Chronic Child Poverty and Later Life Outcomes

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Abstract

Existing literature has estimated the associations between childhood chronic poverty and later life success using the count index; that is, the number of times a child was observed to be poor over a specified period of time. The magnitude of these associations is questionable as the count index does not account for all dimensions of chronic poverty. This study investigates the association between chronic poverty experiences from birth to age 10 and later life outcomes at age 25 and 30 using chronic poverty measures that account for the timing, spacing and severity of poverty spells. After controlling for correlates of childhood poverty, the results reveal that assessing the link between chronic child poverty and adverse outcomes in adulthood based solely on time spent poor, ignoring critical aspects of chronic poverty gives misleading estimates of the extent of damage suffered by adults who experienced chronic poverty as young children.

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1 Introduction

Early childhood experience has been found to be important for later life outcomes. In particular, childhood poverty experiences have been strongly linked to adult outcomes. This paper focuses on the early chronic poverty experiences of children and investigates empirically its association with later life outcomes. I describe the early chronic poverty experiences of children born in the United States from the late 1960s to the early 1970s, following them from birth through to age 10 using the Panel Study of Income Dynamics (PSID) longitudinal dataset. The alternative measures of chronic poverty studied are the Foster (2009) measure (abbreviated as F), the Bossert, Chakravarty and d'Ambrosio (2012) measure (abbreviated as BCD) and the Hoy and Zheng (2011) measure (abbreviated as HZ). Each of the measures differs in the way it accounts for the closeness and timing of poverty spells. The F and BCD measures address chronic poverty concerns while the HZ measure addresses both chronic and early poverty concerns in their measurement of intertemporal poverty. For comparison purposes, I also estimate childhood chronic poverty levels using the traditional count poverty index; i.e., the number of times spent in poverty within a given period. The adult outcomes examined in this study comprise; completed years of schooling, adult health status, labor market success, teenage childbearing, adult poverty status and the formation of own households measured as late as ages 25 and 30. This study is the first to document the link between childhood poverty experiences and later life outcomes using these recently developed chronic poverty measures.

The results from this study indicate that time spent living in poverty as a child still matters in explaining poor outcomes in adulthood even after controlling for a host of demographic and family characteristics often correlated with childhood poverty. I find large and robust associations between chronic child poverty and completed schooling, adult health, employment, teen birth and adult poverty status. The evidence suggests that the choice between one of the chronic poverty measures when analyzing the long-run consequences of childhood chronic poverty depends on the adult outcome of interest, at least using the United States PSID data set between the late 1960s and early 2000s.

The study of the associations between childhood chronic poverty and later life success have been limited because of the non-existence of surveys that follow children from birth into adulthood collecting information on childhood family incomes and later life outcomes. However, with the recent availability of several longitudinal surveys around the world, research has shown that individuals with early poverty experiences end up with worse outcomes such as low employment opportunities, lower productivity, lower educational attainment, poor cognitive development, lower income levels, poor adult health, higher propensities of teen and non-marital births, criminal arrests and adult poverty experiences (Gregg et al., 1999, Suryadarma et al., 2009, Evans and Schamberg, 2009, Wagmiller and Adelman, 2009, Isaacs and Magnuson, 2011, Ratcliffe and McKernan, 2012, Schoon et al., 2012, Dickerson and Popli, 2016, Ratcliffe and Kalish, 2017). The measure of childhood poverty in these studies is either the average family income or the count index, that is, the number of times a child was observed to be poor over a specified period of time.

There are limitations to the commonly used measures of childhood chronic poverty noted above. The average family income does not allow for the identification of who is poor in each period nor the number of times an individual's income fell below the poverty line within a specified period. The count index indicates the number of times an individual spent poor but does not account for the depths and distribution of poverty. Both can lead to misleading estimates and comparisons of chronic poverty levels across individuals and groups. For instance, Asiamah (2020) using the PSID dataset compares chronic poverty levels across different socio-economic groups, including race, and show that the difference in estimates of chronic poverty levels between non-whites and whites is significantly heightened when the depth of poverty and temporal patterns of poverty are accounted for in the measurement of chronic poverty.[1]

Consider two individuals who spend equal periods in poverty. One individual may have poverty experiences occurring very early in life while the other individual experiences poverty later in life. Economic hardships experienced in the early years of life have been found to have a greater impact on future success than those experienced in later years (Duncan et al., 1998, Duncan et al., 2012, Schoon et al., 2012, Ratcliffe and Kalish, 2017). Moreover, Heckman and Kautz's (2013) review of the evidence on the effectiveness of early intervention programs in promoting later life success shows that intervention programs before age three led to improved skills formation and improved IQ. Thus, a measure of chronic poverty should differentiate between the poverty experiences of the two individuals, assigning a greater index to the individual with early poverty spell experiences.

The rest of this paper is organized as follows. Section 2 reviews the literature on the measurement of chronic poverty and its association with later life success. Section 3 explains the poverty measures employed in this paper to estimate child chronic poverty levels. Section 4 describes the data and methodology employed for this study. Section 5 presents the findings from the regression analyses. The study ends with a discussion of the implications of this paper's findings for future research.

2 Literature Review

Chronic poverty experiences in early childhood have been strongly linked to adult outcomes. For example, it has been argued that increases in income for low income families leads to improved mental health for both mother and child in Canada (Milligan and Stabile, 2011) and improved school achievements for children in the United States (Dahl and Lochner, 2005). Economic hardship has been found to increase the psychological stress and depression among parents which may lead to a more coercive and strict style of parenting (McLoyd, 1990). This style of parenting is linked to poor verbal development amongst children (Parker et al., 1999). After controlling for family characteristics, Duncan, Brooks-Gunn and Klebanov (1994) find quantitatively large income effects on intelligence test scores (positive) and behavior problem scores (negative) for children at age five. Children growing up in low income families are also less likely to have access to proper health care (in the absence of public insurance) because their parents often lack health insurance (Duncan and Brooks-Gunn, 1997). The resulting poor childhood health leads to increased risk of poor health as an adult (Freedman et al., 1999, Barker et al., 2002) which can influence labor market outcomes and adult socio-economic status negatively.

How poverty should be defined and measured has received considerable attention among economists, political scientists, sociologists, anthropologists, neuroscientists and other social scientists. The measure of living standards can be quantitative (income, consumption, wealth, etc) or qualitative (access to health care, access to housing, access to information, access to education, etc). To measure a single spell of poverty, i.e., snapshot poverty, the popular FGT (Foster, Greer and Thorbecke, 1984) class of poverty gap measure is frequently adopted. Snapshot poverty focuses on the present standard of living of an individual ignoring the influence of past or future poverty experiences on the current level of hardship suffered (Calvo and Dercon, 2009). In recent years, research has stressed the need to extend snapshot poverty measurement

[1] The relative childhood poverty between different groups for the periods of study in this paper (1968-1982) is qualitatively similar to the relative childhood poverty between different groups for the periods of study (1968-1997) in Asiamah (2020).

to address both the multidimensionality and lifetime (dynamic) aspects of poverty, with the latter often referred to as chronic poverty.

Chronic poverty measures have been developed based on an aggregation of snapshot poverty levels over a sequence of periods into a single index of poverty. These chronic poverty measures can be broadly classified into two categories; the *permanent-income* approach and the *spells* approach. An early attempt to measure poverty over time is the *permanent-income* approach, which computes an average of all incomes over the lifetime (called the permanent income). It identifies a person as chronically poor if the permanent income is below a corresponding poverty line (Rodgers and Rodgers, 1993, Hill and Jenkins, 1999, Jalan and Ravallion, 2000, Valletta, 2006). The permanent-income approach implicitly assumes that income from non-poor periods will compensate the periods of low income by accounting for the potential saving and borrowing behaviour of individuals over their lifetime. With this approach, chronic poverty is the level of poverty an individual experiences as if his/her income in every period equals their permanent income. The second approach, which is the *spells* approach, measures a person's level of chronic poverty by focusing on the distribution of poverty spells over an individual's lifetime (Calvo and Dercon, 2009, Hoy and Zheng, 2011, Bossert, Chakravarty and d'Ambrosio, 2012, Gradin, Del Rio and Canto, 2012, Dutta et al., 2013) or time spent in poverty (the count index) or both (Foster, 2009, Alkire et al., 2017).

