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RESEARCH ARTICLE

Social spending, child deprivation and family structure: a multilevel study in 31 European countries

Antonio L. Pérez-Corral[1] · **Almudena Moreno-Mínguez**[2]

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Abstract

The purpose of this article is to examine the role of social spending policies in reducing child deprivation and inequality between family structures. In particular, based on the idea that the redistributive effects of such policies affect economic well-being in childhood, we analyse whether three functions of social spending (family/children, housing/social exclusion and sickness/disability) are associated with the reduction of different types of child deprivation (nutrition, clothing, education, leisure and social life) in Europe. We employ multilevel techniques for this purpose. Our findings are consistent with the hypothesis that greater social spending on sickness/disability benefits can reduce the risk of child deprivation, particularly for single-parent families, although we cannot exclude the possibility that this association is spurious. Family/children benefits and housing/social exclusion benefits seem to have a somewhat more limited effect but still contribute to reducing inequalities between single-parent and two-parent families in some types of deprivation.

Keywords Child well-being · Inequality · Poverty · Single-parent families · Social benefits

JEL Classification D31 · I38 · J12

✉ Antonio L. Pérez-Corral
antonio.perez@ugr.es

Almudena Moreno-Mínguez
almudena.moreno@uva.es

[1] Department of Applied Economics, University of Granada, Granada, Spain

[2] Department of Sociology and Social Work, University of Valladolid, Segovia, Spain

1 Introduction

Over recent decades there have been major demographic, employment, social and economic shifts in European countries affecting vulnerability in childhood, with a differing intensity depending on the strength of the social protection systems of each Welfare State (Cantó and Sobas 2020). The fact is that over the last 15 years European countries have been affected by economic crises such as that of 2008 and the Covid-19 pandemic, both with a major impact in terms of increased poverty and a worsening in the economic position of families (Chzhen 2017; Fanjul 2014; Palomino et al. 2020). Furthermore, when the Covid-19 health crisis began, many countries had not yet fully recovered from the consequences of the 2008 recession (OECD 2020). Children are, as a population group, highly vulnerable to situations of economic difficulty and precariousness, which have a negative impact on their present well-being (Bradshaw 2015; Saunders and Brown 2019) and also their adult life (Raphael 2011; Ratcliffe and McKernan 2010). In fact, individuals who experience poverty during their childhood have a high likelihood of remaining poor as adults, reflecting a high level of persistence in inequality across generations (Wagmiller and Adelman 2009). When studying child poverty, it is appropriate to place particular emphasis on the children of single-parent families, since this type of family notably experiences a high level of economic precariousness and disadvantage compared with two-parent families (Nieuwenhuis and Maldonado 2018).

Extensive literature covering European countries has demonstrated the key role of social spending in reducing poverty. There are many multilevel studies examining the relationship between the total level of social spending in countries and the risk of individual poverty (see, for example, Bárcena Martín et al. 2014; Chzhen 2017; Chzhen and Bradshaw 2012; Saltkjel and Malmberg-Heimonen 2017). However, certain aspects have received less attention in such studies. First, it is important to consider not only the total level of social spending and its impact on poverty, but also the effectiveness of many of its component programmes. On the other hand, few studies have used poverty measures that reflect the specific deprivations of children (Bárcena-Martin et al. 2017b). In this sense, there is still little understanding of the impact of social spending on the differences in child deprivation between single-parent and two-parent families. We have sufficient empirical evidence available to show that the successive crises have increased inequality among households, with a particular effect on households with children, and single-parent households (Cantó and Sobas 2020; Pérez Corral and Moreno Mínguez 2021; Rafferty and Wiggan 2017; Treanor 2018). Our aim through this article is thus to contribute to literature studying the relationship between social spending and child poverty in the European context.

According to the literature, the association between the volume and type of social spending and child poverty is complex due to the historical and institutional characteristics that welfare states have adopted in the process of modernisation. These peculiarities are compounded by many other factors, such as population composition, industrial policies, citizens' preferences, and normative and

cultural trends. Based on these historical and cultural trends, a fruitful comparative literature on families of nations in relation to the public policies promoted by each country was developed, with the aim of culturally and institutionally contextualising the differentiated architecture of state expenditure and revenue policies (Castles 1993; Obinger and Wagschal 2001). The objective of this article is more modest, as it attempts to provide comparative evidence of the relevance of incorporating the type of household in which a child resides into the design of redistributive social spending policies to reduce child poverty.

The specific goal we pursue is to analyse the relationship between different social spending programmes and the risk of child deprivation associated with single-parent families. To achieve this purpose, we employ multilevel techniques, using the cross-sectional microdata of the European Union Statistics on Income and Living Conditions (EU-SILC) for the year 2014, and data at a country level drawn from the Eurostat database.

2 Vulnerability, social spending policies and child deprivation in single-parent families

The literature has dealt extensively from a comparative perspective with the association between different models of social policy and the aggregate results obtained in terms of poverty and inequality. In particular, the classic article by Korpi and Palme (1998) started from the idea that Western welfare states differ in their institutional structures as they pursue different equality strategies. Clearly, the results of this work refer to the relationship between welfare state generosity and inequality effects. However, the effectiveness of the redistributive policies in welfare states is influenced by greater complexities not considered in these types of studies, such as the composition and structure of the population, as well as institutional and cultural orientations. In our case we start from the idea proposed by Gugushvili and Laenen (2021) that the composition and destination of social spending are not only a product of the generosity of the state, but also of the composition of the population, in this case the type of family in which children live. This is one of the fundamental contributions of this article to comparative studies on the effects of redistribution generated by welfare states in the reduction of inequality through direct and indirect transfer policies.

In this interpretative context the proportion of single parent families has increased in European Union countries in recent decades (Bernardi and Larenza 2018; Bradshaw et al. 2018; Martin and Kats 2003; Nieuwenhuis 2020). According to Eurostat data (Income and Living Conditions), 16.7% of European children aged under 18 lived in a single-parent household in 2022. It should be noted that this increase was mainly a consequence of new social and family trends which emerged from the Second Demographic Transition, such as the increase in divorce rates and births outside marriage (Lesthaeghe 1995; Van De Kaa 1987).

