

Child and Household Deprivation: A Relationship Beyond Household Socio-demographic Characteristics

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Abstract This paper aims to contribute to the literature on poverty and social exclusion by analysing the type of deprivation of the household where the child lives and the level of deprivation that child experiences. Using the EU-SILC 2009 module on deprivation for Spain, we find that the level of child deprivation varies among household types, that is, even after controlling for the socio-economic characteristics of the household and parents, the lack of certain items at the household level induces a more intense child deprivation. Therefore, we can conclude that there exists an association between child deprivation and the household deprivation profile that surpasses the socio-demographic characteristics of the household and parents.

Keywords Child deprivation · Household deprivation profile · Social exclusion · Hierarchical data

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1 Introduction

Child poverty and social exclusion have been widespread and persistent phenomena over the last few decades in most developed countries. More than one in four children in the European Union (EU) lives at risk of poverty and social exclusion (Eurostat 2014). Many of them are exposed to low-quality housing, poor nutrition, and inadequate, inaccessible or unaffordable healthcare and education.

Tackling and preventing child poverty and social exclusion is essential for several reasons. Firstly, poverty and deprivation do not affect children only in the present, through higher risks of death in infancy and childhood, chronic childhood illness, birth weight and child mental health problems (Spencer 2003), but can also last long into adult life, producing damaging effects on a variety of domains, including health, education, employment, individual behaviour, finance, personal relationships and well-being (Ridge 2004; Griggs and Walker 2008). Thus, to the extent that disadvantages faced in childhood are compounded over life, there is also an impact in terms of both economic development and social stability (Haveman and Wolfe 1995; Brooks-Gunn and Duncan 1997; Esping-Andersen et al. 2002).

Secondly, the on-going economic and financial crisis in the EU is causing a special impact on children, since key services and policies supporting children have started to be affected by budget cuts.¹ In 2012, children are more exposed to severe deprivation than the overall population of the EU-28 (11.8 % against 10 %). The percentage of children living in a severely deprived household ranges from 0.5 % in Switzerland and 1.3 % in Sweden, to more than 38 % in Bulgaria and Romania. In Spain the proportion of children living in a severely deprived household reaches 7.4 %, while the corresponding number for adults is 5.8 % (Eurostat 2014).

Finally, in the case of Europe, combating child poverty and social exclusion contributes to the Europe 2020 strategy for stronger social cohesion and sustainable and inclusive growth. The Eurochild report (August, 2014) on ‘The 2013 National Reform Programmes (NRP) from a child poverty and well-being perspective’ reveals that in many Member States there are no specific measures outlined in the NRP to protect children from the worst effects of financial consolidation or austerity packages.²

The literature in the field shows that the situation of children and their risk of deprivation are likely to be significantly influenced by three types of factors. First, the choices made by the society that determine the opportunities available to both children and their parents (social investment in children). Second, the choices made by parents regarding the quantity and quality of family resources devoted to children (parental investment in children). And, finally, the choices that children make given the investments and opportunities available to them. In this paper, we focus on the role of parents choices, which is the second factor.

¹ See Caritas Europa (2013) and Unicef (2012).

² In Spain, the 2006–2008 ‘National Strategic Childhood and Adolescence Plan’ (NSCAP) explicitly promotes for the first time the effective coordination of the different agents involved in the development and delivery of policies in relation to children, both at national and regional level. The National Social Report (2012) mentioned child poverty as a priority to be included in the National Action Plan on Social Inclusion (2013) for this country. However, neither resources nor specific measures have been decided so far.

Although there are many studies establishing the characteristics at the household level, that determine household deprivation, mainly household income and parental labour market status, little is known about how household deprivation translates into child deprivation. This transmission mechanism is frequently neglected in the literature because, due to the lack of appropriate data, child deprivation is typically unobserved and merely inferred using general indicators of the household as a whole.

To analyze this intergenerational mechanism, we use the 2009 wave of the EU-SILC dataset. This dataset includes children-specific items for the measurement of child deprivation.³ We hypothesize that child deprivation is not only influenced by the household's socio-economic characteristics but also by the typology of deprivation at the household level. Therefore, we consider that children are grouped into different kinds of households according to their household deprivation profile. Arguably, two children living in households with the same deprivation profile will display higher correlation in terms of deprivation than two children in households with different deprivation profiles. To account for this potential correlation, we adopt a fixed effects model where the fixed effect is defined at the household deprivation group level.

We identify different household deprivation profiles that are particularly harmful to children. There are specific household deprivation profiles that are significantly related to high levels of child deprivation. Moreover, it is not the intensity of deprivation but the type of deprivation among adults that drives the link. This result holds even after controlling for the household socio-demographic characteristics, i.e., there is evidence of a deprivation transmission mechanism that goes beyond income and employment status, both of them conventional economic variables monitored by politicians and researchers. Therefore, the identification of household deprivation profiles is compelling in the search of children at risk of social exclusion.

The paper is structured as follows. The next section presents a background. Section 3 introduces the data and definitions used in the study. Section 4 explains the method of analysis and the main results. Discussion is presented in Sect. 5. The main conclusions are summarized in Sect. 6.