The bulk of existing empirical research on the associations between childhood chronic poverty and adult outcomes focus on the count index as a poverty measure (Gregg et al., 1999, Suryadarma et al., 2009, Wagmiller and Adelman, 2009, Evans and Schamberg 2009, Ratcliffe and McKernan, 2012, Ratcliffe and Kalish, 2017). This can lead to very conservative estimates of these associations because some critical aspects of poverty are not taken into account. For instance, consider one individual who spends half of his/her lifetime poor and another individual who spends a third of his/her lifetime poor. Suppose the second person experiences larger poverty gaps.[2] Without accounting for the size of their poverty gaps, the first individual is deemed more economically deprived by the count index. However, accounting for poverty gaps in addition to the time spent poor can provide evidence that the second person suffers more chronic poverty than the first person. This is evident in the findings from Asiamah (2020) that, children born to teen mothers only suffer more chronic poverty than children born to older mothers when poverty gaps are ignored (i.e., when chronic poverty is described using only the number of times spent poor within a specified period).

Again, consider two individuals who spend equal time in poverty. Suppose the first individual has all poverty spells occurring consecutively while the other individual's poverty spells are separated by periods of non-poverty. The poverty experience of the latter is more transitory in nature. Hence, its negative impact on later life outcomes is likely to be less severe. Thus, it is pivotal to differentiate between these distinct chronic poverty experiences. For comparison purposes, this study focuses only on chronic poverty measures that differ in terms of how early, close and recurring poverty spells are treated in the measurement of chronic poverty. A more detailed description of these measures is presented in section three below.

Socioeconomic and demographic characteristics often correlated with childhood poverty are included as covariates in the regression models. This is relevant because numerous studies have demonstrated the importance of early childhood environments in shaping the abilities of children and accounting for a substantial variation in their later life outcomes (Currie and Hyson, 1999, Smith and Haddad, 2000, Barker et al., 2002, Currie and Moretti, 2003, Behrman and Rosenzweig, 2004, Cunha et al., 2006, Cunha and Heckman, 2007, Black, Devereux and Salvanes, 2007, Currie, 2009, Huggett, Ventura and Yaron, 2011, Shonkoff et al., 2012).

[2] Gaiha (1989) show that individuals who suffered chronic poverty (i.e., spend all periods under study poor) are not necessarily those with wider poverty gaps.

Prior literature has found strong associations between childhood poverty (measured using the count index) and adult outcomes, yet no study to date has empirically examined these associations using the chronic poverty measures adopted in this study. With the recent development of dynamic poverty measures, this present study aims to fill this gap in the empirical literature by using the United States nationally representative longitudinal data to examine the strength of the association between these "new" chronic poverty measures and adult success.

3 Measures of Child Chronic Poverty

This section describes three recently developed measures of chronic poverty used to measure childhood chronic poverty levels in this paper; the Foster (2009) measure, the Bossert, Chakravarty and d'Ambrosio (2012) measure and the Hoy and Zheng (2011) measure. The traditional count poverty index is also described in this section. For the poverty measures considered, the measurement of chronic poverty is done in two steps. First, the poor is identified in a given population based on a choice of a poverty criterion (e.g., income, consumption, access to health care, malnutrition levels, etc). In the second step, the poverty experiences of the poor individual over a given number of years are summed into an overall index of chronic poverty.

3.1 *Notation*

First, consider some useful notations. Consider an individual i who lives for T periods. The level of chronic poverty suffered by a child is estimated for the first ten years of life (i.e., $T = 10$) and not all T years of life. In each period t = 1,2,...,T, individual i= 1,2,...,N has a level of income x_i^t. Each period's level of income of the individual is then compared with a pre-determined poverty threshold $0 < z^t < \infty$. Individual i is identified as poor in period t if his/her income level x_i^t is strictly less than the poverty line z^t. In any given period t for an individual i, the poverty gap is defined as $G_i^t = z^t$ - x_i^t and the relative poverty gap is given as $g_i^t = \frac{z^t - x_i^t}{z^t}$.
The FGT measure of snapshot poverty in period t for individual i is given as

$$p_i^t = p(x_i^t; z^t) = \begin{cases} \left(1 - \dfrac{x_i^t}{z^t}\right)^{\alpha} & \text{if } x_i^t < z^t \\ \\ 0 & \text{if } x_i^t \geq z^t \end{cases} \tag{1}$$

where the choice of α is typically restricted to values $\{0, 1, 2\}$. α equal to 0 gives the incidence of poverty such that p_i^t is equal to 1 if x_i^t is below the poverty threshold z^t and 0 if the income x_i^t is at least as large as the poverty threshold z^t. $\alpha = 1$ gives the size of the normalized poverty gap whilst $\alpha = 2$ provides a measure of the intensity of poverty. Unless otherwise stated in this paper, α is equal to 1.

3.2 *The Count Index*

This approach does not address the extent to which a person's income is below the poverty line. It involves setting α equal to 0 in equation 1, such that a poverty spell is assigned the value "1" and a non-poverty spell is assigned the value "0". Identifying the chronically poor individual with this approach is based on the fraction of time an individual's income was below the poverty threshold over time. The fraction of time individual i spent poor is derived by dividing the number of 1s (i.e., the number of poverty spells) by the total number of periods of observation T. The time spent poor need not be consecutive and there is no consensus regarding the appropriate cutoff fraction. For instance, one may require an individual to spend at least one-third of the time poor or spend at least half of the time poor to be identified as chronically poor. The greater the duration cutoff fraction, the fewer the people considered to be suffering chronic poverty and vice versa.

3.3 *The Foster (2009) measure of chronic poverty*

The F measure of chronic poverty uses a dual cutoff spells approach in measuring levels of poverty. The first cutoff is in the income space, i.e., setting a poverty line z^t and identifying an individual as poor in a given period if $x_i^t < z^t$. The second cutoff is in the duration line ($0 \leq \tau \leq 1$) which specifies the minimum fraction of time that must be spent in poverty to be identified as chronically poor. For an individual i who spends q out of T periods poor, the F measure of chronic poverty over time is given as

$$P_i^F(x_i^t; z^t) = \begin{cases} \dfrac{1}{T}\displaystyle\sum_{t=1}^{T} p_i^t & \text{if } q/T \geq \tau \\ \\ 0 & \text{if } q/T < \tau \end{cases} \tag{2}$$

where p_i^t is the FGT measure of snapshot poverty described in equation 1. The F measure is sensitive to the cutoff duration line τ in that the smaller the value of τ, the more persons are considered as chronically poor and vice-versa. The F measure addresses chronic poverty concerns through the duration cutoff line, i.e., the sufficient time spent in poverty. For persons who pass the threshold τ, all poverty spells are assigned equal weights regardless of whether they occur closely in time to each other, occur consecutively or occur in isolation. The two chronic poverty measures that are described below are sensitive in different ways to the temporal pattern of poverty spells experienced by an individual.

3.4 *The Bossert, Chakravarty and d'Ambrosio (2012) measure of chronic poverty*

The BCD measure evaluates the persistence in poverty with a focus on the duration of poverty spells in the sense that, ceteris paribus, consecutive poverty spells are assigned greater weights than isolated poverty spells. Moreover, the more poverty spells experienced consecutively, the greater the weight assigned to each of the poverty spells occurring in that string of contiguous poverty spells. The BCD measure for individual i is given as

$$P_i^{BCD}(x_i^t; z^t) = \frac{1}{T}\sum_{t=1}^{T} \gamma^{k-1} p_i^t \tag{3}$$

where k is the (maximal) number of consecutive periods including the t^{th} period with positive poverty gaps and p_i^t is the FGT measure of snapshot poverty. γ is a measure of the sensitivity to chronic poverty with $\gamma \geq 1$. γ^{k-1} is the set of weights assigned to consecutive poverty spells. If γ equals 1, then each poverty spell is weighted equally regardless of the sequence of poverty/non-poverty spells in which it occurs for a given k. Conversely, $\gamma > 1$ assigns more weight to consecutive poverty spells than isolated poverty spells. For example, for γ equal 2, the weight for each poverty spell for the normalized poverty gap profile (0, 3/5, 3/5, 0) is 2 while the weight for each of the poverty spells for the normalized poverty gap profile (0, 3/5, 0, 3/5) is 1. For any given value of γ, the bigger the k, the greater the weight assigned to each poverty spell that occurs in a string of two or more consecutive periods. For example, for γ equal 2, the weight of each poverty spell occurring in a string of 3 consecutive spells for normalized poverty gap profile (0, 3/5, 3/5, 3/5, 0) is 4 while the weight of each of the poverty spells occurring in a string of 2 consecutive spells for normalized poverty gap profile (0, 3/5, 3/5, 0, 3/5) is 2. Note that the BCD measure is not sensitive to the "closeness" of poverty spells if they are not contiguous; e.g., normalized poverty gap profiles (3/5, 0, 3/5, 0, 0) and (3/5, 0, 0, 0, 3/5) will generate the same BCD index value. Unlike the F measure, the BCD measure does not rely on a duration cutoff fraction to describe the chronically poor. All individuals with at least one poverty spell are assigned a positive BCD index value.

