

# The Long-Term Effect of Childhood Poverty

## Working Paper

Rune V. Lesner

Department of Economics and Business

Aarhus University

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### Abstract

This paper finds that an additional year of poverty during the childhood years from the age of one to fourteen have a negative effect on the disposable income of around 4000 DKK per year. The effect is identified by exploiting within-sibling variation in the experience of childhood poverty. It is found that the effect is larger for men than for women and it is found that the older sibling is harmed more by poverty than the younger sibling. Additionally it is found that the negative effect is larger if the additional poverty is experienced in the later years of the childhood. Looking at other outcomes it is found that childhood poverty also has an effect on employment, labour market experience, education and number of children at a young age.

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<sup>1</sup>Address for correspondence: Department of Economics and Business, Aarhus University, Fuglesangs Allé 4, 8210 Aarhus V, Denmark. Email: rlesner@econ.au.dk.

# 1 Introduction

In western countries childhood poverty is a sizable, persistent and controversial feature of the modern economy. In 2011 27% of all children in the EU-27 area were reported as being in risk of poverty and social exclusion (EUROSTAT). Based on such observations a growing literature has been concerned with understanding the potential long-term consequences of childhood poverty.

In recent years the literature has turned from a focus on the intergenerational income correlation to more causal studies of the effect of parental income on child outcomes. The shift in the literature has however come at the cost that researchers primarily has focus on short- and medium-term outcomes such as child behavior and educational attainment due to data limitations. This paper exploit the longitude of the Danish registers to extends the literature by providing a causal study of the long-term consequences of childhood poverty with a specific focus on income, where the income is measured around the age of 30. In this sense this study can be seen as linking the correlation literature on poverty to the literature on causal income effects. This paper additionally adds to the literature by not only studying the over all effect of childhood poverty, but also the role of the timing of the experience of poverty.

The effect of childhood poverty is identified by using a yearly parental poverty measure and within-sibling variation during childhood years to control for other, often unobservable, parental and environment factors. The potential difference in the number of years in childhood poverty between siblings will allow for identification of the marginal effect of the experience of one additional year in childhood poverty. Additionally, age differences between siblings and the timing of parental poverty will allow for identifying heterogeneous age effects of the experience of childhood poverty.

In this paper a relative poverty measure is used to identify the families where children are socioeconomic deprived. The focus on the effect of poverty is based on previous empirical literature finding very large effects for children growing up in low income families on outcomes such as behavior and educational attainment (Løken, Mogstad and Wiswal (2010)). Similar the intergenerational income correlation is also found to be very high at the bottom of the income distribution.

If a policy maker seeks to improve equality of opportunity this paper and the related literature provides arguments for policy makers to focus on individuals experiencing childhood poverty to be the relevant treatment group. In Duncan et. al (2007) it is argued that the total cost for society in terms of foregone earnings, crime and health costs from individuals experiencing childhood poverty can be sizable.

The empirical literature attempting causally estimating the link between poverty or income of the parents and various outcomes of the child can be split into three types based

on the method used.

A small but important group of papers has exploited changes in government income transfer schemes in quasi-experiments. In Duncan, Morris and Rodrigues (2011), Milligan and Stable (2011) and Evans and Garthwaite (2010) it is found that an increase in family income due to an increase in the level of transfer has a modest to large effect on the educational achievement of the child.

A second line of research exploit instrumental variable designs to estimate the effect of parental income on educational outcomes. Løken (2010), Løken, Mogstad and Wiswal (2012) uses regional difference in the economic boom following the discovery of oil in Norway as an instrument. They find sizable effects for low income families on education and IQ of the children and smaller effects for high income families. Dahl and Lochner (2012) uses a non-linear change in the Earned Income Tax Credit system in the US as an instrument and find sizable effects on math and reading scores. Similar to the studies from Norway they find that the effects were largest for disadvantaged families.

The final set of papers related to the present study is studies relying on within family fixed effects methods. Duncan et. al (1998) and Levy and Duncan (1999) uses differences between siblings to identify the effect of parental income on outcomes of the child. In these papers it is found that family income matters for the educational achievement of the child and that family income at early ages of the child is most important for child educational achievement. Blau (1999) includes grandparent fixed effects in the setup and find small and insignificant effect of current family income on achievement and behavioral outcomes of the child.

This study is methodologically related to the final set of papers by seeking to identify the effect of income of the parents on the outcomes of the child through a sibling fixed effects setup. The study however distinct itself from the literature by specifically focusing on childhood poverty and by exploiting the longitude of the Danish data registers to estimate the effect on long-term outcomes such as the income of the child as adult.

