



Contents lists available at ScienceDirect

Advances in Life Course Research

journal homepage: www.elsevier.com/locate/alcr

Household dysfunction and child development: Do financial resources matter?

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ARTICLE INFO

Keywords:

Household dysfunction
Verbal ability
Behavioural problems
Financial resources
Fixed-effects analysis
Millennium Cohort Study

ABSTRACT

Children who experience household dysfunction often report more developmental problems and lower educational attainment. A question, however, is whether these lower outcomes are caused by the household dysfunction itself, or by other (pre-existing) factors, such as growing up in poverty. Based on the extended family stress model, we derived hypotheses on the consequences of household dysfunction for child development. Furthermore, we considered the mediating and moderating role of parents' financial resources in the impact of household dysfunction on children's development. We studied these relationships while rigorously accounting for differential selection into experiencing household dysfunction using data from the British Millennium Cohort Study and employing descriptive and fixed-effects analyses. We found that children who experienced household dysfunction after age 5 already had more behavioural problems prior to these experiences. This underscores the importance of accounting for differential selection into experiencing household dysfunction. We also found that household dysfunction beginning after age 5 led to more behavioural problems but did not impact children's verbal ability. Parents' financial resources declined after household dysfunction, particularly among high-income households. However, we found only weak evidence of a mediating effect of financial resources, and larger declines in financial resources did not translate into larger consequences of household dysfunction among children from high-income households. Financial resources thus mainly seemed to play an important role for selection into experiencing household dysfunction.

1. Introduction

The home environment in which children grow up can be a source of disadvantage, affecting both school-age development and later-life outcomes in education, occupation and well-being (Brian Brown & Lichter, 2006; Bussemakers & Kraaykamp, 2020; Felitti et al., 1998; Wickrama, Conger, & Todd Abraham, 2008). Parents' financial resources seem to play an important role here: children who grow up in poverty often exhibit more developmental problems (Schoon, 2019; Schoon, Hope, Ross, & Duckworth, 2010) and perform less well in school than children whose parents are well off (Brüderl, Kratz, & Bauer, 2019; Hout, 2015; Layte, 2017). Aside from variation in the financial resources available to children, stressful experiences in family life may diminish life chances. In this regard, research across various disciplines points to the importance of household dysfunction, referring to growing up in a single-parent household, with violent parent(s) or with parent(s)

suffering from mental or physical health problems (Felitti et al., 1998). Children who experience such forms of household dysfunction tend to exhibit more developmental problems and attain lower levels of education (Felitti et al., 1998; Giovanelli, Mondì, Reynolds, & Ou, 2019; Hardesty & Ogolsky, 2020; McLanahan, Tach, & Schneider, 2013; Mensah & Kiernan, 2010).

Although studies consistently show that children who experience household dysfunction have poorer developmental outcomes, it remains unclear to what extent developmental inequalities are caused by these experiences. Much previous research on the consequences of adverse childhood experiences is based on cross-sectional and/or retrospective data, making it difficult to disentangle the various family influences and to control for upstream factors, such as social disadvantage. This is particularly problematic in studies of the consequences of parental resources and household dysfunction for child development, as these factors are closely related in multiple ways (Bussemakers, Kraaykamp, &

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<https://doi.org/10.1016/j.alcr.2021.100447>

Received 3 March 2021; Received in revised form 15 September 2021; Accepted 15 September 2021

Available online 20 September 2021

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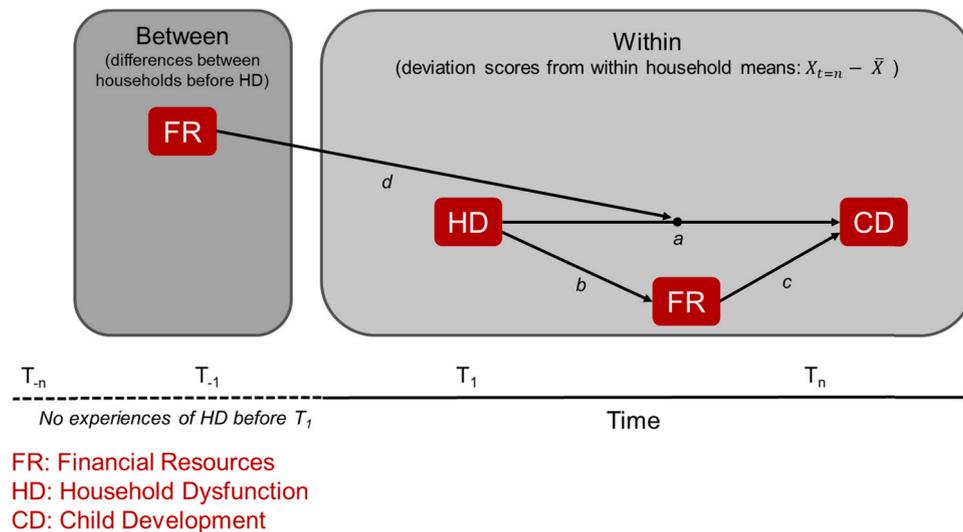


Fig. 1. Conceptual model.

Tolsma, 2019; Cavanagh & Fomby, 2019; Conger, Conger, Martin, & Abstracts, 2010; Raley & Sweeney, 2020).

For example, there may be differential selection into experiencing household dysfunction. After all, the financial stress experienced by low-income parents can lead to forms of household dysfunction, including relationship and personal health problems (Conger et al., 2010). This suggests that developmental differences between children with and without experiences of household dysfunction may, in fact, result from pre-existing differences in parents' financial resources (Cavanagh & Fomby, 2019; Härkönen, Bernardi, & Boertien, 2017; McLanahan et al., 2013; Schoon et al., 2010). Conversely, household dysfunction may impact parents' financial resources (Conger et al., 2010; Hübgen, 2020). This points to a mediation effect: household dysfunction may harm children's development because it reduces the financial resources available to children (Brand, Moore, Song, & Xie, 2019b; Cavanagh & Fomby, 2019).

Further complicating the issue, studies on single parenthood suggest that the consequences of household problems are not uniform across income groups. There are two perspectives on the moderating role of financial resources (Härkönen et al., 2017; Ryan, Claessens, & Markowitz, 2015). The first is the suggestion by some authors that the consequences of single parenthood are stronger in higher income households, because children in these households have more financial resources to lose (Bernardi & Boertien, 2016; Brand, Moore, Song, & Xie, 2019a; Erola & Jalovaara, 2017). A contrasting argument is that a household's financial resources may function as a buffer against the negative consequences of single parenthood, because they help parents and children cope with the new situation (Amato & Anthony, 2014; Augustine, 2014). To disentangle these complex relationships and better understand the factors that place children at risk of poor outcomes, longitudinal data studies are needed (Brand et al., 2019a; Conger et al., 2010; Härkönen et al., 2017).

In the current study, we employed detailed, longitudinal data from the British Millennium Cohort Study (MCS, 2000–2014). We used these data to study the consequences of household dysfunction for children's development during primary and lower secondary education. We focused on children whose first experiences of household dysfunction occurred after they started primary education (after age 5). This allowed us to investigate how changes in the experience of household dysfunction (i.e., increases in household dysfunction) relate to changes in children's development. We used fixed-effects models, as earlier research demonstrates their suitability for studying the impact of changes in family characteristics on children's outcomes. These models account for all stable (observed and unobserved) variation between children

(Brüderl et al., 2019; McLanahan et al., 2013; Ryan et al., 2015). Hence, by design they take into account, or 'control for' the possibility that children who will experience household dysfunction had more developmental problems to begin with, due to pre-existing factors such as poverty. Children experiencing household dysfunction before age 5 were excluded from our study because we could not reliably measure (changes in) their development before this age, and therefore could not apply fixed-effects models on this sample.

