes is applied, however, both informal and non-formal educational provisions are relevant as well.[6] Bearing this in mind, the present report is based on broad spending aggregates including formal, non-formal, and informal educational provisions—and consequently goes beyond expenditure captured in the education budget in the education financial report (*Bildungsfinanzbericht*)[7] or similar studies.

Categorization of Expenditure on Education

In order to analyze families' private monthly expenditure on education, two data sets are combined to provide a representative picture of families in Germany: the Socio-Economic Panel (SOEP) study[8] and the SOEP-related study Families in Germany (*FiD*).[9] Both data sets (in each case from 2012 surveys) capture spending on education for all children at the household level (see Box 1). The study includes all family households—single mothers and fathers and couple households—that have at least one child under the age of 16. The expenditure of these households on education is subdivided into six categories:

1) Expenditure on formal education and care services for children who are not yet in compulsory schooling. This is primarily made up of costs of attendance at child daycare facilities.
2) Expenditure on attendance at fee-paying schools, which essentially refers to private schools.[10]
3) Expenditure on informal educational services (such as an in-home daycare provider)
4) Expenditure on non-formal educational activities, such as music or sports.[11]
5) Expenditure on private tuition.
6) Total expenditure on education; this category is the sum of the first four expenditure categories.[12]

Categories (1) to (5) can only be differentiated for the households that participated in the "Families in Germany" survey (*FiD*) so the given values are based on a smaller number of cases than category (6).[13]

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4 Studies in this field examine investment in children over time. For a recent analysis on this subject see, for example, S. Kornrich and F. Furstenberg, "Investing in Children: Changes in Parental Spending on Children," Demography 50 (2013): 1-23.

5 See, for example, Federal Statistical Office, Konsumausgaben von Familien für Kinder (Wiesbaden: 2014).

6 On this see also Autorengruppe Bildungsberichterstattung, Bildung in Deutschland 2014 (Bielefeld: 2014).

7 Federal Statistical Office, ed., Bildungsfinanzbericht 2014 (Wiesbaden: 2014).

8 G. G. Wagner, J. R. Frick, and J. Schupp, "The German Socio-Economic Panel Study (SOEP); Scope, Evolution and Enhancements," Schmollers Jahrbuch 127 (2007): 139-169.

9 M. Schröder, R. Siegers, and C. K. Spieß, "Familien in Deutschland – FiD," Schmollers Jahrbuch, Jahrbuch of Applied Social Science Studies 133 (2013): 595-606.

10 In 2009, the share of school students attending a private school was approximately nine percent (Federal Statistical Office, "Bildung und Kultur: Private Schulen," 11 (1.1) (Wiesbaden: 2014)). This also corresponds with our data on the share of private school students. As well as the costs incurred for private school attendance, we can also assume that some parents included lunch money in the information they provided on costs incurred for attendance at publicly-funded schools. This can be inferred on the basis of other more in-depth analyses.

11 Here in particular, please refer to further explanations provided in Box 1.

12 Due to data particularities, total expenditure does not include costs incurred for private tuition.

13 All data are weighted.

Box 1

Capturing Data on Private Expenditure for Education in the SOEP and FiD

The representative longitudinal Socio-Economic Panel (SOEP) study and the SOEP-related sample Families in Germany (*FiD*) irregularly provide data on costs incurred for the use of educational provisions at the level of the household.[1] The present study uses recent SOEP and *FiD* data from the year 2012 that include detailed information on expenditure for education. The SOEP captures data on costs incurred by households for school and childcare services as well as their children's various extracurricular activities. For each household, the SOEP records the sum of all the costs. The *FiD* sample, however, presents a more detailed picture: first, it enables us to distinguish costs incurred by households for a child's attendance at a daycare center for infants and toddlers (*Kinderkrippe*) or for pre-schools (*Kindergarten*), at a day care centers for children of all ages (*Kindertageseinrichtung*), or at an after-school program (*Hort*). Second, it is also possible to determine the cost of a child being cared for by someone else in the household such as family day care. Third, the sample captures whether or not fees are paid for a child's schooling and if so, the monthly costs incurred. Fourth, costs of a child's extracurricular activities are calculated - information is collected on exactly the same activities as in the SOEP. For children not yet in compulsory schooling, these comprise costs for children's sport activities, early childhood music programs, or parent-child groups.[2] For children already attending school, this includes possible costs for sports, music, and singing lessons or participation in environmental groups.[3] The *FiD* sample also captures data on the costs of extra tuition incurred over the six months preceding the date of the survey.

1 Both data sets also capture the household's consumer expenditure in various fields in the last year. Both surveys ask how much the household spent on "education/further training." This information was captured in the SOEP for the first–and to date only–time in 2010. See M. M. Grabka, J. Marcus, and R. Siegers, "Preparation of Data from the New SOEP Consumption Module: Editing, Imputation, and Smoothing," *DIW Data Documentation* 70 (2013). The *FiD* survey captures this information annually.

