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Do nonresident fathers compensate for a lack of household resources? The associations between paternal involvement and children's cognitive and educational assessments in the UK



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ABSTRACT

This article investigated the associations between nonresident fathers' involvement and cognitive and educational achievements in children. In particular, we tested the resource compensation model, which predicts that the involvement of nonresident fathers should compensate for the lack of household resources and that the effect should be strong, particularly in families with low resources. We use the British Millennium Cohort Study ($n=3445$), in which 11-year-old children's cognitive and educational assessments were measured using the British Ability Scale and household resources were measured using maternal education and occupation, family income, and number of books in the home (i.e., cultural capital). We found that the involvement of nonresident fathers was associated with higher scores more strongly in families with the lowest level of cultural capital, compared with others. However, nonresident fathers' involvement was not associated with child scores more strongly in lower resource households than in higher resource households, when the resources were measured by maternal education and occupation and by family income. The results showed that, although the involvement of nonresident fathers might compensate for a lack of household resources, the effect tends to vary between resource types.

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1. Introduction

As a part of great social and demographic changes, the number of divorces has grown rapidly in many Western countries (Lesthaeghe, 2014). Currently, one of the highest divorce rates in Europe exists in the UK (OECD, 2014), where more than one third of children have been reported to experience parental separation by the age of 11 (Connelly, Joshi & Rosenberg, 2014). Because children usually stay with their mothers if their parents separate, there are an increasing number of children with nonresident fathers (Sobotka & Toulemon, 2008). Studies have shown that children who live in single-mother families or families with stepfathers have, for instance, higher risk of academic failures, distress and emotional and behavioral problems than children who reside in intact families. Because research on social mobility and stratification has shown that educational achievements in childhood predict socioeconomic success in adulthood (e.g., Duncan, Yeung, Brooks-Gunn & Smith, 1998; Heckman, 2006; Schneider, 2008), the absence of

fathers could have detrimental effects on children, not only in the short term but also in the long term.

The question how to dampen the negative effects of parental separation (i.e., how to deal with losses in household resources) has been the focus of several previous studies (e.g., Augustine, 2014; Mandemakers & Kalmijn, 2014; Martin, 2012). However, in the present study we investigate how involvement of nonresident fathers can compensate for current low levels of resources among single mother and stepfather households. Thus, we analyse whether an extra unit of resources received from nonresident fathers has more benefits for the outcomes of children in low-resource families compared to children in high-resource families. By investigating these questions, we test the predictions based on the resource compensation model, which assumes that the lack of a certain resource in a household (e.g., lack of socioeconomic or cultural capital) can be compensated for by some other resource (e.g., involvement received from nonresident father).

2. Resource compensation and paternal involvement

Previous studies have indicated that parental separation may have negative effects on educational achievements in children (e.g., Astone & McLanahan, 1991; Biblarz & Gottainer, 2000; Sun & Li,

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2008). This effect has been explained by the resource deprivation model (e.g., Coleman, 1988; McLanahan & Sandefur, 1994), which starts from the prediction that high levels of parental resources help children to achieve educational success. Because parental separation tends to result in a decrease in household resources, it can have harmful effects for children. For instance, after parental separation, the financial resources and living standards of the family often decrease (Downey, 1995a, 1995b). In addition, when one parent (usually the father) leaves the household, the parent who leaves may also take away immaterial resources, e.g., cultural capital. Thus, after parental separation, children might lose these resources, which otherwise (i.e., in cases in which parents stay together) would be available to them.

However, in current societies, parental separation does not mean that nonresident fathers totally lose contact with their children or stop invest resources in them. In fact, in Western nations, the level of nonresident fathers' involvement has increased substantially in the last decades, and it is currently increasingly common for nonresident fathers to remain in touch with their children after parental separation (Amato, Mayers & Emery, 2009; Westphal, Poortman & van der Lippe, 2014). Many nonresident fathers regularly see their children, as well as provide financial and non-financial support to their children and their families (Modecki, Hagan, Sandler & Wolchik, 2015; Skinner & Davidson, 2009). This involvement of nonresidential fathers might also help to prevent the potential detrimental effects of parental separation and thus compensate the lack of the current household resources in single mother and stepfather households.

In general, the resource compensation model predicts that missing household resources can be replaced with other resources (e.g., Bernardi, 2014; Bernardi & Radl, 2014). The model has been tested before in the context of parental divorce. The findings of Grätz (2015), based on the German data, suggested that fathers' substantial resources might compensate for the negative long-term intergenerational effects of parental separation. However, there has been a lack of studies investigating whether the involvement of nonresident fathers has different effects on child outcomes according to the different levels of household resources. Based on the compensation model the involvement on nonresident fathers should compensate the lack of household resources more in low-resource families compared to high-resource families.

Here the involvement of nonresident fathers is measured by three indicators, namely contact frequency, relationship closeness and paternal support. Although these are different measurements of involvement, they are not totally separate and thus can overlap with each other. It has been argued that those fathers who regularly see their children might be closer with them and also might be more likely to provide support to them (Dunn, Cheng, O'Connor, & Bridges, 2003). In agreement with this argument, Hawkins et al. (2007), for instance, showed that contact frequency was strongly correlated with other paternal involvement indicators.