I find that the marginal effect of one additional year of childhood poverty will decrease the disposable income of an individual by about 4000 DDK per year or 2.3% of the average disposable income in the population. The identification strategy also allows me to extend the literature by showing that childhood poverty matters the most in the later years of childhood and boys and older sibling are affected much more than their counterparts.

This paper proceeds as follows. In the next section, I give a brief literature review. Section 3 describe the data, the sample selection and the definition of childhood poverty. The strategy for estimating the effect childhood poverty is described in Section 4. Section 5 presents results and robustness checks. Section 6 concludes.

## 2 Related literature

The literature has put forward a series of different channels through which childhood poverty might have an effect on long-term outcomes of the child. These can be summarized into four main channels. Each of these will be carefully examined in the empirical analysis.

The first potential channel examined in this paper is the parents' psychological distress due to their economic hardship. The poverty of parents might have an effect on the parents' non-monetary capacity to actively participate in the development of the child. Parental poverty might affect the parents by lower well-being, depression, poor health and less interaction with the child. In the literature (R.D. Coger and Elder (1994), Elder and Caspi (1988) and McLoyd (1990)) this model is often labeled as the psychological model or the family stress process. In Milligan and Stable (2011) and Evens and Garthwaite (2010) it is found that income transfer programs can improve the emotional well-being of a family. In this paper different causes of parental poverty are exploited to gain insights on the importance of the family stress model. If the family stress model is the main driver of the effect of childhood poverty then one would expect that poverty due to parental job loss should have a large effect. Similarly, one would expect that childhood poverty due to parents being students would have a lower effect.

The second channel can be labeled the welfare trap. In Anderson (1978), Murray (1984), Mead (1986) and Mead (1992) it is suggested that the experience of growing up in a family dependent on government transfers will lower the stigma associated with receiving social transfers for the child later in life. This effect is then suggested to spillover to lower educational ambitions and work ethics. Mead argues that a welfare culture in this sense might have intergenerational spillover and thereby have long-term consequences for the child. The potential existence of a welfare trap is analysed by looking into the potential intergenerational correlation in having government transfers as the main source of income in the sibling fixed effects modeling setup.

The third potential channel is the neighborhood where the child grows up. If parents are poor this limits their choice of housing to neighborhoods with low housing prices. This socio-demographic segregation can potentially have an effect on the development of social capital of the child through the lack of role models, neighborhood safety and school quality. Arguments for this theory can be found in Loury (1981) and Coleman (1990). In the available data source the yearly municipality of residence is available. This information can be used in the sibling fixed effects modeling setup to account for age-municipality fixed effects. If neighborhoods are an important channel it would be expected that these age-municipality fixed effects would lower the residual effect of childhood poverty considerably. In addition the base model is estimated separately for parental educational groups. The results from this exercise will yield information on the stigma of childhood poverty across

social classes.

The fourth channel is the direct income effect. This effect captures the lack of ability of the parents to invest resources in the development of the child through supportive parenting practices. This potential effect is based on human capital theory and emphasize the parents lack of ability to purchase materials, experiences and services to build human capital. Arguments for this theory can be found in Becker and Tomes (1986), Haveman and Wolfe (1994) and Mayer (1997). In Heckman (2008) it is accentuated that this effect goes through the credit constraint of both the parents and the child's inability to borrow against future outcomes. In this paper the direct income effect will be thought of as the residual effect when accounting of the other potential channels.

The main ambition of this paper is to causally estimate the combined effect of childhood poverty on later life outcomes. Relating to the four different channels the effect estimated in this paper will be the sum of the effects from the described channels. In addition this study will also tries to separate the four channels by examining each of them in turn, in order to get insights on each of these mechanisms.

### **3 Data**

This paper takes advantage of the vast Danish data registers. The data base is provided by Statistic Denmark and is called the Integrated Database for Labor Market Research (IDA). The IDA data base is a matched employer-employee longitudinal database including yearly socioeconomic information on all Danes. The version used in this paper consists of information from 1980 to 2010.

#### **3.1 Sample selection**

The data sample used in the estimations is constructed by including all pairs of siblings where both are born between 1979 and 1983. Twins are excluded from the sample since no within family yearly variation can be observed for these pairs<sup>1</sup>. Only individuals where their parents can be observed from birth to the age of 14 are included. Information on the parents in the described years are then included in the sample together with information on the individuals from the years 2008 to 2010. This means that the individuals are between the age of 27 and 31 in 2010. The sample is constructed in this manner in order to be able to observe yearly observations of childhood poverty as well as later life outcomes. The sample include observations on 56,295 individuals and their parents.