3.5 *Hoy and Zheng (2011) measure of chronic poverty*

The HZ poverty measure addresses both chronic poverty and early poverty concerns with a set of weights applied to poverty spells. Firstly, the measure assigns greater weights to earlier poverty spells such that, ceteris paribus, an individual who experiences poverty earlier in life has a higher HZ poverty index (i.e., the early poverty axiom). Consider two individuals who live for three periods; early, middle-age and old age with normalized poverty gap profiles (3/5, 0, 0) and (0, 0, 3/5). The F and BCD measures will assign equal poverty to both individuals, even though the poverty experience of the first individual occurred earlier. The HZ measure, on the other hand, will assign a higher poverty to the individual with the first profile.

Secondly, the HZ measure assigns greater weight to poverty spells that occur closer to each other all else constant (i.e., the chronic poverty axiom). For two individuals with normalized poverty gap profiles A = (3/5, 0, 0, 3/5) and B = (0, 3/5, 3/5, 0), the HZ poverty index for B will be higher than A for any given set of weights that is strictly concave in t. This treatment is similar to the BCD measure. However, when profile B is compared with another profile C = (3/5, 0, 3/5, 0), C will now be poorer than B according to the HZ because of the earlier poverty experience. This illustration depicts the trade-off between early and chronic poverty concerns that the HZ chronic measure accommodates, i.e., earlier poverty in a sense takes priority over closeness of poverty spells. Moreover, a symmetric spread out of poverty spells in a person's lifetime reduces lifetime poverty. Consider the profile (0, 3/5, 0, 3/5, 0). If the poverty spells are spread out uniformly to become (3/5, 0, 0, 0, 3/5), the HZ measure will assign a higher chronic poverty to the first profile because, although the second profile has an experience of poverty in the first period, the two poverty spells are separated by three periods of non-poverty. For an individual i, the HZ measure is defined as

$$P_i^{HZ}(x_i^t; z^t) = \sum_{t=1}^{T} \beta(t, T) p_i^t \tag{4}$$

where $\beta(t, T)$ are weights assigned to per-period poverty and non-poverty spells. These weights are normalized to sum to one. To satisfy the early poverty axiom of the HZ measure, the weight function must be decreasing in t. Likewise, the weight function must be concave in t to satisfy the chronic poverty axiom. Consider the weight function below:

$$\beta(t, T) = \left(1 - \frac{t}{T+1}\right)^{\delta}, \quad 0 \leq \delta \leq 1 \tag{5}$$

The smaller (bigger) the value of δ, the less (more) sensitive the HZ measure is to early poverty concerns and the more (less) sensitive the HZ measure is to chronic poverty concerns. Each period $t's$ weight is obtained by dividing $\beta(t, T)$ by the sum of the weights over time $\sum_{t=1}^{T} \beta(t, T)$.

The weight function $\beta(t, T)$ is linear and flat for δ equal 0 with equal weights $1/T$ assigned to all poverty spells. For δ equal to 1, $\beta(t, T)$ is linear and decreasing in t with the weight on the first period being the highest (only the early poverty axiom is satisfied). For any δ strictly between 0 and 1, $\beta(t, T)$ is strictly concave and the HZ measure addresses both early and chronic poverty concerns in their measure of lifetime poverty.

4 Data and Methodology

4.1 *Data and Summary Statistics*

The analyses are based on over 35 years of data from the Panel Study of Income Dynamics (PSID) of the United States. PSID is an ongoing study which began in 1968 with a nationally representative sample of 5000 families consisting of 15,000 individuals. This survey has followed children and parents for over fifty years spanning from 1968 collecting information such as educational attainment, labor supply, health, income levels, household wealth, among others, on all parties annually.

The poor are identified in this study using the official definition of poverty in the United States. An individual is described as poor in any period if his/her equivalent household income is below the appropriate poverty threshold. Poverty thresholds in the United States are determined by the Census Bureau based on money income before taxes (excluding capital gains or non-cash benefits). They vary by family size and composition and are updated annually for inflation using the Consumer Price Index for All Urban Consumers (CPI-U). The equivalent household income is derived using equivalence scales implied by the poverty thresholds published by the US Census Bureau. For instance, a family size of one compared to a family size of four implies an equivalence scale of about 2 (refer to Table A1 in the Appendix).

Childhood chronic poverty is estimated from birth to age 10 whilst adult outcomes are evaluated at ages 25 and 30. Overall, the final sample consists of 1,047 individuals and 728 individuals followed from birth to age 25 and age 30 respectively over six birth cohort periods from 1968 to 1973. Any loss of observations is due to attrition and missing information on relevant covariates. Summary statistics for the adult outcomes are provided in Table 1. On average, ever poor individuals (i.e., individuals who experienced at least one poverty spell in the first ten years of life) spend an average of 11.7 years in school compared with an average of 12.9 years spent in school by individuals who never experienced poverty in the first ten years of life. 20% of ever poor individuals are found to be poor as an adult compared with 3% of individuals who had zero poverty spell experience in their early childhood. A similar pattern is observed for employment status where 63% of ever poor individuals are found to be currently employed compared with 72% of individuals who never experienced early childhood poverty. Additionally, 93% of ever poor individuals reported a good adult health status compared with 97% for individuals with no early poverty spell experiences. 24% of ever poor individuals had a child before they turned age 20 compared with 8% for individuals who had zero poverty spell experiences in the first ten years of life. The average birth order for ever poor individuals is 3.2 whilst the average birth order for "never poor" children is 2.4. A description of the data set and variables are available in the Appendix.

4.2 *Childhood Chronic Poverty Levels*

In this subsection, chronic poverty levels as estimated by the different poverty measures are reported for the six different birth cohorts.[3] For the count index, four definitions of chronic

[3]Correlation between pairs of poverty indices are available in the Online Appendix (Table A1).

poverty are analyzed; poor at least one out of ten periods; poor at least three out of ten periods, poor at least five out of ten periods and poor at least eight out of ten periods. These chronic poverty rates are presented in Panel A of Table 2. For all birth cohorts, 35.9% of individuals spent at least one period poor, 19.5% of individuals spent at least three periods poor, 12.8% of individuals spent at least five periods poor, and 5.5% of individuals spent at least eight out of ten periods poor. For all duration cutoff fractions, persons born in 1968 have the highest chronic poverty rate. For the duration cut off fraction of 5/10, 17.3% of individuals born in 1968, 13.3% of individuals born in 1970, 11.9% of individuals born in 1972 and 1973, 10.7% of individuals born in 1971 and 7.8% of individuals born in 1969, suffered chronic poverty in their early childhood years.

Chronic poverty levels for birth cohorts estimated by the F measure are reported in panel B of Table 2. The F measure emphasizes the number of periods spent in poverty without considering different temporal patterns of poverty experiences. However, unlike the count index, it takes into account the size of the poverty gap for each year of poverty experienced. In column 1, $\tau = 0.00$ and all individuals who spent at least one period poor over the ten-year period are assigned a positive F chronic poverty index. In the second column, τ equal 0.25 and all individuals who spent at least three out of ten periods poor are assigned a positive F chronic poverty index. Individuals who spent five or more periods poor are assigned a positive F poverty index in the third column ($\tau = 0.50$) whereas individuals who spent eight or more periods poor are assigned a positive F poverty index in the last column ($\tau = 0.75$). The comparison of the degree of F chronic poverty levels between birth cohorts for the most part is similar to the findings from the count index with a few exceptions. For instance, for $\tau = 0.00$, individuals born in 1969 have the least F chronic poverty index even though they suffered more chronic poverty than individuals born in 1973 according to the count index (for the duration cutoff fraction of 1/10). This indicates that compared with persons born in 1969, individuals born in 1973 have relatively deep poverty gaps in the years they spent poor.

Chronic poverty levels are estimated by the BCD measure for different γ values; 1.2, 1.5, 1.7 and 2.0. These are presented in panel C of Table 2. The BCD measure emphasizes the closeness of poverty spells by assigning greater weights to poverty spells that occur in a string of two or more consecutive periods. However, unlike the HZ measure, the BCD measure applies no additional weight to poverty spells that are closer together unless they are contiguous. For a given string of two or more consecutive poverty spells, the larger is the parameter γ, the greater the contribution of each of those poverty spells to the BCD chronic poverty level of an individual. Like the F index, the comparison of the degree of BCD chronic poverty levels between birth cohorts is similar to the findings from the count index with a few exceptions. In panel B when all poverty spells are weighted equally (i.e., τ=0.00), the 1973 birth cohort had a greater chronic poverty level compared with the 1969 birth cohort. However, when consecutive poverty spells are assigned greater weights the rank between the two groups reverses, suggesting that individuals born in 1973 have fewer consecutive poverty spell experiences on average compared with individuals born in 1969. Therefore, different assumptions made regarding the contribution of each poverty spell to the overall level of chronic poverty of an individual leads to different ranking of groups by chronic poverty levels.