Because in this study we sought to control for differential selection into experiencing household dysfunction, we focused on a relatively privileged, but also understudied group of children: those who encountered household dysfunction after age 5. This is the age most children enter school, which marks an important life-course transition. Many children with a stable early home environment (before age 5), nonetheless experience adverse conditions during primary or secondary school. Moreover, a substantial group of children with a stable early home environment exhibit developmental problems when they are older (Gutman, Joshi, & Schoon, 2019). Our study thus sheds light on the role of household dysfunction and associated changes in financial resources in developmental problems among these children in particular.

Moreover, our longitudinal approach provides an opportunity to investigate the role of changes in a household's financial resources (Brand et al., 2019b; Brüderl et al., 2019). We had information on the financial resources available before and after children's first experiences of household dysfunction. This enabled us to assess whether reductions in financial resources explained the consequences of household dysfunction, and whether differential reductions resulted in differential impacts of household dysfunction across income groups.

In sum, our study sheds light on the impact of household dysfunction on child development, and on the mediating and moderating role of financial resources herein. These relationships are often assumed but rarely studied (Conger et al., 2010; Raley & Sweeney, 2020). Specifically, we investigated children's cognitive development, measured via verbal abilities, as well as their behavioural problems. Both types of development are strongly influenced by children's home environment and are essential factors in learning and educational attainment (Cavanagh & Fomby, 2019; Hasselhorn et al., 2015; Schoon et al., 2010).

2. Theory and hypotheses

2.1. Developmental consequences of household dysfunction

To understand how household dysfunction affects children's development, we combined insights from the family investment model and

Table 1
Descriptive statistics final sample.

	Age 5 (wave 3)						Age 7 (wave 4)						Age 11 (wave 5)						Age 14 (Wave 6)					
	N	%	Mean	S.D.	Min.	Max	N	%	Mean	S.D.	Min.	Max	N	%	Mean	S.D.	Min.	Max	N	%	Mean	S.D.	Min.	Max
Verbal ability	5096		0.21	0.98	-3.00	2.33	5052		0.19	0.94	-3.11	1.86	4189		0.14	0.97	-3.84	2.12	3210		0.13	1.02	-2.69	3.79
Behavioural problems	5096		6.10	4.22	0.00	28.00	5052		6.12	4.56	0.00	33.00	4189		6.18	4.85	0.00	32.00	3210		6.41	4.92	0.00	38.00
Household dysfunction																								
One experience	0	0.00					794	15.80					865	20.65					735	22.90				
Multiple experiences	0	0.00					59	1.17					110	2.63					110	3.34				
Financial resources	5096		0.31	0.62	-1.71	1.06	5052		0.29	0.63	-1.71	1.06	4189		0.31	0.64	-1.71	1.06	3210		0.39	0.64	-1.71	1.06
Financial position ^a																								
Low income	1183	23.21					1172	23.32					977	23.32					735	22.90				
High income	3913	76.79					3853	76.68					3212	76.68					2475	77.10				
Poverty	774	15.19					707	14.07					413	9.86					437	13.61				
Age in months	5096		62.49	2.88	53.02	73.52	5052		86.66	2.88	76.41	96.39	4189		133.36	3.86	123.00	147.00	3210		168.50	5.51	159.25	183.75
Grandparents in household	157	3.08					249	4.96					119	2.84					91	2.83				
Step-parents in household	0	0.00					0	0.00					85	2.03					111	3.46				
Number of children in household																								
1	567	11.13					378	7.52					350	8.36					321	10				
2	2718	53.34					2564	51.02					2096	49.39					1588	49.47				
3	1296	25.43					1463	29.11					1207	28.81					894	27.85				
4	385	7.55					457	9.09					403	9.62					292	9.10				
5	84	1.65					102	2.03					108	2.58					73	2.27				
6 or more	46	0.90					61	1.21					52	1.24					42	1.31				
Other language spoken at home																								
Sometimes	246	4.83					250	4.98					232	5.54					152	4.74				
Often	416	8.16					371	7.38					259	6.18					231	7.20				

^a Measured at age 3 (wave 5) to reflect the situation before the onset of household dysfunction.

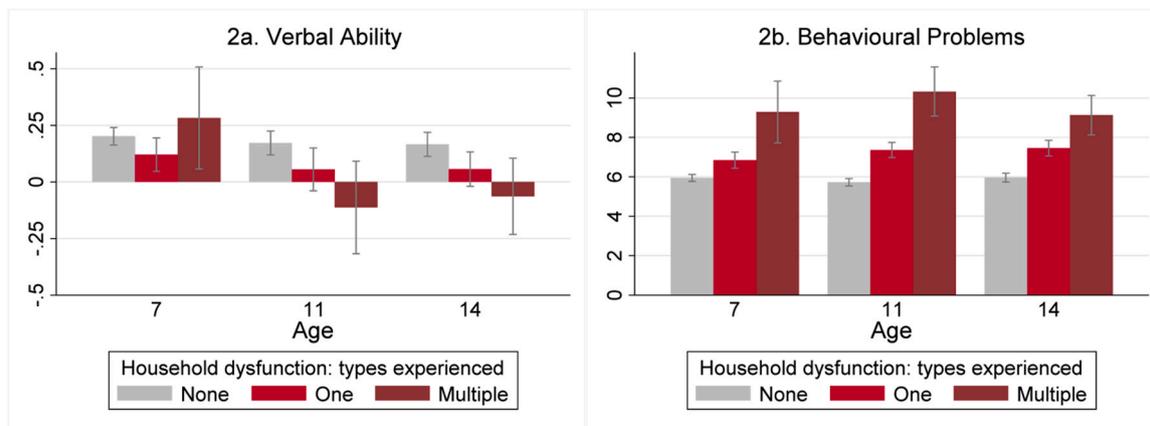


Fig. 2. Cognitive and behavioural performance of children with and without experiences of household dysfunction, 95% confidence intervals.

the (extended) family stress model (Layte, 2017; Schoon et al., 2010). According to the family investment model, inequalities in child development and educational outcomes emerge from differences in the resources parents can invest in their children. Parents with ample financial resources use these to provide their children with adequate food, housing, stimulating materials and additional tutoring to foster their children's learning and development (Conger et al., 2010; Layte, 2017; Schoon et al., 2010). As a result, children from households with abundant financial resources tend to exhibit better cognitive and behavioural development (Chzhen & Bruckauf, 2019; Layte, 2017; Wickrama et al., 2008). The family stress model argues that inequalities in child development not only result from the direct beneficial role of parental financial resources, but also emerge because these resources can protect children against stressful experiences in their home environment (Conger et al., 2010; Layte, 2017; Schoon et al., 2010). Parents with less financial resources more often experience stress, which may cause forms of household dysfunction such as parental divorce, parental (psychological) health problems and violence. These, in turn, may harm the relationship between parents and their children, leading to suboptimal parenting practices and child development (Conger et al., 2010; Mensah & Kiernan, 2010; Schoon et al., 2010).

The family investment model thus argues that children directly benefit from parental resources, while the family stress model emphasises that a lack of financial resources causes household dysfunction, which in turn harms child development. The current paper focuses on the impact of household dysfunction on child development, and not on its mediating role for the impact of financial resources. However, the higher incidence of household dysfunction within lower income groups underscores the importance of accounting for the financial resources available in a household prior to the emergence of household dysfunction (Cavanagh & Fomby, 2019; Raley & Sweeney, 2020). Instead of comparing children with and without experiences of household dysfunction, we examined whether experiences of household dysfunction starting after age 5 changed children's cognitive and behavioural development. Our focus on changes within a child ensured that any found differences in child development were not caused by pre-existing (stable) factors, such as insufficient financial resources. Our first hypothesis therefore is: *household dysfunction harms children's cognitive and behavioural development* (H1). Fig. 1 summarises the conceptual model for this research. In it, arrow 'a' refers to this first hypothesis.