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<sup>1</sup>One might consider including twins in the sample, simply to identify between family variables. However since these are not the parameters of interest in this paper. The twins pairs were left out.

### 3.2 Outcome measures

The main outcome variable of interest is the individual income at ages between 27 and 31 observed in 2010. In order to obtain a reasonable income measure. Three different variables are used. The first is the disposable income of the individual. This variable is available in the IDA database provided by Statistics Denmark and consist of the individual income such as wages, transfers and interest excluding taxes. The measure is designed such that it mirrors the available income for consumption and savings for the individual.

The second measure is the individual hourly wage for those who are employed. This measure is constructed by using the yearly wage income, information of fraction of year employed and weekly hours worked from the pension funds.

The final income measure is the gross income this measure includes all income of the individual during the year before taxes.

A group of other outcome measure are included. These are employment, duration of education, accumulated labor market experience, marriage, if the individual have children and if the individual is in a managerial job. Where managerial job is defined as CEO or as a high ranking executive and labor market experience is measured from the time where the individual finish highest level of education.

While the main focus of the paper is on the effect of childhood poverty on individual income the broad set of outcome measures will allow for additional insights on the role played by childhood poverty on individual position on the labor market.

### 3.3 Explanatory variables

The data sample include a control for siblings being in the same family. Where two siblings are defined as being from the same family if both their biological parents are the same. Beside from this variable capturing between family variation a group of variables capturing within family variation is also include. These consist of the age of the father and the mother when the child was born, individual age, observation year, gender, birth order, age span between the siblings, sibling gender and interaction between sibling gender and birth order. These variables are included in order to account for variation in the estimations beside from variation due to the accumulation and timing of childhood poverty.

### 3.4 Measuring childhood poverty

In this paper the measure of childhood poverty is based on the disposable income of the parents in a given year. The disposable income of the parents is made comparable across household structures by using an equivalence scale. In this paper the OECD-modified scale is applied. The scale assigns a value of 1 to single households without children, a

value of 0.5 for each additional adult and a value of 0.3 for each additional child in the household. By using an equivalence scale marriage are allowed to be an insurance against individual poverty and allows for public goods in the household.

Based on this measure of parental disposable income the childhood poverty measure is then defined as a relative measure for all Danes in the ages between 18 and 55. A person is defined as experiencing childhood poverty at a given age if the disposable income of the parents is below 50% of the median income in the given year. The advantage of this measure is its simplicity and that it follows the dynamics of the income of the rest for the country. This makes it easy to interpret the results from the model and to avoid any politically loaded arguments on the selection of poverty. Since the poverty of students represent a distinct type poverty which is not the focus of this paper, students falling below the relative poverty line will not be considered as poor. The role of parental student poverty will be considered separately in Section 5.3.2.

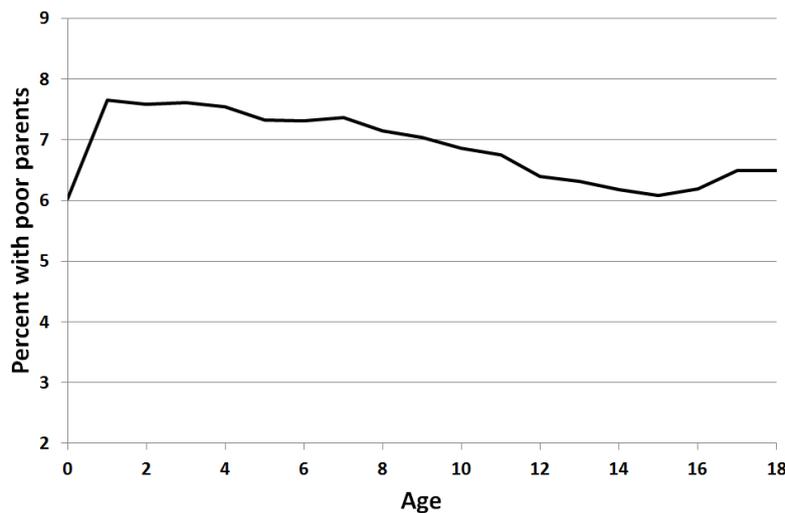


Figure 1: Percent of children experiencing childhood poverty in a given year by age of the child.

### 3.5 Descriptive statistics

In the sample it is found that the intergenerational income correlation in disposable income is 53% and that the sibling income correlation is 64%. These numbers are very much in line with the literature (LITT ON INCOME CORRELATIONS SIB AND PARENTS). In terms of the identification strategy described in the next section one might be concerned that the older siblings experienced substantially more childhood poverty than younger siblings. This is only the case for 63% of the sibling pairs, thus raises no concern.