From compensation perspective it is important to study different indicators of paternal involvement because all paternal involvement measures may not compensate the lack of household resources similarly. For instance, emotional support received from nonresident fathers could be more beneficial for children compared to contact frequencies (Adamsons & Johnson, 2013). One reason why pure contacts between fathers and children could be a poor measurement of paternal involvement is because the time that fathers and children share together can vary substantially in content (Dunn et al., 2003; Smith, Robertson, Dixon, Quigley, & Whitehead, 2001). If fathers have supportive relationships with their children, one might expect that contact frequency is positively associated with child outcomes. In contrast, if the relationship is conflictual, or the fathers harm their children, contact might be negatively associated with child outcomes (Amato & Rezac, 1994;

Amato & Sobolewski, 2004; King & Heard, 1999). The third option is that the effect of paternal involvement is neutral. Terms such as "Disneyland dad" and "fun parent" are used to refer to those fathers who do not engage in activities that could improve child development but rather spend only leisure time with their children (Jenkins, 2009). Although shared leisure activities with nonresident fathers can benefit small children (Jia, Kotila, & Schoppe-Sullivan, 2012), more instrumental paternal involvement, including helping to pay for school-related issues and other financial support, still tends to matter more in cases of older children and adolescents.

3. Household resources

In addition to paternal involvement, household resources (i.e., the socioeconomic and cultural assets of families) have consistently been shown to correlate with academic achievements in children, meaning that when the rents (e.g., Duncan et al., 1998; Heckman, 2006; Hampden-Thompson, 2009). Moreover, several studies have shown that there are lower levels of resources in single-mother and stepfather families than in intact families (e.g., Downey, 1995a, 1995b; McLanahan & Sandefur, 1994; Sun & Li, 2001), with potentially negative effects on children's educational attainments (Sun & Li, 2009; Bernardi & Radl, 2014; Mandemakers & Kalmijn, 2014).

Here, we measured household resources by four factors, which indicate somewhat different aspects of resources, namely maternal education, maternal occupation, household income and cultural capital. Parental education might indicate both cognitive skills and non-cognitive traits, whereas parental occupational position tends to indicate social status, and family income measures financial resources. Obviously, these socioeconomic factors overlap with each other because more highly educated individuals also tend to have, on average, higher incomes and occupational positions.

In addition to these socioeconomic resources, cultural capital is an important household resource type and might be particularly important in the academic environment investigated in the present study. In his hallmark studies, Bourdieu (1977), Bourdieu (1984), Bourdieu (1986) argued that cultural resources represent immaterial types of capital and should be considered similar to financial resources. Esping-Andersen (2006), pp. 14, defined cultural capital as "the ability of parents to transmit the proper 'middle class' cultural baggage – such as self-presentation or language skills – to their children" (see also Lamont & Lareau, 1988). Cultural capital can be transmitted from parents to children via involvement and socialization.

Based on Bourdieu (1977), cultural capital consists of three levels, namely embodied, objectified and institutionalized cultural capital. Embodied cultural capital represents itself, for instance, by linguistic skills, proper preferences and cultural knowledge. Embodied cultural capital can be measured by objectified cultural goods, such as the number of books or artworks in the home. According to Bourdieu, cultural capital is not only one form of capital, but it also represents currency that can be exchanged into other currencies. In the academic world, cultural capital can be converted into educational success and credentials, i.e., institutionalized cultural capital. Thus, based on Bourdieu's theory, higher cultural capital should be associated with greater educational success.

Previous studies have indeed found that children from homes with higher cultural capital also achieve greater success in the academic world (e.g., Andersen & Jaeger, 2014; Cheadle, 2008; Dumais, 2002; Xu & Hampden-Thompson, 2012). In this article, we measured cultural capital by the number of books in the home, a factor that has been shown to have stronger power to explain children's educational achievements compared with several other measurements of cultural capital (Esping-Andersen, 2009 De Graaf, 1986). The correlation between the number of books in the home and edu-

cational success is explained by the presence of several books in the home perhaps indicates a high level of “scholarly culture” and a small number of books perhaps indicates a low level (Evans, Kelley, Sikora & Treiman, 2010). A high level of scholarly culture in turn tends to provide useful skills and knowledge of reading and numeracy that children can utilize in their schoolwork. In contrast, when the family has a low level of scholarly culture, it is more unlikely that the children have these useful skills and knowledge. Moreover, a previous study by Farkas and Hibel (2008) showed that the number of books in the home is one of the most exact indicators measuring parents’ willingness to provide guidance to children. Thus, the number of books in the home represents material objects that can reflect everyday routines, including, reading books, talking about them and using knowledge, something that Bourdieu (1984) called “habitus”.

Although more highly educated and financially better off individuals might have a greater likelihood of possessing cultural capital, these different household resource factors are not always correlated with each other. For instance, teachers tend to have high levels of cultural capital, but they are often relatively poorly paid. In contrast, some higher income individuals, such as engineers, professional athletes or businessmen, do not necessarily possess high levels of cultural capital. Thus, it is important to study different aspects of household resources separately.