Previous literature has confirmed that the children of single-parent families are more likely to experience material deprivation than those of two-parent families (Bárcena-Martín et al. 2017a; b; Chzhen and Bradshaw 2012; Treanor 2018). The

main causes of this difference include the more limited economic resources of single-parent households, essentially because there is only one breadwinner, compared with the two potential breadwinners in a two-parent family (Thomas and Sawhill 2005; Waldfogel et al. 2010). Meanwhile, the absence of a partner living in the home makes it difficult for single parents to achieve a work-life balance, which may restrict their employment opportunities (Nieuwenhuis and Maldonado 2018). The economic and employment disadvantages faced by single-parent families, combined with the fact that parents in such households receive less support in caring for their children, may give rise to an increase in parental stress (Avison et al. 2007; Heinrich 2014; Stack and Meredith 2018). This leads to a reduction in the quality of childcare, and hence a reduced response to their needs (Heinrich 2014; Park and Walton-Moss 2012).

One disadvantage of single-parent families which is receiving increased attention in the literature in the context of Europe is the low educational profile of the mothers who are the head of many such families. According to the thesis of Mclanahan (2004) regarding "diverging destinies", changes in family behaviour associated with the Second Demographic Transition, such as the increase in the number of single-parent families, are mainly affecting women with more limited socio-economic resources. The author specifically argues that women with a lower level of education, aside from having weaker links to the labour market than those with a higher level of education, tend to have more children outside marriage, and at younger ages. This trend therefore has the potential to amplify inequality in family resources and the deprivation of children, depending on their socio-economic background (Mclanahan 2004). In the United States, there was already a negative educational gradient for single mothers of the end of the 1960s, while in European countries this first became more visible in the late 80 s and early 90 s (Härkönen 2017).

The economic vulnerability of children raised in single-parent families can also be explained in terms of the social spending policies of the Welfare State. We see the emergence in the mid-1990s of the paradigm of "social investment", focusing debates as to the effects of Welfare State social policies (Hemerijck 2018; Kowalewska and Vitali 2021). This paradigm is based on the idea that the investment in social policies helps Welfare States adapt to social benefit demands in the post-industrial era (Kowalewska and Vitali 2021). To achieve such goals, it is essential to promote the dual-breadwinner family model, facilitating the occupational integration of both parents, while achieving an appropriate work/life balance for the situation of each family. However, an increase in alternative forms of family to the two-parent model, such as single-parent families, has revealed cracks in the "social investment" strategy. Furthermore, the studies conducted from this perspective have emphasised the lower risk of child poverty and better work and family arrangements among dual-earner couples compared with single-parent families (Esping-Andersen 2002, 2016). Comparative studies as to the risks and socio-economic precariousness that single-parent families must deal with compared with two-parent families have emphasised the significance of child-centred social investment strategy in explaining the differences in the vulnerability of children depending on the Welfare State model (Esping-Andersen 2002). The economic and personal circumstances of single-parent and two-parent families vary widely, and the literature concludes that social and

family policies make a substantial contribution, together with employment policy, in reducing the economic vulnerability of single-parent families, and hence the child deprivation and poverty of lower-income families (Atkinson 2016; Cuesta et al. 2018; Flaquer and Garriga 2009; Hakovirta and Hiilamo 2012; Jenson 2018). In this regard, previous studies have indicated that the vulnerability of single-parent families may vary within the European context depending on the development of public Welfare State policies (Hakovirta et al. 2022; Maldonado and Nieuwenhuis 2015). Specifically, in those countries where there is greater support for single-parent families through redistributive policies and support in achieving a work/life balance, such households reveal lower levels of income poverty and inequality when compared with two-parent families. Although in some European countries, such as the Nordic states, this type of policy is well developed, in the Welfare States of Southern European countries, it is still highly limited (Almeda et al. 2016). A recent study for the Nordic countries has found that single-parent families face a double disadvantage due to educational gradient and job insecurity (Härkönen et al. 2023). This helps to explain the higher level of child poverty in this type of family compared to two-parent families. In the same line of research, studies have also found that in the Nordic countries, family policies aimed at this type of family have alleviated child poverty rates (Bradshaw et al. 2018). However, there are not enough studies that combine the effects of single parenthood with the effects of redistributive policies on child poverty. In short, the national context of social spending policy plays an important role in shaping child poverty and child well-being. This is an important contribution, as most of the literature focuses on studying the role of individual and family characteristics, without considering the institutional context that may influence the meaning of family policies and child wellbeing.

Given the characteristics of single-parent families, placing them in a more vulnerable and disadvantaged position compared with two-parent households, one would expect the precariousness of inequality resulting from the Great Recession to have a more detrimental impact on children living in such households (Nieuwenhuis and Maldonado 2018). Starting out from this scenario, we must now take into account the economic and social consequences of the last health crisis (Palomino et al. 2020; Perugini and Vladisavljević 2021). These events confirm the need to analyse the effect of social protection policies on the well-being of the children of vulnerable families.

Monetary measurements have traditionally been used to study household poverty (Bradshaw and Mayhew 2010), very commonly using the threshold of 60% of the equivalent national median income to identify households at risk of poverty (see, for example, Chzhen 2017; Chzhen and Bradshaw 2012; Nygård et al. 2019; Saltkjel and Malmberg-Heimonen 2017). However, there is a broad consensus in the literature as to the multidimensional nature of poverty, and non-monetary measurements such as material deprivation are therefore becoming increasingly significant in the European context (Bradshaw and Mayhew 2010; Guio et al. 2016). Material deprivation measurements are in fact considered more appropriate than income to evaluate the living conditions of individuals and families (Fusco et al. 2010).

Several of the studies available have analysed the relationship between the level of social spending in European countries and the material difficulties faced by

individuals. These contributions include the study by Bárcena-Martín et al. (2014), confirming the existence of a negative association between spending on social protection and the risk of material deprivation. The most notable findings also include the fact that differences among individuals in terms of deprivation depending on educational level, employment situation and income are lower in those countries with greater social spending. Very similar results are found by Nelson (2012), who examines the effect of the level of spending on social assistance. Similarly, the findings of Saltkjel and Malmberg-Heimonen (2017) confirm that in general the most vulnerable groups in terms of employment situation, educational level and health are less likely to experience material difficulties in those countries that spend more on social benefits. In short, previous evidence obtained would seem to demonstrate that the generosity of social spending alleviates material difficulties, with the most vulnerable groups being the main beneficiaries.