2 For an analysis of participation in these activities see, for example, P.S. Schober and C.K. Spiess (2013): Early Childhood Education Activities and Care Arrangements of Disadvantaged Children in Germany, in: *Child Indicators Research* (6, 709–735).

3 For school children, the activities category also includes participation in after-school clubs which are generally free of charge, however.

The detailed analysis only takes into account families that are reasonably likely to incur the private education expenditure under consideration. Consequently, child daycare expenditure only refers to households with at least one child not yet in compulsory education and school-related expenditure only refers to households with at least one child in compulsory schooling. For the analysis of categories (3), (4), and (6), however, all households with children under the age of 16 are relevant because expenditure in these categories could be incurred by children in any age group. Spending on education is depicted along the distribution of needs-weighted net monthly household income of the families (see Box 2). The needs weighting is carried out by taking into account the differences in income needs of different household types.

Spending on Early Education and Care Services Most Relevant

The calculations show that each family in Germany with children under the age of 16 spends an average of around 93 euros per month on education (see Table 1). However, since expenditures on education is zero for almost a quarter (23 percent) of the families, average expenditures of families who do invest money in the education of their children are markedly higher, around 120 euros. Further calculations show that families spend most on formal early education and care services: expenditure on such services accounts for almost 60 percent of total spending. Averaged across all family households, 27 percent of total spending goes toward non-formal educational provisions, i.e., leisure activities, and seven percent on fee-paying schooling and seven percent on informal education and care.

Significant Differences between Income Groups and by Number of Children

The absolute expenditure on education varies considerably between income groups, ranging from less than 50 euros per month in the lowest income quantiles to over 200 euros in the upper quantiles (see Figure 1). This systematic increase in expenditure on education is also evident for each individual expenditure category and family type. The share of families that actually incur expenditure on education also increases with income: in the lowest quantiles, approximately half of all families invest private money in their children's education whereas in the upper quantiles, the corresponding figure is 90 percent. This does not necessarily mean,

Box 2

Methodological Approach to Analyzing Expenditure on Education by Household Income

The focus of the present study is to show the relationship between absolute and relative private expenditure on education and the needs-adjusted net monthly household income of family households. The incomes of different household types are made comparable using the Organization for Economic Co-operation and Development (OECD) equivalence scale. According to the OECD modified equivalence scale, for example, a couple with one child needs 1.8 times the income of a single-person household to secure the same material standard of living for both.[1] For the present report, in order to present the distribution of expenditure on education, all households with children were sorted in ascending order of their needs-adjusted net income and divided into 20 segments (quantiles). The analyses take into account the expenditure of families along these income quantiles, and the results are illustrated by means of graphs.

The following values were determined for each quantile and graphically presented: (a) the absolute amount spent on education in euros per month; (b) spending relative to net household income, irrespective of whether the families actually incur costs for education or not; (c) the share of families actually incurring costs on education, and (d) spending relative to the net household income for families with expenditure in the relevant category.[2] The graphical analysis is restricted to education categories that can be frequently observed.

In addition to the graphical representation, the correlation between expenditure on education and the number of children is examined using a multivariate analysis. The objective of these analyses is to examine the relationship between relative spending and various household characteristics.[3]

1 In order to now make the household income comparable across the different types of households, it is divided by a household-specific equivalent scale, in our case, the modified OECD scale. This ratio is referred to as needs-adjusted income. For more on the concept of needs-weighted or equivalence-weighted income, see C. Schröder and T. Bönke, "Country inequality rankings and conversion schemes," *Economics – The Open-Access, Open-Assessment E-Journal*, vol. 6 (Kiel Institute for the World Economy, 2012): 1-43 and http://www.diw.de/de/diw_01.c.411605.de/presse/diw_glossar/aequivalenzeinkommen.html.

2 The average shares of costs in the individual quantiles are calculated as the average across the household-specific shares of costs.

3 Tobit and OLS models are estimated. For an explanation of the methods used, see W. Greene, *Econometric Analysis*, 7th ed. (Prentice Hall, 2008).

however, that low-income families use educational provisions less frequently: particularly in the field of child daycare, families on low incomes either pay lower fees or are completely exempted.[14] Moreover, some German *Länder* grant payment exemptions for entire years, particularly in the years prior to a child starting school. Around 18 percent of families with children attending a child daycare facility analyzed in the present study reported they had incurred no expenditure for use of the said services.[15] In other areas, however, the relationship between take-up and costs incurred is more direct, although establishments such as publicly-funded music schools also take social aspects into account.[16]

The relative level of expenditure also increases with income, provided that all families are considered. The picture is different if only families who spend on education are taken into account: then relative spending is higher in the lower income groups.[17] While the share of expenditure on education in the lower income bracket is over 4.4 percent, this drops to around 3.4 percent in the upper income groups. A corresponding correlation is evident for all types of expenditure.