4. Potential confounding variables

Previous studies have shown that several factors are associated with both paternal involvement and child outcomes. Thus, it is important to control for these potentially confounding variables. With regard to gender, studies have shown that fathers see their sons more often than their daughters and also provide more support to sons (e.g., Harris & Morgan, 1991; Mitchell, Booth & King, 2009). However, research has consistently shown that girls earn higher scores on educational tests than boys (e.g., Hampden-Thompson, 2009). When studying children who are in the middle of their developing years, it is important to adjust for age because older students tend to perform better on educational and cognitive tests than younger students due to a more advanced stage of development (Karwath, Relikowski, & Schmitt, 2014). Moreover, the influence of nonresident fathers’ involvement tends to vary by ethnic background, although these associations can be complicated (King, Harris & Heard, 2004).

One of the most robust findings in the social mobility and stratification literature is that when the number of siblings increases, the academic achievements in children decrease (e.g., Jaeger, 2008; Sieben, Huinink, & de Graaf, 2001). This finding might occur because parental resources are finite; thus, new children in the household reduce the resources that parents are able to invest in any certain child (Coleman, 1988; Downey, 2001). Not only the number of siblings but also the birth order can be a factor, and studies have shown that first-born children tend to earn higher scores than later-born children (e.g., Conley & Glauber, 2006). Moreover, children with younger mothers have been found to earn lower educational and developmental scores than children with older mothers (Tanskanen & Danielsbacka, 2016), and close mother-child relationships tend to be associated with improved well-being in children.

Family structure has been shown to be associated with both nonresident fathers’ involvement and child outcomes. First, previous studies have shown that children from intact families achieve higher academic success than children from single-mother families (e.g., Biblarz & Gottainer, 2000; Sun & Li, 2009). Second, when children live with new stepfathers, they may receive less support from their nonresident fathers (e.g., Furstenberg, Nord, Peterson &

Zill, 1983; Stephens, 1996). Finally, some studies have shown that the point the father leaves the household may influence paternal involvement and child outcomes (Adamsons & Johnson, 2013).

5. Objective

This study explores the associations between nonresident fathers’ involvement (measured as contact frequency, relationship closeness, and paternal support) and children’s cognitive and educational attainments in the UK. We tested the resource compensation hypothesis, which predicts that the involvement of nonresident fathers should compensate for a lack of current household resources. According to the resource compensation model we assume that the involvement of nonresident fathers correlate with increased educational scores in children more strongly in lower resource families than in higher resource families.

6. Material and methods

We used data from the British Millennium Cohort Study (MCS), which includes information about children born at the beginning of the new millennium in England, Wales, Scotland and Northern Ireland. We used the fifth round data collected in 2012, when the children were, on average, 11 years old. In the MCS, the cohort member children are targets, and information is collected by interviewing their parents or parental figures. The main respondents are usually the biological mothers of the children, who have responded to questions concerning cohort member children, other family members, and their socioeconomic and household situation. The fifth survey reached approximately 13,000 responding families, and the response rate was 69% (see Hansen, 2014, for a full data description).

In the present study, we selected in the analyses all cohort member children with nonresident fathers (biological or non-biological) who are living in single-mother or stepfather households. Only cases in which the mothers live in the same household as the cohort member child were included. In addition, in cases of twins and triplets, only one child of the set was included. Finally, children who did not participate in cognitive and educational attainment tests were excluded. After these exclusions, the analytic sample included 3445 children.

In the fifth round of the MCS, children’s cognitive and educational attainments were measured by the British Ability Scales (BAS), which measure verbal reasoning and knowledge in children (Elliott et al., 1996 Elliott, Smith & McCulloch, 1996; Elliott, Smith & McCulloch, 1997). BAS scores are based on the responses of cohort member children who are interviewed at home. In the analyses, we used the adjusted BAS scores that were computed using the conversion tables from the BAS manuals, and the standardized scores have a mean of 50 with a standard deviation of 10 (Connelly, 2013; Hansen, 2014). To correct for the skewness of the BAS score variable, it was transformed using square transformation and dividing the square by 1000 ($M = 3.35$, $SD = 0.99$).

The involvement of nonresident fathers was measured by contact frequency, relationship closeness, and paternal support. The information was based on the reports of the cohort member children’s mothers. In the MCS, the responding mothers were asked to report how often the cohort member child sees his/her nonresident father, ranging from 0 = never to 6 = every day ($M = 2.08$, $SD = 1.75$). In addition, respondents were asked to report how close would they say the cohort member child is to his/her nonresident father. The scale of the father-child closeness variable ranges from 0 = not close to 4 = extremely close ($M = 1.83$, $SD = 1.45$).