2.2. Mediation: developmental consequences of a reduction in financial resources

Combining the family stress model and the family investment model also helps us understand how household dysfunction may harm children's development. Originally, the family stress model focused on the

impact of stressful experiences themselves. Thus, financial hardship was understood to cause parental stress which, in turn, negatively affected family functioning and children's socialisation and development. The extended family stress model argues that there is a feedback loop from stressful experiences to the financial resources available in a household (Conger et al., 2010). Most notably, parents who leave the household after a separation or divorce contribute less to the household income, reducing the financial resources available to children (Brand et al., 2019b; Havermans, Botterman, & Matthijs, 2014; Hübgen, 2020). A similar reasoning may apply when the physical and emotional toll of problems relating to health and/or violence reduces parents' opportunities to work, which then leads to a decline in income (Anderson, 2010; Chatterji, Alegria, & Takeuchi, 2011; Kawachi, Adler, & Dow, 2010; Mensah & Kiernan, 2010). Following the family investment model, such a reduction in financial resources decreases parents' opportunity to invest in their children's development (Martin, 2012; Schoon et al., 2010). This leads to our second hypothesis: *the effect of experiencing household dysfunction on children's cognitive and behavioural development is mediated by a reduction in parental financial resources* (H2). This mediating relationship is depicted by arrows 'b' and 'c' in Fig. 1.

2.3. Moderation: understanding variation in developmental outcomes across income groups

How well children and parents cope with household dysfunction may also depend on the initial resources available in a household (Cross, 2020). There are two theoretical perspectives on the moderating role of financial resources (Härkönen et al., 2017; Ryan et al., 2015). The first perspective focuses on the reduction in social reproduction after household dysfunction, which is commonly shown in studies on divorce (Bussemakers & Kraaykamp, 2020; Härkönen et al., 2017). In this view, the impact of household dysfunction is greater among children whose parents have more resources (prior to household dysfunction), because they experience a larger loss of parental resources after household dysfunction (Bernardi & Boertien, 2016; Brand et al., 2019a; Prix & Erola, 2017). This is most apparent when high-income parents leave the household and contribute less to their children's upbringing and development. A similar argument can be applied to other forms of household dysfunction, for instance, when due to mental health problems high-income parents lose (part of) their earnings. Obviously, children of poorer parents also suffer from reductions in financial resources resulting from household dysfunction. However, the reduction in their case is smaller (in absolute terms) as they already had less financial resources available before they experienced household dysfunction (i.e., a floor effect). Since drops in financial resources worsen children's development, we expect larger reductions in financial resources after household dysfunction to have larger developmental consequences. This

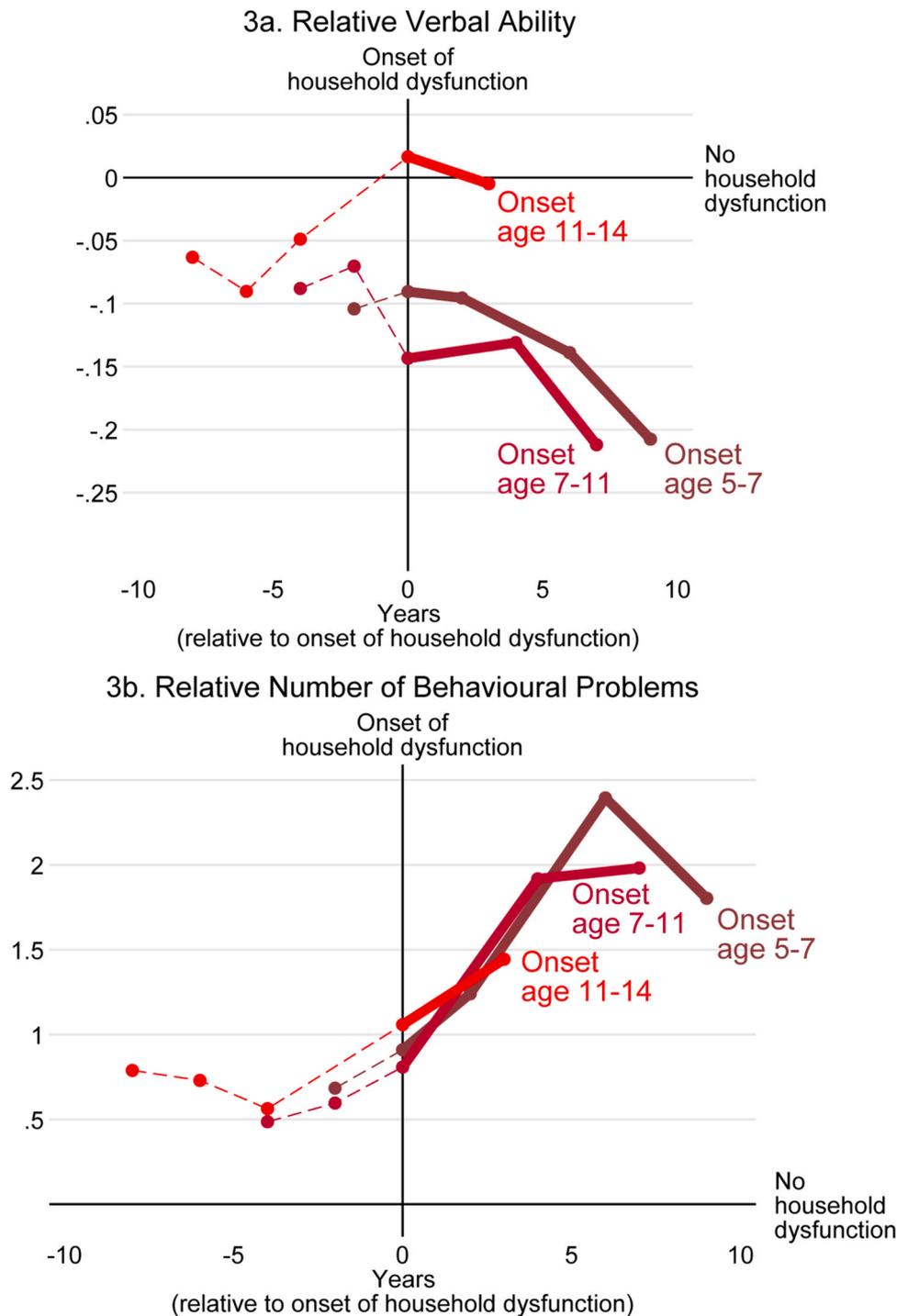


Fig. 3. Cognitive and behavioural development of children who experienced household dysfunction.

suggests our third and fourth hypotheses: *the effect of experiencing household dysfunction on children's cognitive and behavioural development is larger for children of parents with a higher initial income (H3), and this larger effect is explained by a larger reduction in parental financial resources (H4)*. Referring to Fig. 1, this moderating effect is depicted by a more steeply declining arrow 'b', meaning that the change in financial resources is larger for children whose parents have more resources, resulting in larger developmental consequences of household dysfunction (arrow 'd' to 'a').