One important group for distribution analysis is "income-poor" families.[18] These have the most limited financial resources available to invest in education. In fact, 44 percent of this group do not spend on education at all (non-poor families: 18 percent). Overall, they also spend

14 On this, see, for example, C. K. Spiess, E. M. Berger, and O. Groh- Samberg, "Overcoming disparities and expanding access to early childhood services in Germany: Policy Considerations and Funding Options," UNICEF Innocenti Research Centre Working Paper, IWP-2008-03, (Florence, 2008).

15 This could be connected with the income-related fee scale or the fee-exempt years provided in some federal states. Since spring 2012, at the very least the preschool year in child daycare facilities is exempt from fees in Berlin, Hamburg, Hesse, Lower Saxony, North Rhine-Westphalia, and Rhineland-Palatinate. See http://www.laendermonitor.de/fileadmin/contents/indikatoren/datenblaetter_2013/tab.37_lr13.jpg (last updated in February 2015).

16 See, for example, http://www.musikschulen.de/medien/doks/vdm/richtlinien-des-vdm-2011_logo.pdf (last updated in February 2015).

17 There is a simple explanation for these apparently contradictory patterns: if all households are considered, the relative expenditure in the lower quantiles is so low because only a below-average share of these households spends money on education. Conversely, if only households actually incurring expenditure on education are taken into account, this correlation does not exist.

18 A household is considered to be income-poor if its equivalence-weighted income is less than 60 percent of median income. On this, see C. Schröder and T. Bönke, "Country inequality rankings and conversion schemes," Economics – The Open-Access, Open-Assessment E-Journal, vol. 6 (Kiel Institute for the World Economy, 2012): 1-43.

Table 1

Families' Monthly Expenditures on Formal, Non-Formal, and Informal Education 2012
In Euro

	All families		Families with expenditures			N
	Mean	Standard deviation	Share in percent	Mean	Standard deviation	
Expenditures on educational services—All families						
All	92.83	142.14	77.19	120.26	151.24	5 884
1 child	66.35	104.63	70.96	93.50	113.53	2 404
2 children	119.67	165.89	84.74	141.23	171.56	2 187
3 and more children	146.59	193.74	84.43	173.61	199.41	1 293
Expenditures on early formal education and care (daycare services)—Families with at least one child of daycare age[1]						
All	101.21	126.50	70.12	144.34	128.83	2 072
1 child below school age	84.83	102.57	66.53	127.50	101.84	1 242
2 children below school age	131.13	152.19	76.71	170.96	152.94	703
3 and more children below school age	132.92	196.60	76.73	173.22	208.45	127
Expenditures for private (fee-paying) schools—Families with at least one school-aged child						
All	12.03	49.26	12.85	93.66	106.13	2 599
1 school-aged child	9.97	38.12	11.67	85.48	77.68	1 344
2 school-aged children	11.92	58.40	12.82	92.99	138.52	865
3 and more school-aged children	25.58	71.81	20.49	124.84	113.41	390
Expenditures on informal education—All families						
All	7.19	50.25	3.98	180.39	179.74	3 671
1 child	4.72	41.29	3.35	140.93	179.98	1 197
2 children	8.45	51.00	4.59	184.24	157.16	1 364
3 and more children	9.82	65.84	3.89	252.28	225.86	1 110
Expenditures on non-formal education / leisure-time activities—All families						
All	28.98	60.30	56.65	51.15	72.70	3 671
1 child	16.53	42.94	44.26	37.34	58.24	1 197
2 children	29.54	52.31	62.77	47.07	59.47	1 364
3+ children	58.40	96.77	70.45	82.90	106.14	1 110
Expenditures on tutoring—Families with at least one school-aged child						
All	7.31	26.53	12.71	57.53	51.53	2 599
1 school-aged child	5.52	21.56	10.45	52.85	44.27	1 344
2 school-aged children	9.64	32.73	15.41	62.58	60.53	865
3 more school-aged children	10.94	30.88	18.14	60.32	47.94	390

1 Only families that have no child in a "Hort", a form of after-school daycare , since Hort expenditures cannot be separated from day care expenditures in the dataset.
Source: Total expenditures on education based on FiD 4.0 and SOEP v29, wave 2012; the individual expenditure categories are based on FiD v4.0, wave 2012

On average, families spend almost 93 euros per month on their children's education.

considerably less (37 euros on average) on educational provisions than non-poor family households (107 euros).

Another group of families that is of interest for distribution analysis is those with several children. In this group, expenditure on education in the lower quantiles is almost independent of the number of children, while in the upper quantiles it increases considerably with a higher number of children (see Figure 2). This finding may be explained by both income-dependent fees and different incidences of use.