In the MCS, the support provided by nonresident fathers was measured by ten different questions: Does the father contribute

Table 1
Distribution of household resource variables.

	n	%
Maternal education		
None	407	11.8
NVQ level 1	327	9.5
NVQ level 2	966	28.0
NVQ level 3	615	17.9
NVQ level 4	895	26.0
NVQ level 5	235	6.8
Maternal occupation		
Not working	1379	40.0
Routine	204	5.9
Semi-routine	499	14.5
Small employer, self-employed and lower supervisor/technical	247	7.2
Intermediate	446	13.0
Lower professional	561	16.3
Higher professional	109	3.2
Family income		
Bottom quintile	1137	33.0
Second	1062	30.8
Third	612	17.8
Fourth	368	10.7
Top quintile	266	7.7
Number of books		
0–10	692	20.1
11–25	601	17.5
26–100	1179	34.2
101–500	869	25.2
More than 500	104	3.0

money to child maintenance? Does the father buy clothes, toys or presents for the child? Does the father pay for the child's school-related activities? Does the father look after the child? Does the father help with repairs around the child's house? Does the father buy food for the child's household? Does the father help to pay rent or mortgage payments for the child's household? Does the father help to pay for utilities or other household bills for the child's household? Does the father help to pay for vacations for the child and/or take the child on vacation? Does the father help to pay for outings to special places or events for the child? Does the father help with other expenses? Each question was assessed on a scale of 0 = no or 1 = yes. The paternal support variable was calculated by totaling the answers to the ten questions (Cronbach's alpha = 0.78), and the scale of the summed variable was between 0 and 10 (M = 1.88, SD = 2.07). In the case of the paternal support variable, a higher score indicated stronger involvement.

In this study, we measure household resources by maternal education, occupation, family income and cultural capital. In the MCS, maternal education was measured by National Vocational Qualification (NVQ), in which a higher level of NVQ indicates higher educational qualifications. The scale ranges from 0 = no qualification to 5 = higher education degree or postgraduate qualification. The maternal occupation variable measures the occupational standing of the current job and includes seven categories (0 = not working, 1 = routine, 2 = semi-routine, 3 = small employers, self-employed and lower supervisors/technical, 4 = intermediate, 5 = lower professional, 6 = higher professional). Family income was measured by equalized income quintiles, based on the UK income distribution (ranging from 1 = bottom to 5 = top). Finally, cultural capital was measured by number of books in the home, a variable shown to be a most important measure of cultural capital in several previous studies (e.g., Blake, 1981; Evans et al., 2010; Park, 2008). The scale ranged from 1 = 0–10 books to 5 = more than 500 books. The distributions of household resource variables are presented in Table 1.

Table 2
Descriptive statistics.

	n	%/mean	SD
Child's age (in months) (mean)	3445	134.2	4.09
Child's gender (%)			
Boy	1745	50.6	
Girl	1700	49.4	
Child's ethnicity (%)			
White	2954	85.8	
Mixed	162	4.7	
Indian	29	0.8	
Pakistani and Bangladeshi	105	3.1	
Black	174	5.1	
Other	21	0.6	
Number of siblings (mean)	3445	1.5	1.50
Birth order (%)			
First born	1521	44.2	
Later born	1924	55.9	
Family structure (%)			
Single-mother	2514	73.0	
Stepfather	931	27.0	
Maternal age (mean)	3445	37.7	6.19
Mother-child relationship quality (mean)	3445	4.4	0.86
Point father left household (%)			
Before the child's age of 5	2090	60.7	
Between the child's ages of 5 to 7	491	14.3	
After the child's age of 7	864	25.1	

Methodologically, we used linear regression analysis with fixed effects, controlling for between country variation (OLS with country dummies) and several potentially confounding variables that were shown to be associated with paternal involvement and child outcomes in previous studies (e.g., Hampden-Thompson, 2009; Jaeger, 2008; Sun & Li, 2009). These variables are the child's age (in months), gender, ethnicity, number of siblings, birth order, family structure (single-mother household or stepfather household), maternal age and the time when the father left the household (1 = before the child's age of five, 2 = between the ages of five and seven, 3 = after the age of seven). In addition, we attempted to control for mother-child relationship quality by adjusting the variable measuring how often mothers talk to cohort member children about things that are important to him/her (ranging from 1 = less than monthly to 5 = every day). Finally, the household resource variables were mutually adjusted in all models (i.e., these variables were included in the same models at the same time). Descriptive statistics are presented in Table 2.

7. Results

We first provided bivariate correlations of household resources and paternal involvement variables. Appendix A Table 1 shows that the strongest correlations are between father-child closeness and contact frequency, paternal support and contact frequency and father-child closeness and paternal support. In addition, there are moderate correlations between maternal occupation and family income, maternal occupation and maternal education, and maternal education and family income. In the case of household resource variables, the number of books (i.e., cultural capital) is not correlated with other household resource variables (i.e., maternal education, occupation and family income) as strongly as these three variables are correlated with each other.

We found that all types of paternal involvement factors are associated with increased cognitive and educational scores in children (Table 3). When contact frequency, relationship closeness and paternal support increases also test scores increase. There were also significant correlations between household resource variables and child outcomes. When maternal educational level

Table 3
Cognitive and educational attainments: Associations between nonresident fathers' involvement, family resources and attainments in children.