The second perspective on the moderating role of financial resources is derived from theories on the accumulation of disadvantage. It argues that adverse events trigger other negative circumstances, amplifying

negative outcomes (DiPrete & Eirich, 2006; Hübgen, 2020). In the current study, this means that household dysfunction is particularly harmful when a subsequent drop in financial resources leads to poverty (Almquist & Brännström, 2018; Giovanelli et al., 2019; January et al., 2017). In such circumstances, children must cope with both household dysfunction and poverty, while their parents have less financial resources to support them (Amato & Anthony, 2014; Giovanelli et al., 2019; Layte, 2017). If sufficient financial resources remain after the start of household dysfunction (i.e., parents avoid relative poverty), parents may use these assets to promote children's well-being and help them cope with adverse events, for instance, by bringing in professional psychological support or tutoring (Bussemakers & Kraaykamp, 2020;

Table 2

Fixed-effects estimates of the impact of household dysfunction on child development and financial resources in household.

	Verbal Ability (B-estimate)			Behavioural Problems (B-estimate)				Financial Resources (B-estimate)		Poverty (Exp B-estimate - OR)			
	Model 1a	Model 3a	Model 4a	Model 1b	Model 3b	Model 4b	Model 2a	Model 2b					
Experiences of household dysfunction													
One	0.004	0.007	0.006	0.586	***	0.508	***	0.579	***	-0.204	***	2.481	**
Multiple	0.042	0.045	0.044	1.010	***	0.894	***	0.996	***	-0.302	***	4.138	***
Financial resources		0.011				-0.382	***						
Poverty			-0.027					0.147	**				
N	5,275	5,275	5,275	5,275	5,275	5,275	5,275	5,275	5,275	5,275	5,275	945	

Note: Models control for changes in age, household composition (grandparents, step-parents, number of children in residence) and other language spoken at home.

* $p < .1$;

** $p < .05$;

*** $p < .01$.

Zolkoski & Bullock, 2012). In this way, parents' financial resources can help protect children from poor developmental outcomes (Chzhen & Bruckauf, 2019). This leads to our final hypotheses: *the effect of experiencing household dysfunction on children's cognitive and behavioural development is greater for children of parents with a lower initial income (H5), and this larger effect is explained by a higher risk of falling into poverty (H6)*. Referring back to Fig. 1, this means that the risk of poverty after household dysfunction (arrow 'b') would be larger for children of less well-off parents. This results in larger developmental consequences of household dysfunction (arrow 'd' to 'a').

3. Data and methods

3.1. Data

The Millennium Cohort Study (MCS) is a British longitudinal study following the lives of 18,818 children. The MCS focuses on children born in the years 2000–2002 across the UK, and surveys them and their parents every 2 to 4 years at important points in their childhood and youth. For the current study, we mainly used the information collected at age 5 (which is the first year of primary school) and ages 7, 11 and 14 (primary and lower secondary school). Each wave provides information on the household in which the children grew up, as well as the children's performance and development. The sample is stratified by ethnicity and area disadvantage (Joshi & Fitzsimons, 2016). In our analyses, we accounted for this by clustering standard errors within geographical areas (election wards).

Since our study focuses on the influence of experiencing household dysfunction after age 5, we included only children who participated in the study at least until age 7. This ensured us of obtaining indicators of children's development for at least two time points (at minimum, for age 5 and 7, and more if they participated longer).

We started with several sample selections. First, when multiple children from the same household were sampled (e.g., twins), we selected one child. Second, we included only children who grew up with one or both natural parents, excluding children who lived with adoptive or foster parents (105 children, 0.86%). Developmental problems among adoptive or foster children are beyond the scope of this study.

To investigate how increases in household dysfunction affected the children's development, while controlling for selection into experiencing household dysfunction, we excluded children who had experienced household dysfunction before age 5 (55.9%). Naturally, we observed a lower incidence of poverty in the resulting analytical sample, compared to the complete sample, because poverty and household dysfunction are strongly related. This is exactly the reason why we deselected children with early experiences of household dysfunction. That being said, more than 15% of the families in our analytical sample experienced poverty when the children were 5 years old. This enabled us to examine whether financial resources moderated the impact of

household dysfunction. Aside from a lower incidence of poverty, our final sample did not substantially differ on other key demographics. Although we found a statistically significant difference in parental education between our final sample and the complete sample, the difference was small. Moreover, the children in our final sample did not differ from the complete sample in terms of ethnicity and gender (for an overview see Appendix A).

Since we were interested in the impact of an increase of household dysfunction and not in how a cessation of household dysfunction affects children's development – which may be different – measurement observations indicating a transition out of household dysfunction were removed from our sample (e.g., children with experiences of household dysfunction at age 7 and 11, but not at age 14, were only included until age 11). Finally, we excluded children with missing information on the variables included in our study from that specific wave. Appendix B presents an overview of the number of participants excluded from our analyses due to attrition after age 7, improvement of household dysfunction and missing values on key variables.¹ This produced our final sample of 5,275 children about whom we had information from at least two waves and who either experienced household dysfunction for the first time after age 5 or did not experience household dysfunction at any age.

3.2. Measures

Our two dependent variables refer to children's cognitive and behavioural development from age 5 to 14. Cognitive development was measured with age-appropriate vocabulary tests administered directly to a child. The scores were standardised within the (full) sample of each wave, so scores reflect children's performance relative to all other children in a cohort.

To measure behavioural development, we used information provided by the main parent (generally the mother) using the Strengths and Difficulties Questionnaire. This is a validated questionnaire to measure internalising (social and peer) problems, as well as externalising (hyperactivity and conduct) problem behaviour (Goodman, Lamping, & Ploubidis, 2010). By totalling the number of problematic behaviours reported by parents, a scale measuring behavioural problems was obtained.²

¹ These numbers are based on our sample of children who participate at least until age 7 and who did not experience household dysfunction up until age 5. Information on attrition in all MCS waves can be found in Mostafa and Ploubidis (2017).

² In a sensitivity analysis, we also examined the impact of household dysfunction and financial resources on internalising and externalising problems separately. We did not find substantial differences in the impact of these factors on the two forms of behavioural problems.

Table 3
Fixed-effects estimates of the impact of household dysfunction on child development with financial resources, separated by income groups.

Experiences of household dysfunction	Verbal Ability (B-estimate)		Behavioural Problems (B-estimate)		Financial Resources (B-estimate)			
	Model 1a		Model 1b		Model 2			
	Low	High	Low	High	Low	High		
One	0.003	-0.009	-0.086	0.765	0.525	0.415	-0.121	-0.254
Multiple	0.751	-0.019	-0.019	1.409	0.791	0.629	-0.272	-0.373
Financial resources			-0.003			-0.433		
N	1,308	3,967	1,308	1,308	3,967	3,967	1,308	3,967

Note: Models control for changes in age, household composition (grandparents, step-parents, number of children in residence) and other language spoken at home.

Bolded effects indicate statistically significant differences in effects between low- and high-income households ($p < .05$).

* $p < .1$;

** $p < .05$;

*** $p < .01$.

The main independent variable, household dysfunction, was measured as a composite score of four types of household dysfunction reported by children’s parents in each wave. If children lived with both parents, information from both parents was used. Otherwise it refers to the parent the children lived with most of the time, thus reflecting dysfunction in the primary home children grew up in. Following conventions in research on household dysfunction, we counted the types of dysfunction that children experienced (Merians, Baker, Frazier, & Lust, 2019). We then created a nominal variable distinguishing between children who experienced none, one or multiple forms of household dysfunction in each wave. This distinction enabled us to estimate the generally stronger impact of combinations of adverse experiences (Appleyard, Egeland, Dulmen, & Alan Sroufe, 2005; Merians et al., 2019).³ The first experience is parental absence, meaning that one natural parent no longer lived in a child’s household. The second is parental health problems, meaning that either or both parent(s) reported having a longstanding illness that limited their day-to-day activities. The third is parental mental health problems, as indicated by parent(s) having a high score on the Kessler Psychological Distress Scale (Prochaska, Sung, Max, Shi, & Ong, 2012). Our final indicator of household dysfunction is violence between parents, based on whether parent(s) indicated that their partner had ever used force on them.⁴ Note that because we excluded children whose parents reported these forms of household dysfunction at or before age 5, all reports of household dysfunction refer to experiences starting after this time.