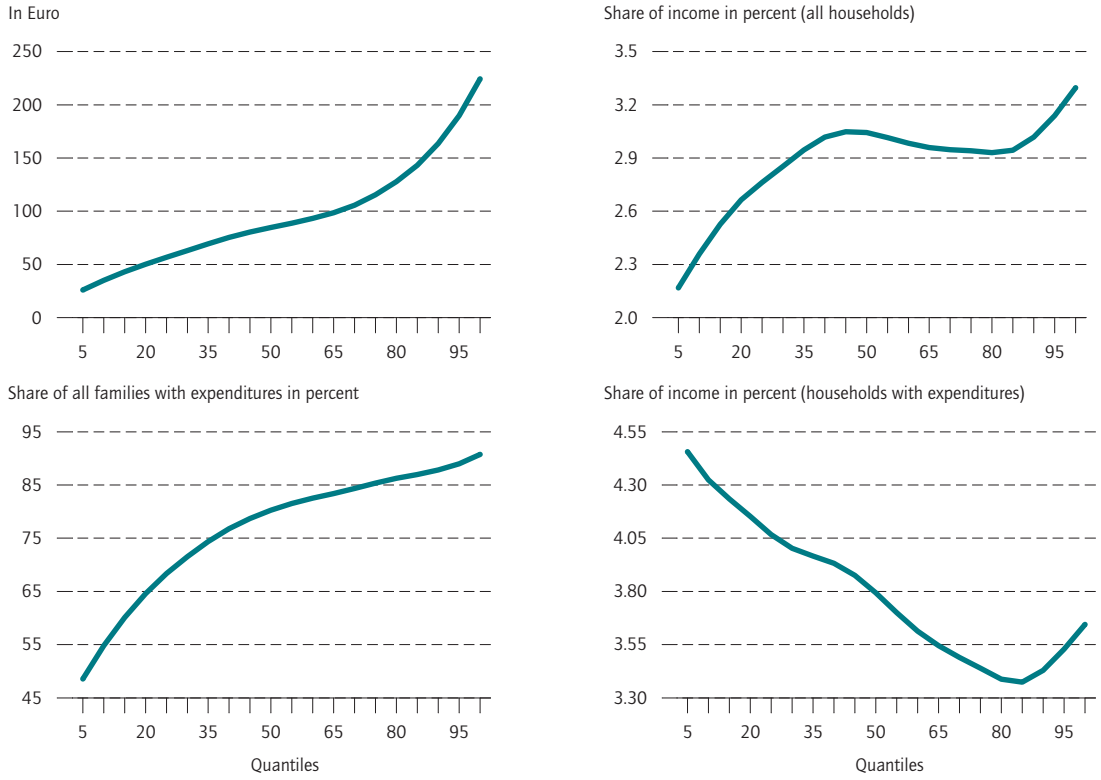
Along with income and number of children, the parents' highest educational qualification is an important determinant of expenditure on education. Families in the upper income groups in particular spend more on education if at least one parent has a university degree (see Figure 3). The impact of parental educational attainment on child-related educational expenditures can also be observed in the lower income groups, albeit to a lesser extent. The relationship is strongest for families with at least three children.

Costly Early Education and Care Services: Low-income Families Spend Relatively More

Families that actually use early education and care services spend an average of 119 euros a month on this service (see Table 2). This group also includes families

Figure 1

Families' Total Monthly Education Expenditures 2012



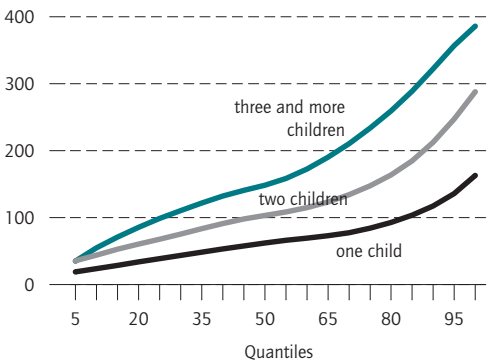
Source: FiD 4.0 and SOEP v29, wave 2012. Calculations by DIW Berlin.

Lower-income families with expenditures spend more of their income on education than higher-income families who have expenditures.

Figure 2

Families' Monthly Education Expenditures by Number of Children 2012

In Euro



Source: FiD 4.0 and SOEP v29, wave 2012. Calculations by DIW Berlin.