2 Background

Numerous studies have contributed significantly to the scientific and policy debate about child poverty, social exclusion and well-being (Bradshaw et al. 2006; Bradshaw and Richardson 2009; OECD 2009; Richardson et al. 2008; Menchini and Redmond 2009; TARKI Social Research Institute and Applica 2010). These papers, however, rely on indicators of family income poverty and material deprivation, assuming that resources are pooled in the household and that, adults and children share not only similar deprivation conditions but also needs. More recently, researchers have come to realize that this approach has obscured the monitoring of children and the identification of particular characteristics, relevant needs and, consequently, effective policies.

In what follows, we review the literature on child deprivation in two dimensions. First, we overview the international studies that conceptualize the child as the unit of analysis, gathering data on different aspects of children's life. We mainly focus our review on evidence for developed countries. For an excellent review, concerning developing

³ Some recent works have made use of this data set to model child deprivation (De Neubourg et al. 2012; Guio et al. 2012; Frazer and Marlier 2014).

countries see Gordon et al. (2003). Second, we examine the major determinants of child deprivation that emerge from the literature.

The existing evidence shows that domains of children well-being (health, education, safety, education, housing, emotions, social relationships or integration, civic engagement, productivity, etc.) are related to the questions of how children are faring; while contextual variables (family processes and family socio-economic profile) reflect aspects of children's environments that are likely to influence their well-being. Land et al. (2001) with US data and Bradshaw et al. (2007) for European data are examples of indexes constructed with only the former list of well-being dimensions. The studies of Moore et al. (2007, 2008) for US data, Wüst and Volkert (2012) for Germany, and Bastos and Machado (2009) for Portugal include an overall child well-being index as well as an overall index of the condition of children, which include information also from contextual domains.

Differently to previous papers, Grodem (2008), using Norwegian data, develops parallel deprivation indicators for adults and children based on three key dimensions (housing, ownership of consumer durables and subjective experience of financial hardship). A strong association is found between the number of housing problems mentioned by the parents and housing deprivation indicators among children, although the effects are not necessarily linear.

Finally, using the child module of the EU-SILC (2009), as in this paper, de Neubourg et al. (2012) estimate a child deprivation scale based on 14 specific child-related variables. Guio et al. (2012) complement the children's deprivation items with items collected at household level. Later studies have relied on Guio et al.'s index to provide a description of deprivation among children in the EU-27 (Frazer and Marlier 2014).

Concerning the determinants of child deprivation, the literature in the field has documented meaningful relationships between household socio-economic factors and child deprivation. These factors are relevant from a policy point of view, insofar as programmes targeted at affecting family conditions are frequently regarded as a route to affecting child well-being. Although having a family income adequate for meeting basic material needs is certainly essential to any conception of child well-being, using income alone does not fully predict whether a child experiences deprivation under broader measures. In fact, there is evidence that some low-income households experience few additional deprivations and some higher-income households experience many (Whelan et al. 2001; Ciula and Skinner 2015).

Apart from income, there are a number of important non-income risk factors that have also been associated with inferior child outcomes. Parental education reduces the likelihood of unemployment and facilitates access to high-pay jobs, and this translates into an improved material situation within the household. In addition, it has consequences on the child through incentives to accumulate human capital and different parent-child relationships. Several studies have shown that children with more educated parents are less deprived than children with less educated parents (Moore et al. 2007, 2008; Bastos and Machado 2009; de Neubourg et al. 2012; Wüst and Volkert 2012).

Lone parenthood has negative effects on the situation of the child (Social Protection Committee 2008; Bradshaw and Chzhen 2009, 2012; Atkinson and Marlier 2010, de Neubourg et al. 2012, Wüst and Volkert 2012). This might be partially explained by the fact that lone parent households have lower incomes and depend to a larger extent on state support in the form of financial transfers (Budría and Díaz-Giménez 2007). However, it is also the lack of time that might prevent single parents from nourishing their children in a more healthy way or from providing them with their basic needs in terms of education or leisure time. Parental employment status is another important determinant of children's

living standards. Parents' participation in the labour market is essential not only for enhancing the family's material situation, but also because it helps establish a family routine and strengthen the work-ethic and stability in children's lives. The available evidence indicates that children with parents in full-time employment are less likely to be deprived with respect to unemployed or part-time employed parents (Grodem 2008; Bastos and Machado 2009; TARKI 2010; de Neubourg et al. 2012).

The neighborhood in which families reside also affects the risk of child deprivation (Daly et al. 2008; TARKI 2010; de Neubourg et al. 2012; Sharkey et al. 2012). On the one hand, urbanization provides unique political, cultural, economic, and educational opportunities for children and families. On the other hand, to the extent that urban advances are uneven, this may lead to marginalized urban settings where children are exposed to high rates of crime, violence, substance use, abuse, housing deterioration and poverty. Another factor that affects the risk of deprivation is the number and age of children within the household. The number of children determines the amount of resources that can be assigned to each child, whereas age is a key determinant of resources allocation inasmuch as the type and quantity of children's necessities tend to change as children get older. Consistent with this view, the literature typically finds a positive correlation between the number of children at home and child deprivation (Moore et al. 2007; Bastos and Machado 2009) and a specific child deprivation profile for different child age groups (Wüst and Volkert 2012).