We measured parental financial resources in three ways. First, we created a detailed (time-varying) score of the financial resources available in the household in each wave, to discern any reduction in these resources after the first experience of household dysfunction. Factor analysis was used to combine the income quintile the household belonged to, home ownership and the subjective financial position reported by the main parent (ranging from ‘living comfortably’ to ‘finding it very difficult to manage financially’).⁵ Changes in this combined measure thus refer to reductions in financial resources due to a loss of income, but also important changes in a child’s family life in the form of moving to a rented home after household dysfunction. The factor analysis was performed on the entire MCS sample and standardised for this group.

Second, we included a (time-varying) dichotomous measure indicating whether a household’s income fell below the poverty line. Following OECD guidelines, we used equivalised household income, meaning that income was adjusted for the number of adults and children living in a household. Households with an income below 60% of the median income in Britain in a specific year were considered poor. This

³ Sensitivity analyses showed that our results are robust against changes in our measure of household dysfunction. We tested four alternative measures: counting the total number of experiences (e.g., when both parents experience health problems, this is counted as two instead of one), excluding each specific type of experience from the composite scale, excluding children who experience parental death, and including moderate levels of distress as a measure of psychological health problems. Neither of these changes had a substantial impact on our results.

⁴ Appendix C shows per wave how many children experienced each of these forms of household dysfunction. In terms of transitions, children most often made the transition from no household dysfunction to one experience or multiple experiences at the same time. As shown in Appendix C, parental absence and health problems were the most common experiences. The most common combination was parental health problems and parental mental health problems. Once children experience household dysfunction, they often continued to experience the same types of dysfunction until age 14, without changing from one to another or gaining an additional one. Children who experienced parental violence were an exception to this: they often experienced parental separation later on.

⁵ Appendix D provides the factor loadings of each variable in the factor analyses

Table 4

Fixed-effects estimates of the impact of household dysfunction on child development with poverty, separated by income groups.

	Verbal Ability (B-estimate)				Behavioural Problems (B-estimate)				Poverty (Exp B-estimate - OR)							
	Model 1a		Model 3a		Model 1b		Model 3b		Model 2							
	Low	High	Low	High	Low	High	Low	High	Low	High						
Experiences of household dysfunction																
One	0.003	-0.009	0.002	-0.007	0.765	***	0.525	***	0.765	***	0.490	***	1.397	**	8.574	***
Multiple	0.751	-0.019	0.070	-0.016	1.409	**	0.791	**	1.410	***	0.731	***	2.423	**	11.830	***
Poverty			0.043	-0.025					-0.009		0.446	**				
N	1,308	3,967	1,308	3,967	1,308		3,967		1,308		3,967		637		308	

Note: Models control for changes in age, household composition (grandparents, step-parents, number of children in residence) and other language spoken at home. **Bolded effects** indicate statistically significant differences in effects between low- and high-income group ($p < .05$).

* $p < .1$;** $p < .05$;*** $p < .01$.

was measured in each wave to study whether poverty was more common after household dysfunction.

Third, we created a (time-stable) measure of a household's financial position before the onset of household dysfunction, to discern for which group consequences of household dysfunction were largest. We divided households in two income groups, based on household income at age 5, again using equivalised household income. The low-income group consisted of households in the bottom two income quintiles. Households with an income in the highest three quintiles were referred to as the high-income group.

Because fixed-effects models inherently control for all stable, pre-existing differences between children (and their families), we only included control variables that change over time. At the child level, we controlled for children's age in months. At the household level, we included measures of household composition (step-parents, grandparents and number of children residing in the household), as well as whether a language other than English was spoken at home (sometimes or often). Table 1 provides an overview of the variables per wave, including descriptive statistics.

3.3. Analytical strategy

We started with descriptive analyses, examining differences in verbal ability scores and behavioural problems, as well as developments herein, between children who did and did not experience household dysfunction. Second, we estimated fixed-effects (FE-)models to determine the impact of experiencing household dysfunction on children's development. In the first FE-model, we estimated the impact of household dysfunction on children's verbal ability and behavioural problems. We subsequently assessed whether household dysfunction reduced the available financial resources and/or led to poverty in a household, by using these variables as the dependent variable in our models. Third, we examined whether changes in financial resources and poverty explained the impact of household dysfunction on changes in children's verbal ability and behavioural problems. Having modelled this for our total sample (i.e., including both low- and high-income households), we conducted these analyses separately for children from low-income and high-income households, to investigate to what extent the developmental consequences of household dysfunction were moderated by parents' financial resources prior to household dysfunction. Lastly, we tested the hypothesis that differential changes in financial resources, or becoming poor after household dysfunction, explained heterogeneity in the impact of household dysfunction across these groups.

Most of our models were estimated with linear FE-analyses (with children's verbal ability, behavioural problems and the financial resources in the household as dependent variables). Logistic FE-analyses were used to estimate the impact of household dysfunction on changes in poverty, because poverty functions here as a binary outcome variable.

Results of the logistic models are presented in exponentiated b-coefficients, to illustrate how household dysfunction affected the odds of a household's income dropping below the poverty line. As we used FE-models to study changes over time, we could only estimate the impact of household dysfunction on poverty among households whose poverty status changed between waves. We discuss the implications of this when presenting the analyses results.

4. Results

4.1. Descriptive analyses

Fig. 2 displays the verbal performance and behavioural problems of children with and without experiences of household dysfunction at age 7, 11 and 14. It shows that there were no significant differences in verbal ability between children with and without these experiences in all three age groups. Though children who experienced household dysfunction had lower verbal ability at age 11 and 14, the differences were small and not statistically significant. For behavioural problems, the differences found were more substantial. Children who experienced household dysfunction after age 5 exhibited more behavioural problems, and this difference was greater for children who experienced multiple types of household dysfunction simultaneously. Similar patterns were found across all age groups.

The observed differences in behavioural problems are in line with our expectation that household dysfunction harms child development. However, children may have already had worse developmental scores before they experienced household dysfunction for the first time, pointing to a selection effect. Fig. 3 presents the verbal and behavioural development of children who first reported household dysfunction at age 7 (onset between age 5 and 7), age 11 (onset age 7–11) and age 14 (onset age 11–14), relative to children who did not experience household dysfunction at all. The figure indicates that there were indeed pre-existing differences in child development. Fig. 3a indicates that the children who experienced household dysfunction already had lower verbal ability in the years preceding these experiences, underscoring the relevance of accounting for differential selection. Furthermore, the drop in children's verbal abilities after household dysfunction was small, indicating that experiences of household dysfunction after age 5 had little impact on children's verbal ability.

For behavioural development, we found a similar pattern but with larger differences. Fig. 3b shows that the children who experienced household dysfunction already had more behavioural problems before the onset of household dysfunction (compared to children who did not experience household dysfunction at all). These differences were statistically significant, except for children for whom household dysfunction started between age 7 and 11. This means that pre-existing differences between children from households with and without

household dysfunction played a role in children's behavioural development. Children did display a steep increase in behavioural problems after they first experienced household dysfunction. Our descriptive results thus suggest that experiencing household dysfunction may harm children's development, particularly in the behavioural domain.