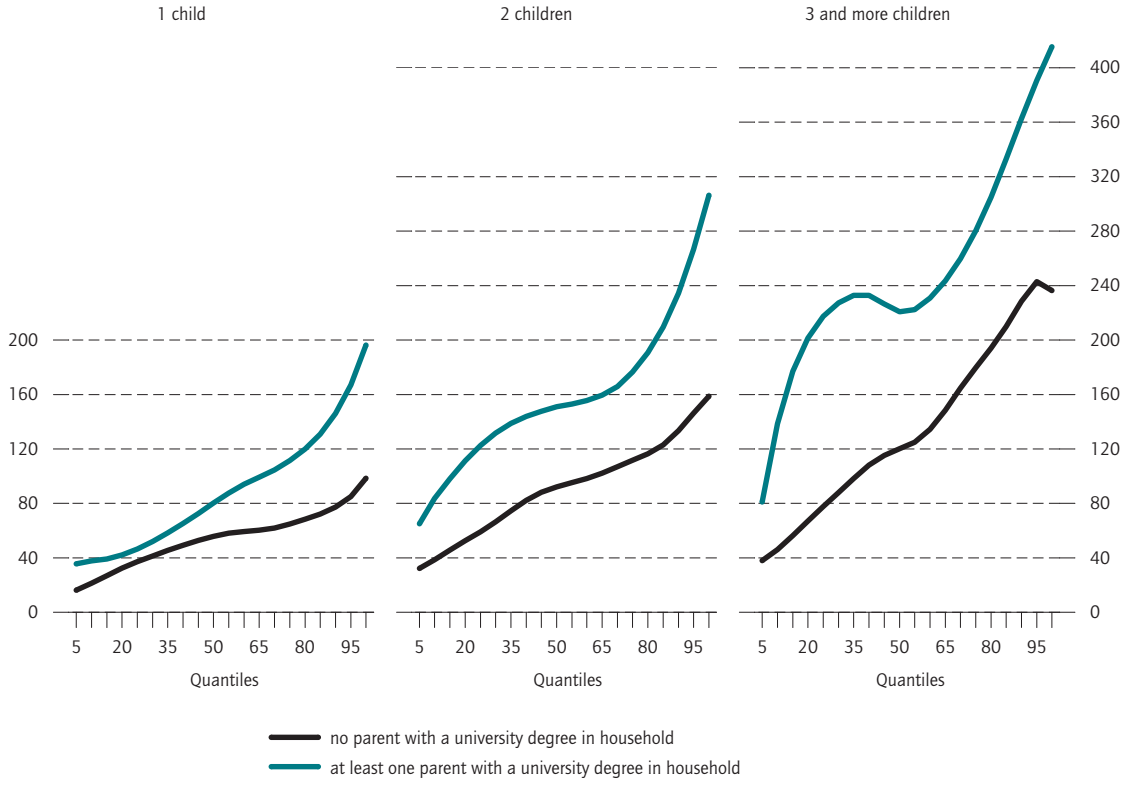
The higher a family's income and the higher the number of children, the more they spend on education.

who are exempt from paying fees for such services although their children attend such an establishment. If only families spending money on early education and care services are considered, average monthly expenditure amounts to 144 euros.

In the lowest income bracket, almost 50 percent of families incur no costs for early education and care services, either because they do not use such services or because they are exempt from paying any fees. The corresponding figure for the upper income bracket is approximately ten percent of households (see Figure 4). Remarkable is the relative income share of families who incur costs for early education and care services: The lower income bracket incurs the highest relative expenditure, spending is lower (but relatively flat) across the different mid-range income groups, while spending among the ten percent of families with the highest incomes is much lower.

Figure 3

Families' Monthly Education Expenditures by Number of Children and Parental Education 2012
In Euro



Source: FiD 4.0 and SOEP v29, wave 2012. Calculations by DIW Berlin.

Even at the same income levels, university-educated parents spend more on their children's education than non-university-educated parents.

Table 2

Families' Monthly Expenditures on Early Formal Education and Care (Daycare)[1] 2012
In Euro

	All families using daycare		Families using daycare services, with expenditures			N
	Mean	Standard deviation	Share in Percent	Mean	Standard deviation	
All	119.13	129.23	82.54	144.34	128.83	1 725
1 child in daycare	101.70	99.57	81.68	124.51	96.42	1 304
2 children in daycare	195.32	186.26	86.50	225.79	182.27	386
3 and more children in daycare[2]	*221.62*	*382.84*	*83.23*	*266.28*	*405.80*	*35*