	Model 1			Model 2			Model 3		
	Contact frequencies			Relationship closeness			Paternal support		
	β	SE	P	β	SE	P	β	SE	P
Paternal involvement	0.03	0.01	0.001	0.04	0.01	0.001	0.02	0.01	0.022
Maternal education									
None	ref			ref			ref		
NVQ level 1	0.10	0.07	0.133	0.10	0.07	0.136	0.10	0.07	0.129
NVQ level 2	0.13	0.05	0.017	0.13	0.05	0.021	0.13	0.05	0.019
NVQ level 3	0.16	0.06	0.014	0.16	0.06	0.015	0.16	0.06	0.014
NVQ level 4	0.16	0.06	0.009	0.16	0.06	0.010	0.17	0.06	0.008
NVQ level 5	0.20	0.09	0.023	0.20	0.09	0.027	0.19	0.09	0.030
Maternal occupation									
Not working	ref			ref			ref		
Routine	0.11	0.07	0.118	0.11	0.07	0.114	0.11	0.07	0.120
Semi routine	0.05	0.05	0.392	0.05	0.05	0.376	0.05	0.05	0.352
Small employer, self-employed and lower supervisor/technical	0.17	0.07	0.017	0.16	0.07	0.018	0.17	0.07	0.016
Intermediate	0.08	0.06	0.145	0.08	0.06	0.146	0.09	0.06	0.134
Lower professional	0.03	0.06	0.640	0.03	0.06	0.623	0.03	0.06	0.566
Higher professional	0.17	0.10	0.104	0.17	0.10	0.104	0.18	0.10	0.077
Family income									
Bottom quintile	ref			ref			ref		
Second	0.17	0.05	0.001	0.16	0.05	0.001	0.17	0.05	0.001
Third	0.20	0.06	0.002	0.19	0.06	0.003	0.20	0.06	0.002
Fourth	0.21	0.08	0.007	0.20	0.08	0.011	0.20	0.08	0.010
Top quintile	0.31	0.09	0.001	0.30	0.10	0.002	0.30	0.10	0.002
Number of books									
0–10	ref			ref			ref		
11–25	0.13	0.05	0.018	0.12	0.05	0.020	0.12	0.05	0.020
26–100	0.27	0.05	<0.001	0.27	0.05	<0.001	0.27	0.05	<0.001
101–500	0.46	0.05	<0.001	0.46	0.05	<0.001	0.45	0.05	<0.001
More than 500	0.50	0.10	<0.001	0.50	0.10	<0.001	0.50	0.10	<0.001
Adjusted R2	0.11			0.11			0.10		
n	3445			3445			3445		

Notes. Control variables: child's age, gender, ethnicity, number of siblings, birth order, family structure, maternal age, mother-child relationship quality and time point father left household.

increases, so do the scores of the children. Children with mothers who are small employers, self-employed workers or lower supervisors earn higher scores than children with unemployed mothers. Finally, when family income and number of books in the household increased, so did educational scores.

Next, we tested the prediction based on the compensation model and investigated whether we can find evidence that paternal involvement had more influence on cognitive and educational scores in lower resource families than in higher resource families. First, we included interaction terms between paternal involvement variables and maternal education (Table 4). These results indicated that paternal involvement might benefit children with the least educated mothers more than others. However, these differences are primarily not significant.

Then, we included interaction terms between paternal involvement measurements and maternal occupation (Table 5). We found that only paternal support (but not other paternal involvement variables) is associated with educational scores more strongly in children with unemployed mothers than in children with mothers with higher professional positions.

Subsequently, interactions between paternal involvement and family income were investigated (Table 6). Although there is a slight non-significant trend showing that paternal involvement might benefit children more in lower incomes families than in higher income families, we did not find convincing evidence for compensation.

Finally, we included interaction terms between paternal involvement factors and number of books in the home (i.e., cultural capital). Results are presented in Table 7 and illustrated in

Figs. 1–3. The results indicate that paternal involvement is associated more strongly with children's cognitive and educational scores in households with the lowest number of books when compared with others. This result is the case with all of the paternal involvement measurements, although there are some differences in the magnitude. These results provide support for the prediction that involvement received from nonresident fathers compensates for a lack of cultural capital.

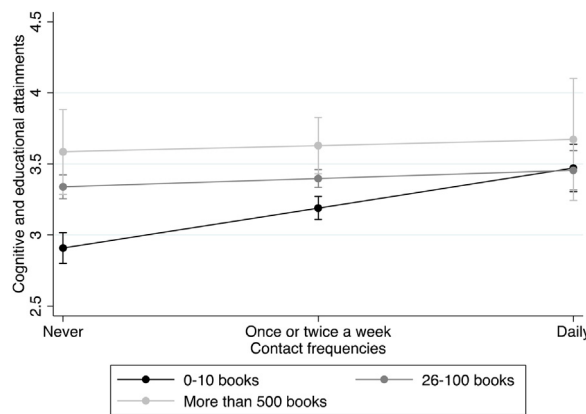


Fig. 1. Cognitive and educational attainments: Associations between paternal involvement and children's attainments by cultural capital (predictive margins and 95% confidence intervals).

Table 4
Cognitive and educational attainments: Associations between paternal involvement and children's attainments by maternal education.