Chronic poverty levels are estimated by the HZ measure for different δ values; 0.2, 0.5, 0.8 and 1.0. These are presented in panel D of Table 2. The HZ measure emphasizes the closeness of poverty spells by assigning greater weights to poverty spells that occur closer in time to each other without the requirement that poverty spells be consecutive as required by the BCD measure. It also emphasizes another aspect of the timing of poverty spells by assigning greater weights to poverty spells that occur earlier in life. As the value of δ is increased, the HZ measure becomes more sensitive to early poverty spells and less sensitive to close poverty spells. Similar to the results from the BCD measure, children born in 1968 have the greatest HZ index, followed by children born in 1970 with children born in 1973 having the least HZ index. As sensitivity to early poverty increases, the HZ chronic poverty index for the 1968, 1970 and 1971 cohorts increases while the HZ index for the 1973 cohort decreases. Therefore, poverty experiences for the 1973 cohort occur much later while individuals born in 1968, 1970 and 1971 experience poverty much earlier. The HZ chronic poverty index for the 1969 and 1972 birth cohorts is not very sensitive to the value of the parameter δ. For all sample children, the HZ chronic poverty index increases as sensitivity to early poverty is increased.

4.3 *Methodology*

Adult outcomes are modelled as a function of childhood chronic poverty, socioeconomic characteristics and household controls.
The baseline model is expressed as:

$$y_i = a_o + b\mathbf{Index}_i + c\mathbf{X}_i + d\mathbf{HH}_i + v_i \tag{6}$$

where y_i represents the different adult outcome variables of interest for individual i; that is, completed years of schooling, employment status, general health status, formation of own household, adult poverty status and the likelihood of teenage birth.

The different chronic poverty indices for individual i; that is, the F, BCD, HZ and the count index comprise the variable $\mathbf{Index}_i$. As another measure of early childhood economic deprivation, $\mathbf{Index}_i$ in equation 6 is replaced with the average poverty gap over the first ten years of life for individual i (APG_i). Whilst the APG only takes into account the depth of poverty in any period and the count index only accounts for the duration of poverty spells, the F, BCD and HZ indices account for the depth of poverty as well as the duration, timing and closeness of poverty spells but in distinct ways. Exploring the different measures in this study is useful to make a sharp comparison of the predictive performance of different childhood chronic poverty measures.

The vector $\mathbf{X}_i$ includes certain time-invariant characteristics of the child including gender (male or female), race (white or non-white) and birth order (continuous). Theoretically, Becker and Lewis (1973) and Becker and Tomes (1976) show the trade-off that exists between the number of children (i.e., quantity of children) and the amount of resources in the form of goods and time that parents devote to each child (i.e., quality of children). Empirically, studies have found both negative (Black et al., 2005, Booth and Kee, 2009, Hatton and Martin, 2009) and positive (Ejrnaes and Portner, 2004) birth order effects on outcomes including educational attainment, adult health status, teen birth, labor supply earnings, etc. A positive birth order effect is likely to occur in situations where older siblings are forced to leave school to find some work to support the younger siblings and the family at large. Including this variable in the regression models will address the long-term consequences of resource dilution within a household. Figure 1 depicts a negative relationship between average completed years of schooling and birth order for individuals in the sample. The negative relationship still persists when the sample is restricted to individuals with at least one poverty spell experience or to individuals with no early childhood poverty experience. However, the pattern is not strictly monotonic.

The variables included in $\mathbf{HH}_i$ are a vector of household and background characteristics for individual i including: completed education of the household head which is usually for the father in a two parent household and for the mother in a single parent household; age of mother at birth (continuous); region of birth (North-East, North-Central, South or West); year of birth; whether the household head is an immigrant; and whether the individual experienced disruptions in the household environment due to parental marital dissolution growing up.[4] Transitioning to live with a single parent for the most part is accompanied with a fall in household income. The resulting economic hardships can force children to leave school early which can lead to lower occupational attainment and wages, and adult poverty experiences. Parental marital separations also affect the amount of time that parents spend with their children (Ram and Hou, 2003). In addition, marital break-up is often found to be preceded by parental conflict, parental alcohol/drug abuse, physical and mental abuse of spouses and children (White, 1990) which are all indicators of inadequate parenting. These deficiencies in parenting lead to poor outcomes for the child (Hetherington and Stanley-Hagan, 1999, Amato, 2000, Ram and Hou, 2003). Thus, including this variable in the regression models addresses two key channels through which divorces in early childhood years affect children's future success; directly through deficiencies in parenting and unstable environments and more indirectly through the effect of poverty.

The main coefficient of interest is b. If the hypothesis that early childhood chronic poverty is linked to poor childhood development is correct, b should be negative for good outcomes and positive for bad outcomes. v_i is the classical stochastic error term. In all regression models, standard errors are clustered at the household level to correct for multiple children born into the same household.

5 Results and Discussion

For the regression estimations, different parameters of the chronic poverty indices are investigated. However, only the regression results for parameter values that performed better on average across outcomes in terms of the coefficient of determination and Akaike Information Criterion (AIC) are presented in this paper. The AIC values from regressions involving all parameter values considered for all the chronic poverty measures are provided in the Online Appendix (Table A2). Therefore, I present for all outcome regressions, $\tau = 0.00$ for the F Index; $\gamma = 1.2$ for the BCD Index; $\delta = 0.2$ for the HZ Index; and a cutoff fraction of 3/10 (i.e., an individual suffers chronic poverty if they spent at least three out of ten periods poor) for the count index. All the parameter values are exogenous. The association between early childhood chronic poverty and adult outcomes when no household and background characteristics are controlled for in the regressions is available in the Online Appendix (Table A3). Once additional controls are introduced, the associations are attenuated. This implies that poor outcomes in adulthood operate through several correlates of childhood poverty such as, age of mother at birth, birth order, region of birth, whether household head is an immigrant, whether the individual experienced parental divorces during childhood, etc.

In each table, childhood chronic poverty levels estimated by the F measure are presented in column 1, childhood chronic poverty levels estimated by the BCD measure are presented in column 2 and childhood chronic poverty levels estimated by the HZ measure are presented in column 3. In column 4, the chronic poverty measure is the count index. In the last column, the chronic poverty measure is the average poverty gap over the 10 years. In each table, I report the standardized coefficients for each covariate in order to compare the relative strength of their association with the adult outcomes.[5] The standardized coefficient represents the standard deviation changes in a given outcome associated with a one standard deviation increase in a given independent variable. The higher the absolute value of the standardized coefficient, the

[4]Other causes of household disruptions found in the data include death of parent(s) and/or move-ins with a relative. I focus on parental divorces because it constitutes about 95% of the disruptions in the initial household environment of children in the data set.

[5]Standardized coefficients are the coefficients that you get if the variables in the regression model are all converted to z-scores before running the analysis.

stronger the association between an outcome variable and an independent variable. Hence, a standardized coefficient of -0.8 has a stronger association than a standardized coefficient of 0.5.

5.1 *Childhood Chronic Poverty Experience and Completed Education*

The association of levels of childhood chronic poverty with completed schooling by age 25 is presented in Table 3. The results indicate that on average, individuals who suffered chronic poverty very early in life are less likely to complete more years of school by age 25. The result is statistically significant for all poverty measures at 1%. The size of the associations with years of completed schooling is greatest with the count index. The F and HZ indices have a similar coefficient estimate of -0.10 whereas the BCD index has the least size association with the number of years spent in school by an individual at age 25 with a coefficient estimate of -0.05.

Females are found to be more likely to spend more years in school compared with males. Children with older mothers also attain more years of schooling on average. A negative and significant birth order effect on educational attainment is observed across all columns. Interacting birth order with age of mother reveals that when later born children have older mothers at birth, they complete more years of school. Older mothers have more financial resources at time of birth, are partners with fathers of higher quality (Aizer, Devereux and Salvanes, 2018) and have lower levels of psychosocial stress (Kingston et al., 2012), a condition found to reduce the incidence of deficient parenting behaviors (Reid and Meadows-Oliver, 2007). This result highlights the role that age of mother plays in mediating the effects of birth order on the educational attainment of children. Individuals who experienced parental marital dissolution during the early childhood years complete fewer years of school on average. Across all columns, experiencing parental divorces in childhood is negatively associated with years spent in school by a child; coefficient estimates range between -0.05 and -0.07. Having a household head with at least a high school degree is positively associated with years of completed schooling. Second generation citizens (i.e., children of immigrant(s)) spend more years in school on average compared to third and higher generation citizens (i.e., children born in the United States with both parents born in United States). Compared with children born in the North East Region, children born in the South Region complete fewer years of school.