Other factors that have been found to be potentially relevant are whether the accommodation is owned or rented (Moore et al. 2007) and having an immigrant condition (Wüst and Volkert 2012). Having bad health, reduces the extent of labour market productivity and participation and increases the necessary resources for a household (Atkinson and Marlier 2010). Since in-work earnings typically show a strong progression from the early twenties until the mid-fifties, parental age is also likely to affect the risk of poverty and deprivation among children. These patterns are quite common across countries as de Neubourg et al. (2012) show in their international study.

Our paper is more in line with Grodem (2008), which is the only study that explicitly investigates the effect of household deprivation on child deprivation. She finds that deprivation reported by parents in key areas (housing, ownership of consumer durables and subjective experience of financial hardship) translates into deprivation for their children in the same areas. Nonetheless, our paper embraces a broader purpose, since we do not just analyze the effect of the lack of each household item by itself on child deprivation, but the effect of any combination of household items (profile). The identification of the effect of each different profile allows us to extract richer conclusions. Another difference is that we consider the whole population while Grodem (2008) considers only low-income families.

3 Data Set and Definitions

3.1 Data Set

The Statistics on Income and Living Conditions (EU-SILC) was constructed with the aim of collecting timely and comparable cross-sectional and longitudinal micro-data (European Commission 2009). It contains information on household income and on relevant household characteristics including housing, labour, health, demography, education and

deprivation. It thus allows researchers to follow a multidimensional approach for the study of social exclusion.

Launched in 2004, it contains information both at the household and personal level, consisting of primary (annual) and secondary (ad-hoc modules) target variables. The secondary target variables are introduced every 4 years (sometimes, less) only in the cross-sectional component. In this paper, we use the 2009 wave. This wave contains a module that entails specific questions on children's material deprivation. This module considers only children aged below 16.

Although the module provides information on specific child material deprivation items, the information is collected from the household. According to the survey protocol, if in a given household at least one child does not have an item it is then assumed that all the children belonging to that household lack that item. Then our unit of measurement is the household, while the unit of analysis is the child. We select the sample of Spanish households from the EU-SILC database. The rate of severely deprived children in 2012 reaches 7.4 %, according to the whole population EU index, while the corresponding number for adults is 5.8 % (Eurostat 2014). These figures make Spain an interesting country to analyse. Our sample contains 3662 observations, although due to lack of response in some variables we end up with 3006 observations.

3.2 Deprivation Indicators

Treating the problem of deprivation as multidimensional requires the aggregation of indicators into a single index. Although aggregation can lead to some opacity as to which are the most critical areas of well-being, it eliminates the problem of interpreting large batteries of indicators and facilitates comparison between years and population groups. Moreover, a composite index of deprivation requires judgment on the relative importance of each domain or indicator. While most studies give equal weights to the domains/indicators (Land et al. 2001; Barnes et al. 2008; Moore et al. 2007, 2008; Wüst and Volkert 2012), some others place more importance on indicators in which deprivation is not widespread, the so called frequency-based weighting or data-driven weight approach (Whelan et al. 2001; Bastos and Machado 2009; Figari 2011; Fusco 2012; Decancq and Lugo 2013).

In our analysis, we will consider data-driven weights where the weight associated to each child-specific item corresponds to the percentage of children having access to the item in the country (frequency-based weighting approach). This choice is motivated, first, by the idea that not having access to widely spread items should be a more relevant determinant of deprivation than less widely spread items. Therefore, widely-spread items are assigned higher weights. Secondly, weights are constructed based on the distribution of achievements in society, without taking into consideration any value judgment about how the trade-offs between the items should be. The advantages of this approach are threefold. First, it allows the deprivation score of a given child to increase if his/her conditions do not change and the conditions of all other improve. Second, the index takes into account economic conditions and social and cultural preferences in the access of items. Third, this approach is robust to the inclusion of items that are relevant only for a small minority of the population. Using a threshold of X or more hardships out of Y in presence of items whose possession is highly generalized⁴ implies that the threshold could be finally applied de facto to a list of smaller number of indicators thus reflecting only situations of very

⁴ We thank an anonymous referee for addressing this point.

severe deprivation. As a robustness check, we also compute indices where all items are weighted equally (the counting approach).

To compute the child deprivation index we make use of the fourteen specific items included in the EUSILC 2009 (Child Module). They refer to the affordability of: some new clothes; two pairs of properly fitting shoes; fresh fruit and vegetables once a day; three meals a day; one meal with meat, chicken or fish; books at home suitable for their age; outdoor leisure equipment; indoor games; regular leisure activities; celebrations of special occasions; inviting friends round to play and eat from time to time; participating in school trips or events that cost money; a suitable place to study; and outdoor space in the neighbourhood to play safely.⁵ The rest of the items are optional in the survey and there is no information on them in the Spanish sample. In our sample, the average level of child deprivation measured as the weighting index is 3.31 over a maximum of 100, and in the case of the counting index is 0.495 over a maximum of 12 (Table 1).

3.3 Link Between Child-Specific and Household Deprivation

At the household level, we build material deprivation measures using information on a set of enforced lack of goods and services that can be considered as necessary to enjoy a decent standard of living. In particular, we adopt the set of nine items proposed by Eurostat, which are: paying rent, mortgage or utility bills; keeping the home adequately warm; facing unexpected expenses; eating meat or proteins regularly; going on holiday; a television; a washing machine; a car; and a telephone.⁶

Some studies investigate child and household deprivation jointly, suggesting that children and parents experience parallel deprivation (Cantillon et al. 2004; Skevik 2008). Nonetheless, others have shown how parents and children may not experience deprivation to the same extent (Middleton et al. 1997; Daly and Leonard 2002; Gordon et al. 2003; Whelan and Maître 2012).