Although limited in number, some studies have used specific measurements of child deprivation (Bárcena-Martín et al. 2017b; Guio et al. 2020), since while the material difficulties experienced by the household's adults are correlated to the deprivation faced by the children (Grødem 2008), they are not always simultaneous (Gábos et al. 2011). One of the most interesting aspects of the study by Bárcena-Martín et al. (2017b) is that it analyses the relationship between various social protection programmes and child deprivation, finding that the reduction in deprivation is mainly implemented through programmes that do not solely focus on households with children.

It should be stressed that previous studies tend to use a general measurement of deprivation based on the lack of various types of goods and services. In this regard, and according to the results obtained by Garratt (2019), social benefits might not always be effective in protecting families and individuals against all types of deprivation. Specifically, for European countries as a whole, the author finds that spending on social benefits does not seem to mitigate nutritional deprivation. Such findings stress the need to also distinguish between the dimensions of material deprivation. One of the main contributions of our article will therefore be to examine the role of social spending in reducing different types of child deprivation.

Furthermore, the impact of social spending on the child deprivation of more vulnerable households, such as single-parent families, has received little attention in previous empirical literature. Chzhen and Bradshaw (2012) show that spending on cash benefits has no impact on the material difficulties of single-parent families. However, the deprivation measurement used in this study is based on items of household deprivation that do not reflect the specific circumstances of children. There is therefore a need for more studies examining the effect of social spending on child deprivation depending on family structure.

Bearing in mind all these considerations, our main research question is whether social spending programmes on family/child benefits, housing/social exclusion benefits, and sickness/disability benefits can reduce differences in child deprivation between single-parent and two-parent families within the European context. With regard to family/children benefits, although the limited literature that has examined this social spending has not found it to be associated with lower levels of child deprivation (Bárcena-Martín et al. 2017b; Guio et al. 2020), there are no studies that

have focused on its effect according to the type of family. Housing and social exclusion benefits are often targeted at the poor population (Cammeraat 2020). Given the vulnerability of single-parent families, these benefits may be effective in reducing inequalities between family structures. Lastly, Bárcena-Martín et al. (2017b) found that sickness and disability benefits are associated with lower child deprivation. In this sense, households with disabled or sick parents or children are at a high risk of poverty (Blackburn et al. 2010; Bradshaw 2010), especially if they are single-parent households (Engster 2012). Considering the high rates of divorce among parents of disabled children (Blackburn et al. 2010), these benefits could be of great assistance to single-parent families. In addition, previous studies have indicated that single mothers are more likely to suffer from limiting long-standing illness than cohabiting mothers (Lanza-León & Cantarero-Prieto 2024; Van de Velde et al. 2014).

On the other hand, the results presented in this article may provide additional evidence to the contradictory findings reported by previous studies on the association between aggregate data on social spending and its contribution to child poverty reduction (Van Lancker and Van Mechelen 2015). In these studies, there is an implicit debate on whether the redistributive policies of universalistic welfare states contribute to reducing poverty and inequality to a greater extent than those of selective welfare states, taking into account the policy orientation and the volume of social spending (Brady and Bostic 2015; Clasen and Siegel 2007; Obinger and Wagschal 2010). While this paper has not resolved this empirical dilemma, it can provided evidence on how the introduction of new factors and dimensions in the analysis of the effects of redistributive policies on child poverty reduction contributes to enriching comparative studies on welfare states.

3 Data and variables

The main database used is the EU-SILC, which contains data at a micro level on certain characteristics of households and their members, including income, living conditions, education, employment and health (Eurostat 2021). To supplement the main information, the EU-SILC provides an ad hoc module each year, with secondary variables concerning specific topics (Wolf et al. 2010). Given the purpose of this study, we use the cross-sectional microdata from the 2014 wave, as it is currently the last wave to offer a module with variables for child deprivation. Specifically, the information from this module addresses child deprivation at the household level, since it indicates whether at least one of the children in the household (aged between 1 and 15 years) lacks a particular item (European Commission 2014). We furthermore include data at the country level obtained from the statistics compiled by Eurostat for the year 2014.

The analyses are applied to a sample of 53,968 households with at least one child aged 1–15 from 31 European countries. These countries are Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Poland, Portugal, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland and the United Kingdom. Although information is also

available for Norway, we did not include the country in our final sample because of the lack of data for some of the main variables studied.

As dependent variables we used the dimensions of child deprivation established by the Multiple Overlapping Deprivation Analysis for the European Union (EU-MODA) (Chzhen et al. 2016, 2018). These dimensions comprise material deprivation items from the EU-SILC. We specifically used those EU-MODA dimensions comprising only items of child deprivation (nutrition, clothing, education, leisure and social life). Similarly to Chzhen et al. (2018), the dimensions studied use the following items:

1. *Nutrition*: (a) Fruit and vegetables once a day; (b) one meal with meat, chicken or fish (or vegetarian equivalent) once a day.
2. *Clothing*: (a) Some new clothes, (b) two pairs of properly fitting shoes.
3. *Education*: (a) Books at home suitable for children's age, (b) early childhood education and care, (c) participate in school trips and events.[1]
4. *Leisure*: (a) Outdoor leisure equipment, (b) indoor games, (c) regular leisure activity
5. *Social life*: (a) Celebrations on special occasions, (b) invite friends round to play or eat from time to time.

These child deprivation variables are measured as dummy variables, given the code "1" if the household contains children deprived of at least one of the items of the respective dimension, and "0" if the children face no deprivation.[2] According to EU-MODA methodology, children are considered deprived of a certain item if the household cannot afford it and when the item is not available for any other reason (Chzhen et al. 2016, 2018).

As for the independent variables, the main variable at a micro level is *Single-parent family,* given the value of 1 if only one of the parents lives in the household, and 0 for a two-parent household. This variable identifies as single-parent households all those where there is a single-parent family unit, even if other relatives or adults live in the household (Chzhen and Bradshaw 2012). Similarly, regardless of the number of adults in the household, two-parent households are identified as such whenever there is a two-parent family unit.[3] In accordance with prior studies (Bárcena-Martín et al. 2017a, b; Chzhen and Bradshaw 2012; Saltkjel and Malmberg-Heimonen 2017), we also include a set of control variables. The variable *Youngest child 12–15* has the value of 1 if the youngest child in the household is between 12 and 15 years old, and 0 if the child is 11 years old or younger. *Large family* indicates if there are

[1] Early childhood education and care is only included in the education dimension if the household contains children aged between three years and the minimum compulsory schooling age, while participation in school trips is included if there are children of school age.

