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Impressum

Content

Abstract

While contemporary studies of relative deprivation typically compare adults, households, or regions, we compare children according to whether and to what extent they are deprived. We use the data from the German family survey "Growing up in Germany (in short: AID:A)" 2019. In contrast to the counting approach usually applied to compare deprived and non-deprived social entities, we classify the children into different types of relative deprivation using a Ward cluster analysis. We then use multinomial logistic regression models to estimate each child's probability of being assigned to each type, using predictors related to the children, their household, and the region in which they live. Our results indicate the prevalence of relative deprivation of children covaries with economic resources available to the children's households. Resource inequalities partially mediate differences in deprivation risks by family type and migration background. Further, we find only marginal differences between children within the same household.

Keywords

Deprivation, Parental Differential Treatment, Resource Dilution, Migration, Step Families, Health, Germany, AID:A

JEL Classification

D10 I32 J13

1   Introduction

The child poverty issue poses a serious and widespread challenge within the European Union. According to the EU statistics on income and living conditions in Europe for the year 2022, 14.8% of children and adolescents under 18 years old, and 14.0% of children under 6 years old in Germany were at risk of income poverty (Eurostat, 2023a). However, income poverty is just one dimension of poverty, inadequately capturing all aspects of children's living standards and well-being. As an indirect indicator of poverty measurement, it directs attention toward the means required to alleviate conditions of deprivation. Deprivation may manifest not only in material but also in social and cultural dimensions; children may suffer from social deprivation when lacking access to social networks and activities providing support and belonging. Similarly, cultural deprivation may occur when children lack access to cultural resources and practices that impart education and identity. Consequently, a direct measurement of poverty necessitates focusing on all goods, services, and social activities essential for a decent life. To gauge material and social deprivation in children and adolescents, the European Union, building upon Townsend (1979), has developed various indicators, such as the ability to afford a meal with meat or fish, or the opportunity to invite friends to their home.

Existing research on material and social deprivation has predominantly focused on measuring and explaining the frequency and extent of deprivation. Less attention has been given to exploring the diversity and heterogeneity of experiences among deprived individuals. It is crucial to recognize that not all individuals undergo the same deprivation experiences, possessing diverse needs and resources. Furthermore, prior studies have typically concentrated on comparing the life situations of adults, households, or regions, often utilizing the EU-SILC dataset (Blatná, 2017; Israel & Spannagel, 2019; Kis & Gábos, 2016; Łuczak & Kalinowski, 2020; Šoltés & Ulman, 2015; Whelan & Maître, 2012). However, there is a scarcity of investigations into the deprivation of minors, except for the work by Chzhen et al. (2014).

Hence, the objective of this study is to analyze children's deprivation in Europe from a multidimensional perspective. Based on theory and empirical evidence factors are identified that increase the risk for children to experience deprivation. The study then compares information on children based on parental reports of material, social, and cultural constraints in the German family survey AID:A. Employing cluster analysis, the study identifies groups of children with similar experiences. Subsequently, these groups are compared through multinomial regression analysis on three levels (individual, household, and regional level) to determine factors influencing membership in a particular group. The study contributes to a better understanding of the multidimensional poverty of children and provides crucial insights for shaping policy measures to combat poverty.

2 Theory and empirical evidence on child deprivation

Poverty is a construct that can be conceived and measured in various ways. Concerning theoretical concepts, a distinction must be made, first, between objective and subjective poverty, and, second, within objective poverty, a further differentiation between absolute and relative poverty is warranted. Regarding the measurement of poverty, a dichotomy arises between direct and indirect poverty measurement, allowing both absolute and relative poverty to be measured either directly or indirectly.

This article focuses on objective poverty, as we aim to scrutinize the actual limitations in the daily lives of children due to financial constraints rather than their subjective evaluations. Additionally, our emphasis is on the concept of relative poverty, which we measure directly through so-called deprivation indicators.

Objective poverty refers to the actual situation of an individual: the failure to satisfy basic needs, extending to the threat of physical existence. When this lack of participation is compared to a specific standard or norm prevailing in the society where the person lives (sociocultural subsistence level), it is termed relative poverty, a more significant variant for developed countries. The Council of the European Communities defines it as "persons, families and groups of persons whose resources (material, cultural and social) are so limited as to exclude them from the minimum acceptable way of life in the Member States in which they live" (85/8/EEC, Art. 1 Para. 2, Council of the European Communities, 1985). Relative poverty is thus contingent on the social context and prevailing values and norms (Council of the European Communities, 1985; Townsend, 1979). Deprivation indicators serve as a starting point for direct poverty measurement. Instead of indirectly inferring deficiencies through insufficient monetary resources (income poverty), these indicators directly address the material, social, and cultural deficiencies by inquiring about the goods, services, and social activities that the family in which the child lives can (or cannot) afford. The deprivation is relative because the list of goods, services, and activities used reflects the standard necessary in Germany to lead a decent life ("enforced lack of necessary and desirable items to lead an adequate life": Eurostat, 2023b). Townsend (1979) has also established a connection between deprivation items and income poverty by defining the poverty threshold as the income at which the number of deprivations sharply increases.

2.1 Resource poverty as a driver of deprivation

Gordon et al. (2017) analyzed the development of material deprivation between 2013 and 2014 in 14 European countries, revealing a decline in deprivation in most examined nations. Notably, they observed reductions in the deprivation related to furniture replacement, clothing, and children's pocket money availability. However, constraints in leisure activities and socializing with friends remained stable in many

countries and increased in some. The authors also demonstrated a significant correlation between material deprivation and respondents' household income. They posit that respondents claiming to forego items due to non-financial reasons may still exhibit adjusted consumption patterns: "[P]oor people may report that they do not want things, simply because they cannot afford them and have got 'used' to living without them" (p. 26). Chzhen et al. (2014) measured multidimensional child poverty in 31 European countries in 2014, revealing that material deprivation is just one of several dimensions of poverty, encompassing health, education, housing, and social participation. While their results showed a positive association between multidimensional child poverty and relative income poverty of households, they emphasized that deprivation and income poverty do not entirely overlap. Social participation, for instance, depends on sufficient social networks, and children from economically vulnerable households are less likely to attend daycare, affecting their interactions with peers (Schmitz et al., 2023, also applicable to children with non-German family language, see Hypothesis 4). Lanau (2023a) demonstrated that deprived children often reside with deprived parents in households characterized by low income. The study also highlights that parents typically prioritize the needs of their children over their own. Prein and Quellenberg (2021) corroborate these findings for the German context using survey data from the family survey AID:A. It can be summarized that insufficient or limited wealth, operationalized as both, income and assets, increases the risk of deprivation for three reasons: firstly, lacking income leads to material deprivation (color television, washing machine, telephone, private car). Secondly, insecure or fluctuating incomes cannot be cushioned without sufficient assets. Thirdly, income from assets is eliminated as an additional source of income. We, thus, assume:

Hypothesis 1   Children living in households with (a) low net household income and (b) low household assets have a higher risk of experiencing deprivation.