In Table 2, we cross-tabulate the incidence of deprivation among households and the extent of child deprivation. The first column shows that 50.53 % of the sample households are not deprived at all (i.e., they have access to all items), divided into 42.12 % of household whose children neither experience child deprivation and an 8.42 % that experiences some deprivation. As expected, we find that the proportion of child specific non-deprived decreases as the extent of household deprivation increases. Thus, using household indicators of deprivation as a proxy for children's deprivation is inadequate. Both figures reveal, from our point of view, that there is no clear correspondence between the number of items that the household lacks and the intensity of child deprivation, and it implies that the relevant feature is the combination instead of the number of items that the household fails afford. Therefore, there is a clear need to analyze child deprivation with specific items and at the same time to accomplish an in-depth study of the link with household deprivation.

⁵ See "Appendix" section for the complete list of items available in EU-SILC. For specific items whose measurement unit is not only all household members aged 1–15 but those 1–15 attending school, we have taken the decision of dropping them, since the option of assigning not deprivation if they are not attending school could be ad-hoc. We have checked the robustness of our results if instead we take the decision of considering them as not deprived if they are not attending school and main results remain.

⁶ As shown in "Appendix" section, EU-SILC data set contains more non-monetary household deprivation indicators. Although alternative groupings of those deprivation items and different indices, also based on the EU-SILC microdata, have been proposed (see Whelan and Maître 2012; Guio and Marlier 2013), we follow the official definition of Eurostat in terms of household deprivation with the nine items listed above.

Table 1 Descriptive statistics of deprivation

Variable	Mean	SD	Min	Max
Household deprivation (weighting index)	8.352	11.37	0	75.28
Household deprivation (counting index)	0.956	1.218	0	7
Child deprivation (weighting index)	3.318	8.188	0	86.92
Child deprivation (counting index)	0.495	1.218	0	12

Table 2 Descriptive statistics of deprivation

Child deprivation	Household deprivation			
	Not deprived (%)	Lack 1–3 items (%)	Lack more than 4 (%)	Total (%)
Not deprived	42.12	27.94	0.90	70.96
Lack 1–5 items	8.42	16.93	2.10	27.45
Lack more than 6	0.00	0.80	0.80	1.60
Total	50.53	45.68	3.79	100.00

The influence of household deprivation on child deprivation will be modeled through household deprivation profiles. Each household features a vector of nine zero–one components, representing access to the different items mentioned before. We generate a matrix with all the existing household deprivation vectors (theoretically 521 types, but 50 in practice), where each row comprises different combinations of “zeros” and “ones” for each household.⁷ We find that 49.90 % of the sample present a profile with all zero components, that is, no deprivation at all. The following most frequent deprivation profiles in our sample are characterized by not being able to afford 1 week annual holidays nor to face unexpected financial expenses. This is not surprising since we find that in 66.7 % of households cannot afford 1 week annual holidays, in 61.1 % of households cannot face unexpected financial expenses as the most frequent items, and in 5.6 % of households cannot afford meal with meat, chicken, fish as less frequent item that a household lacks. The idea is to determine whether these household deprivation profiles have different influences on child deprivation.⁸

3.4 Explanatory Variables

Following the existing evidence, we consider two different groups of variables, those that describe the situation in the household and those that are specific of parents. The main descriptive statistics of these variables are reported in Table 3.

⁷ For example the vector (0,0,0,1,0,0,0,1,0) means that household lacks item 4 and item 8.

⁸ As an anonymous referee suggests, it could be more informative to establish the link in terms of the household deprivation profile and the specific combination of items a child fails to afford but this requires the estimation of multiple separate regressions, as many as possible combinations of items a child fails to afford (theoretically $16,384 = 2^{14}$) and conclusions would be more difficult to obtain and interpret. The link analysed in this paper allow us to identify the household deprivation profiles more frequently associated to high children material hardship once we control for other characteristics of the household.

Table 3 Descriptive statistics of main determinants

Variable	Mean	SD
Household characteristics		
<i>Nch_2</i>	0.191	0.409
<i>Nch_3_5</i>	0.381	0.539
<i>Nch_6_11</i>	0.793	0.671
<i>Nch_12_16</i>	0.426	0.594
<i>Couple</i>	0.751	0.432
<i>Single</i>	0.067	0.251
<i>Urbanization (dense)</i>	0.449	0.497
<i>Urbanization (thinly)</i>	0.273	0.446
<i>Owner</i>	0.822	0.383
<i>Income</i> ^a	13.891	8.936
<i>Per_chronic</i>	0.202	0.295
Parents characteristics		
<i>Full_father</i>	0.777	0.416
<i>Tertiary_father</i>	0.303	0.460
<i>Young_father</i>	0.019	0.138
<i>Old_father</i>	0.005	0.070
<i>Immigrant_father</i>	0.111	0.314
<i>Full_mother</i>	0.432	0.495
<i>Tertiary_mother</i>	0.335	0.472
<i>Young_mother</i>	0.060	0.237
<i>Old_mother</i>	0.001	0.029
<i>Immigrant_mother</i>	0.136	0.342
N. Observations		3006

^a In thousands of Euros

To describe the household, we include the effect of the age and the number of children using four variables: younger than 3 years old (*Nch_2*); between three and 5 years old (*Nch_3_5*); between six and eleven years old (*Nch_6_11*); and between 12 and 16 years old (*Nch_12_16*). On average, there are respectively 0.19, 0.38, 0.79 and 0.43 number of children of each group age.