5.2 *Childhood Chronic Poverty Experience and Adult Health Status*

The association of levels of childhood chronic poverty with adult health status at age 25 is presented in Table 4. The BCD index has the least size association with adult health status (coefficient estimate is -0.10) whereas the count index has the greatest size association with adult health status (coefficient estimate is -0.22). All other covariates except race and the educational attainment of the child's household head are statistically insignificant in the health regressions. Having an educated household head whilst growing up is positively associated with the likelihood that an individual reports a good health; the conditional size correlation ranges between 0.18 and 0.21 across all columns.

5.3 *Childhood Chronic Poverty Experience and the Likelihood of Teen Births*

The association between childhood chronic poverty levels and the propensity that an individual has an early birth is presented in Table 5. Early chronic poverty is found not to be associated with teen births. The coefficients of the poverty indices are positive but statistically insignificant. Rather unexpectedly, the coefficient of the BCD index is negative and significant ($p< 0.10$). When all other covariates are excluded from the regression, the coefficients of the poverty indices are positive and statistically significant (results shown in Table A3 of the Online Appendix).

This suggests that the likelihood that an individual has a teen birth may be associated with other unfavorable background conditions and/or poverty experiences in later childhood years other than childhood chronic poverty experiences during the first ten years of life.[6]

Gender and race of an individual, the educational attainment of the household head, region of birth and age of mother have significant associations with the likelihood that an individual has a teen birth. Females are more likely to have an early first birth by age 19 compared with males and non-whites are more likely to have a teen birth compared with whites. Children with educated household heads have a lower propensity to have a teen birth compared with children with less educated heads (i.e., less than a high school degree). Individuals who had younger mothers at birth are found to be more likely to have an early first birth. Compared with individuals born in the North East Region, the association between the propensity of teen births and being born in other Regions is 0.15 points higher.

5.4 *Childhood Chronic Poverty Experience and Labor Market Success*

Table 7 presents the results from the employment regressions. The association of childhood chronic poverty with the likelihood of being employed at age 30 is reported. The BCD has the greatest size association with the employment status of an individual with a coefficient estimate of -0.11 which is slightly higher than the coefficient estimate of the F index and the HZ index of -0.10. The count index has the least size association of -0.01 followed by the average poverty gap with a coefficient estimate of -0.08. The coefficients of the count index and the average poverty gap are both statistically insignificant. The individual's own years of completed schooling are controlled for in the employment regressions and the results show a positive and significant association with employment status. This is consistent with recent evidence on the importance of own education on labor market success (Oreopoulos, 2007, Fischer et al., 2016, Brunello, Weber and Weiss, 2016, Hofmarcher et al., 2019) measured in terms of earnings or employment status.

According to human capital theory (Becker, 1964, Grossman, 1972), health plays an important role in an individual's labor supply decision. I control for the current health status of individuals in the employment regressions. Consistent with the literature (Scott, Smith and Rungeling, 1977, Currie and Madrian, 1999 review of the US literature, Cai and Kalb, 2006, Cai, 2010), the results indicate a positive and significant association between an individual's health status and the likelihood of being employed. Compared with males, females are found to be less likely to be working. A negative and significant ($p<0.05$) birth order effect on adult employment status is found across all columns. Individuals whose parents separated or divorced very early in their childhood life are less likely to be working at age 30. This result is consistent with the evidence on the many mechanisms through which divorces affect children. The disruption does not only lead to economic hardships in the short run; it also affects the educational attainment and the labor market success of the child in the long run.

5.5 *Childhood Chronic Poverty Experience and Adult Poverty Status*

The relationship between childhood chronic poverty experiences and the likelihood that an individual experiences an adult poverty spell at age 30 is presented in columns 1, 2, 3, 4 and 5 of Table 8. The results indicate a "vicious cycle" of poverty. After accounting for years of completed schooling, the current health and employment status of an individual, individuals with chronic poverty experiences in the first ten years of their childhood life are found to be

[6] For instance, Duncan et al. (2012) using the PSID data, found that non-marital births were strongly correlated with average family income from age 11 to 15 than family income averaged from birth to age 10.

more likely to experience a poverty spell as a young adult. The coefficients of the poverty indices are positive and statistically significant (except for the BCD index). The conditional size correlation is 0.121 for the F index, 0.044 for the BCD index, 0.119 for the HZ index, 0.226 for the count index and 0.110 for the average poverty gap.

Being economically active is negatively associated with an adult poverty spell experience. Moreover, having a good health status lowers the risk of adult poverty experiences with a coefficient estimate of -0.10 across all columns. The results also indicate that, an additional year spent in school by an individual significantly reduces the likelihood of being poor with a coefficient estimate between 0.22 and 0.26 across all columns. Oreopoulos (2007) and Hofmarcher et al. (2019) found similar results. Females are more likely to experience a poverty spell at age 30 compared with males. Similarly, compared with whites, non-whites have a greater chance of experiencing an adult poverty spell at age 30.

5.6 *Childhood Chronic Poverty Experience and Forming Own Households*

The results indicate no significant associations between the likelihood that an individual forms their own household and early childhood chronic poverty for all the chronic poverty measures studied. The results are presented in Table 6. Females are more likely to form their own households by age 25 compared with males. Non-whites are less likely to form their own households compared with whites. Individuals born to older mothers at birth are less likely to form their own households and live independently by age 25. Compared with individuals who grew up in the North East Region, individuals who grew up in other Regions are more likely to form their own households by age 25.

5.7 *The Choice between Chronic Poverty Measures*

From the above sections, there is no single chronic poverty index that has the greatest size association across the various adult outcome variables studied; that is, no poverty index "performs best" across all outcome variables. Given this, I compare the different possible regression models under study using the Akaike Information Criterion (AIC) of model selection. This is to help determine which model is the best fit for the data. The "best" fit candidate model is the model with a minimum AIC. The AICs are reported at the bottom of each regression results table. Among the three chronic poverty indices: the F chronic poverty index has the least AIC in the adult poverty status and formation of own household regression models; the BCD chronic poverty index has the least AIC in the teen birth and employment status regression models; and the HZ chronic poverty index has the least AIC in the completed schooling and general health status regression models. However, when the model performance is compared across all the poverty measures, the count index becomes the chronic poverty measure with the least AIC in the schooling, health and adult poverty regression models. Therefore, no chronic poverty measure is the best fit for the data as the least sophisticated poverty measure, the count index, which accounts for only the number of times an individual spent poor and ignores other aspects of chronic poverty works best in explaining some adult outcomes.

5.8 *Robustness Checks*

The robustness of the results is explored in many ways, first by examining different specifications of the outcome variables. Alternatively specifying the child's education as a binary variable equal to 1 if a child completed at least 12 grades of school and 0 otherwise and labor market success as a binary variable equal to 1 if an individual is currently in the labor force were tried. The regression results from these specifications are qualitatively similar to those reported in this paper. In addition, the results from the adult health regressions are robust to good health specified as excellent or very good. The results are available in Table A6 of the Online Appendix.

Research in the areas of economics and epidemiology offer support for the fetal origins hypothesis which indicates that, prenatal conditions have significant effects on the development of an individual ranging from infancy through to adulthood (see Almond and Currie, 2011 for a review of the literature). Although the HZ measure assigns greater weight to earlier poverty spells (for bigger values of the parameter δ), it is still likely the case that the harmful effect of experiencing poverty *in utero*, a critical period of life, is being subdued by the averaging of poverty spells over the years. Therefore, I examine the association between adult outcomes and being poor in the prenatal year. The results, provided in the Online Appendix Table A5, indicate that individuals whose families experienced poverty in the prenatal year are less likely to report a good adult health status ($p<0.05$) and more likely to experience poverty ($p<0.10$) in early adulthood. The results indicate no significant associations between prenatal poverty experience and completed schooling years, employment or the propensity of teenage births. Therefore, although poverty in the prenatal period is linked to worse adult outcomes, poverty experiences in the years that follow are also harmful to a child's development.