	Model 1			Model 2			Model 3		
	Contact frequencies			Relationship closeness			Paternal support		
	β	SE	p	β	SE	p	β	SE	p
Paternal involvement	0.06	0.02	0.008	0.09	0.03	0.006	0.03	0.02	0.200
Maternal education									
None	ref			ref			ref		
NVQ level 1	0.19	0.10	0.068	0.18	0.11	0.091	0.04	0.09	0.676
NVQ level 2	0.23	0.08	0.004	0.24	0.08	0.004	0.15	0.07	0.041
NVQ level 3	0.13	0.09	0.151	0.10	0.09	0.281	0.11	0.08	0.165
NVQ level 4	0.17	0.09	0.068	0.21	0.09	0.024	0.15	0.08	0.056
NVQ level 5	0.32	0.13	0.014	0.34	0.13	0.012	0.26	0.12	0.026
Maternal education x paternal involvement									
Paternal involvement x none	ref			ref			ref		
Paternal involvement x NVQ 1	-0.05	0.04	0.155	-0.06	0.05	0.204	0.02	0.04	0.487
Paternal involvement x NVQ 2	-0.06	0.03	0.049	-0.08	0.04	0.040	-0.02	0.03	0.476
Paternal involvement x NVQ 3	-0.01	0.03	0.678	-0.004	0.04	0.926	-0.006	0.03	0.840
Paternal involvement x NVQ 4	-0.02	0.03	0.527	-0.05	0.04	0.200	-0.01	0.03	0.667
Paternal involvement x NVQ 5	-0.09	0.04	0.056	-0.11	0.05	0.039	-0.05	0.04	0.121
Adjusted R2	0.10			0.10			0.10		
n	3445			3445			3445		

Notes. Control variables: child's age, gender, ethnicity, number of siblings, birth order, family structure, maternal age, mother-child relationship quality, time point father left household, maternal occupation, family income and number of books.

Table 5
Cognitive and educational attainments: Associations between paternal involvement and children's attainments by maternal occupation.

	Model 1			Model 2			Model 3		
	Contact frequencies			Relationship closeness			Paternal support		
	β	SE	p	β	SE	p	β	SE	p
Paternal involvement	0.03	0.01	0.021	0.05	0.02	0.010	0.03	0.01	0.057
Maternal occupation									
1 Not working	ref			ref			ref		
2 Routine	0.25	0.11	0.019	0.22	0.11	0.052	0.20	0.10	0.036
2 Semi routine	0.01	0.08	0.863	0.06	0.08	0.425	0.06	0.07	0.348
4 Small employer, self-employed and lower supervisor/technical	0.25	0.11	0.020	0.22	0.11	0.050	0.18	0.09	0.051
5 Intermediate	0.12	0.09	0.176	0.07	0.09	0.444	0.09	0.08	0.243
6 Lower professional	0.06	0.08	0.494	0.12	0.09	0.185	0.10	0.07	0.172
7 Higher professional	0.30	0.19	0.123	0.36	0.21	0.092	0.46	0.16	0.004
Maternal occupation x paternal involvement									
Paternal involvement x 1	ref			ref			ref		
Paternal involvement x 2	-0.05	0.04	0.177	-0.04	0.05	0.388	-0.03	0.03	0.346
Paternal involvement x 3	0.03	0.03	0.280	0.01	0.03	0.848	0.01	0.03	0.761
Paternal involvement x 4	-0.03	0.04	0.502	-0.02	0.05	0.731	0.005	0.03	0.878
Paternal involvement x 5	0.001	0.03	0.986	0.021	0.04	0.557	0.01	0.03	0.659
Paternal involvement x 6	-0.004	0.03	0.883	-0.033	0.03	0.320	-0.02	0.02	0.320
Paternal involvement x 7	-0.05	0.06	0.463	-0.08	0.08	0.318	-0.11	0.05	0.029
Adjusted R2	0.10			0.10			0.10		
n	3445			3445			3445		

Notes. Control variables: child's age, gender, ethnicity, number of siblings, birth order, family structure, maternal age, mother-child relationship quality, time point father left household, maternal education, family income and number of books.

8. Conclusions

In this study, we investigated the associations between non-resident fathers' involvement and 11-year-old children's cognitive and educational attainments in the UK. In agreement with several previous studies (see [Adamsons & Johnson, 2013](#) for review), we found correlations between paternal support and child outcomes, as well as between child-father relationship closeness and child outcomes. Moreover, positive correlations between contact frequency and child outcomes were detected. In line with several previous studies, we also detected positive associations between household resources and child scores (e.g., [Andersen & Jaeger, 2014](#); [Hampden-Thompson, 2009](#)). We found that, when the maternal

educational level, family income and number of books in the home (i.e., cultural capital) increased, so did the cognitive and educational attainments of children. However, we did not find convincing support for the assumption that higher maternal occupational status is associated with increased educational scores in children.

The main objective of this study was to analyze whether the involvement of nonresident fathers compensated for the lack of household resources more strongly in lower resource families than in higher resource families. We found that the involvement of nonresident fathers is associated with children's scores more strongly in children who live in households with fewer than 10 books (i.e., in the group having the lowest level of cultural capital) compared with others. This was the case for all paternal involve-

Table 6
Cognitive and educational attainments: Associations between paternal involvement and children's attainments by family income.