[2] Following Chzhen et al. (2018), households with missing values in any of the child deprivation items have not been included in the analysed samples.

[3] In alternative analyses, available upon request, we restrict the sample to households where only the family unit resides, as well as to those households in which the parents are of working age. The main regression results remain practically unaltered in terms of signs and significance.

three or more children in the household. *Non-home ownership* has the value of 1 if the accommodation where the family lives is not owned by any of its members. *Family unit* takes the value 1 if only the family unit resides in the household, and 0 if other adults also reside. With regard to the characteristics of the parents, the dummy *Young parents* identifies families with parents aged 30 or under. *Parents with low educational level* has the value of 1 if neither parent in the household has higher than lower secondary education. *Parent unemployed* indicates if at least one of the parents in the two-parent household or the sole parent in the single-parent household is unemployed. *Immigrant parents* serves to identify those households with parents who were not born in the country of residence.

The country-level control variables are *GDP pc*, which is the GDP per capita in PPS as a percentage of the EU-27 average, and *Long unemployment rate*, which indicates the long-term unemployment rate in the countries. We also include three social spending variables (measured as a percentage of GDP). *Family/children* indicates spending on social benefits primarily targeted at families with children. *Housing/social exclusion* reflects benefits aimed at assisting with housing costs and combating social exclusion. *Sickness/disability* represents expenditure on benefits to help sick or disabled people. These social protection functions are included in the European System of Integrated Social Protection Statistics (ESSPROS) (Eurostat 2019).[4]

4 Analysis

The analyses are based on the estimation of multilevel binomial logistic regression models, which take into account the hierarchical structure of the data, and also allow predictors to be used at the country level (Hox 2010). First of all, for each of the dependent variables of child deprivation, we begin with a null model with no explanatory variables. This empty model is used to compute the Intraclass Correlation Coefficient (ICC), which indicates the proportion of the variance in the dependent variables due to differences between countries. Then, we estimate a model with the explanatory variables at the micro-level and the control variables at the country-level (Model 1). This allows us to examine the relationship between these independent variables and the different types of deprivation. This model, which only allows the intercept to vary between countries, is specified as follows:

$$\mathrm{Log}\left[P_{hc}/\left(1-P_{hc}\right)\right] = \gamma_0 + \gamma_1 \mathrm{F_{hc}} + \gamma_2 \mathrm{X_{hc}} + \gamma_3 C_c + \varsigma_{0c}$$

where P_{hc} is the probability that children in household h in country c will experience material deprivation; F_{hc} represents the single-parent family variable; X_{hc} is the set of micro-level control variables; C_c represents the country-level control variables; and ς_{0c} is the random intercept.

[4] See Table A1 in the appendix for a more detailed description of the different types of benefits covered by social spending variables.

Subsequently, we estimate models in which the social spending variables are included (Models 2, 3 and 4). Similar to Bárcena Martín et al. (2023) and Guio et al. (2020), each model includes a separate social spending variable (S_c).

$$\text{Log}\left[P_{hc}/\left(1-P_{hc}\right)\right] = \gamma_0 + \gamma_1 F_{hc} + \gamma_2 X_{hc} + \gamma_3 C_c + \gamma_4 S_c + \varsigma_{0c}$$

Lastly, we interact the single-parent household variable with the social benefits variables (Models 5, 6 and 7). Using these models, we evaluate whether the association between this type of vulnerable family and child deprivation varies according to the level of social spending in each of the functions. We adopt a conservative focus by adding the random slope for the level 1 variable of the interactions (Heisig and Schaeffer 2019). This thus allows the single-parent household variable effect to differ between countries. These models where we include cross-level interaction terms may be represented as:

$$\text{Log}\left(P_{hc}/\left(1-P_{hc}\right)\right) = \gamma_0 + \gamma_1 F_{hc} + \gamma_2 X_{hc} + \gamma_3 C_c + \gamma_4 S_c + \gamma_5 S_c F_{hc} + \varsigma_{0c} + \varsigma_{1c} F_{hc}$$

where ς_{1c} is the random slope of the level 1 variable of the interaction.

5 Results

5.1 Descriptive results

Before showing the main findings obtained in the multilevel models, we present a descriptive portrait of the families included in our study sample. As shown in Fig. 1, in all European countries there is a greater prevalence of two-parent than single-parent households. Latvia, Lithuania, Iceland and the United Kingdom are the countries with the highest percentage of single-parent households. Meanwhile, Greece, Croatia, Poland and Slovakia have the lowest percentages of this type of family.

Figure 2 reports the child deprivation rates in each of the dimensions for the two types of family. Following Chzhen et al. (2018), a child is considered to be deprived if living in a household where there is material child deprivation.[5] It may in general be found that the five types of child deprivation are more frequent among children in single-parent than two-parent households. Bulgaria, Hungary and Romania typically reveal higher rates of child deprivation in single-parent households. Particular mention should be made of the high percentage of children in single-parent families experiencing leisure deprivation in Bulgaria and Romania (83% and 98%, respectively). Meanwhile, and although this depends on the type of child deprivation, the Nordic countries and Switzerland have the lowest percentages of children in single-parent households experiencing deprivation.

[5] As these authors indicate, it should be taken into account that child deprivation rates may be fairly high, since the EU-SILC variables provide information on deprivation at the household level, and cannot be used to distinguish the specific situation of each child.