As Bourdieu (1984) emphasized, individuals derive agency and decision-making capabilities not only from economic capital but also from cultural and social capital. Bourdieu, particularly in the context of reconversion strategies, argues that the three mentioned forms of capital are transformable into one another. For instance, economic capital can be utilized to acquire knowledge and skills through educational offerings, thereby incorporating them as cultural capital, and obtaining educational certificates as institutionalized cultural capital. We adopt this notion by anticipating that cultural and social capital can function as alternative resources to economic capital in averting deprivation. Cultural capital, on the one hand, might prove useful in deploying existing economic capital more efficiently for meeting needs (Becker, 1993). On the other hand, social capital can be employed to access the economic capital of others for personal needs (Coleman, 1988) or acquire information more readily (Granovetter, 1973), facilitating the cost-effective satisfaction of individual needs.

Dudek and Szczesny (2021), in their investigation of Polish families between 2015 and 2017, identified significant differences in the educational levels of surveyed families, explaining variations in household material deprivation independently of household labor market integration. Lanau (2023b), through cross-sectional anal-

yses, demonstrates that the deprivation risk for children decreases with the increasing educational attainment of their parents (also supported by studies on adult deprivation: Saltkjel, 2018; Šoltés & Ulman, 2015; Whelan & Maître, 2012). Furthermore, the results of Lanau's study indicate that cohabitation with grandparents can reduce the deprivation risk for children, while larger households are simultaneously more prone to deprivation. Consequently, we posit that a supportive social network comprising friends, acquaintances, neighbors, and relatives can mitigate the risk of deprivation.

Hypothesis 2   Children living in households with (a) low cultural and (b) low social resources have a higher risk of experiencing deprivation.

Additionally, the existing research literature points to specific disadvantages faced by particular family constellations. Heintz-Martin and Langmeyer (2020) find that stepfamilies and single-parent families in Germany have a higher risk of poverty than nuclear families. Parents in these family forms also subjectively perceive themselves as more deprived. Kreyenfeld and Martin (2011) compare European countries using data from the Generations and Gender Survey, revealing that stepfamilies in France and West Germany more frequently encounter financial difficulties than nuclear families. In Russia and East Germany, there are minimal differences between nuclear and stepfamilies; however, families with single parents report the greatest financial challenges in all four studied countries. In some of these countries, a significant share, even the entire variance, can be attributed to family size, education, and employment integration. Stepfamilies tend to be larger than nuclear families, and parents in step- and single-parent families are often less educated or more frequently unemployed. In Germany, even after controlling for these covariates, the effect of family form persists. Neuberger et al. (2019), analyze income differences between single mothers without a partner in the household and married mothers living with their husbands in one household based on data from the German Socioeconomic Panel 1997-2015 and find that income inequality between the two groups further increased over the years. This is attributed to the improving educational resources and increased labor market activity of married mothers, while single mothers increasingly relied on social benefits. These findings suggest that the higher deprivation risk for children in step- and single-parent families is largely due to group composition effects. When focusing on the children themselves, existing findings indicate additional heterogeneities. Lanau (2023b) examined inequality within households in remarried couple households in European countries in 2014, finding that children in these households have a higher risk of deprivation than children in other household types. The findings of Lopoo and DeLeire (2014) suggest that the remarriage of the mother serves as a protective factor for children, providing them with more economic resources compared to children whose mothers were never married or did not remarry after separation. Ribar (2004) notes the surprising economic disadvantage of stepfamilies compared to nuclear families, considering that married stepfamilies should theoretically enjoy similar advantages – more resources, higher household productivity, etc. Explanations may lie in the greater instability of stepfamilies, selection mechanisms, parental underinvestment in the child's well-being due to lower parental cooperation (Ribar, 2004; Weiss & Willis, 1985), and the aforementioned composition effects. At the children's level,

deprivation might also be associated with lower parental investment in step- compared to biological children. Considering deprivation on an individual child basis within a family appears to be a fruitful approach, and we thus pursue the following hypothesis:

Hypothesis 3   Children living in (a) single parent or (b) reconstituted family/step-family have a higher risk of experiencing deprivation.

A familial migration background can pose an additional risk factor for child deprivation. Risks stem, firstly, from parental human and social capital influencing the labor market resources of parents and, consequently, the material situation of the family. Secondly, children's social participation can be compromised not only by a lack of financial resources but also by the absence of friends. The deficient social integration of parents negatively influences the social integration of children. Components of parental human capital include their formal qualifications and work experience. Migrants' labor force participation tends to be lower on average due to language-related barriers (Bedaso, 2021; Below, 2007; Hartmann, 2016), lower levels of educational and vocational qualifications, less work experience (Brücker, 2010; Connor & Koenig, 2015; Scheller, 2015; Worbs & Baraulina, 2017), or the non-recognition of qualifications obtained abroad (Nohl, 2009). Consequently, migrants are more frequently represented in marginal employment or entirely excluded from the labor market (Hausen, 2009). A migration background is also a risk factor for formal overqualification in employment, leading to negative income consequences (Boll et al., 2016). The willingness to demand recognition of one's educational qualifications is higher with a higher underlying educational level, a higher occupational status in the country of origin, younger age, and better language skills of migrants (Kogan, 2012). This suggests an additional selection bias that favors migrants who are inherently better prepared for the labor market, further exacerbating social inequality within this subgroup. Proficiency in the host country's language is another aspect of human capital (Chiswick, 2016) that mitigates labor market integration. Another approach to explaining the more challenging labor market access for individuals with a migration background is seen in a poorer availability of social capital. Drawing on Granovetter's "Strength of Weak Ties" theory, Thomsen (2009) highlights the significance of loose contacts with acquaintances, particularly in transforming human capital into a professional and income position on the labor market. While familial and milieu-specific contacts can contribute to employment in general, professional contacts, for example, from the extended family or organizations, are more likely to facilitate appropriate employment, while closer family contacts are associated more with placement in less qualified positions (Schmidtke, 2009). The study from Kalter and Kogan (2014) also suggests that social capital can be beneficial for obtaining simple, low-status employment; for qualified positions, however, an adequate level of human capital and connections to labor market-related organizations are crucial (Battisti et al., 2018). Lower social integration of parents can not only affect the labor market integration of parents but also the social integration of children. Parental contact with Germans is crucial to compensate for the lack of institutional knowledge, such as applying for a daycare spot. There is robust evidence for an immigrant-native gap in childcare use also for Germany (Schmitz et al., 2023; Schober & Spieß, 2013; Stahl et al., 2018), and the reasons are manifold and cover primary disparities such as parents' education, household income and