To assess the impact of the household type, we include a dummy variable to identify households with two adults (*Couple*). In our sample, around 75 % of the households have two adults. We capture the impact of the degree of urbanization on child deprivation considering two dummies *Urban_dense* and *Urban_thinly* to cover a densely (around 45 % of the household in the sample) and thinly populated area (around 27 % in the sample) respectively.⁹ The effect of whether the accommodation is owned or rented is included by means of a dummy variable (*Owner*) that takes value 1 to capture house ownership. More than 82 % of the households in the sample own the accommodation.¹⁰ The well-known

⁹ Densely populated area implies a density superior to 500 inhabitants per square kilometer, where the total population for the set is at least 50,000 inhabitants. Intermediate area means a density superior to 100 inhabitants per square kilometer, and either with a total population for the set of at least 50,000 inhabitants or adjacent to a densely-populated area. Finally, thinly-populated area is the set of local areas belonging neither to a densely-populated nor to an intermediate area.

¹⁰ A person is owner if he possesses a title deed independently of whether the house is fully paid or not.

relationship between deprivation and income is captured through the inclusion of *Income*, a variable for annual equivalised disposable household income.¹¹ We also control for the ratio of adults who suffer from any chronic illness or condition, (*Perc_chronic*). This variable ranges from 0 to 1, with a sample average of 0.20 members of the households reporting some type of chronic illness or condition.¹²

In the second group, we include variables for parental characteristics. Concerning the employment status, we include a dummy to capture fathers and mothers working full-time (*Full_father*; *Full_mother*). In our sample, around 78 % of the fathers are full-time employed, while this percentage for mothers is about 43 %. We include two dummy variables to capture tertiary education (*Tertiary_father*, *Tertiary_mother*), which in our sample are around 30 % for fathers and 33 % for mothers. We also consider whether they are younger than 30 (*Young_father*, which is about 2 % of the sample, and *Young_mother*, around 6 %), or older than 65 (*Old_father*, which represents around 0.5 % and *Old_mother*, almost 0.1 %). Finally, we include the effect of being immigrant with two dummies *Immigrant_father* and *Immigrant_mother*, which account for about 11 and 14 %, respectively, in the sample.

4 Empirical Model and Results

We consider that children are grouped into different kinds of households according to their household deprivation profile; therefore, our sample shows a hierarchical structure in which we anticipate some dependency, given that two children belonging to households with the same deprivation profile will display higher correlation in terms of deprivation than two children in households with different deprivation profiles. In order to account for the source of this correlation, we use a fixed effects model where the fixed effects are at the household deprivation-group level. Therefore, our estimates are controlling for unobservable characteristics at the group level. Specifically, child deprivation is assumed to be a function of the household and parental characteristics described in the previous section,

$$ChD_i = \beta_0 + \beta_1 HH_i + \beta_2 P_i + v_j + \varepsilon_i \quad (1)$$

where ChD_i is the extent of deprivation of child i living in a household with deprivation profile, HH_i is a vector with household characteristics and P_i captures parental characteristics. The term v_j represents the group fixed effect and ε_i is an iid error term.

To set the proportion of the total variance due to between-group differences, we use the information of the fraction of variance due to fixed effects to explain whether the explanatory variables fully capture the group-variation, and whether there is no significant group heterogeneity left.

The estimation allows us to determine whether belonging to a specific group affects the level of child deprivation, since we can calculate the fixed effect by deprivation profile. In this sense, we can figure out which household deprivation profiles are the most

¹¹ Total equivalised disposable household income is the sum for all household members of gross personal income components minus regular taxes on wealth, regular inter-household cash transfer paid, tax on income and social insurance contributions. Income refers to the previous calendar year. The equivalence scale used is the modified OECD scale.

¹² Chronic illness or conditions refer to permanent situations that are expected to require a long period of supervision, observation or care. Temporary problems are not considered.

unfavourable (i.e. profiles that put a child in worse situation).¹³ Our first result indicates that there is evidence of differences in the level of child deprivation between children who live in households with different deprivation profiles. This stems from the results of the F-test in Table 4.

Before entering in the specific effect of each socio-economic variable, we classify household deprivation profiles according to their relative position with respect to the overall mean child deprivation.¹⁴ The range of fixed effects varies from -4.57 , for those who suffer the lowest level of deprivation, to a level of 14.72 for those with the highest level, which is a level of deprivation ten times higher.¹⁵ Table 5 displays the fixed effects estimates associated with the different deprivation profiles.