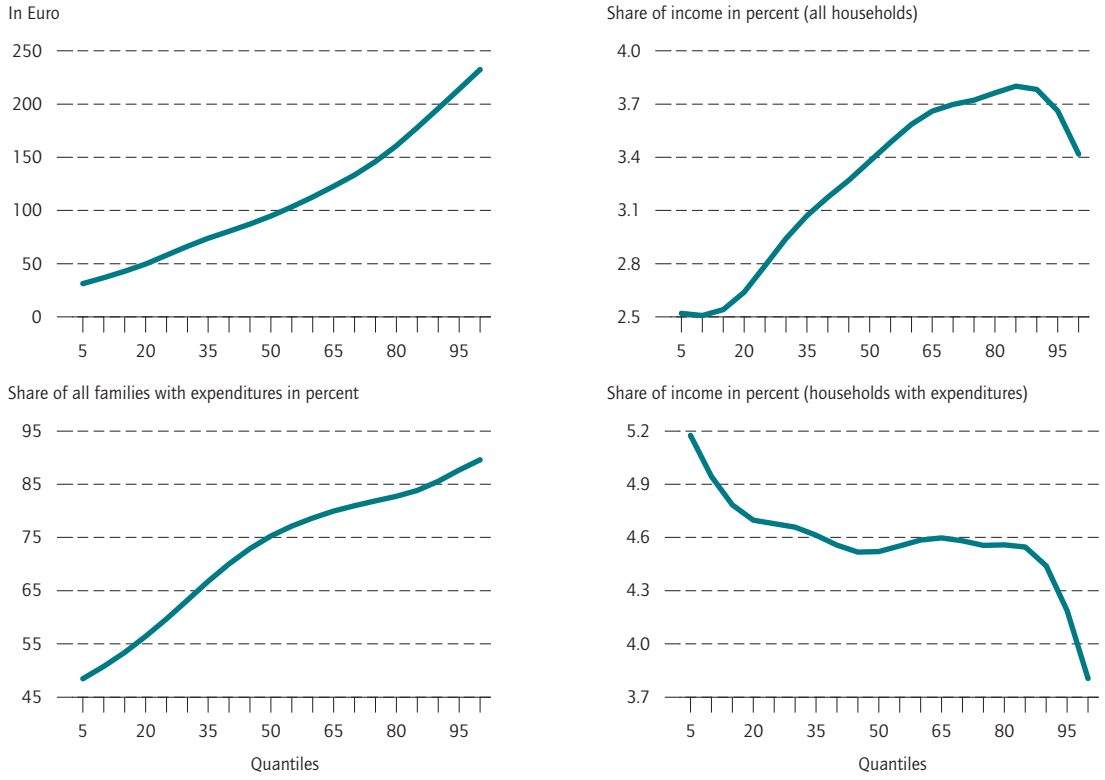
1 Only families using daycare.
2 Because of the low number of cases, the results for three and more children in daycare should be interpreted with caution.

Source: FiD 4.0, wave 2012.

Around 18 percent of families with children in daycare do not have to pay anything for these services.

Figure 4

Monthly Expenditures on Early Formal Education and Childcare (Daycare) by Families with at Least One Child below School Age 2012[1]



1 Only families that have no child in a "Hort", a form of after-school daycare , since Hort expenditures cannot be separated from daycare expenditures in the dataset.

Quellen: FiD 4.0., Welle 2012; Berechnungen des DIW Berlin.

With increasing household income, the share of families that spend money on early formal education and care and the size of their expenditures increase.

Higher-Income Families More Likely to Pay for Children's Schooling

Just less than 13 percent of families with school-age children spend money on schooling (see Table 1). The share of families incurring expenditure on this is considerably higher in the upper income groups than in the lower ones: in the latter category, only around five percent of families indicate spending here, while the corresponding figure for the upper income bracket is around 25 percent.

Only four percent of families incur expenditure on informal education and care services, although they spend as much as 180 euros a month on average. The share of families who spend here increases with the level of income and amounts to almost 15 percent for the top income groups. Spending relative to income, however, decreases with income (no table).[19]

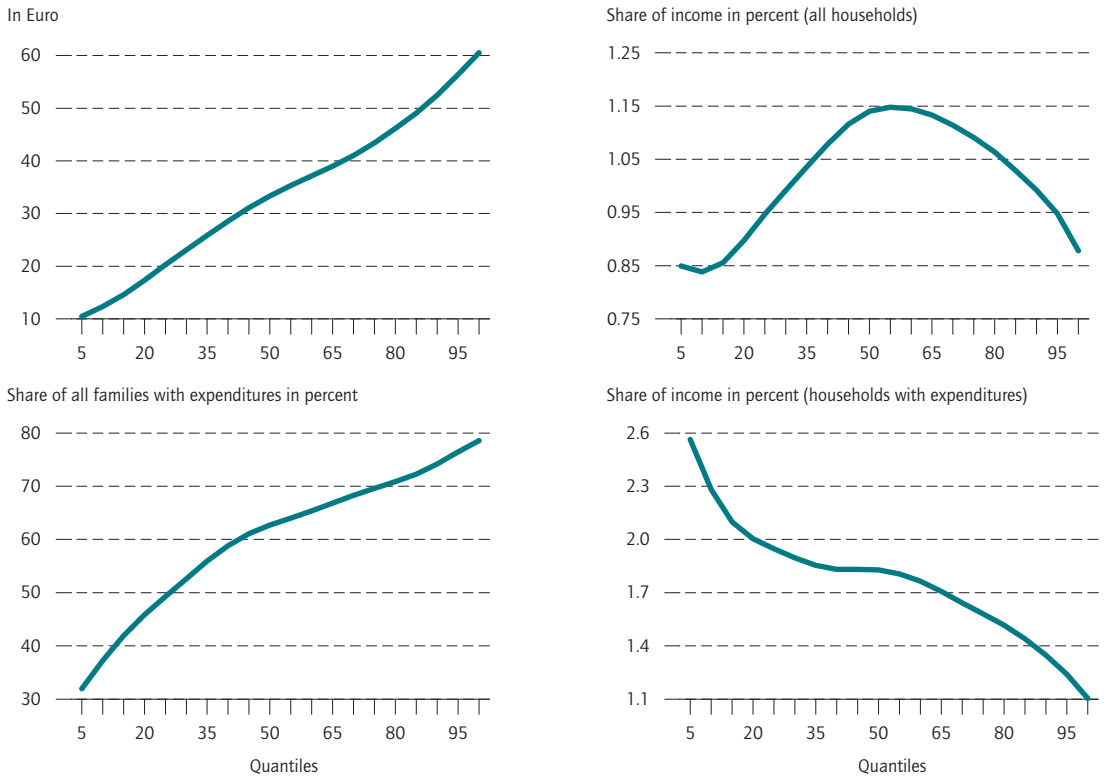
Around Half of Families Spend on Extra-Curricular Activities