social status, but also immigrant-specific factors, i.e. length of stay, cultural norms in the region of origin and citizenship (for an overview cf. van Lancker & Pavolini, 2023). For instance, a lack of knowledge on how to apply for a daycare spot may favor discrimination by institutions. Recent experimental studies in Germany indeed point to discrimination against migrant families in placement allocation (Hermes et al., 2023). Further, the cultural distance between the country of origin and the destination country plays a role. Immigrant households born in regions with more traditional norms on motherhood are less likely to use childcare (van Lancker & Pavolini, 2023). Such norms also answer for the average lower labor market attachment of migrant mothers, which by itself decreases the likelihood of childcare use (Uunk et al., 2005). If children do not attend daycare, it can impede their contact with peers and shared activities with them. Summing those results up we would suggest hypothesis four, assuming:

Hypothesis 4   Children living in migration families have a higher risk of experiencing deprivation.

2.2   Resource dilution hypothesis

According to the Resource Dilution Hypothesis (Blake, 1989; Steelman et al., 2002), parents possess limited resources that they must distribute among their children. These resources include emotional and physical energy, attention, and interactive capacity. Additionally, material resources come into play, which can be allocated for providing e.g. housing, clothing, education, or leisure activities. In larger families, a smaller share of the household's resources is attributed to each child.

Lanau (2023a) shows that deprived children often reside in households with a higher number of children. Interaction quality is also considered a scarce resource in this context, as conversations with adults among siblings, for instance, are divided. Leeuw et al. (2022) demonstrate, based on a sample of Dutch adolescents, that these individuals perceive the maternal and paternal involvement of their parents as lower with an increasing number of (biological) siblings. Strohschein et al. (2008) similarly show that positive interactions, such as shared laughter, talking, and playing, decrease for existing children with the birth of another child. However, consistent parenting does not decrease; in fact, it increases. According to the authors, this suggests a realignment of parenthood aiming to cater adequately to the needs of all family members. The division of parental resources can lead to differences between siblings, for instance, in their respective vocabularies (Karwath et al., 2014). This leads us to hypothesis five:

Hypothesis 5   Children living with more siblings in the same household have a higher risk of experiencing deprivation.

2.3   Parental differential treatment

Beyond family heterogeneity in terms of economic prosperity on the household level and per capita, families with more than one child differ in parental treatment

of siblings. Psychological family research with a focus on parental differential treatment reveals that children from the same family can have different experiences with their parents and within their family as a non-shared environment (Feinberg & Hetherington, 2001). Tucker et al. (2003) for example investigated differential treatment in five domains of parenting comparing first- and second-born children in couple-parent families. Although parents prefer equal treatment regarding devoted affection and time as well as claims such as doing chores, they reported differential treatment in all domains. They could show that children's gender predicted differences in parental time investment, children's personality traits predicted differential discipline requirements, and both, gender and personality, predicted differential parental affection. On the other hand, the authors report differences in privileges and chores according to age and birth order differences. For example, parents allowed firstborn children more often to invite friends, go to parties, or stay up late than second-born children. In a later investigation of the same domains, Poonam and Punia (2012) underline the importance of gender and age for parental differential treatment when they show that differential parenting often occurs when the children within a family have opposite sexes and differ in age. While mothers spend more time with their adolescent daughters, fathers spend more time with their adolescent sons. Gender norms concerning the comparative ability of parents to teach their offspring sex-linked behaviors also may affect paternal involvement. According to these norms, fathers' participation in childcare should be higher with sons than with daughters (Harris & Morgan, 1991). Further, older children are favored in terms of privileges but are also more disciplined and involved in doing the chores than younger children, who in turn get more affection from their parents. Additionally, in a study on parental differential treatment between biological and non-biological children, Segal et al. (2015) found only limited support for the hypothesis that parents favor their biological children. Although parents reported more unfavorable traits for their adopted than for their biological children, they reported an equal number of favorable traits for both types of their children.

In economic family research, a similar debate on differential investments of parents in education and the health of their children evolved in the past five decades. Some studies argue that parents tend to invest in their more endowed children expecting better outcomes for their investment. For instance, Frijters et al. (2013) use longitudinal data measuring the development of cognitive resources spent by parents and the cognitive abilities of their offspring and show that parents spend more resources for children with higher cognitive abilities. Other studies posit that parents tend to compensate for the disadvantages of their children by investing the strongest in the less endowed ones (Behrman et al., 1982). Fan and Porter (2020) use data on investments in education in Ethiopian families and find that parents compensate disadvantaged children by spending more money on educational fees. Further, the differential parental treatment seems to differ by parental socio-economic background: A study by Grätz and Torche (2016) reveals that only parents with high socio-economic background respond to differences in their children's abilities at an early age while parents from low socio-economic status do not. Introducing parental preferences for equal distribution of children's life chances, Becker and Tomes (1976) combine the investment and compensation motive in a model predicting parental resource allocation to differently endowed siblings. The higher parents' equal distribution preferences, the stronger their compensation motive and the more likely

it is that parental resource allocation will level off any disadvantageous effects of ability differences between siblings.

For school-aged children, cognitive abilities can be approximated by school grades, while health status indicates physical and/or mental condition or disability. Initial endowment advantages of older or first-born children may exert further investment incentives of parents into these children, resulting in a self-enforcing process of differential parental treatment. We therefore hypothesize:

Hypothesis 6   (a) Older, (b) firstborn, (c) healthier, and (d) biological children have a lower risk of experiencing deprivation.

On the other hand, parents may favor either younger and last born as well as less able, less healthy, and non-biological children to compensate for their higher vulnerability due to young age and growing up with older siblings, health problems, ability deficits, and parental dissolution. To the extent to which those strategies overcompensate original disadvantages, this may result in decreased depreciation risks.

Hypothesis 7   (a) Younger, (b) last born, (c) less healthy, and (d) non-biological children have a lower risk of experiencing deprivation.

3   Data and methods

Our analysis employs cross-sectional survey data from the 2019 wave of the German family survey "Growing up in Germany" (Kuger et al., 2020). In total, a register-based random sample of more than 6000 households across Germany with at least one member in the age range from birth to 32 was surveyed on the living conditions of children, youth, young adults, and parents primarily using personal interviews (CAPI).