The sensitivity of the results to different childhood time periods is tested by evaluating separately, the association of chronic poverty experiences from birth to age 5 with adult outcomes and the association of chronic poverty experiences from age 6 to 10 with adult outcomes. The results, provided in the Online Appendix (panel B of Table A5), indicate that chronic poverty experiences up to age 5 matter more for the schooling and health outcomes. This is consistent with the findings of Duncan et al. (2012) who find that family income from ages 0 to 5 matter more in explaining completed schooling than family income from ages 6 to 10. The results also reveal that chronic poverty experiences beyond age 5 has a greater size association with poor labor market outcomes and adult poverty experiences. Thus, chronic poverty regardless of its timing during the first ten years of life is linked to adverse outcomes in adulthood. The coefficients of the poverty indices measured from age 6 to 10 and from birth to age 5 are both statistically insignificant in the teen birth and formation of own household regressions.

I test the robustness of the results to attrition. For the first ten years of life, 1,549 children were present in the PSID survey. However, by age 25, only 1,047 of them remained as respondents yielding an attrition rate of 32%. Does being poor predict attrition? Are the poor more likely to exit the PSID survey? If this assertion holds, then it suggests that the estimates of the association between early chronic poverty and later life outcomes found in this study may well be a lower bound. The result provided in Table A4 of the Online Appendix, indicates that being poor in the 10th year increases the log odds of exiting the PSID survey at age 25 by 0.52 points ($p<0.01$). Despite missing some poor children, I find significantly large associations between early childhood chronic poverty and adult outcomes. This makes the findings in this study robust. It also indicates that the extent of harm suffered by children born in the United States between the late 60s and early 70s due to chronic poverty may be greater than imagined.

6 Conclusion

This paper compares the performance of recently developed measures of chronic poverty with measures that do not take into account the timing, spacing and closeness of poverty spells. The association of chronic poverty experienced between birth and age 10 with adverse outcomes in adulthood are examined. The chronic poverty measures examined comprise the Foster (2009) measure, the Bossert, Chakravarty and D'Ambrosio (2012) measure, and the Hoy and Zheng (2011) measure. The most common two poverty measures studied in the empirical poverty literature, the count index and the average poverty gap, are also employed. The Foster (2009) measure emphasizes the number of periods spent in poverty without taking into account different temporal patterns of poverty experiences. However, unlike the count index, the Foster (2009) accounts for the gaps in poverty. The Bossert, Chakravarty and d'Ambrosio (2012) measure emphasizes the closeness of poverty by assigning greater weights to poverty spells that occur in a string of two or more contiguous poverty spells. The Hoy and Zheng (2011) emphasizes the timing and spacing of poverty spells by assigning greater weights to earlier poverty spells and poverty spells that occur closer in time to each other.

Using PSID data from the late 1960s to the early 2000s, this paper is the first to document the association between chronic poverty experiences of children and their later life outcomes using these three recently developed chronic poverty measures. I find that time spent living in poverty as a child still matters in explaining poor adult outcomes even after controlling for a host of demographic and family background characteristics. The results suggest large and robust associations between early childhood chronic poverty and completed schooling, adult health status, employment status, propensity of teen births and adult poverty status measured as late as ages 25 and 30.

However, there is no single measure that performs best for all adult outcome variables according to the Akaike Information Criterion of model selection. The results reveal that, the count index has the greatest size associations with years of completed schooling, adult health status and adult poverty status; the Foster (2009) index has the greatest size associations with the likelihood that an individual forms their own household; and the Bossert, Chakravarty and d'Ambrosio (2012) index has the greatest size associations with the propensity of teen births and labor market success. Additionally, the Foster (2009) index and the Hoy and Zheng (2011) index have similar size associations with the adult outcomes studied. Since each poverty measure captures different properties of childhood poverty, it may be the case that different adult outcomes simply depend on different characteristics of childhood poverty. More research using different data sets should be done before any firm conclusions on this matter can be reached.

Beyond establishing relationships between childhood poverty measures and adult outcomes, I find other results of interest. In particular, the finding that there exists a negative effect of parental divorces beyond that of reducing family income and pushing children into poverty on some adult outcomes is of major interest. The results suggest that children whose parents separated or divorced in their early childhood years complete fewer years of school and are more likely to be poor as young adults. This result is consistent with the evidence on the many mechanisms through which divorces affect children. Compared with children from other Regions, children born in the South Region fare worse as young adults. This suggests that economic difficulties lie ahead of them. Racial disparities are also observed across all outcomes studied. Children of color are the least successful in escaping poverty. The results also reflect an inter-generational transmission of poverty. Children with early chronic poverty experiences are found to be more likely to experience an adult poverty spell.

The findings from this research point future empirical work in the direction of childhood chronic poverty estimations that is over and beyond a count approach when examining its long run impacts on later life achievements. For example, the National Longitudinal Survey of Youth may be combined with these recently developed poverty measures to examine outcomes not included in the Panel Study of Income Dynamics such as cognitive test scores, non-cognitive skill assessments, high school grades, occupation choices, health behaviors, substance use, etc.

References

[1] Alkire, S., M. Apablaza, S. Chakravarty, and G. Yalonetzky, "Measuring chronic multidimensional poverty," *Journal of Policy Modeling*, 39(6), 983-1006, 2017.

[2] Almond, D., and J. Currie, "Killing me softly: The fetal origins hypothesis," *Journal of Economic Perspectives*, 25(3), 153-72, 2011.

[3] Aizer, A., P. J. Devereux, and K. G. Salvanes, "Grandparents, Moms, or Dads? Why Children of Teen Mothers Do Worse in Life," (No. w25165), National Bureau of Economic Research, 2018.

[4] Amato, P. R., "The consequences of divorce for adults and children," *Journal of Marriage and Family*, 62(4), 1269-1287, 2000.

[5] Asiamah, H. A., "Childhood Chronic Poverty Estimations: Looking Beyond a Count Index," *Child Indicators Research*, https://doi.org/10.1007/s12187-020-09764-2, 2020.

[6] Barker, D. J., J. G. Eriksson, T. Forsén, and C. Osmond, "Fetal origins of adult disease: strength of effects and biological basis," *International journal of epidemiology*, 31(6), 1235-1239, 2002.

[7] Becker, G. S., "Human Capital," Columbia. New York, 1964.

[8] Becker, G. S. and H. G. Lewis, "On the Interaction between the Quantity and Quality of Children," *Journal of Political Economy*, 81(2, Part 2), S279-S288, 1973.

[9] Becker, G. S. and N. Tomes, "Child endowments and the quantity and quality of children," *Journal of Political Economy*, 84(4, Part 2), S143-S162, 1976.

[10] Behrman, J. R. and M. R. Rosenzweig, "Returns to birthweight," *Review of Economics and Statistics*, 86(2), 586-601, 2004.

[11] Black, S. E., P. J. Devereux, and K. G. Salvanes, "The more the merrier? The effect of family size and birth order on children's education," *The Quarterly Journal of Economics*, 120(2), 669-700, 2005.

[12] Black, S. E., P. J. Devereux, and K. G. Salvanes, "From the cradle to the labor market? The effect of birth weight on adult outcomes," *The Quarterly Journal of Economics*, 122(1), 409-439, 2007.

[13] Booth, A. L. and H. J. Kee, "Birth order matters: the effect of family size and birth order on educational attainment," *Journal of Population Economics*, 22(2), 367-397, 2009.

[14] Bossert, W., S. R. Chakravarty, and C. D'Ambrosio, "Poverty and time," *The Journal of Economic Inequality,* 10(2), 145-162, 2012.

[15] Brunello, G., G. Weber, and C. T. Weiss, "Books are forever: Early life conditions, education and lifetime earnings in Europe," *The Economic Journal*, 127(600), 271-296, 2016.

[16] Cai, L. and G. Kalb, "Health status and labour force participation: evidence from Australia," *Health Economics*, 15(3), 241-261, 2006.

[17] Cai, L., "The relationship between health and labour force participation: Evidence from a panel data simultaneous equation model," *Labour Economics*, 17(1), 77-90, 2010.

[18] Calvo, C. and S. Dercon, “Chronic poverty and all that: the measurement of poverty over time,” *Poverty Dynamics, Oxford University Press, Oxford*, 29-59, 2009.

[19] Cunha, F., J. J. Heckman, L. Lochner, and D. V. Masterov, “Interpreting the evidence on life cycle skill formation,” *Handbook of the Economics of Education*, 1, 697-812, 2006.

[20] Cunha, F., and J. J. Heckman, “The technology of skill formation,” *American Economic Review*, 97(2), 31-47, 2007.

[21] Currie, J. and R. Hyson, “Is the impact of health shocks cushioned by socioeconomic status? The case of low birthweight,” *American Economic Review*, 89(2), 245-250, 1999.

[22] Currie, J. and B. C. Madrian, “Health, health insurance and the labor market,” *Handbook of Labor Economics*, 3, 3309-3416, 1999.