	Model 1			Model 2			Model3		
	Contact frequencies			Relationship closeness			Paternal support		
	β	SE	p	β	SE	p	β	SE	p
Paternal involvement	0.04	0.01	0.008	0.05	0.02	0.017	0.03	0.02	0.043
Maternal occupation									
1 Bottom quintile	ref			ref			ref		
2 s	0.24	0.06	0.000	0.21	0.07	0.001	0.18	0.06	0.002
3 Third	0.25	0.09	0.004	0.24	0.09	0.006	0.31	0.08	0.000
4 Fourth	0.28	0.12	0.015	0.25	0.12	0.037	0.26	0.10	0.009
5 Top quintile	0.23	0.15	0.112	0.31	0.15	0.042	0.37	0.13	0.003
Family income x paternal involvement									
Paternal involvement x 1	ref			ref			ref		
Paternal involvement x 2	-0.02	0.02	0.301	-0.01	0.03	0.603	0.003	0.02	0.882
Paternal involvement x 3	-0.01	0.03	0.753	-0.01	0.03	0.756	-0.04	0.02	0.084
Paternal involvement x 4	-0.02	0.04	0.531	-0.01	0.04	0.724	-0.02	0.03	0.480
Paternal involvement x 5	0.03	0.04	0.437	0.001	0.05	0.987	-0.02	0.03	0.446
Adjusted R2	0.10			0.10			0.10		
n	3445			3445			3445		

Notes. Control variables: child's age, gender, ethnicity, number of siblings, birth order, family structure, maternal age, mother-child relationship quality, time point father left household, maternal education, maternal occupation and number of books.

Table 7
Cognitive and educational attainments: Associations between paternal involvement and children's attainments by cultural capital.

	Model 1			Model 2			Model3		
	Contact frequencies			Relationship closeness			Paternal support		
	β	SE	p	β	SE	p	β	SE	p
Paternal involvement	0.09	0.02	<0.001	0.11	0.03	<0.001	0.07	0.02	<0.001
Number of books									
1) 0–10	ref			ref			ref		
2) 11–25	0.38	0.08	<0.001	0.28	0.08	0.001	0.23	0.07	0.001
3) 26–100	0.43	0.07	<0.001	0.41	0.07	<0.001	0.38	0.06	<0.001
4) 101–500	0.59	0.08	<0.001	0.59	0.08	<0.001	0.53	0.07	<0.001
5) More than 500	0.68	0.16	<0.001	0.83	0.17	<0.001	0.70	0.14	<0.001
Number of books x paternal involvement									
Paternal involvement x 1	ref			ref			ref		
Paternal involvement x 2	-0.12	0.03	<0.001	-0.09	0.04	0.013	-0.06	0.03	0.018
Paternal involvement x 3	-0.07	0.03	0.003	-0.08	0.03	0.014	-0.07	0.02	0.004
Paternal involvement x 4	-0.06	0.03	0.023	-0.07	0.03	0.031	-0.05	0.02	0.039
Paternal involvement x 5	-0.08	0.06	0.161	-0.17	0.07	0.020	-0.10	0.04	0.023
Adjusted R2	0.11			0.10			0.10		
n	3445			3445			3445		

Notes. Control variables: child's age, gender, ethnicity, number of siblings, birth order, family structure, maternal age, mother-child relationship quality, time point father left household, maternal education, maternal occupation and family income.

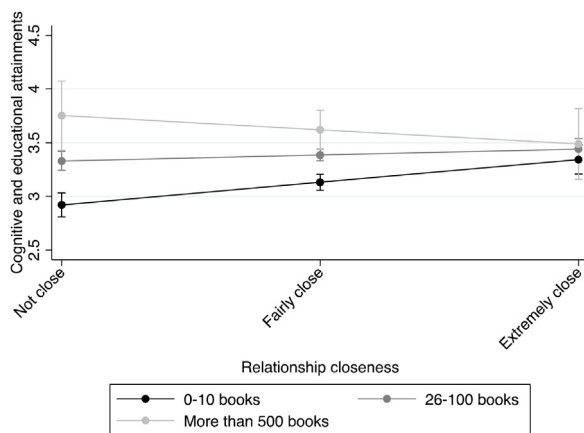


Fig. 2. Cognitive and educational attainments: Associations between relationship closeness of nonresident fathers and children's attainments by cultural capital (predictive margins and 95% confidence intervals).