Children reported on certain aspects of their lives themselves from the age of 9 years onwards while parents of minors provided information on financially induced restrictions experienced by each child concerning material and immaterial goods. These were selected based on the principle of "common" living standards and comparability with deprivation items in EU-SILC (Gordon et al., 2017). For our analysis, we utilize these parental reports for a total of 4815 children residing in 2903 different households. Additionally, we incorporate variables from the regional database INKAR (Bundesinstitut für Bau-, Stadt- und Raumforschung [BBSR], 2023), offering regional contextual information for the 202 districts and cities where the children reside.

4   Measures and descriptive statistics

Given that children have diverse resources and needs it is reasonable to assume that they experience deprivation differently. In the first step, we aim to distinguish children based on the deprivations they encounter. Departing from the customary counting approach in deprivation research (Atkinson, 2003; Dudek, 2019), which tallies the number of missing goods, services, and activities, we conduct a cluster analysis enabling the identification of groups of children with similar experiences (Najera Catalan, 2017). Subsequently, we employ parental reports on twelve limitations their children face to compute a cluster analysis. The questions pertain to the areas of nutrition, leisure activities, clothing, and social interactions (column 2 in Table 1). Parents were requested to assess, separately for each child, whether they (a) have the respective item, (b) do not have it due to financial restrictions, or (c) have other reasons. By the aforementioned EU convention ("enforced lack"), we consider deprivation when the item is financially unattainable for the parents, meaning they cannot afford it. Column 3 of Table 1 displays the absolute and relative frequencies of deprivation for these twelve items.

Tab. 1: Deprivation items by area and child

Area	Item	Number (share) of deprived children for financial reasons	
Nutrition	A high-quality meal once a day	4	(0.07 %)
	Fresh fruits and vegetables once a day	8	(0.15 %)
	Three meals a day	9	(0.16 %)
Leisure	Indoor toys	6	(0.11 %)
	Outdoor toys	12	(0.22 %)
	Age-appropriate books in the house	28	(0.51 %)
	Regular leisure activity	82	(1.50 %)
Clothes	Two pairs of matching shoes	23	(0.42 %)
	New, unused clothing	120	(2.20 %)
Social	Birthday parties etc.	8	(0.15 %)
	Invite friends	23	(0.42 %)
	At least one week vacation	578	(10.59 %)
Non-deprived		4764	(87.27 %)
Total		5459	(100.00 %)

Note: unweighted, source: AID:A 2019

We conduct the cluster analysis (Everitt et al., 2011) in two stages. In the first stage, utilizing the Single Linkage method, we estimate the similarity among valid cases to identify outliers. The five cases identified in this process exhibit comparatively extreme response patterns and are consequently excluded from further analysis. In the second stage, we perform a hierarchical cluster analysis using the Ward method. Based on similarity values (Figure 1), a three-cluster solution appears appropriate for partitioning the children in our sample.

Fig. 1: Dendrogram for Ward cluster analysis (top 25 branches)

Dendrogram for Ward cluster analysis
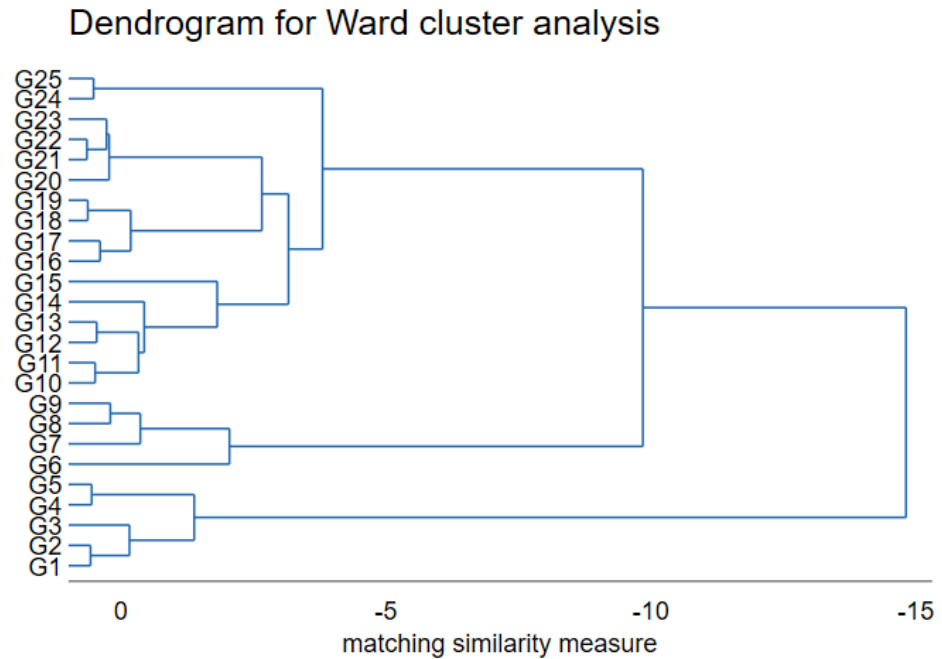
In the second step of our analysis, we estimate a multinomial regression model to statistically explain the categorization of individual children into one of the four deprivation groups. Children without current deprivation experiences serve as the reference group. When estimating the model, we use clustered standard errors to account for the fact that multiple children can belong to the same households, and their characteristics may not be independent. Predictors include features of the children, households, and the region in which the children reside.

Individual level (children)

In AID:A, children were only directly interviewed from the age of 9, limiting our cross-age analysis for children under 12 to a few characteristics. In this analysis, we use the age of the children in years and the birth order determined by the age of all children living in the same household. To analyze differences between first-born and last-born children and those born in between, we include information on the gender of the children (0 – male, 100 – female) and their relationship to the parents in the household (whether the child has at least one non-biological parent or only biological parents). We also consider whether the child was born in Germany or has a direct migration background. Health differences are examined through the classification of their health on a six-point scale (1 – not good at all to 6 – very good) and whether they have physical, mental, or social disabilities or impairments.

Certain child characteristics are aggregated for the household, and the mean is computed. Subsequently, individual child features are centered around these group mean values (Enders & Tofighi, 2007). This process includes the mean age of all minors in the household, the subjective health status, the percentage of children with disabilities or impairments, and the percentage of girls among all minors in the household. The naming of variables reflects the centering through two subscripted suffixes. If a variable represents a calculated mean at the household level, it receives

the suffix "gm" (group mean). If a variable is centered around the group mean, it is labeled with the suffix "cwc" (centering within cluster). In this manner, we construct the mean age of all minors in the household, subjective health status, the percentage of children with disabilities or impairments, and the percentage of girls among all minors in the household. We calculate individual child characteristics (e.g., boys having negative values, and girls having positive values) as deviations from these mean values. Direct migration background is averaged across all household members as the percentage of individuals with a direct migration background. Centering ensures statistical independence between individual and group characteristics, facilitating a more nuanced differentiation of disparities across various analytical levels (Snijders & Bosker, 2012). Leveraging this property allows us to provide a more detailed description of the extent to which the life circumstances of children with and without deprivation experiences differ concerning their features, households, or residential locations.