Descriptive statistics on the sample of individuals can be found in Table 1 and Table

2. The descriptive statistics in Table 1 has information on the individuals and Table 2 include information about their parents. Both Table 1 and Table 2 are split into three columns, where column one present information on all individuals, column two present information on only those individual who never have experienced childhood poverty and column three present information on individuals who have experienced at least one year of childhood poverty. From the last row of the table it can be seen that about 25% of the individuals in the sample have experienced poverty at least one year during childhood. Looking into the difference between who have never experienced childhood poverty and those who have it can be seen that those who never have experienced childhood poverty have a higher income both in terms of disposable income, gross income and hourly wage. They also have higher employment levels, accumulated labor market experience and longer educations. Additionally, a lower fraction of them are observed as being poor in year 2010 and they are more likely to live in the capital area around Copenhagen.

Table 2 show results on parental characteristics. From the table it can be seen that people who never experienced childhood poverty have younger parents with on average higher educations. They grow up in household with higher disposable incomes and their parents are less likely to be immigrants.

Overall these numbers suggest that people who experience childhood poverty are doing worse than others in terms of labor market outcomes. They also suggest that their parents were doing worse. Whether the difference in the labor market outcomes of the individuals can be attributed to the experience of childhood poverty or whether it is purely due to selection is the main question attempted answered in the later sections of this paper.

**Table 1: Descriptive statistics of individual characteristics.**

	All	Never experienced childhood poverty	Experienced childhood poverty at least once
<b>Individual characteristics in 2010:</b>			
Disposable income	191,302	192,993	186,149
Brutto income	279,543	280,711	275,982
Hourly wage	151.47	154.06	143.57
Gender	0.52	0.52	0.52
Age	29.03	29.01	29.08
Employment rate	0.74	0.75	0.70
Labor market experience	5.85	5.88	5.75
Managerial job	0.24	0.25	0.21
Self-employed	0.03	0.03	0.04
Regular worker	0.50	0.50	0.50
Poor (50% of median income)	0.10	0.10	0.12
Married	0.29	0.28	0.29
Have children	0.42	0.42	0.42
Older sibling	0.50	0.50	0.51
Sibling age span	0.00	-0.02	0.05
Residence in the capital area	0.26	0.27	0.24
Years of education	13.34	13.41	13.11
<b>Education:</b>			
Low	0.26	0.25	0.29
Medium	0.35	0.35	0.34
High	0.39	0.40	0.36
<i>N</i>	56,295	42,393	13,905

*Note:* The first column shows means statistics for the entire sample, the second column shows statistics for those who never experienced childhood poverty and the third column show statistics for those who experienced poverty at least for one year during childhood statistics for those who experienced poverty at least for one year during childhood. All statistics are measured in 2010.

**Table 2: Descriptive statistics of parental characteristics.**

	All	Never experienced childhood poverty	Experienced childhood poverty at least once
<b>Parental characteristics:</b>			
Age of father at birth	29.65	29.40	30.46
Age of mother at birth	26.59	26.46	27.00
At least one immigrant parent	0.07	0.05	0.10
Parents married at birth	0.95	0.97	0.91
Father in a UI-fund*	0.81	0.78	0.88
Disposable income in household**	98,978	107,427	73,219
<b>Educational group of father*:</b>			
Low	0.36	0.32	0.46
Medium	0.42	0.44	0.37
High	0.22	0.24	0.17
<b>Educational group of mother*:</b>			
Low	0.45	0.43	0.53
Medium	0.29	0.29	0.26
High	0.26	0.28	0.21
<i>N</i>	56,295	42,393	13,905

*Note:* The first column shows means statistics for the entire sample, the second column shows statistics for those who never experienced childhood poverty and the third column show statistics for those who experienced poverty at least for one year during childhood statistics for those who experienced poverty at least for one year during childhood. \*Measured in 2010. \*\*In year 1991 in 1991 prices.