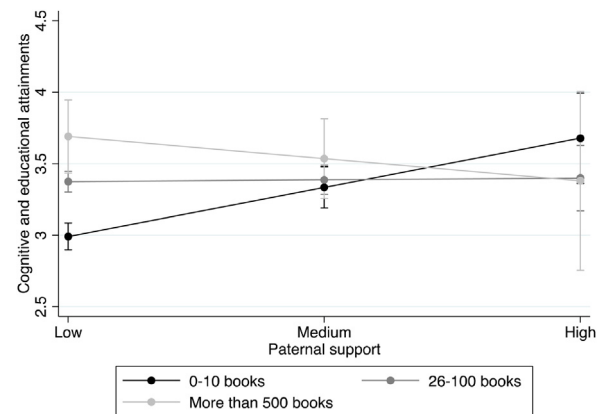


Fig. 3. Cognitive and educational attainments: Associations between support of nonresident fathers and children's attainments by cultural capital (predictive margins and 95% confidence intervals).

ment variables studied, and these results held even after several potential confounding variables were controlled for. In the cases of maternal education and family income, we did not find significant associations showing support for the prediction that paternal involvement benefit children more in lower resource families than higher resource families. Thus, we can conclude that the involvement of nonresident fathers seems to compensate for a lack of cultural capital but not for the lack of other household resources.

Although different household resource factors are often correlated with each other, they do not measure exactly the same aspects of stratification. In the present study, we found that maternal education, maternal occupation and family income variables were correlated more strongly with each other than with the number of books in the home. However, it is not self-evident why the compensation effect of nonresident fathers' involvement exists only in the case of cultural capital but not in the cases of other resources. To some extent, similar results have nonetheless been reported elsewhere. Møllegaard and Jæger (2015) studied grandparents' influence on grandchildren's educational success in Denmark. They found that only grandparents' cultural resources appear to have a directly positive effect, minus the parents' resources, whereas economic and social capital did not matter. The authors argued that one of the reasons for this finding is that cultural capital can be reused, unlike many other forms of capital. In other words, cultural capital is a resource that one cannot entirely deplete.

In the case of the present study, it is important to note that the nonresident father might also have children by subsequent spouses in whom he must invest resources. The resources that cannot be reused (e.g., financial capital) might benefit only or mainly the children by a new spouse, but it is possible that the cultural capital will benefit children from both previous and current relationships (e.g., all children can read the same books). Thus, a child from a low cultural capital household can utilize the cultural capital of a nonresident father without the risk of exhausting it entirely. Further, one can argue that in families with the least cultural capital, mothers or stepfathers have less ability, capability or willingness to be involved compared with other households. According to the previous study by Farkas and Hibell (2008) the number of books in the home is strongly associated with parents' willingness to provide guidance to their children. Thus, in these family circumstances, the involvement of nonresident fathers may matter the most. Finally, it could be that the number of books in the home is related to overall "family scholarly culture" (Evans et al., 2010), meaning that in the households where this is not strong the extra help from nonresident fathers may be particularly important.

Compared with previous studies investigating the associations between nonresident fathers' involvement and child outcomes, the present study has several strengths. Most former studies of the topic have used small and non-representative samples (see Adamsons & Johnson, 2013; Amato & Gilbreth, 1999 for reviews). Here, we have analyzed a large and representative sample from the UK, and we were also able to control for several potentially confounding variables. Moreover, we were able to use several paternal involvement factors, as well several household resource indicators. Thus, the results might be more generalizable than several previous findings (see Henrich, Heine & Norenzayan, 2010 for discussion). The study also has some limitations. Because of the data structure, we have only a limited amount of information about nonresident fathers. For instance, we do not know whether the nonresident fathers have children by new spouses or even whether they have new spouses at all. Both of these factors likely influence nonresident fathers' involvement and, thus, might also be correlated with child outcomes. The amount of paternal involvement is based on maternal reports who may either under- or overstate the involvement of nonresident fathers (Mikelson, 2008). Previous studies comparing nonresident father and resident mother reports of paternal involve-

ment have shown that nonresident fathers tend to report that they are more involved in their children's life than resident mothers do (e.g., Kitterød & Lyngstad, 2014; Seltzer & Brandreth, 1994). Moreover, in the data, cultural capital was measured by only one indicator, i.e., number of books in the home. Fortunately, previous studies have shown that this indicator is a relevant measurement of cultural capital (e.g., Evans et al., 2010; Park, 2008) because it tends to have stronger explanatory power than other measurements of cultural capital (De Graaf, 1986; Esping-Andersen, 2009).

In conclusion, our results show that nonresident fathers' involvement is associated with increased cognitive and educational achievements in children, in particular, in low resource households where children's risks to educational failures are often high. Thus, our results also have policy implications. To promote children's educational success, policy makers and practitioners should pay closer attention to how to encourage nonresident fathers' involvement. Although in Western countries the amount of nonresident fathers' involvement has increased in the last decades, there remains a large number of nonresident fathers who have no or very limited contact with their children (Amato et al., 2009). Improving fathers' possibilities of being involved in their children's lives after parental separation might benefit those children who might often be at high risk for school failures.

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Appendix A.

See Table A1.

Table A1

Bivariate correlations: Family resource and paternal involvement variables.

	1	2	3	4	5	6
1 Contact frequencies.	–					
2 Relationship closeness.	0.81					
3 Paternal support	0.61	0.66				
4 Maternal education	0.08	0.14	0.15			
5 Maternal occupation	0.14	0.19	0.19	0.48		
6 Family income	0.15	0.24	0.28	0.55	0.59	
7 Number of books	0.02	0.06	0.10	0.32	0.23	0.28

Notes. Bolded numbers indicate significant associations: $p < 0.001$

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