Individual level (children)

In addition to the means for individual characteristics such as age, gender, non-biological parenthood, migration background, health status, and disability/impairment, we incorporate features of the parents of the children investigated in AID:A as predictors at the household level. The first set of these features signifies the income and wealth of the households in which the examined children reside. This includes household net income, logarithmically transformed to a base of ten for better interpretability, and the residence in a single- or two-family house as opposed to a multi-family house with more than two private households in the building. We utilize the receipt of basic income support (unemployment benefit II) as an indicator of wealth since the disbursement of these benefits presupposes the depletion of personal assets up to an age-dependent allowance of 150 euros per year of life (plus 750 euros for necessary purchases and a protective amount for retirement provision). The second set comprises two indicators for the human and social capital of parents or households in which the examined children live. Human capital is assessed based on the highest vocational education attainment among all parents living in the household, represented by the CASMIN scale (Brauns & Steinmann, 1999), with distinctions made between basic (general elementary and/or basic vocational qualification), intermediate (intermediate general qualification/maturity and/or intermediate vocational qualification/maturity), and tertiary education. To gauge social capital, the main contact person for the respective household was questioned about their social support from close individuals and neighbors using three questions from the Oslo-III scale (Kocalevent et al., 2018): (1) "How many people are so close to you that you can count on them when you have great personal problems?" (1 – none to 4 – six or more), (2) "How much interest and concern do people show in what you do?" (1 – none to 5 – a lot), (3) "How easy is it to get practical help from neighbors if you should need it?" (1 – very difficult to 5 – very easy). Employing an exploratory factor analysis, we consolidate these three indicators into a factor representing social support. Thirdly, we scrutinize variations between different family constellations, comparing households of different sizes and single-parent families with two-parent families.

Regional level

For the households surveyed in AID:A, their place of residence in Germany is known at the district or independent city level (NUTS-3). We now introduce regional contextual information from the INKAR database (BBSR, 2023) for the year 2019 to control for regional disparities. Some of this information allows us to further center household-related characteristics around the district's mean. This applies to the average age and the percentage of girls among minors in a household relative to the average age of minors in the district or the percentage of women in the total population of the district. Additionally, we use the average income of households, average household size, the proportion of single and two-family houses among all residential buildings, and the social transfer rate (primarily unemployment benefits) to center the respective household features.

All predictors used in the multinomial regression models (after forming group mean values or centering) and the dependent variable are described in Table 2.

Tab. 2: Descriptive statistics

Variable	Mean	SD	Min	Max	Factor loading[1]
Dependent variable					
Deprivation cluster					
Not deprived	0.875	0.331	0.000	1.000	
Vacation	0.083	0.275	0.000	1.000	
Clothing and Vacation	0.029	0.167	0.000	1.000	
Leisure and Vacation	0.013	0.115	0.000	1.000	
Level 3 (NUTS-III)					
Household net income (log10)$_{gm}$	3.293	0.047	3.152	3.472	
One/two family-house$_{gm}$	81.812	11.501	50.030	96.040	
Basic income support$_{gm}$	7.374	4.290	1.340	24.110	
Household size$_{gm}$	2.052	0.172	1.610	2.440	
Age children$_{gm}$	8.909	0.162	8.405	9.188	
Women$_{gm}$	50.600	0.602	48.764	52.277	
Level 2 (Household)					
Household net income (log10)$_{cwc}$	0.212	0.291	-1.470	1.279	

Variable	Mean	SD	Min	Max	Factor loading[1]
One/two-family house$_{cwc}$	-15.187	43.639	-93.580	49.950	
Basic income support$_{cwc}$	-7.247	4.246	-24.110	-0.340	
Highest educational attainment (CASMIN)					
Basic education	0.074	0.261	0.000	1.000	
Intermediate education	0.449	0.497	0.000	1.000	
Tertiary education	0.477	0.500	0.000	1.000	
Social Support	-0.025	0.658	-2.768	0.103	
People you can count on if great personal problems	3.263	0.727	1.000	4.000	0.507
People show interest and concern in you	3.786	0.871	1.000	5.000	0.509
How easy to get practical help from neighbors	3.847	1.071	1.000	5.000	0.345
Household size$_{cwc}$	2.309	1.115	-0.360	8.180	
Age children$_{gm.cwc}$	-2.761	3.346	-9.158	5.729	
Girls children$_{gm.cwc}$	-2.468	35.611	-52.277	51.236	
Children with non-biological parent(s)$_{gm}$	0.037	0.155	0.000	1.000	
One parent family	0.107	0.309	0.000	1.000	
Migrational background all household members$_{gm}$	16.918	28.282	0.000	100.000	
Health children$_{gm}$	4.688	0.500	0.000	5.000	
Disability children$_{gm}$	5.932	17.782	0.000	100.000	
Level 1 (Child)					
Last born child	0.595	0.491	0.000	1.000	
Firstborn child	0.437	0.496	0.000	1.000	
Age$_{cwc}$	-0.586	2.340	-10.400	6.667	
Girl$_{cwc}$	0.258	35.055	-85.714	85.714	

Variable	Mean	SD	Min	Max	Factor loading[1]
Has non-biological parent(s)$_{cwc}$	-0.011	0.106	-0.857	0.750	
Migrational background$_{cwc}$	-10.708	23.617	-92.308	85.714	
Health$_{cwc}$	0.019	0.377	-3.143	2.500	
Disability$_{cwc}$	0.090	15.500	-66.667	85.714	
N	4815				

Note: unweighted, source: AID:A 2019, 1exploratory factor analysis (standardized factor loadings)

5   Results

As a result of the cluster analysis, we distinguish three groups of children with varying deprivation experiences (Table 3). The first group comprises children experiencing deprivation, specifically the absence of at least one week of vacation per year. Since these children do not encounter any other restrictions, we label their deprivation group as "Vacation". The second, considerably smaller group includes children with an average of almost two deprivations, which are, again, a lack of vacation but also facing limitations in their available clothing. Additionally, these children often cannot engage in regular leisure activities. Therefore, we designate the second deprivation group as "Clothing and Vacation". The third group exhibits a more heterogeneous composition of deprivation experiences. Children belonging to this group also experience an average of nearly two deprivations. However, there is no deprivation shared (almost) universally among all children in this group. Most commonly, children in the third deprivation group experience restrictions in their regular leisure activities and, again, vacations leading us to label this group as "Leisure and Vacation". Nevertheless, some of these children are also unable to invite friends to their homes or celebrate events. Similarly, certain children lack age-appropriate books or toys. Collectively, children in the third deprivation group most frequently encounter limitations in the deprivation areas "Social" and "Leisure" (Table 1). In a few instances, their parents report that these children do not always receive three meals a day or fresh fruits and vegetables.