## 4 Empirical method

In order to identify the effect of childhood poverty a siblings fixed effects model is introduced. This modelling setup exploits the differences in the accumulated poverty experienced during childhood as well as the timing of these experiences to identify the effect. Two separate types of models are estimated. These can be seen in (1) and (2).

$$y_{i,t} = \alpha + \gamma_f + \beta_1 P_i^{total} + \delta X_{it} \quad (1)$$

$$y_{i,t} = \alpha' + \gamma'_f + \beta_2 P_i^{1,5} + \beta_3 P_i^{6,10} + \beta_4 P_i^{11,14} + \delta' X_{it} \quad (2)$$

$\gamma_f$  is the sibling fixed effect,  $\alpha$  is a constant,  $y$  is the relevant outcome and  $X$  represent a set of controls introduced in the previous section. The set of controls include age and year dummies, a gender indicator, parental age dummies, birth order and age span between

siblings, sibling gender and interaction between sibling gender and birth order. Poverty experienced in the year of birth are included as a control since the effect of poverty in the birth year might have very different effects than poverty experienced from the age of 1 to 14.  $P^{total}$  in (1) is the accumulated years of poverty experienced from the age of 1 to the age of 14. The relevant treatment effect can be observed as  $\beta_1$  in the equation and represent the marginal effect of one additional year of poverty experienced during childhood.  $P^{1,5}$ ,  $P^{6,10}$  and  $P^{11,14}$  is the accumulated years of poverty experienced from the age of 1 to 5, 6 to 10 and 11 to 14 separately. Thus,  $\beta_2$ ,  $\beta_3$  and  $\beta_4$  represent the marginal effect of one additional year of poverty conditional on the timing of the childhood poverty experience.

## 5 Results

In this section the results of the paper are presented. In the first part the results on the marginal effect of childhood poverty are shown. These are the main results of the paper. The second part present results on the potential channels through which childhood poverty might affect labor market outcomes. The third part of this section present results on the robustness of the main results of the paper to different poverty measures.

### 5.1 The effect of childhood poverty

Table 3 present the results on the marginal effect of one additional year of childhood poverty on later life income. The table show results on the three income measures: disposable income, gross income and hourly wage. The results are based on sibling fixed effects regressions as described in the previous section. Referring to the empirical models in Section 4 the estimates in the table are  $\hat{\beta}_i$  for  $i = 1, \dots, 4$ .

The results from model (1) show a significant negative effect of one additional year of childhood poverty on later life income across income measures. From the table it can be seen that one additional year of childhood poverty will lower the yearly disposable income of an individual with 4046 DDK, which amount to 2.3% of the average yearly disposable income for the observed population. The gross income is decreased by 3083 DDK, which amount to 1.2% of average yearly gross income and the hourly wage is decreased by 2.7 DKK, which is 1.4% of average hourly wage.

**Table 3: The effect of childhood poverty on adult income and the difference in the effect over age of the child.**

	Disposable income	Gross income	Hourly Wage		
<b>No. of years in childhood poverty:</b>					
Total no. of years	-4046.1** (1438.8)	-3082.6** (1523.4)	-2.7** (1.1)		
No. of years between age 1 and 5	-2624.7 (1916.3)	-969.7 (1880.7)	-1.6 (1.4)		
No. of years between age 6 and 10	-4517.4** (1802.8)	-1844.5 (1987.2)	-3.3* (1.7)		
No. of years between age 11 and 14	-5410.8** (1926.8)	-7015.7** (2270.1)	-3.8** (1.9)		
Number of observations	168894	168894	168894	119003	119003

*Note:* All income measures are measured in 2010. Gross income include all types of income an individual receives before taxes. The disposable income is an after taxes measure including interest and accounted for price of housing. The hourly wage is the yearly labour market income of an individual divided by the number of hours worked during the year. A number available from the mandatory labour market pension scheme. Sibling pair clustered standard errors in parentheses.\*  $p < 0.10$ , \*\*  $p < 0.05$ .

The difference in the timing of the experience of childhood poverty found by estimating model (2) described in the previous section are also presented in Table 3. From these estimates it can be seen that the marginal effect of childhood poverty is increasing in the age of the child. The result is robust across income measures. Interestingly these timing effects are different than what is found in Duncan et. al (1998) and Levy and Duncan (1999) for the U.S., where it is found that family income matter most in the early years for the educational achievement of the child. The differences in institutional settings and levels of income inequality between Denmark and the U.S. however makes a comparison difficult.

Results for other outcome measures from estimations of the model (1) can be found in appendix A.1 . From these results it can be seen that the marginal effect of childhood poverty also is significantly negative on years of education and on the likelihood of being in a high-end job. While it has a positive effect on the probability of having a child before the age of 31.

## 5.2 Heterogeneous effects

In Table 4 versions of model (1) where the effect of childhood poverty is allowed to differ between gender and between birth order of the siblings are presented. From these results it can be seen that the marginal effect of childhood poverty is significant for both men and women, but that it is 48% larger for men than for women. This substantial difference in the levels of the effect suggest that men are much more affected by the experience of childhood poverty than women in terms of labor market performance. (LIT ON GENDER DIFF IN CHILDHOOD).