4.2. Fixed-effects analyses of the developmental consequences of household dysfunction

Table 2 presents the results of our fixed-effects analyses using the sample containing both low- and high-income households. It shows how household dysfunction changed child development. Model 1a shows no negative impact of household dysfunction on children's verbal ability, as the effects found were very small, positive and not statistically significant ($b_{\text{one experience}}=0.004$, $b_{\text{multiple experiences}}=0.042$). Household dysfunction, however, did have a significant impact on children's behavioural problems. The results in model 1b indicate a substantial increase in behavioural problems after experiencing one ($b=0.586$) or multiple forms of household dysfunction ($b=1.010$). It should be noted that these effects are smaller than those indicated by the descriptive results in Fig. 2b. This indicates that the higher rates of behavioural problems in Fig. 2b were due in part to pre-existing differences between children, underscoring the relevance of our longitudinal analyses to account for selection. Our first hypothesis is thus partly confirmed: household dysfunction after age 5 increased children's behavioural problems, but it did not affect their verbal ability.

In line with our expectations, model 2a shows that household dysfunction reduced parents' financial resources ($b_{\text{one experience}}=-0.204$, $b_{\text{multiple experiences}}=-0.302$, both statistically significant). Model 3a and 3b estimate the impact of household dysfunction, as well as changes in financial resources, on children's development. According to model 3b, financial resources had a significant negative impact ($b=-0.382$) on children's behavioural problems, indicating that a reduction in financial resources increased problem behaviours among children. Accounting for the reduction in financial resources after household dysfunction, in model 3b, reduced the effects of household dysfunction ($b_{\text{one experience}}=0.508$, $b_{\text{multiple experiences}}=0.894$). Although these reductions were statistically significant, they are relatively small (17% for one experience, 11% for multiple experiences), and effects of household dysfunction on children's behavioural problems remained large even when controlling for changes in financial resources. Furthermore, model 3a shows that neither household dysfunction nor financial resources affected children's verbal ability.

Considering the role of poverty, the pattern found was rather similar. Model 2b indicates that household dysfunction strongly increased the odds of a household's income dropping below the poverty line ($\text{Exp-}b_{\text{one experience}}=2.481$, $\text{Exp-}b_{\text{multiple experiences}}=4.138$, both statistically significant). Although these effects are large, we must point out that they refer to 945 (out of 5,275) children from households that transitioned into or out of poverty during the years under study. Thus, for most families in our sample, household dysfunction did not lead to poverty. Model 4b shows that falling into poverty did not explain the impact of household dysfunction. Although transitions into poverty increased children's behavioural problems ($b=0.147$), the negative consequences of household dysfunction were only slightly smaller when accounting for these transitions ($b_{\text{one experience}}=0.579$, $b_{\text{multiple experiences}}=0.996$). Moreover, model 4a shows that poverty did not affect children's verbal ability. Therefore, there is only weak evidence for hypothesis 2, assessing mediation: reductions in financial resources explained a small part of the negative impact of household dysfunction on children's behavioural development. Poverty did not mediate the impact of household dysfunction on behavioural problems, nor were financial resources and poverty related to children's verbal ability.

4.3. The developmental consequences of household dysfunction across income groups

Tables 3 and 4 present the FE-analyses of the consequences of household dysfunction for the development of children from low- and high-income groups. This part of the analyses served to investigate the moderating role of a household's financial resources prior to household dysfunction. Model 1a presents the results for children's verbal ability, showing no negative effects of household dysfunction for either group. Considering the impact of household dysfunction on behavioural problems, we found larger effects for children from low-income households ($b_{\text{one experience}}=0.765$, $b_{\text{multiple experiences}}=1.409$) compared to high-income households ($b_{\text{one experience}}=-0.525$, $b_{\text{multiple experiences}}=-0.791$). These differences, however, were not statistically significant, and household dysfunction clearly increased children's behavioural problems in both low- and high-income households. This means we must reject both hypotheses 3 and 5: the impact of household dysfunction was not moderated by parents' financial position before they experienced household dysfunction.

We did find statistically significant differences in the impact of household dysfunction across income groups on the mediating factors. Model 2 in Table 3 presents the influence of household dysfunction on parents' financial resources. In line with our expectations, the results indicate that the reduction in financial resources was larger in high-income households ($b_{\text{one experience}}=-0.254$, $b_{\text{multiple experiences}}=-0.373$) compared to low-income households ($b_{\text{one experience}}=-0.121$, $b_{\text{multiple experiences}}=-0.272$). Model 3b includes the impact of household dysfunction on behavioural problems, controlled for changes in financial resources. Here we found a pattern similar to model 1b: the consequences of household dysfunction remained slightly larger for children in low-income households, but these differences were not statistically significant. Furthermore, neither household dysfunction nor changes in financial resources affected children's verbal ability, in either income group, as shown in model 3a. We therefore must reject hypothesis 4: household dysfunction led to a larger reduction in financial resources among high-income households, but this did not translate into greater consequences for children's development.

Regarding poverty, we expected household dysfunction to be more harmful for children from low-income households, because in such circumstances, dysfunction would be more likely to lead to poverty. Model 2 shows that household dysfunction significantly increased the odds of poverty among both low-income households ($\text{Exp-}b_{\text{one experience}}=1.397$, $\text{Exp-}b_{\text{multiple experiences}}=2.423$) and high-income households ($\text{Exp-}b_{\text{one experience}}=8.574$, $\text{Exp-}b_{\text{multiple experiences}}=11.830$). We need to be aware that these FE-analyses were based on households that experienced poverty at least at one time point in the survey period. Hence, it should not come as a surprise that the impact of household dysfunction on the odds of experiencing poverty was particularly large among households with a high income before household dysfunction, because these families were unlikely to experience poverty in the first place. Model 3b shows that poverty did not lead to an increase in behavioural problems among children from low-income households ($b=-0.009$, not statistically significant). Children from high-income households did display more behavioural problems after a transition into poverty ($b=0.466$), but this did not explain the impact of household dysfunction ($b_{\text{one experience}}=-0.490$, $b_{\text{multiple experiences}}=-0.731$). Poverty did not affect the verbal abilities of children from low- or high-income households (model 3a). Therefore, we reject our final hypothesis: household dysfunction was not more harmful for children from low-income households due to the different risks of falling into poverty.

4.4. Additional analyses

We performed two main additional analyses. First, we investigated whether results depended on our analytical strategy. Our FE-models addressed within-family changes in household dysfunction and

financial resources, but they did not account for a possible bi-directional relationship between changes in household dysfunction and financial resources over time. To ensure such relationships did not affect our results, we ran our full model as a random intercept cross-lagged panel (RI-CLP) model (Hamaker, Kuiper, & Grasman, 2015). This served to estimate the lagged effects of household dysfunction, financial resources and children's behavioural development on each other, to account for bi-directional effects. The inclusion of random intercepts at the household level for each outcome variable ensures that effects can be interpreted as within-household effects (as in our FE-models). Appendix E presents the model including the estimated effects. The RI-CLP model showed strong effects for both household dysfunction and financial resources on children's behavioural problems. According to the RI-CLP model, financial resources (significantly) mediated a small part of the impact of household dysfunction on behavioural problems, but again the direct effect of household dysfunction on behavioural problems remained substantial, even after we accounted for this effect. Noteworthy is that the RI-CLP model also indicated that household dysfunction (significantly) mediated the relationship between financial resources and behavioural problems. However, even when we accounted for this, our results regarding the impact of household dysfunction on children's behavioural problems and mediation by financial resources remained very much in line with our FE-models.⁶

We were interested in studying the impact of household dysfunction while rigorously controlling for possible selective transition into experiencing household dysfunction, hence, we selected children who did not experience any form of household dysfunction up to age 5. For our FE-models, however, it was sufficient to observe an increase in household dysfunction over time. Therefore, in a second additional analysis we included another distinct group of children in our analyses: those who experienced one form of household dysfunction before age 5 and transitioned to experiencing multiple forms of household dysfunction between age 5 and 14 ($N = 671$). Appendix F presents the results, which are similar to those of our main analyses. In short, we found a strong impact of household dysfunction on children's behavioural problems, but not on their cognitive ability, and there was little indication of a mediating or moderating role of financial resources.