Tab. 3: Ward cluster solution of deprived children under 12 years of age

Items	Cluster		
	Vacation	**Clothing and Vacation**	**Leisure and Vacation**
A high-quality meal once a day	1%	0%	0%
Indoor toys	0%	3%	0%
Fresh fruits and vegetables once a day	0%	0%	5%
Birthday parties etc.	0%	0%	5%
Three meals a day	0%	0%	6%
Outdoor toys	0%	0%	7%
Two pairs of matching shoes	3%	7%	2%
Invite friends	0%	0%	14%
Age-appropriate books in the house	0%	1%	16%
Regular leisure activity	0%	16%	67%
New, unused clothing	0%	100%	3%
At least one week vacation	99%	45%	57%
N	459	75	161
Avg. number of deprivations	1.0	1.7	1.8

Reading example: 16% of the 75 children assigned to the "Clothing and Vacation" cluster experience restrictions in their regular leisure activities due to financial reasons. Note: unweighted, source: AID:A 2019

In the second step of the analysis, we compare the classification of children into one of the three deprivation groups compared to non-deprived children using a multinomial regression model. To illustrate the relevance of individual predictors, we present three model specifications, gradually expanding the initial model with new predictors while keeping the sample constant. Table 4 depicts the first model specification. Model 1 solely encompasses children's characteristics, in part centered on the household mean (cwc), without controlling for this household mean. Although the model explains only a small portion of the variance in the dependent variable, it indicates that the youngest children in a household have a lower risk of falling into the groups of socially deprived children compared to middle children, albeit the effect is only significant for the deprivation groups "Vacation" and "Clothing and Vacation". Apart from the last-born status, children with at least one

non-biological parent in the household have a higher risk of having to forgo vacations when compared to their siblings who are biological children of both parents (complex stepfamilies). However, even in this model, where we do not control for household and regional characteristics, there are no differences in the deprivation risk between children of the same household.

Tab. 4: Multinomial logistic regression model 1 on deprivation risk

Reference category: non-deprived	Model 1								
	Vacation			Clothing and Vacation			Leisure and Vacation		
	Beta	SE	Sig	Beta	SE	Sig	Beta	SE	Sig
Level 1 (Child)									
Last born child	-0.462	0.166	**	-0.597	0.283	*	-0.050	0.426	
Firstborn child	-0.205	0.157		-0.262	0.255		0.323	0.448	
Age$_{cwc}$	-0.049	0.035		0.038	0.077		0.053	0.158	
Girl$_{cwc}$	-0.002	0.001		0.001	0.002		0.001	0.004	
Has non-biological parent(s)$_{cwc}$	1.119	0.557	*	1.329	0.862		1.745	1.794	
Migrational background$_{cwc}$	-0.005	0.003		-0.007	0.004		-0.005	0.006	
Health$_{cwc}$	0.265	0.145		0.021	0.233		-0.347	0.384	
Disability$_{cwc}$	0.003	0.003		0.003	0.005		-0.006	0.010	
Intercept	-1.975	0.167	***	-2.847	0.234	***	-4.206	0.443	***
N (Children)	4815								
N (Households)	2903								
N (NUTS-3)	202								
Pseudo R²	0.012								

Notes: *** p<.001 ** p<.01 * p<.05, gm = group (cluster) mean, cwc = centering within cluster, weighted, source: AID:A 2019

Moving to the second model (Table 5) where we add socio-demographic information about the household in which the children live and relevant regional char-

acteristics, the lower statistical deprivation risk of last-born children disappears. Particularly, by considering household size, the influence of birth order on the deprivation risk of children diminishes the differences from the comparison group of middle children when controlling for household size since the effect of large families is extracted from the birth order effect. This suggests that the reduced risk of last-born children in the first model is primarily attributable to an elevated risk in larger families. Introducing the control variable for the proportion of children with non-biological parents in the household shows that all children in stepfamilies have a higher risk of vacation deprivation and potentially deprivation of leisure activities. Within these families, children with non-biological parents have an additional increased deprivation risk in this model. However, the standard error of these estimates is also high, making the effect statistically significant only concerning the first deprivation group. By controlling for the proportion of individuals with a direct migration background in the household, it becomes evident that the deprivation risk of children varies concerning the migration background of their parents but not their direct migration background. Significant differences are observed for all three clusters. Children in single-parent families also face a significantly elevated risk for all three deprivation groups. Neither the subjective health nor the presence of at least one disability has any connection to a deprivation risk in either the first or second model. Conversely, in the second model, it becomes evident that particularly children in households with overall poorer health among all children have a higher risk of having to forgo vacations and potentially unused, suitable clothing.

Tab. 5: Multinomial logistic regression model 2 and 3 on deprivation risk

Reference category: non-deprived	Model 2									Model 3								
	Vacation			Clothing and Vacation			Leisure and Vacation			Vacation			Clothing and Vacation			Leisure and Vacation		
	Beta	SE	Sig	Beta	SE	Sig	Beta	SE	Sig	Beta	SE	Sig	Beta	SE	Sig	Beta	SE	Sig
Level 3 (NUTS-III)																		
Household net income (log10)$_{gm}$										0.436	3.391		0.169	4.478		6.008	6.090	
One/two family-house$_{gm}$										0.030	0.017		0.047	0.025		0.067	0.038	
Basic income support$_{gm}$										0.834	0.242	**	0.960	0.296	**	1.832	0.524	***
Household size$_{gm}$	1.735	0.621	**	-1.055	0.733		-0.213	1.100		2.884	0.846	**	-0.946	1.081		-0.546	1.743	
Age children$_{gm}$	1.400	0.547	*	0.932	0.716		2.174	1.112		-0.144	0.900		-1.079	1.339		0.292	2.086	
Women$_{gm}$	0.379	0.162	*	-0.163	0.169		0.128	0.281		0.300	0.204		-0.309	0.242		-0.152	0.394	
Level 2 (Household)																		
Household net income (log10)$_{cwc}$ linear										-1.870	0.488	***	-4.333	0.747	***	-3.457	1.038	**