[23] Currie, J. and E. Moretti, “Mother’s education and the intergenerational transmission of human capital: Evidence from college openings,” *The Quarterly Journal of Economics*, 118(4), 1495-1532, 2003.

[24] Currie, J. “Healthy, wealthy, and wise: Socioeconomic status, poor health in childhood, and human capital development,” *Journal of Economic Literature*, 47(1), 87-122, 2009.

[25] Dahl, G. B. and L. Lochner, “The impact of family income on child achievement,” *National Bureau of Economic Research*, No. w11279, 2005.

[26] Dickerson, A. and G. K. Popli, “Persistent poverty and children’s cognitive development: evidence from the UK Millennium Cohort Study,” *Journal of the Royal Statistical Society: Series A (Statistics in Society)*, 179(2), 535-558, 2016.

[27] Duncan, G. J., J. Brooks-Gunn, and P. K. Klebanov, “Economic deprivation and early childhood development,” *Child development*, 65(2), 296-318, 1994.

[28] Duncan, G. J. and J. Brooks-Gunn, “Consequences of growing up poor,”(eds.), Russell Sage Foundation, 1997.

[29] Duncan, G. J., W. J. Yeung, J. Brooks-Gunn, and J. R. Smith, “How much does childhood poverty affect the life chances of children?,” *American Sociological Review*, 63(3), 406, 1998.

[30] Duncan, G. J., K. Magnuson, A. Kalil, and K. Ziol-Guest, “The importance of early childhood poverty,” *Social Indicators Research*, 108(1), 87-98, 2012.

[31] Dutta, I., L. Roope, and H. Zank, “On intertemporal poverty measures: the role of affluence and want,” *Social Choice and Welfare*, 41(4), 741-762, 2013.

[32] Ejrnæs, M. and C. C. Pörtner, “Birth order and the intrahousehold allocation of time and education,” *Review of Economics and Statistics*, 86(4), 1008-1019, 2004.

[33] Evans, G. W. and M. A. Schamberg, “Childhood poverty, chronic stress, and adult working memory,” *Proceedings of the National Academy of Sciences*, 106(16), 6545-6549, 2009.

[34] Fischer, M., M. Karlsson, T. Nilsson, and N. Schwarz, “The sooner the better? compulsory schooling reforms in Sweden,” 2016.

[35] Freedman, D. S., W. H. Dietz, S. R. Srinivasan, and G. S. Berenson, “The relation of overweight to cardiovascular risk factors among children and adolescents: the Bogalusa Heart Study,” PEDIATRICS-SPRINGFIELD, 103, 1175-1182, 1999.

[36] Foster, J., J. Greer, and E. Thorbecke, “A class of decomposable poverty measures,” *Econometrica*, 52(3), 761-766, 1984.

[37] Foster, J. E., “A class of chronic poverty measures,” *Poverty dynamics: Interdisciplinary Perspectives*, 59-76, 2009.

[38] Gaiha, R., “Are the chronically poor also the poorest in rural India?,” *Development and Change*, 20(2), 295-322, 1989.

[39] Gradín, C., C. Del Río, and O. Cantó, “Measuring poverty accounting for time,” *Review of Income and Wealth*, 58(2), 330-354, 2012.

[40] Gregg, P., S. Harkness, and S. Machin, “Child development and family income,” *Yps*, 1999.

[41] Grossman, M., “On the concept of health capital and the demand for health,” *Journal of Political Economy*, 80(2), 223-255, 1972.

[42] Hatton, T. J. and R. M. Martin, “The effects on stature of poverty, family size, and birth order: British children in the 1930s,” *Oxford Economic Papers*, 62(1), 157-184, 2009.

[43] Heckman, J. J. and T. Kautz, “Fostering and measuring skills: Interventions that improve character and cognition”, *National Bureau of Economic Research,* No. w19656, 2013.

[44] Hetherington, E. M., and M. Stanley-Hagan, “The adjustment of children with divorced parents: A risk and resiliency perspective,” *The Journal of Child Psychology and Psychiatry and Allied Disciplines*, 40(1), 129-140, 1999.

[45] Hill, M. S. and S. P. Jenkins, “Poverty among British children: chronic or transitory?,” *ESRC Research Centre on Micro-Social Change, University of Essex*, 1999.

[46] Hofmarcher, T., “The Effect of Education on Poverty: A European Perspective” (No. 2019: 9), 2019.

[47] Hoy, M. and B. Zheng, “Measuring lifetime poverty,” *Journal of Economic Theory*, 146(6), 2544-2562, 2011.

[48] Huggett, M., G. Ventura, and A. Yaron, “Sources of lifetime inequality,” *American Economic Review*, 101(7), 2923-54, 2011.

[49] Isaacs, J. and K. Magnuson, “Income and education as predictors of children’s school readiness,” *Washington, DC: Brookings Institution,* 2011.

[50] Jalan, J. and M. Ravallion, “Is transient poverty different? Evidence for rural China,” *The Journal of Development Studies*, 36(6), 82-99, 2000.

[51] Kingston, D., M. Heaman, D. Fell, B. Chalmers, and Maternity Experiences Study Group of the Canadian Perinatal Surveillance System, “Comparison of adolescent, young adult, and adult women’s maternity experiences and practices,” *Pediatrics*, 129(5), e1228-e1237, 2012.

[52] McLoyd, V. C., “The impact of economic hardship on Black families and children: Psychological distress, parenting, and socioemotional development,” *Child development*, 61(2), 311-346, 1990.

[53] Milligan, K. and M. Stabile, “Do child tax benefits affect the well-being of children? Evidence from Canadian child benefit expansions,” *American Economic Journal: Economic Policy*, 3(3), 175-205, 2011.

[54] Oreopoulos, P., “Do dropouts drop out too soon? Wealth, health and happiness from compulsory schooling,” *Journal of Public Economics*, 91(11-12), 2213-2229, 2007.

[55] Parker, F. L., “Parent-child relationship, home learning environment, and school readiness,” *School Psychology Review*, 28(3), 1999.

[56] Ram, B. and F. Hou, “Changes in family structure and child outcomes: Roles of economic and familial resources,” *Policy Studies Journal*, 31(3), 309-330, 2003.

[57] Reid, V. and M. Meadows-Oliver, “Postpartum depression in adolescent mothers: an integrative review of the literature,” *Journal of Pediatric Health Care*, 21(5), 289-298, 2007.

[58] Ratcliffe, C. and S. McKernan, “Child poverty and its lasting consequence,” Low-Income Working Families Working Paper 21. Washington, DC: Urban Institute, 2012.

[59] Ratcliffe, C. and E. Kalish, “Escaping Poverty,” Washington, DC: Urban Institute, 2017.

[60] Rodgers, J. R. and J. L. Rodgers, “Chronic poverty in the United States,” *Journal of Human Resources*, 25-54, 1993.

[61] Schoon, I., E. Jones, H. Cheng, and B. Maughan, “Family hardship, family instability, and cognitive development,” *Journal of Epidemiology and Community Health*, 66(8), 716-722, 2012.

[62] Scott, L. C., L. H. Smith, and B. Rungeling, “Labor force participation in southern rural labor markets,” *American Journal of Agricultural Economics*, 59(2), 266-274, 1977.

[63] Shonkoff, J. P., A. S. Garner, B. S. Siegel, M. I Dobbins, M. F. Earls, L. McGuinn, J. Pascoe, D. Wood, and Committee on Early Childhood, Adoption, and Dependent Care, “The lifelong effects of early childhood adversity and toxic stress,” *Pediatrics*, 129(1), e232-e246, 2012.

[64] Smith, L. C. and L. J. Haddad, “Overcoming child malnutrition in developing countries: past achievements and future choices,” *International Food Policy Research Institute (IFPRI) Paper No. 30,* 2000.

[65] Suryadarma, D., Y. M. Pakpahan, and A. Suryahadi, “The effects of parental death and chronic poverty on children’s education and health: evidence from Indonesia,” *Chronic Poverty Research Centre Working Paper No. 133*, 2009.

[66] Valletta, R. G., “The ins and outs of poverty in advanced economies: Government policy and poverty dynamics in Canada, Germany, Great Britain, and the United States,” *Review of Income and Wealth*, 52(2), 261-284, 2006.

[67] Wagmiller, R. L. and R. M. Adelman, “Childhood and intergenerational poverty: The long-term consequences of growing up poor,” 2009.

[68] White, L. K., “Determinants of divorce: A review of research in the eighties,” *Journal of Marriage and the Family,* 904-912, 1990.