Families who do in fact report expenditures for the use of non-formal educational activities outside of child daycare facilities and schools spend an average under 51 euros a month. For families with only one child, the corresponding figure is around 37 euros, although 44 percent of families with one child spend nothing at all in this area. The share of those who have such expenditures increas-

19 Lower income quantiles spend an average of around nine percent of their income on this, while the corresponding figure for the upper income groups is between four and five percent.

Figure 5

Families' Monthly Expenditures on Non-Formal Education / Leisure Activities 2012



Source: FiD 4.0., wave 2012. Calculations by DIW Berlin

Higher-income families spend up to six times more on leisure activities than lower-income families.

es with income: from just under 30 percent in the bottom income groups to 80 percent in the top ones (see Figure 5). However, for these families, expenditure relative to income falls across the quantiles (from 2.5 to one percent).

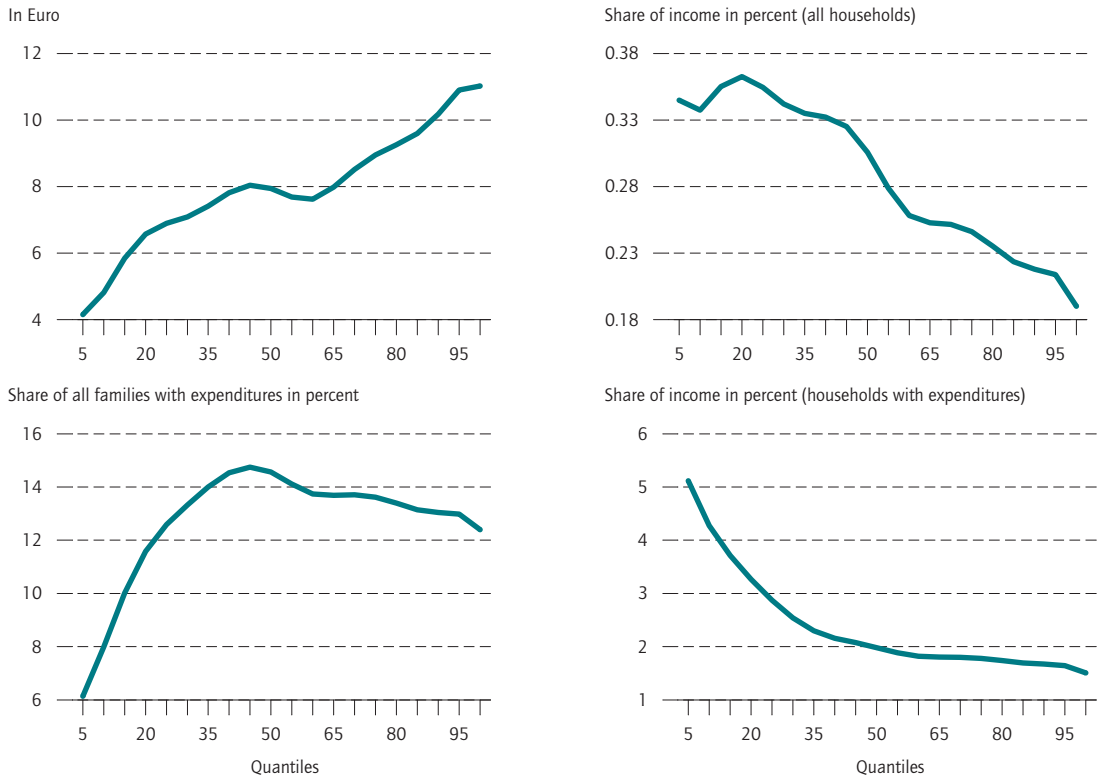
If families pay for private tuition for their school-age children, this amounts to a monthly average of around 57 euros per month. The share of those having the respective expenditures increases in the mid-range income groups. If private tuition is paid for, families with low incomes spend more on these services relative to their income (see Figure 6).