Looking into the role of birth order it can be seen that the older sibling is affected much more by the experience of childhood poverty than the younger sibling. In particular the results in Table 4 suggest that the marginal effect of childhood poverty is 41% larger for the oldest sibling. This is interesting given that (BIRTH ORDER LIT).

**Table 4: The effect of childhood poverty on adult income by gender and by birth order.**

	Disposable income	
<b>No. of years in childhood poverty:</b>		
Total no. of years	-3213.0** (1422.8)	-3967.8** (1430.5)
Total no. of years*Gender(Male)	-1552.4** (616.4)	
Total no. of years*Birth order(Older sibling)		-1637.2** (488.2)
Number of observations	168894	168894

*Note:* The disposable income measures is measured in 2010. The disposable income is an after taxes measure including interest and accounted for price of housing. Sibling pair clustered standard errors in parentheses. \*  $p < 0.10$ , \*\*  $p < 0.05$ .

## 5.3 Potential Channels

In the introduction of this paper four potential channels through which childhood poverty can affect labor market outcomes were presented. These channels are: parental psychological distress, welfare trap, neighborhood and social class and a direct income effect. In this section the marginal effect of childhood poverty found in the previous section is tried explained by the three first of these channels. Since the potential channels will be hard to identify the results in this section can only be seen as suggestive evidence.

### 5.3.1 Parental Psychological distress

The first potential channel is parents psychological distress due to their economic hardship. The poverty of parents might have an effect on the parents non-monetary capacity to actively participate in the development of the child. Parental poverty can affect the parents by lower well being, depression, poor health and less interaction with the child (R.D. Cogger and Elder (1994), Elder and Caspi (1988) and McLoyd (1990)).

In this paper two indicators are proposed to give some insights on the role of parents psychological distress due to their economic hardship. If the family stress model is the main driver of the effect of childhood poverty then one would expect that poverty due to parental job loss should have a large effect. Similar one would expect that childhood poverty due to parents being students would have a lower effect.

Table 5 show the results of the base model including a separate effect for poverty due to parents being job loss. From the table it can be seen that there indeed is a large negative marginal effect of parental job loss on disposable income of the child as adult. The point estimate is however non-significant. This results can be seen as suggestive evidence for the family stress model, it is however interesting to see that the marginal effect of childhood poverty is largely unaffected by the inclusion of the separate effect of parental job loss and that no significant interaction effects between childhood poverty and parental job loss can be found. These results suggest that while the family stress model might have an important effect on labor market outcomes the effect do not seem to go through the experience of childhood poverty.

**Table 5: The effect of childhood poverty and the role of the father losing his job or the father being in school.**

	Disposable income	
No. of years of parental job loss	-3577.5 (3256.9)	
No. of years of father in the educational system		11488.3** (2881.7)
<b>No. of years in childhood poverty:</b>		
Total no. of years	-4021.2** (1411.2)	-3950.8** (1409.1)
Total no. of years conditional on parental job loss	238.1 (12321.5)	
Total no. of years conditional on father in the educational system		2153.3 (3508.1)
Number of observations	168894	168894

*Note:* The disposable income measure is measured in 2010. The disposable income is an after taxes measure including interest and accounted for price of housing. Sibling pair clustered standard errors in parentheses. \*  $p < 0.10$ , \*\*  $p < 0.05$ .

In Table 5 the results on the marginal effect of having a father in the educational system during childhood can be found. From this table it can be seen that having a father in the educational system during childhood has a large positive effect of the disposable income of the child. It can however also be seen that there is no significant effect of the experiencing poverty during childhood simultaneously with the father being in the educational system. The sign of these effect are also in line with expectations based on the family stress model.

### 5.3.2 Welfare trap

In Anderson (1978), Murray (1984), Mead (1986) and Mead (1992) it is suggested that the experience of growing up in a family dependent on government transfers will lower the stigma associated with receiving social transfers for the child later in life. This effect is then suggested to spillover to lower educational ambitions and work ethics. This paper looks into the possible presence of a so called welfare trap by estimating the marginal

effect of one additional year of the father receiving workfare transfers during childhood on the probability of the child receiving transfers as adult and on the disposable income of the child as adult. Since the focus of this paper is on the effect of childhood poverty the interaction between the experience of childhood poverty and the experience of the father receiving transfers is also investigated. The result from this can be seen in Table 6.