5. Conclusion and discussion

In this study we examined the consequences of household dysfunction for children's development, while accounting for differential selection into these experiences, as well as disentangling mediating and moderating influences of parents' financial resources. Children who experienced household dysfunction for the first time after age 5 already had lower verbal ability scores and more behavioural problems before these experiences. This indicates that a substantial share of the difference in child development between children with and without experiences of household dysfunction is due to differential selection into these experiences. A main reason for this is that household dysfunction is more common among children whose parents have less financial resources, and low household income is also detrimental to child development

⁶ A disadvantage of RI-CLP models is that the time lag between variables is arbitrary and (in our study) relatively long. It is likely that there were also changes in household dysfunction and financial resources within waves, which we cannot include in the model. This is better captured by the FE-models, which relate within-family changes in one variable to changes in the other. Furthermore, RI-CLP models are not entirely appropriate here because they estimate stability paths in household dysfunction for a sample of children who experienced household dysfunction for the first time after age 5 (i.e., this variable can only increase over time). Moreover, RI-CLP models with three dependent outcome variables (one of which is a dichotomous one) and with expected mediation and moderation effects are not only (very) difficult to model but also to interpret. FE-models are therefore more appropriate to test our hypotheses.

(Bussemakers et al., 2019; McLanahan et al., 2013).

Using fixed-effects models to account for differential selection into experiencing household dysfunction with Fixed Effects-Models, we found that household dysfunction after age 5 did not affect children's verbal development. This strengthens the proposition that the foundation of children's verbal skills is laid in early childhood, perhaps making adverse experiences after the start of primary education less impactful (Cavanagh & Fomby, 2019; Schoon et al., 2010). However, experiences of household dysfunction between age 5 and 14 did increase children's behavioural problems. This is an important way in which household dysfunction may shape children's opportunities later in life, as behavioural problems are highly related to children's well-being and final educational attainment (Cavanagh & Fomby, 2019).

To understand the developmental consequences of household dysfunction, we studied the mediating and moderating role of parents' financial resources. In line with the extended family stress model, we found that household dysfunction reduced the financial resources available to children (Conger et al., 2010). However, we found only weak evidence that this reduction in financial resources drove the impact of household dysfunction, as reductions in financial resources explained a relatively small part of the impact of household dysfunction on children's problem behaviour. Moreover, we found no substantial differences between income groups in the consequences of household dysfunction for financial resources and child development.

Based on theories regarding the accumulation of disadvantage, we expected reductions in income after household dysfunction to lead to more poverty among low-income households, amplifying the negative consequences of household dysfunction for behavioural adjustment. However, our results indicate that changes in poverty status did not affect the behavioural development of children from low-income households. Falling into poverty only led to an increase in behavioural problems among children from households that initially had a high income. This, however, was a rare event, and could not explain the negative consequences of household dysfunction among children from high-income households. In other words, poverty was not the driving force behind the negative consequences of household dysfunction for behavioural problems.

The reduced reproduction perspective suggests that the consequences of household dysfunction are greater for children of parents with greater financial resources, because these children face a larger reduction in financial well-being (Härkönen et al., 2017; Prix & Erola, 2017). Although our results confirmed that the reduction in financial resources after household dysfunction was larger in high-income households, this did not translate into a larger impact of household dysfunction on children's development. The discrepancy between our results and those of earlier studies may result from our more rigorous methodological approach. Because we used longitudinal panel data, we accounted for differential selection into the household dysfunction group. Earlier studies on the moderating role of parental financial resources employed cross-sectional data, making it impossible to fully control for the higher incidence of these experiences in households with fewer resources and/or other risk factors (Härkönen et al., 2017).

Our sample selection may also have played a role. We focused on children who had a relatively stable early home environment and experienced household dysfunction for the first time after age 5. It could be that these children, especially those from richer households, had already established relevant coping skills which enabled them to withstand some of the challenges of household dysfunction (Harold and Sellers, 2018). However, experiencing household dysfunction after age 5 affected the behavioural development of children from high-income households as well, underscoring the impact of these experiences, even among relatively privileged groups. Moreover, this finding was confirmed in additional analyses of a less privileged sample which included children who had experienced one type of household dysfunction prior to age 5.

Alternatively, the difference between our findings and earlier work

on the moderating role of financial resources may be due to our focus on children’s cognitive and behavioural development, while earlier research studied the impact on children’s final educational attainment. It is possible that a larger reduction in financial resources after household dysfunction would be particularly important at later stages of children’s educational careers. One study suggests that especially children from high-income, single-parent families may be unable to attend university due to financial constraints, which limits their educational attainment (Bernardi & Boertien, 2016). Future studies in which children are followed over a longer time period could shed light on how the interplay between household dysfunction and financial resources affects children’s educational transitions.

Future research may also expand the scope of the independent variables under study. We studied the consequences of four main types of household dysfunction, but there are other adverse experiences that may harm children’s development, such as parental addiction, incarceration, and child abuse and neglect (Bussemakers et al., 2019; Felitti et al., 1998). Unfortunately, we were unable to study the impact of these experiences, as they were not measured in (all relevant waves of) the MCS. Similarly, explanatory factors other than financial resources may be studied. The family stress model argues that stressful experiences, such as household dysfunction, reduce the quality of parenting, but we were unable to directly investigate the potential mediating role of parenting quality. Future research may shed light on whether changes in parenting indeed explain why children who experience household dysfunction have more behavioural problems. Other mediating and moderating factors may be studied as well, such as characteristics of individual children and the influence of the wider social environment in which children grow up (Raley & Sweeney, 2020).

Finally, we would like to mention a methodological drawback of the current study. We used fixed-effects analyses to investigate the consequences of household dysfunction and thus focused on within-child changes in development. A major advantage of this approach is that it automatically controlled for differential selection into the household dysfunction group by excluding pre-existing (stable) variation between children and households. However, it could not account for unobserved factors that changed during the period under study (McLanahan et al., 2013). This means that our estimates of the consequences of household dysfunction on child development may have been influenced by unobserved changes in children’s lives. Furthermore, the models do not fully account for bi-directional relationships between household dysfunction, financial resources and child development. Nonetheless, in this light, it is important to note that additional analyses with RI-CLP models, which include bi-directional relationships, pointed to similar consequences of household dysfunction for financial resources and child development.

To summarise, our study demonstrates that household dysfunction had an independent impact on children’s behavioural development, although part of the difference in development between children with and without experiences of household dysfunction after the start of primary school was due to pre-existing differences. Parents’ financial resources were important for selection into experiencing household dysfunction, as financial problems often provoke such experiences (Bussemakers et al., 2019; Cavanagh & Fomby, 2019; Conger et al., 2010). Nevertheless, financial resources played a limited mediating or moderating role in the impact of household dysfunction on child development. It therefore remains important to focus on both the prevention of poverty and household dysfunction, as well as sources of non-financial support for vulnerable children and their families.