	Model 2									Model 3								
Household net income (log10)$_{cwc}$ squared										-6.013	1.315	***	-4.861	1.376	***	-3.024	1.569	
Household net income (log10)$_{cwc}$ cubic										-3.373	1.009	**	6.400	1.392	***	4.165	1.453	**
One/two-family house$_{cwc}$										-0.007	0.002	***	0.000	0.003		-0.001	0.005	
Basic income support$_{cwc}$										0.763	0.237	**	0.877	0.301	**	1.698	0.498	**
Highest educational attainment (CASMIN) (Ref.: basic education)																		
Intermediate education										-0.499	0.239	*	-1.011	0.306	**	0.278	0.514	
Tertiary education										-1.172	0.277	***	-1.597	0.368	***	-0.330	0.616	
Social Support										-0.341	0.129	**	-0.427	0.171	*	-0.154	0.227	
Household size$_{cwc}$	0.285	0.084	**	0.329	0.127	*	0.263	0.169		0.312	0.086	***	0.310	0.128	*	0.248	0.177	
Age children$_{gm,cwc}$	-0.048	0.028		-0.035	0.041		-0.012	0.048		-0.019	0.028		-0.006	0.041		0.060	0.049	

	Model 2									Model 3								
Girls children$_{gm,cwc}$	0.002	0.002		-0.001	0.003		-0.001	0.004		0.001	0.002		-0.003	0.003		-0.002	0.004	
Children with non-biological parent(s)$_{gm}$	1.109	0.417	**	-0.328	0.688		1.977	0.744	**	0.854	0.443		-0.755	0.701		1.787	0.755	*
One parent family	1.863	0.206	***	1.780	0.322	***	2.267	0.390	***	0.797	0.235	**	0.502	0.344		0.867	0.451	
Migrational background all household members$_{gm}$	0.014	0.003	***	0.022	0.004	***	0.016	0.005	**	0.000	0.003		0.007	0.004		0.002	0.006	
Health children$_{gm}$	-0.365	0.150	*	-0.609	0.200	**	-0.331	0.220		-0.189	0.162		-0.510	0.211	*	-0.257	0.217	
Disability children$_{gm}$	0.003	0.004		-0.006	0.007		-0.006	0.009		-0.001	0.004		-0.011	0.007		-0.011	0.010	
Level 1 (Child)																		
Last born child	-0.228	0.197		-0.252	0.298		0.008	0.397		0.092	0.206		0.080	0.318		0.342	0.382	
Firstborn child	-0.071	0.168		0.132	0.293		0.471	0.397		0.027	0.180		0.218	0.303		0.616	0.410	
Age$_{cwc}$	-0.018	0.037		0.033	0.062		0.073	0.127		0.047	0.039		0.107	0.062		0.149	0.113	
Girl$_{cwc}$	-0.002	0.001		0.001	0.002		0.001	0.004		-0.002	0.001		0.000	0.002		0.001	0.004	
Has non-biological parent(s)$_{cwc}$	1.005	0.457	*	1.352	1.024		1.091	1.255		0.975	0.430	*	1.336	0.996		1.175	0.979	

	Model 2									Model 3								
Migrational background$_{cwc}$	0.002	0.003		0.005	0.004		0.002	0.006		0.001	0.003		0.003	0.005		-0.002	0.007	
Health$_{cwc}$	0.224	0.120		0.033	0.178		-0.226	0.318		0.258	0.129	*	0.086	0.179		-0.121	0.283	
Disability$_{cwc}$	0.003	0.003		0.004	0.005		-0.004	0.010		0.003	0.003		0.003	0.006		-0.003	0.011	
Intercept	- 37.097	9.344	***	0.086	9.892		- 29.619	17.652		- 25.890	13.723		21.364	18.009		- 24.343	25.410	
N (Children)	4815									4815								
N (Households)	2903									2903								
N (NUTS-3)	202									202								
Pseudo R²	0.109									0.248								

Notes: *** p<.001 ** p<.01 * p<.05, gm = group (cluster) mean, cwc = centering within cluster, weighted, source: AID:A 2019

Lastly, to address resource poverty as a driver of deprivation, we extend the model to incorporate the economic, cultural, and social resources of households, along with measures of distribution for some of the mentioned socio-economic or demographic individual or household characteristics across the regions where the children reside. This complete model reveals that both economic and cultural-social resources make a significant contribution to distinguishing between deprived and non-deprived children. Children living in affluent households have a significantly lower risk of falling into one of the three deprived groups. Estimating the income effect not only linearly but also with additional quadratic and cubic components illustrates that the deprivation risk does not decline monotonically with increasing income. Instead, it remains constant initially, then decreases at moderate income levels, gradually approaching a probability of 0 percent for higher income levels (Figure 2). For instance, the average risk of having to forgo a vacation for a child from a household with a regionally average income is approximately 10 percent. For a child from a household with double the income (+0.3 on the logarithmic income scale; a difference of +0.1 on the logarithmic income scale corresponds to an increase of about 26 percent of nominal income, and so forth), this risk is halved. Furthermore, children living in a single- or two-family house, indicating a higher household income compared to living in a multifamily dwelling, have a lower risk of having to forgo vacations. Conversely, if the household in which children live receives basic income support, meaning that the family is unable to secure its members' livelihoods using income or assets that are not exempted, the affected children have a higher deprivation risk for all three clusters. Some of this inequality is also reflected at the regional level. The risk of being deprived is higher not only for children whose households receive social transfer payments but also for children living in areas with a higher proportion of households in receipt of social benefits, even if they do not reside in such households. In addition to economic resources, the deprivation risk of having to forgo vacations and potentially new, suitable clothing is also elevated for children with low-educated parents. Children whose parents perceive a lower level of social support in their environment are equally exposed to higher deprivation risks. Crucial for our analysis is the partial elimination, once we control for the economic, cultural, and social resources of the households of the examined children, of differences depicted in the second model between various family and household forms. The significance of single parents and stepfamilies for the deprivation risk weakens once parental resources are taken into account. As expected, the significance of the migration background almost entirely disappears: the effect of parental migration background seems to be mediated through both the mechanism of limited material resources and limited social networks. This highlights that the disadvantage of these families can be attributed, in part, to their economic and social situation. Independently, children in stepfamilies and larger households have higher deprivation risks than their respective reference groups, while the significance of children's health restrictions diminishes.