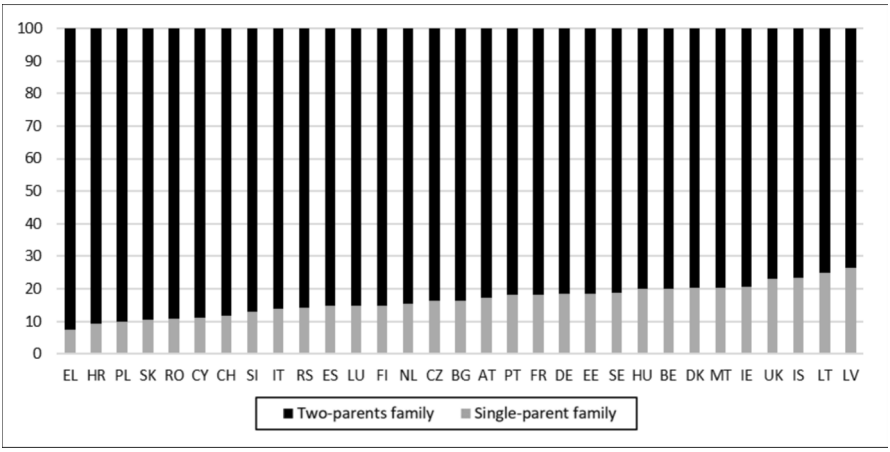

Fig. 1 Distribution of households according to type of family (%). 31 European countries. *Note* Data based on households with children aged 1–15 years. Country labels: AT = Austria, BE = Belgium, BG = Bulgaria, CH = Switzerland; CY = Cyprus, CZ = Czech Republic, DE = Germany, DK = Denmark, EE = Estonia, EL = Greece, ES = Spain, FI = Finland, FR = France, HR = Croatia, HU = Hungary, IE = Ireland, IS = Iceland, IT = Italy, LT = Lithuania, LU = Luxembourg, LV = Latvia, MT = Malta, NL = Netherlands, PL = Poland, PT = Portugal, RO = Romania, RS = Serbia, SE = Sweden, SI = Slovenia, SK = Slovakia, UK = United Kingdom

Figure 3 shows the sum of expenditure on the three functions of social protection for each of the European countries. Denmark, Iceland, Finland and France are the countries with the highest level of expenditure as a percentage of GDP. On the other hand, Latvia, Romania, Cyprus and Lithuania are the countries with the lowest expenditure.

5.2 Results of multilevel models

The ICC of the empty model in Table 1 indicates that approximately 22% of the variation in deprivation in nutrition and clothing, 17% of the variation in deprivation in education, 15% of the variation in deprivation in leisure, and 20% of the variation in deprivation in social life are due to differences between countries.

Table 2 presents the results of Model 1. The single-parent family variable coefficient is positive and statistically significant for the five types of child deprivation. These results confirm that the children of single-parent families are more likely to experience deprivation in the different dimensions studied than those of two-parent families. In fact, the greatest effect of single parenthood seems to take place in the dimension of nutrition and clothing. We likewise find that in general the variables for the remaining household characteristics have a statistically significant relationship with child deprivation. Specifically, if the youngest child in the household is between 12 and 15 years old, there is a greater risk of nutritional child deprivation, but a lower risk of deprivation in terms of clothing, leisure and social life. Likewise, children have a greater likelihood of deprivation in nutrition, clothing and education

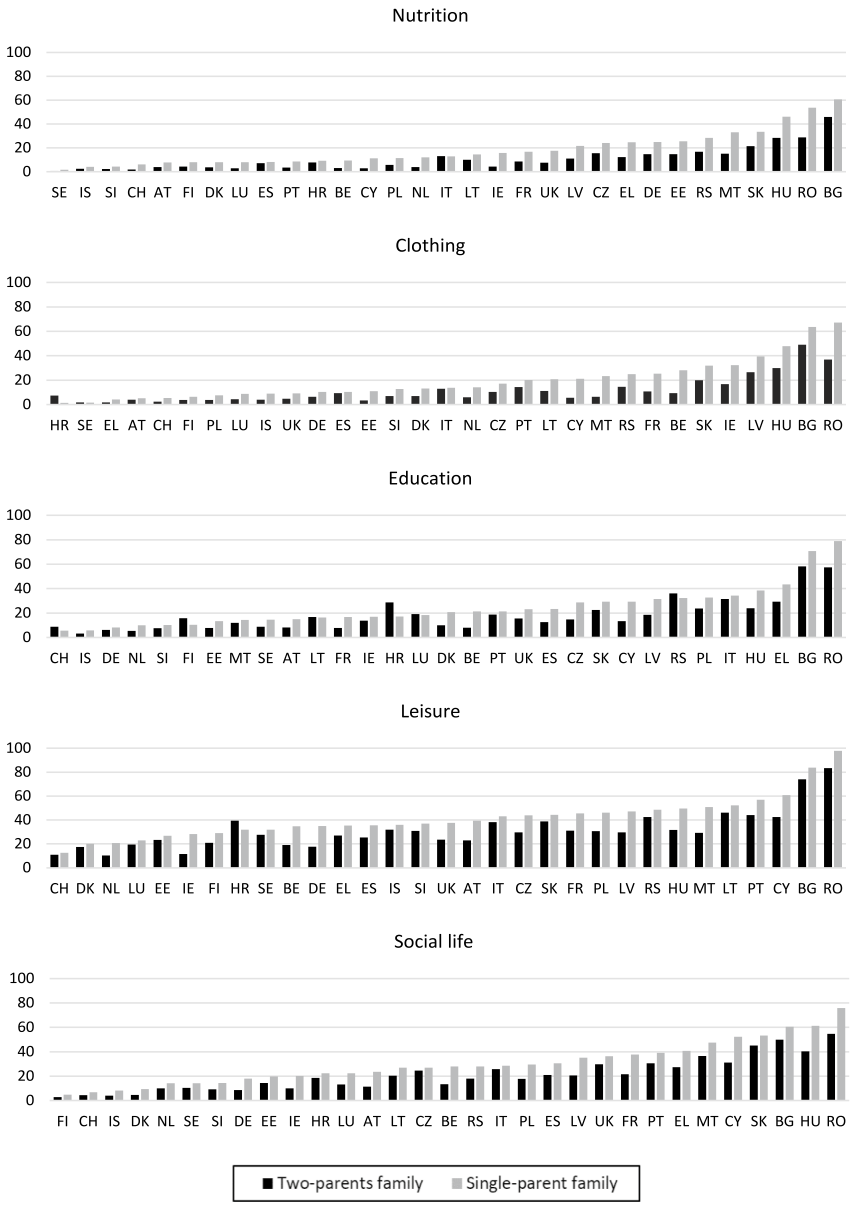

Fig. 2 Child deprivation rate by dimension and type of family (%). 31 European countries. *Note* AT = Austria, BE = Belgium, BG = Bulgaria, CH = Switzerland; CY = Cyprus, CZ = Czech Republic, DE = Germany, DK = Denmark, EE = Estonia, EL = Greece, ES = Spain, FI = Finland, FR = France, HR = Croatia, HU = Hungary, IE = Ireland, IS = Iceland, IT = Italy, LT = Lithuania, LU = Luxembourg, LV = Latvia, MT = Malta, NL = Netherlands, PL = Poland, PT = Portugal, RO = Romania, RS = Serbia, SE = Sweden, SI = Slovenia, SK = Slovakia, UK = United Kingdom