Funding

This work was supported by a Research Grant from the Netherlands Organisation of Scientific Research (NWO) (Grant number 406.17.504).

Declaration of Competing Interest

None

Appendix

See Appendix Tables A1, B1, C1, D1, F1, F2, F3
See Appendix Fig. E1

Table A1

Comparison of households excluded from analyses and households in final sample.

	Households excluded from analyses (N=6,773)	Households in final sample (N=5,275)	Pearson chi-square
	%	%	
Poverty (wave 3)			804.47 (1) ***
No	59.24	83.16	
Yes	40.76	16.48	
Education (highest educated parent)			15.87 (5) ***
None	13.70	12.52	
NVQ1	8.47	7.37	
NVQ2	27.93	28.80	
NVQ3	14.96	14.89	
NVQ4	30.03	29.98	
NVQ5	4.92	6.44	
Ethnicity child			1.93 (1)
White	82.89	83.96	
Non-white	17.11	16.04	
Gender child			2.33 (1)
Male	49.92	51.32	
Female	50.08	48.68	

*p<.1

**p<.05

*** p<.01

Table B1

Reason for exclusion from analytical sample per wave (attrition, improvements in household dysfunction and missing values).

	Age 5 (wave 3)	Age 7 (wave 4)	Age 11 (wave 5)	Age 14 (wave 6)
Total participants in sample ^a	5,338	5,338	5,338	5,338
Attrition (compared to previous wave)	n.a.	-	486	558
Participants per wave	5338	5,338	4,852	4,294
Improvement in household dysfunction	n.a.	-	437	694
Participants without improvement in household dysfunction	5338	5,338	4,415	3,600
Missing values per variable				
Financial resources/poverty	32	31	78	66
Verbal ability	54	131	67	238
Behavioural problems	193	165	139	104
Missing values on at least one variable	242	313	226	390
Participants in analytical sample	5,096	5,025	4,189	3,210

^a Participants in sample: no household dysfunction up until age 5, participation at least until age 7.

Table C1
Incidence of types of household dysfunction across waves.

	Age 5 (wave 3)		Age 7 (wave 4)		Age 11 (wave 5)		Age 14 (Wave 6)	
	N	%	N	%	N	%	N	%
Parental absence	0	0.00	197	3.92	449	10.72	457	14.24
Parental health problems	0	0.00	495	9.85	367	8.78	350	10.90
Parental mental health problems	0	0.00	88	1.77	141	3.40	99	3.16
Violence between parents	0	0.00	135	2.73	138	3.33	61	1.94

Table D1
Factor loadings of the variables measuring financial resources.

	Factor loading
Income quintile	0.73
Home ownership	0.67
Satisfaction with financial situation	0.49

Table F1
Fixed-effects estimates of the impact of household dysfunction on child development and financial resources in household (less restrictive sample).

	Verbal Ability (B-estimate)			Behavioural Problems (B-estimate)			Financial Resources (B-estimate)	Poverty (Exp B-estimate - OR)
	Model 1a	Model 3a	Model 4a	Model 1b	Model 3b	Model 4b	Model 2a	Model 2b
Experiences of household dysfunction								
One	-0.002	0.000	-0.001	0.477***	0.390***	0.474***	-0.198***	0.777**
Multiple	0.029	0.032	0.032	1.458***	1.313***	1.450***	-0.333***	1.675***
Financial resources		0.008			-0.436***			
Poverty			-0.027			0.065		
N	5,946	5,946	5,946	5,946	5,946	5,946	5,946	1,190

Note: Models control for changes in age, household composition (grandparents, step-parents, number of children in residence) and other language spoken at home.

*p<.1
** p<.05
*** p<.01

Table F2
Fixed-effects estimates of the impact of household dysfunction on child development with financial resources, separated by income groups (less restrictive sample).

	Verbal Ability (B-estimate)				Behavioural Problems (B-estimate)				Financial Resources (B-estimate)	
	Model 1a		Model 3a		Model 1b		Model 3b		Model 2	
	Low	High	Low	High	Low	High	Low	High	Low	High
Experiences of household dysfunction										
One	0.022	-0.017	0.016	-0.017	0.561**	0.456***	0.521*	0.336***	-0.099**	-0.240***
Multiple	-0.010	0.000	-0.027	0.001	1.682***	1.238***	1.573***	1.009**	-0.272***	-0.459***
Financial resources			-0.062	0.000			-0.401**	-0.498***		
N	1,740	4,206	1,740	4,206	1,740	4,206	1,740	4,206	1,740	4,206

Note: Models control for changes in age, household composition (grandparents, step-parents, number of children in residence) and other language spoken at home.

Bolded effects indicate statistically significant differences in effects between low- and high-income group (p<0.05)

* p<.1
** p<.05
*** p<.01

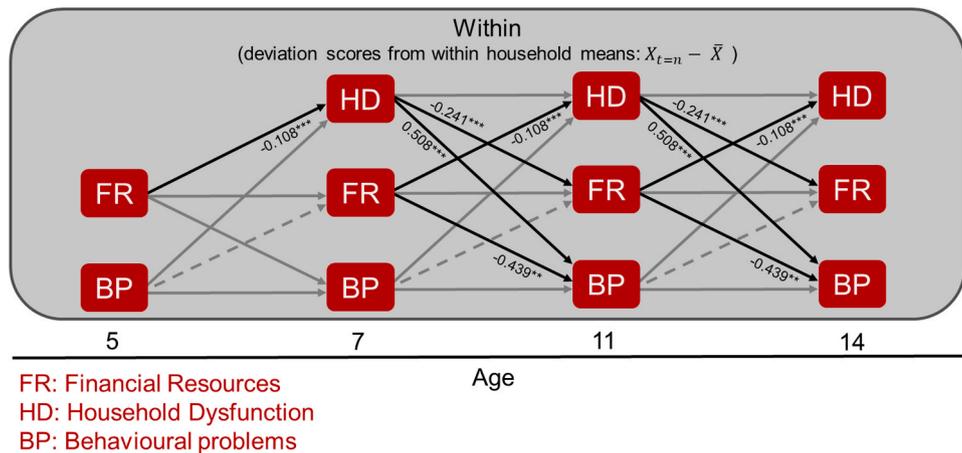
Table F3

Fixed-effects estimates of the impact of household dysfunction on child development with poverty, separated by income groups (less restrictive sample).

	Verbal Ability (B-estimate)				Behavioural Problems (B-estimate)				Poverty (Exp B-estimate - OR)	
	Model 1a		Model 3a		Model 1b		Model 3b		Model 2	
	Low	High	Low	High	Low	High	Low	High	Low	High
Experiences of household dysfunction										
One	0.022	-0.017	0.022	-0.015	0.561**	0.456***	0.561***	0.430***	0.189	1.899***
Multiple	-0.010	0.000	-0.138	0.006	1.682***	1.238***	1.688***	1.168***	1.131***	3.327***
Poverty			0.027	-0.032			-0.041	0.375**		
N	1,740	4,206	1,740	4,206	1,740	4,206	1,740	4,206	817	373

Note: Models control for changes in age, household composition (grandparents, step-parents, number of children in residence) and other language spoken at home. **Bolded effects** indicate statistically significant differences in effects between low- and high-income group ($p < 0.05$).

* $p < .1$
 ** $p < .05$
 *** $p < .01$



* $p < .1$; ** $p < .05$; *** $p < .01$
 Grey effects are included, but not displayed. Dotted lines: not statistically significant ($p < .1$).
 The models also include random intercepts of all variables and control for the effects of changes in age, household composition and language spoken at home on behavioural problems.

Fig. E1. Random Intercept Cross-Lagged Panel model.

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