We first find that there are three items that no household lacks: telephone, television, and washing machine. This fact is in line with literature in the order of acquisition of durables (Deutsch and Silber 2008). Moreover, there is no household that lacks neither meal with meat, chicken, fish.¹⁶

Secondly, we find common patterns of household deprivation among children who suffer an above-average level of deprivation (display a positive fixed effect). This group comprises children in households that certainly cannot afford simultaneously unexpected expenses nor go on holidays, in line with literature in the order in which different items and activities are first curtailed (Deutsch et al. 2015). This is not the case for children with child specific deprivation lower than the average (that is, those with negative fixed effect).

Moreover, among those that are above the average level of child deprivation (i.e. those that cannot afford holidays and unexpected expenses), we find that the highest intensities of child deprivation (i.e. the greatest positive fixed effects) are associated with the non-affordability of keeping the house warm. This item is so crucial that the lack of it is more relevant than the lack of the two other items (arrears and car).

Furthermore, we address the question of whether there is a relationship between the estimated group-level fixed effect and the weighted mean number of items that a household lacks. This analysis (Table 5; Fig. 1) reveals that there is no clear correspondence between the number of items that the household lacks (weighted number) and the intensity of child deprivation.¹⁷ This implies that the relevant feature is the combination instead of the number of items that the household fails to afford.

Regarding the effect of socioeconomic characteristics (Table 4), we get similar results to the literature. We find that there is a positive association between the number of children in the household and the level of child deprivation. In line with the international evidence,

¹³ Additionally, we have estimated the two model specifications considering a wider number of items at the household level (as proposed in Guio et al. 2015). Results are available upon request. We have also checked for the existence of regional differences and we have obtained that living in La Rioja and Ceuta is associated with greater child specific hardship while living in Principado de Asturias, Aragón, Murcia is associated with lower levels. Living in the rest of regions is not statistically significant. We finally do not include this regional considerations in order not to detract attention from our main goal.

¹⁴ We consider only deprivation profiles whose frequency is equal or larger than 10 observations which implies to drop 2.5 % of the sample.

¹⁵ Being above (below) the overall mean of child deprivation fixed effect implies a positive (negative) estimated group fixed effect. Our figures comprise 20 % of the dependent variable range. The figures reported in Table 5 correspond to those groups with more than ten observations. The range is -7.82 to 77.57 when all groups are considered.

¹⁶ This latter finding corresponds to household profiles with more than 10 observations.

¹⁷ We have performed a multinomial estimation of the error with respect to the number of items that each household lacks. The results confirm that there are no statistically significant differences in the effect of household deprivation level on the probability of belonging to a specific child deprivation group.

Table 4 Fixed effect estimation results

	Weighting approach	Counting approach
<i>Nch_2</i>	1.099*** (0.399)	0.151*** (0.057)
<i>Nch_3_5</i>	1.222*** (0.308)	0.170*** (0.044)
<i>Nch_6_11</i>	1.101*** (0.238)	0.156*** (0.034)
<i>Nch_12_16</i>	1.533*** (0.291)	0.212*** (0.042)
<i>Couple</i>	-0.734** (0.338)	-0.101** (0.048)
<i>Urban(dense)</i>	0.644* (0.343)	0.089* (0.049)
<i>Urban(tiny)</i>	0.254 (0.367)	0.028 (0.052)
<i>Tenure</i>	-1.210*** (0.374)	-0.174*** (0.053)
<i>Inc</i>	-0.041** (0.020)	-0.006** (0.003)
<i>Perc_chronic</i>	1.046** (0.460)	0.151** (0.066)
<i>Full_father</i>	-1.114*** (0.346)	-0.157*** (0.049)
<i>Tertiary_father</i>	0.084 (0.355)	0.009 (0.051)
<i>Young_father</i>	3.198*** (1.017)	0.440*** (0.145)
<i>Old_father</i>	4.077*** (1.413)	0.541*** (0.202)
<i>Immigrant_father</i>	1.871*** (0.595)	0.250*** (0.085)
<i>Full_mother</i>	-0.620** (0.296)	-0.084** (0.042)
<i>Tertiary_mother</i>	-0.598* (0.348)	-0.089* (0.050)
<i>Young_mother</i>	-0.539 (0.651)	-0.069 (0.093)
<i>Old_mother</i>	-3586 (4.215)	-0.540 (0.602)
<i>Immigrant_mother</i>	0.725 (0.539)	0.098 (0.077)
<i>Constant</i>	4.020*** (0.654)	0.605*** (0.093)
<i>Observations</i>	3.006	3.006

Table 4 continued

	Weighting approach	Counting approach
<i>N.groups</i>	50	50
σ_u^2	14.54	2.04
σ_e^2	7.27	1.04
Fraction of variance due to σ_u^2	0.80	0.80
R^2		
<i>Within</i>	0.06	0.05
<i>Between</i>	0.25	0.25
<i>Overall</i>	0.17	0.17
<i>F test (Ho: all $u_i = 0$) p value</i>	0.00	0.00

Table 5 Relationship between household and child deprivation

Group residuals (estimated)	Mean Child dep.	Mean Household dep.
-4.57	0.02	0.24
-2.42	0.03	0.12
-2.19	0.01	0.00
-2.16	0.01	0.21
-1.80	0.01	0.00
-1.77	0.04	0.22
-1.67	0.02	0.08
-1.64	0.02	0.09
-1.24	0.02	0.13
-0.86	0.03	0.08
0.74	0.05	0.18
3.61	0.10	0.31
5.71	0.11	0.18
8.42	0.14	0.31
11.42	0.18	0.32
11.82	0.18	0.33
14.31	0.20	0.41
14.72	0.21	0.43

This table only includes groups with more than ten observations

the level of child deprivation is reduced in households with two adults. Child deprivation is found to be negatively associated with the degree of urbanization (*Urban*) and household equivalent income (*Inc*). Home ownership (*Tenure*) decreases the level of child deprivation. As expected, higher levels of child deprivation are found in households reporting higher proportions of people with a chronic (long-standing) illness or condition (*Perc_chronic*).