**Table 6: The effect of childhood poverty and the role of the father receiving public transfers.**

	Receiving public transfer as main income		Disposable income	
No. of years of father receiving public transfers as main income (a)	-0.002 (-0.39)	-0.002 (-0.32)	2186.8 (1.50)	1812.2 (1.17)
No. of years in childhood poverty (b)		0.002 (0.74)		-4075.7** (-2.81)
Interaction between (a) and (b)		-0.002 (-0.11)		2448.6 (0.49)
Number of observations	168894	168894	168894	168894

*Note:* The disposable income measure is measured in 2010. The disposable income is an after taxes measure including interest and accounted for price of housing. The outcome 'Receiving public transfer as main income' is equal to one if the individual rely on public transfers as main source of income.  $t$  statistics in parentheses.

\*  $p < 0.10$ , \*\*  $p < 0.05$ .

Table 6 provides no argument of the presence of a welfare trap. The marginal effect of one additional year of father receiving welfare transfers has no significant effect on the probability of the child receiving transfers as adult. Additionally it also do not have an effect on the disposable income of the child as adult. When looking at the effect of childhood poverty and father receiving welfare transfers in a given year the results indicates that there seem to be no significant interaction effect.

The results in this section can be seen as suggestive evidence that the marginal effect of childhood poverty is not affected by the possible presence of a welfare trap.

### 5.3.3 Neighborhood and social class

In order to look into the role of neighborhood and social class to methods are used. The role of neighborhood is investigated by including age-municipality fixed effects. This

captures the potential effect of growing of in different municipality between sibling, while the sibling fixed effect are expected to capture the effect of siblings growing up in the same neighborhood. Table 7 presents the result on the marginal effect of childhood poverty from this regression. From this it can be seen that the inclusion of age-municipality fixed effects have very little effect on the size of the effect. If anything the point estimate become larger due to the inclusion of the fixed effects. This result suggest that neighborhood effects matter very little for the effect of childhood poverty. The result is however in no way conclusive since most movement are expected to be between neighborhoods within the municipalities which are not captured by the age-municipality fixed effects.

**Table 7: The effect of childhood poverty and the role of neighborhoods and the education of the father.**

	<b>Municipality Fixed effects</b>	<b>Education Low</b>	<b>Education Medium</b>	<b>Education High</b>
	<b>Disposable income</b>	<b>Disposable income</b>	<b>Disposable income</b>	<b>Disposable income</b>
No. of years in childhood poverty	-4466.5** (-3.15)	-2283.3 (-1.26)	-6222.0** (-2.50)	-8272.3 (-1.37)
Number of observations	168894	59838	71694	37362

*Note:* The disposable income measures is measured in 2010. The disposable income is an after taxes measure including interest and accounted for price of housing. The three educational groups are based on the duration of the education. A description of the three educational groups can be found in section 3. *t* statistics in parentheses.

\*  $p < 0.10$ , \*\*  $p < 0.05$ .

In order to get some insights on the effect of childhood poverty across social class the model is estimated separately for subsamples split by the educational level of the father. The educational level is split into three as described in Section 3 and labeled low, medium and high. The result from these subsample estimation are also presented in Table 7. Due to the lower sample sizes only the effect for the medium educated fathers becomes significant. The results across subsamples however exhibit a patter of increasing effect sizes in the fathers educations. Relating to the family stress model this can be seen as indicating that the cost of childhood poverty is higher in social classes where it is less common. Thus the stigma of poverty becomes higher.

## 5.4 Robustness

This section present results based on different variations of the poverty measure. The first part show results using different relative childhood poverty thresholds and the second part presents results on persistent childhood poverty.

### 5.4.1 Different poverty measures

In order to look into the importance of the poverty threshold the base model is estimated using different threshold. In Table 8 result for the effect of childhood poverty on the disposable income of the child as adult can be found for poverty measures varying from a measure of 20% of median income in a given year to 60% of median income in a given year.

**Table 8: The effect of childhood poverty using other poverty thresholds.**

Poverty measure:	60%	40%	30%	20%
	<b>Disposable income</b>	<b>Disposable income</b>	<b>Disposable income</b>	<b>Disposable income</b>
No. of years in childhood poverty	-3670.8** (1111.5)	-3695.5** (1313.5)	-2753.2** (1254.9)	-2774.2** (1268.9)
Number of observations	168894	168894	168894	168894

*Note:* The disposable income measures is measured in 2010. The disposable income is an after taxes measure including interest and accounted for price of housing. Sibling pair clustered standard errors in parentheses. \*  $p < 0.10$ , \*\*  $p < 0.05$ .