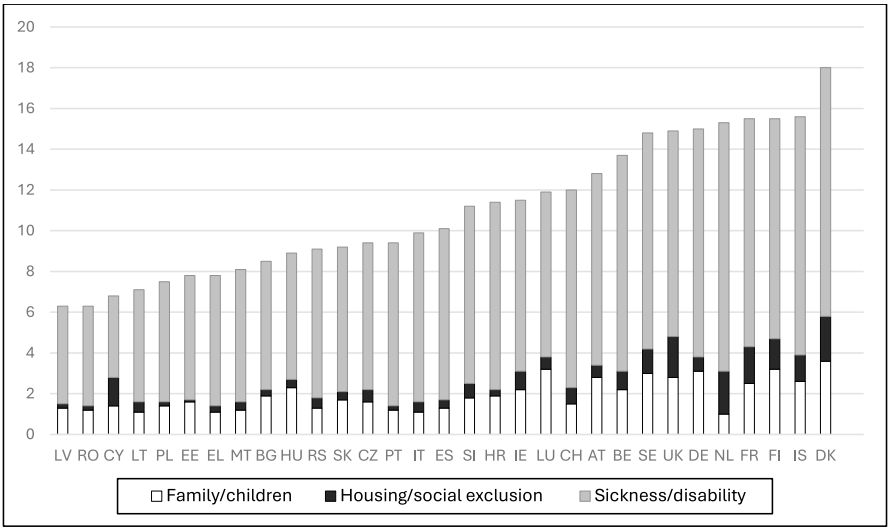

Fig. 3 Social spending by functions (as a percentage of GDP). 31 European countries. *Note* Country labels: AT = Austria, BE = Belgium, BG = Bulgaria, CH = Switzerland; CY = Cyprus, CZ = Czech Republic, DE = Germany, DK = Denmark, EE = Estonia, EL = Greece, ES = Spain, FI = Finland, FR = France, HR = Croatia, HU = Hungary, IE = Ireland, IS = Iceland, IT = Italy, LT = Lithuania, LU = Luxembourg, LV = Latvia, MT = Malta, NL = Netherlands, PL = Poland, PT = Portugal, RO = Romania, RS = Serbia, SE = Sweden, SI = Slovenia, SK = Slovakia, UK = United Kingdom *Source*: Eurostat database

Table 1 Null model

	Nutrition	Clothing	Education	Leisure	Social life
Constant	− 2.433***	− 2.437***	− 1.775***	− 0.812***	− 1.474**
	(0.175)	(0. 174)	(0.148)	(0.137)	(0. 162)
Var constant	0.934	0. 929	0.670	0.578	0 .808
ICC	0.221	0.220	0.169	0.150	0.197
Log likelihood	− 16,162.411	− 15,700.600	− 22,116.329	− 31,120.292	− 25,291.328
Observations	53,968	53,968	53,968	53,968	53,968
Number of countries	31	31	31	31	31

Standard errors in parentheses

*$p < 0.10$; **$p < 0.05$; ***$p < 0.01$

if they live in large families (three or more children). The risk of child deprivation in the five dimensions is greater if no member of the household is the homeowner. On the contrary, in households where only the family unit resides, there is a lower likelihood of deprivation. Focusing on the characteristics of the parents, the risk of children experiencing deprivation in terms of education, leisure and social life is higher if the parents are aged 30 or younger. In households where the parents have a low level of education, are unemployed or immigrants, there is a greater risk of child deprivation in any of the five dimensions. With regard to the country-level variables, it can be seen that GDP per capita has a negative and statistically significant

Table 2 Multilevel logistic model of child deprivation

Model 1					
	Nutrition	Clothing	Education	Leisure	Social life
Level 1 variables					
Single-parent family	0.476*** (0.039)	0.511*** (0.039)	0.220*** (0.034)	0.164*** (0.028)	0.222*** (0.031)
Youngest child 12–15	0.320*** (0.037)	−0.076* (0.042)	0.042 (0.032)	−0.098*** (0.026)	−0.083*** (0.029)
Large family	0.552*** (0.041)	0.728*** (0.040)	0.780*** (0.033)	0.003 (0.029)	0.049 (0.033)
No-home ownership	0.388*** (0.037)	0.595*** (0.037)	0.437*** (0.031)	0.569*** (0.025)	0.484*** (0.028)
Family unit	−0.192*** (0.038)	−0.192*** (0.040)	−0.348*** (0.032)	−0.298*** (0.027)	−0.290*** (0.030)
Young parents	0.016 (0.059)	0.074 (0.059)	0.343*** (0.048)	0.838*** (0.041)	0.595*** (0.043)
Parents with low educational level	0.948*** (0.041)	0.991*** (0.042)	0.947*** (0.035)	0.893*** (0.032)	0.777*** (0.037)
Parent unemployed	0.867*** (0.038)	0.983*** (0.038)	0.704*** (0.032)	0.683*** (0.028)	0.706*** (0.030)
Immigrant parents	0.223*** (0.059)	0.353*** (0.056)	0.496*** (0.046)	0.402*** (0.039)	0.426*** (0.042)
Level 2 variables					
GDP pc	−0.013*** (0.004)	−0.013*** (0.004)	−0.008*** (0.003)	−0.013*** (0.003)	−0.010*** (0.003)
Long unemployment rate	−0.029 (0.042)	−0.062 (0.043)	0.038 (0.034)	−0.045 (0.029)	0.013 (0.037)
Constant	−1.587*** (0.551)	−1.499*** (0.565)	−1.546*** (0.448)	0.458 (0.384)	−0.799* (0.482)
Var constant	0.727	0.765	0.483	0.355	0.561
ICC	0.181	0.189	0.128	0.097	0.146
Log likelihood	−15,029.206	−14,170.082	−20,430.211	−29,030.646	−23,783.012
Observations	53,968	53,968	53,968	53,968	53,968
Number of countries	31	31	31	31	31

Standard errors in parentheses

*$p<0.10$; **$p<0.05$; ***$p<0.01$

relationship with all dimensions of deprivation. However, the results do not show a significant association between the unemployment rate and any of the dimensions.