Regarding parental characteristics, we find that working full-time (any of the parents) and tertiary educated mothers are associated with the lowest levels of child deprivation. Only for the case of fathers, being middle age and non-immigrant reduces the level of deprivation.

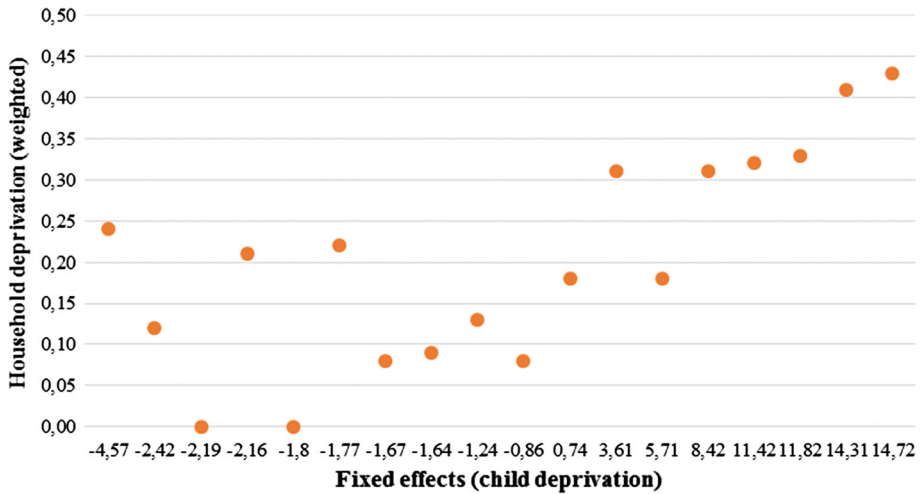


Fig. 1 Household deprivation versus child deprivation

The fixed effects estimation allows us to assess the degree of between-group variation. The fraction of variance due to deprivation profiles is around 80 % of the total variance in child deprivation.¹⁸ This figure reveals the crucial role of the household deprivation profiles in determining the intensity of child deprivation.

Therefore, we can conclude that there exists an association between child deprivation and the household deprivation profile that surpasses the socio-demographic characteristics of the household and the parents. We find that children who suffer an above-average level of deprivation belong to households that cannot afford unexpected expenses nor go on holidays. The non-affordability of keeping the house warm is also crucial for those in the worst situation. Household deprivation profiles reveal coping strategies of the parents and how resources are allocated within the household, which play a substantial role in shaping how children experience deprivation.

5 Discussion

One of the main conclusions that can be extracted from our results is that intra-household resource allocation plays an important role in determining children's well-being and their level of deprivation. A number of studies on child poverty have emphasized the importance of taking intra-household inequality into account (Save the Children 2001; Harpham 2003; Gordon et al. 2003; Corak 2006). Intra-household inequalities are compatible and explicable with modern theories on household decision-making, which conceive the intra-household allocation of resources as the result of bargaining between the household members, each having distinct preferences, particularly with respect to children, and a certain bargaining power.

Studying how resources are allocated among family members is thus a crucial exercise, particularly when vulnerable components, such as children, are concerned (Peluso and

¹⁸ For deprivation measured with counting approach, this fraction is the same.

Trannoy 2007). Nonetheless, analyzing how households allocate resources internally is a complex issue, because household arrangements are not only determined by individual preferences but are also strongly influenced by prevailing social and cultural norms in the long run, and by economic conditions in the short run. Bargaining and collective models have been used in the literature to analyze intra-household resource allocation. Empirical evidence based on this type of model has found, for instance, that reallocating income from fathers to mothers tends, on average, to increase children's consumption, nutrition, and well-being (for a review, see Lechene 2006). In a similar vein, there is evidence of the importance of the identity of the recipient of a cash transfer in explaining children's outcomes (Barrientos and Dejong 2006). Other studies suggest that the source of income in the household makes a difference to the types of goods purchased and consequently to their relative benefits for children (Lundberg et al. 1997; Duflo 2000).

The evidence thus suggests that neglecting the distributional dimension could lead to important measurement and identification errors. In our analysis, we have attempted to overcome this measurement error by measuring child deprivation through specific items. Moreover, in order to study the association between child deprivation intensity and household deprivation we have analysed the combination of items that the household cannot afford instead of the number of items it fails to afford. It is not the intensity of deprivation but the type of deprivation in the household that drives the link.