Families with Young Children Spend Most on Education

Multivariate analyses which take into account the influence of other characteristics which influence education expenditures confirm that the expenditure share for education falls with income for families who actually spend money on their children's education (see Table 3, Model 2). This also applies when the number and age of children or other household characteristics are included in the analysis. If, however, all families are considered (including those with zero expenditures), the relative expenditure on education increases with income (see Table 3, Model 1). Thus our results from the graphical analysis still hold true after controlling for other factors. Both models also show that compared to families whose youngest child is of secondary school age, families with younger children spend a higher share of their income on education. This applies in particular to families whose youngest child is eligible to use early education and care services. The share of income spent increases with the number of children. In relative terms, single-parent families spend a larger share of their income on education than couple families. This also applies to families where parents living in the household are in full-time employment. For both family types, this

Figure 6

Monthly Expenditures on Tutoring by Families with at Least One School-Aged Child 2012



Source: FiD 4.0., wave 2012. Calculations by DIW Berlin

The higher a family's income, the lower the share of income spent on tutoring.

may also be explained by the fact that they are more reliant on external education and care services.

Families with at least one parent being an academic also spend more on education. This suggests that children who are privileged in any case due to their parents' higher level of education, are also more likely to be able to benefit from higher expenditure on education than children from more educationally disadvantaged parental homes—and this still applies to children from families with the same income and where the parents exhibit the same employment behavior. However, it should be taken into account that certain groups do not have to pay for using educational provisions. This still applies in particular in the context of early education and care services.

Conclusion

Families pay considerable amounts for their children's education. This is all the more true if the concept of education is broadly defined and in addition to spending on formal educational provisions such as early education and care services and fee-paying schools, expenditure on informal and non-formal provisions such as in-home daycare providers or sports clubs and music lessons is also included. However, even with a broad understanding of expenditure on education, on average, across all households, spending on early education and care services accounts by far the highest share of all educational expenditure. This clearly reflects the fact that families expend considerable sums on education in a phase when they frequently have a lower income due to one parent's ability to work being limited.

If a wide definition of the concept of education is used, family households in Germany spend on average up to 3.5 percent of their monthly income on their children's education. The higher the income, the higher is this share. There are two possible causes for the relatively lower share of expenditure incurred by families with lower incomes: either they use the educational provi-

sions less or they have to pay less or nothing at all for using them due to income-based fees. Indeed, relevant studies on the use of early education and care services confirm that families with very low incomes are generally less likely to use such services.[20]

Provided that families in the lower income groups do spend money on education, however, their relative expenditure is higher than for families with more money at their disposal. This applies to expenditure for virtually all educational provisions examined in the present analysis, and to the costs for early education and care services. Although households in the lower income bracket mostly pay income-based fees, the relative spending of households paying for such daycare services in this bracket is higher than in the upper income groups.

Another finding concerns unequal educational opportunities: families whose children inherently have better educational opportunities because at least one parent has an academic qualification, for instance, also spend more on education in relative terms.

A substantial share of expenditure on education is spent on non-formal educational provisions: there is a considerable difference in expenditure of over 50 euros between families with high and low incomes. Provided that they do have expenditure in this area, low-income families also spend more in relative terms.

In conclusion, the level of private expenditure on education varies quite considerably with family income: those with a high income are more likely to spend money on education and also tend to spend more. These patterns might offer an explanation for the often debated differences in educational success of children from different parental income groups and educational backgrounds.

Table 3

Relationship between Expenditures on Education Relative to Household Income and Household Characteristics

	Model 1	Model 2
	All families	Families with expenditures
	Marginal effects[1]	Coefficients[2]
Household income	1.36***	−1.27***
Household income ^ 2	−0.50***	0.20*
Household income ^ 3	0.07***	−0.02
Youngest child below school age	2.79***	2.39***
Youngest child of primary school age	1.53***	0.81***
Reference: Youngest child of secondary school age		
Number of children in the household	0.52***	0.44***
Lone-parent household	0.86***	1.00***
Reference: Couple household		
Both parents work full-time	0.53***	0.50***
Reference: Only one or no parent works full-time		
At least one parent with university degree	2.03***	1.67***
Reference: No parent with university degree		
Living in East Germany	0.38**	0.31**
Reference: Living in West Germany		
Constant	−1.99***	2.21***
Log likelihood	−14 922 926	
N	5 915	4 638

1 Marginal effects from a censored regression model (Tobit).
2 Coefficients from a linear regression model (OLS).
*Significance level: * p < 0,1; ** p < 0,05; *** p < 0,01.*

Source: FiD 4.0 and SOEP v29, wave 2012.

Multivariate analyses confirm that low-income households with expenditures spend more of their income on education than higher-income households.

For an education policy aiming to develop the educational potential of all children, this is an important result. In particular, a more progressive scaling of fees for early education and care services and contributions for publicly-funded sports clubs or music schools might be a useful further step for education policy in order to alleviate the burden of expenditure on education for households with lower incomes.

20 See P. Schober and C. K. Spiess, "Early Childhood Education Activities and Care Arrangements of Disadvantaged Children in Germany," Child Indicators Research 6 (2013): 709-735 or P. Schober and J. Stahl, "Childcare Trends in Germany—Increasing Socio-Economic Disparities in East and West," DIW Economic Bulletin, no. 11 (2014): 51-58.

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