Models 2, 3, and 4 in Table 3 show the results of social spending variables. Specifically, spending on family/children benefits (Model 2) does not seem to have a significant relationship with any of the deprivation dimensions, while housing and social exclusion benefits (Model 3) only have a negative and significant relationship with the education dimension. Spending on sickness/disability benefits (Model 4) has a negative and statistically significant relationship with all five dimensions. Furthermore, the greatest effect of these benefits is observed in the social life dimension.

Models 5, 6 and 7 present the results of the cross-level interactions. In Model 5, the coefficient of interaction between the single-parent family variable and social spending on family benefits is significant and negative for leisure deprivation. To facilitate the interpretation of this interaction, we estimate the average marginal effect of single-parent households according to the level of social spending on family/children benefits. Figure 4 shows that single-parent status has a low effect on leisure deprivation in countries with higher spending. For the remaining deprivation dimensions (nutrition, clothing, education and social life), the coefficient of the interaction term with social spending on family/children benefits is not statistically significant.

The results of Model 6 show that the coefficient of the interaction with spending on housing and social exclusion is significant and negative for deprivation in leisure and social life. As illustrated in Fig. 5, the greater the spending on housing and social exclusion benefits, the lower the average marginal effect of single parenthood on deprivation in leisure and social life, which may even disappear.

Focusing on the results of interaction with spending on sickness/disability benefits (Model 7), it may be seen that the coefficient of this interaction is also significant and negative for deprivation in leisure and social life. In countries with higher sickness/disability benefits, the average marginal effect of single parenthood on the two dimensions is lower (Fig. 6).

6 Conclusions and discussion

The prevailing explanations for child poverty have been based on the effects of single parenthood on the socio-economic situation of families (Chzhen and Bradshaw 2012; Rafferty and Wiggan 2017; Treanor 2018), while neglecting studies into the effect of redistributive social spending policies on child deprivation according to the type of family in which the children live.

We first studied the relationship between social spending and child deprivation without differentiating between family structures. The results indicate that sickness and disability benefits are negatively correlated with all dimensions of child deprivation, which is consistent with previous research (Bárcena-Martin et al. 2017b). In addition, Engster (2012) finds a very similar result when examining child poverty using income measures. When we focus the analysis on the relationship according to the type of family, we once again find the significant relevance of sickness and disability benefits. This social spending seems to reduce differences between

Table 3 Multilevel logistic models of child deprivation (social spending variables)

Family/children benefits	Model 2					Model 5				
	Nutrition	Clothing	Education	Leisure	Social life	Nutrition	Clothing	Education	Leisure	Social life
Family/children	0.035 (0.259)	−0.103 (0.265)	0.012 (0.211)	0.071 (0.180)	−0.212 (0.224)	0.015 (0.267)	0.011 (0.268)	0.023 (0.213)	0.087 (0.182)	−0.216 (0.225)
Interaction										
Single-parent family* Family/Children						0.029 (0.067)	−0.039 (0.084)	−0.092 (0.084)	−0.098* (0.055)	−0.028 (0.070)
Housing and social exclusion benefits	Model 3					Model 6				
	Nutrition	Clothing	Education	Leisure	Social life	Nutrition	Clothing	Education	Leisure	Social life
Housing/social exclusion	−0.441 (0.275)	−0.304 (0.288)	−0.416* (0.221)	−0.271 (0.194)	−0.359 (0.243)	−0.462 (0.282)	−0.287 (0.283)	−0.430* (0.223)	−0.241 (0.197)	−0.320 (0.244)
Interaction										
Single-parent family* Housing/social exclusion						0.007 (0.080)	0.120 (0.093)	0.070 (0.106)	−0.117* (0.065)	−0.166** (0.079)
Sickness/disability benefits	Model 4					Model 7				
	Nutrition	Clothing	Education	Leisure	Social life	Nutrition	Clothing	Education	Leisure	Social life
Sickness/disability	−0.145** (0.074)	−0.137* (0.076)	−0.177*** (0.055)	−0.115** (0.050)	−0.211*** (0.057)	−0.157** (0.077)	−0.121 (0.076)	−0.175*** (0.056)	−0.106** (0.051)	−0.204*** (0.058)
Interaction										

Table 3 (continued)

Sickness/ disability benefits	Model 4					Model 7				
	Nutrition	Clothing	Education	Leisure	Social life	Nutrition	Clothing	Education	Leisure	Social life
Single-parent family* Sickness/ disability						−0.028 (0.022)	−0.022 (0.026)	−0.023 (0.028)	−0.051*** (0.017)	−0.051** (0.021)

Standard errors in parentheses. Only the coefficients of the social spending variables and interactions are shown, but all the explanatory variables of model 1 (Table 2) have been included in the estimations. *$p < 0.10$; **$p < 0.05$; ***$p < 0.01$

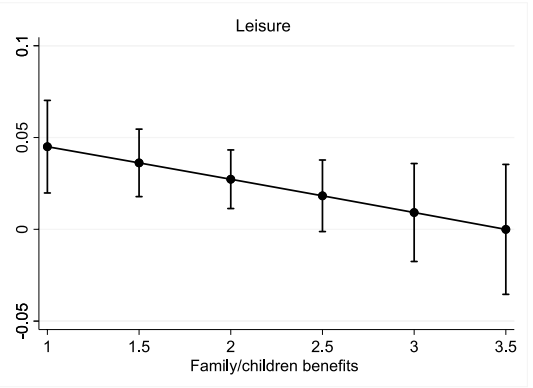

Fig. 4 Average marginal effects of single parenthood on child deprivation in leisure by level of spending on family/children benefits. *Note* Based on Model 5 of Table 3

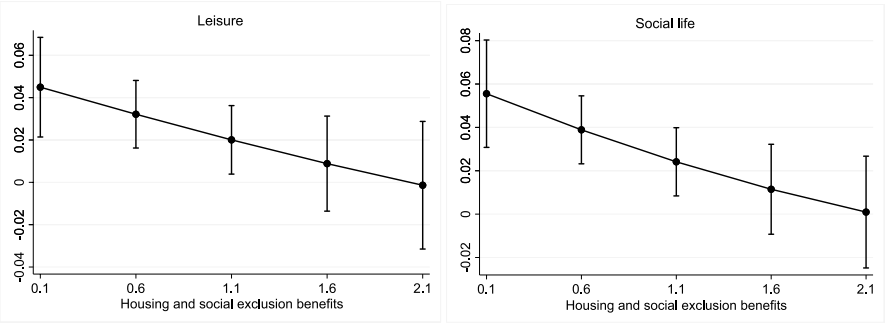

Fig. 5 Average marginal effects of single parenthood on child deprivation in leisure and social life by level of spending on housing and social exclusion benefits. *Note* Based on Model 6 of Table 3