Our results suggest as described in previous section that there are specific household deprivation profiles that are significantly related to the level of child deprivation. We find that children who suffer an above-average level of child deprivation certainly belong to households that cannot afford unexpected expenses nor go on holidays. Additionally, the highest intensity of child deprivation is associated with the non-affordability of keeping the house warm. This result holds even when controlling for household socio-demographic characteristics, i.e., there is evidence of a deprivation transmission mechanism that goes beyond income and employment status, both of them conventional economic variables monitored by politicians and researchers. Therefore, the identification of household deprivation profiles is compelling in the search for children at risk of social exclusion.

In view of the previous results, we can conclude that an association exists between child deprivation and the household deprivation profile that surpasses the socio-demographic characteristics of the household and parents. While in some instances, children experience more deprivation than their parents, in others parents prioritize protecting their children from deprivation and household resources are directed towards making sure the children have an adequate standard of living, at the expense of the parents. Therefore, indicators measuring available resources at the household level (and thus capturing the overall deprivation of a group of people) are not enough to understand the level of deprivation experienced by children. More effort should be put to identifying the household deprivation profiles that are most harmful for children's well-being.

6 Conclusion

The recent credit crunch and the ensuing economic crisis have raised policy concerns on poverty and social exclusion particularly among children, who are more exposed than the overall population. Combating child poverty and social exclusion has recently been encouraged at the EU level in an attempt to contribute to the Europe 2020 strategy for stronger social cohesion and sustainable and inclusive growth. Tackling and preventing

child poverty and social exclusion is essential inasmuch as it does not only affect the well-being of today's children, but can also last long into adult life, producing damaging effects on future life opportunities.

An important consideration is that assuming that children obtain an equal share of available household resources charts a middle road between the deprivation they may be subject to if parents consume a disproportionate share, and the extra protection they might receive if parents make sacrifices to ensure children do not go without. Therefore there is a clear need to analyse child deprivation with specific items and, at the same time, to accomplish an in-depth study of the link with household deprivation beyond the mere intensity of household deprivation. For this purpose we have used the module of the EUSILC (2009) that contains specific child-deprivation items. Furthermore, we have focused our attention on Spain, a country where children suffer a level of material deprivation above the average in the EU.

Our results reveal that there exists an association between child deprivation and the household deprivation profile that surpasses the socio-demographic characteristics of the household and parents. We interpret these findings as evidence that adult decisions on the allocation of resources among household members play a crucial role in child deprivation outcomes. This role is at least as important as the household ability to generate resources, at least as far as income is concerned. This observation suggests that the deprivation-reducing scope typically attributed to income-based policies may be more reduced than previously thought.

It is therefore impossible to ignore the role that household norms and practices play in determining child deprivation, but it is also hard to incorporate these concerns in the analysis of child deprivation, due to the considerable heterogeneity in norms and arrangements. In this paper, we have attempted to estimate the link between household and child deprivation without introducing any assumption about the intra-household allocation of resources. Instead, we consider the multidimensionality of household deprivation to explore and identify the dimensions of household deprivation that are relevant for children's experience of deprivation. Understanding those dimensions of household deprivation that are most damaging for children will help policymakers in the design of the best policies and initiatives to combat child deprivation. Unfortunately, we can only interpret the findings in terms of intrahousehold allocation process without assessing the specific mechanism behind. Overall, a more profound understanding of the mechanisms, incentives and processes that surround adult decisions on households that, ultimately, affect their children's well-being is necessary in order to improve interventions.

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Appendix

Original questions in EUSILC data set

Non-monetary household deprivation indicators

Arrears on mortgage or rent payments
 Arrears on utility bills
 Arrears on hire purchase instalments or other loan payments
 Capacity to afford paying for one week annual holiday away from home
 Capacity to afford a meal with meat, chicken, fish (or vegetarian equivalent) every second day
 Capacity to face unexpected financial expenses
 Do you have a telephone (including mobile phone)?
 Do you have a colour TV?
 Do you have a computer?
 Do you have a washing machine?
 Do you have a car?
 Ability to make ends meet
 Lowest monthly income to make ends meet
 Financial burden of the total housing cost
 Financial burden of the repayment of debts from hire purchases or loans

Variables from HS010 to HS150 in EU-SILC

Non-monetary child deprivation indicators (2009 MODULE ON MATERIAL DEPRIVATION)

Basic needs

Some new (not second-hand) clothes
 Two pairs of properly fitting shoes (including a pair of all-weather shoes)
 Fresh fruit and vegetables once a day
 Three meals a day
 One meal with meat, chicken or fish (or vegetarian equivalent) at least once a day

Educational or leisure needs

Books at home suitable for their age
 Outdoor leisure equipment (bicycle, roller skates, etc.)
 Indoor games (educational baby toys, building blocks, board games, computer games, etc.)
 Regular leisure activity (swimming, playing an instrument, youth organisations, etc.)
 Celebrations on special occasions (birthdays, name days, religious events, etc.)
 Invite friends round to play and eat from time to time
 Participate in school trips and school events that cost money
 Suitable place to study or do homework
 Outdoor space in the neighbourhood where children can play safely
 Optional: Go on holiday away from home at least 1 week per year

Medical needs

Optional: Unmet need for consulting a GP or specialist, excluding dentists and ophthalmologists

Optional: Main reason for unmet need for consulting a GP or specialist, excluding dentists and ophthalmologists

Optional: Unmet need for consulting a dentist

Optional: Main reason for unmet need for consulting a dentist

Variables from HD100 to HD265 in EU-SILC 2009

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