Table 8 reveals that the overall result of the marginal effect of childhood poverty on labor market outcome is rather robust to choice of threshold for the childhood poverty measure. These results can be seen as a product of the small variation in income at the lower end of the income distribution in Denmark given the Danish social security system.

Based on these result the choice of a poverty measure of 50% of the median income in a given year seem to be reasonable in providing insight to the effect of childhood poverty.

### 5.4.2 Persistent poverty

In the literature (LITT ON PERSISTENCE OF POVERTY) it is often argued that it is the experience of persistent poverty which carry the main long-term effect of poverty. A monetary argument can be that a household experiencing temporary poverty might be able to borrow money from friends and family, this however will not be a possibility when experiencing persistent poverty. A counter argument can however be found using

the family stress model. A household moving from a year of non-poverty to a year of poverty might be more psychologically affected than a family experiencing its second year of poverty. The result from these conflicting arguments are by no means clear.

In this paper the role of persistent poverty in the effect of childhood poverty is sought elaborated by two separate estimations. The empirical modeling setup is the same as in the base model of the paper except that in the first version the effect of number of years in childhood poverty is split into three: at least one year of childhood poverty, at least five years of childhood poverty and at least nine years of childhood poverty. This model will capture the potential effect of an increasing effect of childhood poverty in the duration of childhood poverty. The result from this estimation can be seen in column one of Table 9. These results point to the effect of childhood poverty increasing in the duration of childhood poverty. The results are however unclear since the data do not provide enough variation in order to properly assess this hypothesis.

The second method used in order to assess the role of persistent poverty in the effect of childhood poverty is by estimating the base model but switching the measure of number of years in childhood poverty with three measures: at least one year of childhood poverty, at least two consecutive years of childhood poverty, at least three consecutive years of childhood poverty. The main results from this estimation can be found in column two in Table 9. It is not clear from these results that the persistence of poverty is the main driver of the effect of childhood poverty. The estimates are unfortunately insignificant and therefore very little can be said from these results.

The results in this section provide no smoking gun for the argument of persistent poverty being the main driver of the effect of poverty. The arguments from this section are however limited by the lack of variation in the data.

**Table 9: The effect of childhood poverty using persistency poverty measures.**

	Disposable income	
At least 1 year of childhood poverty	-4956.7 (3379.4)	-3708.0 (11291.7)
At least 5 years of childhood poverty	-4159.1 (5121.6)	
At least 9 years of childhood poverty	-11383.9	
At least 2 consecutive years of childhood poverty		-3661.0 (4019.1)
At least 3 consecutive years of childhood poverty		-1124.5 (4157.8)
Number of observations	168894	168894

*Note:* The disposable income measures is measured in 2010.

The disposable income is an after taxes measure including interest and accounted for price of housing. Sibling pair clustered standard errors in parentheses.

\*  $p < 0.10$ , \*\*  $p < 0.05$ .

## 6 Concluding remarks

In this paper, I have examined the effect of childhood poverty on adult outcomes using within-sibling variation during childhood years to control for other, often unobservable, parental and environment factors. Consistent with the recent literature on the effect of parental income on short and medium term outcomes, I find that childhood poverty has a significant effect on long-term outcomes such as adult income. This result is in line with the intergenerational correlation studies and can be seen as linking the causal studies of parental income to the long-term correlation literature. In particular I find that the marginal effect of one additional year of childhood poverty will decrease the disposable income of an individual by about 4000 DDK per year or 2.3% of the average disposable income in the population. The identification strategy also allows me to extend the literature by showing that childhood poverty matters the most in the later years of childhood and boys and older sibling are affected much more than their counterparts.

The effect found in the paper is explained as hinging from a combination of a series of mechanisms. In the paper; I makes a first approach to disentangle these channels. It is

however clear that future work is needed in this area in order to really get insights into the complex patters through which childhood poverty affects adult outcomes.

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## A Appendix

**Table A.1: The effect of childhood poverty other outcomes**

	<b>Employed</b>	<b>Poor</b>	<b>Married</b>	<b>Labour market experience</b>
No. of years in childhood poverty	-0.002 (0.005)	0.005 (0.004)	0.007 (0.005)	0.07** (0.03)
No. of observations	168894	168894	168894	168894
	<b>Years of education</b>	<b>Have a child</b>	<b>Managerial job</b>	
No. of years in childhood poverty	-0.06** (0.02)	0.02** (0.005)	-0.01** (0.004)	
No. of observations	168063	168894	168894	

*Note:* Sibling pair clustered standard errors in parentheses. \*  $p < 0.10$ , \*\*  $p < 0.05$ .