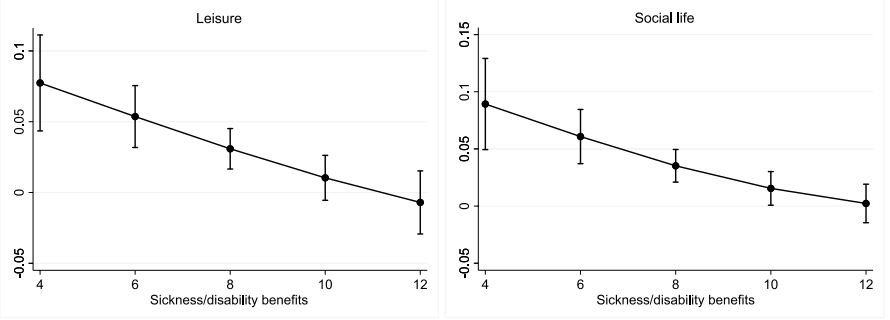

Fig. 6 Average marginal effects of single parenthood on child deprivation in leisure and social life by level of spending on sickness/disability benefits. *Note* Based on Model 7 of Table 3

single-parent and two-parent families in two dimensions (leisure and social life). Previous literature has indicated that in households where parents or children have a disability or illness there is a greater risk of poverty (Blackburn et al. 2010;

Bradshaw 2010; Engster 2012), and that single-parent households are more likely to have members with disabilities or illness compared to two-parent households (Lanza-León & Cantarero-Prieto 2024; Van de Velde et al. 2014). Some authors suggest that sickness and disability benefits can potentially help to alleviate poverty in single-parent families (Engster 2012). Nevertheless, it remains unclear whether this association is of a causal or spurious nature given cross-national differences in household composition, the incidence of single-parent families, welfare regimes and deprivation. These benefits can either provide essential income for families or help with the care of disabled persons, which could facilitate the work-family balance for many parents. However, it would be necessary in the future to analyse in greater detail the relationship between the different items of spending on sickness/disability benefits and child poverty, particularly if information on disabled or sick children is available.

Family benefits and housing/social exclusion benefits do not seem to be as clearly related to the reduction of child deprivation as sickness and disability benefits when no distinction is made between family structures. The result of spending on family benefits may seem surprising, but it has been observed in previous studies that examine child poverty using measures of material deprivation (Bárcena-Martín et al. 2017b; Guio et al. 2020). As Chzhen (2017) argues, family benefits alone may not always be enough to alleviate child poverty if they are not complemented by other types of social benefits. However, when we consider the distinction between family structures, the results show that inequalities in child deprivation between single-parent and two-parent households in some dimensions, such as leisure or social life, are less evident in countries with higher spending on family/children and housing/social exclusion benefits. The in-kind benefits of these programmes, such as rent benefits or childcare services, can serve both to meet certain needs of single-parent families and to reduce their expenses on these types of goods or services. This, in turn, could allow them to use part of their limited financial resources to obtain other types of material goods related to their children's leisure activities (Kenworthy 2011). Cash transfers may also assist them in covering these expenses.

In general, the results are in the main consistent with those of previous studies at a European level, indicating that social spending is associated with less deprivation among vulnerable population groups (Bárcena-Martín et al. 2014; Nelson 2012; Saltkjel and Malmberg-Heimonen 2017). In addition, it should be noted that the results have been obtained after controlling for GDP per capita. On the other hand, our findings also show that the evaluated social spending programmes do not decrease differences between family structures in all dimensions of child deprivation. Social spending is not always effective in reducing all types of deprivation (Garratt 2019). Although further research is needed, this result may also indicate that for many single-parent families receiving social benefits, items in some dimensions of child deprivation are less of a priority than those in other dimensions. Literature on child wellbeing and these findings highlight the importance of identifying the types of families that most need social protection and that have the most problems with work-family balance.

Given the scant empirical literature on child deprivation in European countries, the need is for more studies like this, analysing the role of social spending

in the different dimensions. This would thus give us a better understanding of the mechanisms which occur in child deprivation and poverty, so as to design public policies to increase the well-being of children and help us identify the specific vulnerability of certain single-parent families (Heflin et al. 2009, 2011; Skinner et al. 2017). It should be noted that there are many other relevant measures of child deprivation (see, for example, Jiang et al. 2022) not included in this study due to limitations in the available data.

The findings collated in this research also seem to reveal the limitations of the "social investment" paradigm indicated by Hemerijck (2018) in explaining child deprivation, since this is based exclusively on a two-parent structure. To begin with, we confirm the need for Welfare States to invest in social policies so as to reduce child deprivation and poverty, above all in those nation states with lower social spending. Meanwhile, the results of this study suggest the need to incorporate the family structure variable so as to evaluate how social spending programmes affect inequality among families, and hence provide a comparative perspective on child deprivation. This study makes a novel contribution for several reasons. First, it incorporates the child-centred social investment strategy (Esping-Andersen 2002). Secondly, it provides results on the possible effect of social spending policy on reducing child deprivation in underprivileged families, such as single-parent households, from a comparative perspective. In addition, the findings may have implications for the development of single parent support policies, although they should also be interpreted with caution due to the limitations of the data and the analyses performed.

The paper has provided comparative empirical evidence that suggests the complexity of redistributive policies and their possible differential implications. In particular, the analysis has shown the relevance of considering single parenthood in the design of redistributive policies, since when family structure is introduced there are improvements in some dimensions of child deprivation. An effective redistributive social and family policy must identify vulnerable family situations, encourage parental responsibility regarding the needs of children, and help reduce the economic vulnerability of single-parent families, so as to achieve the goal of reducing poverty and deprivation, thereby achieving greater child well-being. Although, as reported in the literature (Obinger and Wagschal 2010), the gross social spending indicator does not capture the full complexity of the effects of redistributive policies on child deprivation and poverty, it has allowed us to find that social spending could play a role in reducing child deprivation in single-parent families.

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Declarations

Conflict of interest The authors declare no competing interests.

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