Fig. 2: Predicted deprivation risks for cluster-centered household net income at means of other covariates with 95-% confidence intervals

Source: AID:A 2019, weighted
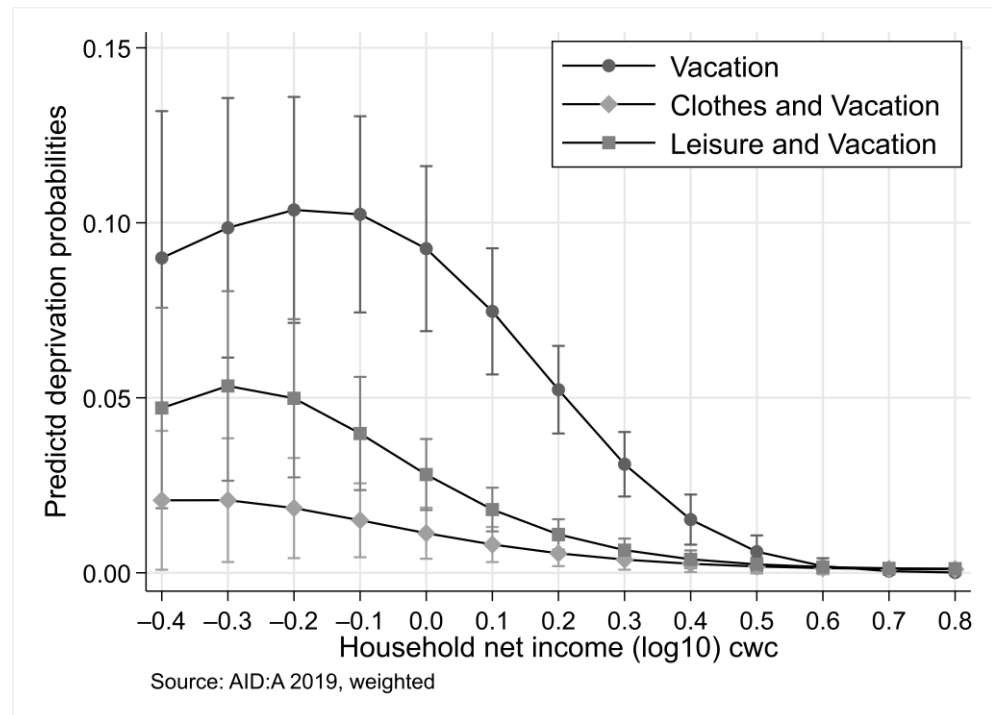
6   Discussion

This study aims to analyze children's deprivation from a multidimensional perspective. We compare children based on their parents' reports of material, social, and cultural restrictions in the German family survey "Growing up in Germany". Utilizing cluster analysis, we identify groups of children with similar deprivations. The largest identified group of deprived children must forgo at least one week of vacation per year due to financial reasons, without facing additional deprivation. The children in the two smaller groups are multiply deprived: Children in the smallest deprivation group must forgo new, suitable clothing and a significant share of them also experience restrictions in vacation and a smaller share in regular leisure activities. In the third deprivation group, each child is multiply deprived, with varying compositions. Most commonly, children in this group experience restrictions in their leisure activities and vacations. However, some of these children also face limitations in accessing age-appropriate books, toys, and a balanced diet. Others have to forgo inviting friends or celebrating events.

Confirmation of hypotheses

Through multinomial regression analyses, we determine factors influencing the membership of children in a specific group. The results of this analysis support five central assumptions regarding the social conditions under which deprivation experiences arise in children up to the onset of puberty. Firstly, deprivation experiences emerge in conjunction with low household resources where deprived children live. Not only differences in the economic status of households between deprived and non-deprived children are evident (Hypothesis 1), but low cultural and social resources of parents also contribute to an increased deprivation risk for their children (Hypothesis 2). Additionally, regional influences of the population and labor market structure at the place of residence are visible in our analysis, highlighting the importance of the socio-structural and infrastructural environment; these could influence the social networks of parents and children, which, in turn, affect their material and social deprivation. Secondly, the particularly high deprivation risks of children from single-parent families, stepfamilies (Hypothesis 3), and families with a migration background (Hypothesis 4) can partly be attributed to their disadvantages in the labor market and the associated lower economic resources; in the case of migrant families, it could also be due to fewer social contacts. Thirdly, the generally higher deprivation risks of children in larger families do not seem to be associated with the parental position in the labor market but can, according to the Resource Dilution Thesis (Hypothesis 5), be explained by the higher demand for given income in larger households. Fourthly, we find unequal deprivation risks of children within the same family regarding the birth order, but this is explained by the family size. Fifthly, we interpret the favoritism of biological children as a strategic decision (Hypothesis 6) in complex stepfamilies, which could be attributed to an ambivalent emotional closeness of parents and a shared responsibility with the child's other biological parent. In contrast, the stronger investment in health-challenged children seems to correspond to the Compensation Thesis (Hypothesis 7). We could not identify further discrimination of children by their parents based on age, gender, or

migration background when controlling for the social and economic characteristics of the family.

Limitations and future research

The data we use provides a broad view of the prevalence of material deprivations among children under 12 years, as it reflects this population group in its full diversity. At the same time, this form of sampling results in only a smaller subsample of surveyed households reporting any material deprivation. Consequently, the resulting small subsample of deprived children complicates the identification of distinct deprivation types and contrasting differences based on child, household, and regional characteristics. Additionally, in our analysis, we have information about the location of surveyed households, allowing us to estimate regional segregation effects. However, as the analyses showed, the classification of NUTS-3 areas appears to be too rough to fully capture regional differences. Finally, we want to emphasize once again that our analysis relies on information from parents about their children living in the same household. Thus, our results cannot reflect the perspective and experiences of the children, which may differ from those of their parents.

Future research efforts should aim to validate the typology we identified, using quota samples with oversampling of, for example, low-income households receiving social transfer payments, as well as stepfamilies, single-parent families, and families with migration backgrounds. This would enable more detailed distinctions between different deprivation situations. To study regional differences, we recommend using more detailed data on, for example, residential neighborhoods, as we assume that the regional mobility of families at risk of poverty and deprivation is rather low, and their dependence on / connection to their immediate living environment is therefore greater. Furthermore, we recommend multi-perspective poverty research to systematically compare children's deprivation experiences from the perspective of different actors. It is questionable whether children perceive their material deprivation in the same or a similar way as other family members.

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Data availability

The primary dataset AID:A 2019 analyzed during the current study is available in the data repository of the German Youth Institute, https://doi.org/10.17621/aida2019. Access is restricted to non-commercial scientific use. The dataset INKAR containing regional variables is available to the public under: https://www.inkar.de/.

Conflict of interest

The authors have no relevant financial or non-financial interests to disclose.

Consent to participate

Informed consent was obtained from all individual participants included in the study.

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8 Figures and Tables