Table 1: Descriptive Statistics: Adult Outcomes by Childhood Poverty Status

	Never Poor (Mean or %)	Ever Poor (Mean or %)	All (Mean or %)
Completed schooling	12.9 years	11.7 years	12.5 years
Currently working (%)	72.3	62.8	68.9
Good Health (%)	96.9	92.8	95.4
Form own Households (%)	69.3	70.7	69.8
Teen Birth (%)	8.3	23.7	13.8
Currently poor (%)	3.2	20.1	8.7
Birth Order	2.4	3.2	2.7
Mother's age at birth	26.2 years	25.5 years	25.9 years
Age of first-time moms	22.8 years	20.8 years	22.3 years

Notes: Ever Poor individuals spent at least one of the first ten years of life poor. Never poor individuals had zero poverty spell experiences over the first ten years of life. See the Appendix for an explanation of the variables.
Source: Author, PSID Data 1968-2003.

Figure 1: Average Completed Years of Schooling by Birth Order

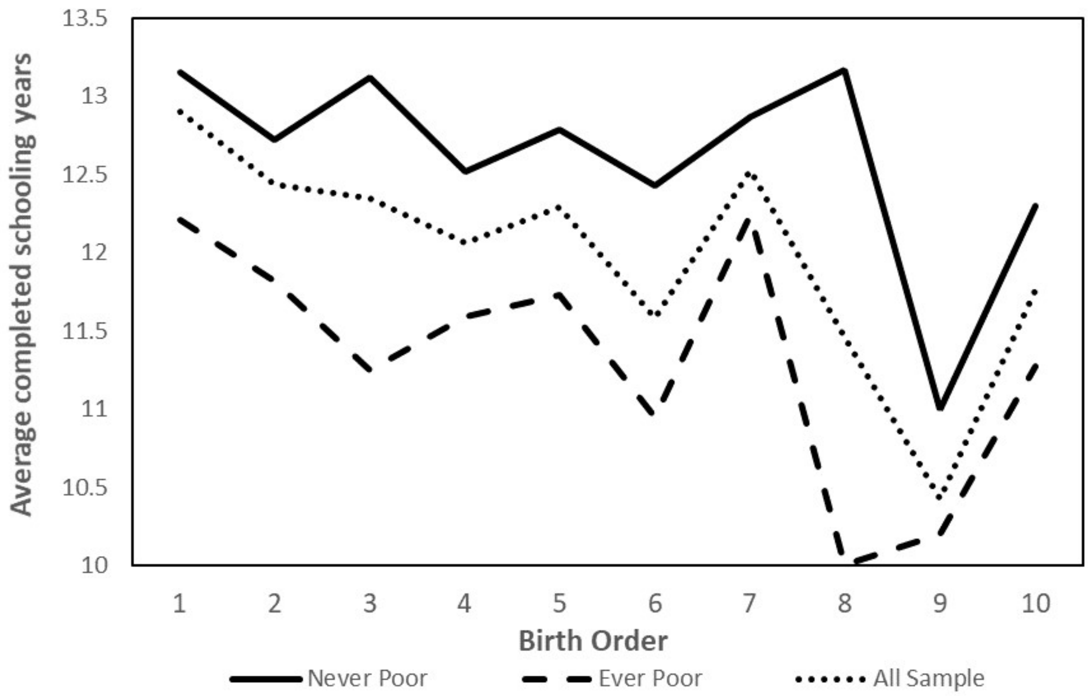

Table 2: Chronic Child Poverty, by Birth Cohort Year

Panel A: Count Index	N	1/10	3/10	5/10	8/10
1968 Cohort	279	42.3	24.1	17.3	9.4
1969 Cohort	126	31.7	15.0	7.8	4.8
1970 Cohort	174	35.6	19.0	13.3	6.3
1971 Cohort	159	35.8	18.8	10.7	2.5
1972 Cohort	175	33.1	18.2	11.9	5.1
1973 Cohort	134	30.6	17.9	11.9	1.5
All Cohorts	1,047	35.9	19.5	12.8	5.5
Panel B: F Index		0.00	0.25	0.50	0.75
1968 Cohort	279	0.055	0.048	0.041	0.028
1969 Cohort	126	0.032	0.027	0.020	0.014
1970 Cohort	174	0.050	0.044	0.038	0.024
1971 Cohort	159	0.040	0.033	0.025	0.011
1972 Cohort	175	0.046	0.041	0.035	0.020
1973 Cohort	134	0.035	0.030	0.023	0.003
All Cohorts	1,047	0.045	0.039	0.032	0.018
Panel C: BCD Index		1.2	1.5	1.7	2.0
1968 Cohort	279	0.148	0.728	1.992	7.822
1969 Cohort	126	0.075	0.331	0.873	3.285
1970 Cohort	174	0.126	0.575	1.521	5.775
1971 Cohort	159	0.097	0.374	0.980	3.822
1972 Cohort	175	0.116	0.515	1.353	5.115
1973 Cohort	134	0.056	0.113	0.176	0.328
All Cohorts	1,047	0.111	0.487	1.286	4.917
Panel D: HZ Index		0.2	0.5	0.8	1.0
1968 Cohort	279	0.056	0.058	0.059	0.060
1969 Cohort	126	0.033	0.033	0.033	0.033
1970 Cohort	174	0.051	0.051	0.052	0.052
1971 Cohort	159	0.040	0.041	0.042	0.042
1972 Cohort	175	0.046	0.046	0.046	0.046
1973 Cohort	134	0.034	0.032	0.031	0.031
All Cohorts	1,047	0.045	0.046	0.046	0.047

Notes: The Count Index represent the percentage of children who suffered chronic poverty. For the count index, chronically poor children are identified using four cutoff fractions; 1/10 (poor at least once), 3/10 (poor at least three times), 5/10 (poor at least five times) and 8/10 (poor at least eight times). Four different values of τ; 0.00, 0.25, 0.50 and 0.75 are considered for the F Index. Four different values of γ; 1.2, 1.5, 1.7 and 2.0 are considered for the BCD Index. Four different values of δ; 0.2, 0.5, 0.8 and 1.0 are considered for the HZ Index.
Source: Author, PSID Data 1968-2003.

Table 3: Association between Childhood Chronic Poverty and Completed Schooling Years

	Model 1	Model 2	Model 3	Model 4	Model 5
F Index	-0.104***				
BCD Index		-0.052**			
HZ Index			-0.104***		
Count Index				-0.123***	
APG					-0.095***
Child is a 'switcher'	-0.060*	-0.068*	-0.062*	-0.053	-0.059*
Child is female	0.085***	0.085***	0.084***	0.085***	0.085***
Child is Non-white	-0.004	-0.021	-0.004	0.0002	-0.009
Head's Education	0.120***	0.129***	0.119***	0.110***	0.123***
Second generation citizen	0.051*	0.053*	0.051*	0.049*	0.052*
Age of Mother	0.392*	0.182*	0.390*	0.362	0.395*
Age of $Mother^2$	-0.349	-0.360	-0.348	-0.312	-0.349
Birth Order	-0.402**	-0.403**	-0.403**	-0.348**	-0.386**
Birth Order×Age of Mother	0.320*	0.309	0.320*	0.262	0.306
Region (Ref: North East)					
North Central	-0.045	-0.047	-0.046	-0.047	-0.045
South	-0.088*	-0.095**	-0.088*	-0.092**	-0.089*
West	0.003	0.005	0.003	-0.001	0.004
Regression Statistics					
Obs	1,041	1,041	1,041	1,041	1,041
R-squared	0.087	0.081	0.087	0.090	0.086
P-value	2.09e-17	1.58e-17	3.53e-17	1.64e-16	4.20e-18
AIC	4966.12	4973.1	4966.08	4963.1	4967.6

Notes: The dependent variable is the completed years of schooling estimated using a linear regression model. $\tau = 0.00$ for F; $\gamma = 1.2$ for BCD, δ=0.2 for HZ and cutoff fraction is 3/10 for the count index. North East is the baseline Region. Standardized coefficients are reported in each column; they represent the standard deviation changes in years of completed schooling associated with a one standard deviation increase in a given covariate. All regressions include a constant term and birth cohort dummy variables which are not reported. See the Appendix for an explanation of all variables.
Source: Author, PSID Data 1968-2003.
* $p < .10$; ** $p < .05$; *** $p < .01$.

Table 4: Association between Childhood Chronic Poverty and Good Health

	Model 1	Model 2	Model 3	Model 4	Model 5
F Index	-0.158**				
BCD Index		-0.096**			
HZ Index			-0.162***		
Count Index				-0.222***	
APG					-0.125**
Child is a 'switcher'	0.047	0.037	0.045	0.070	0.048
Child is female	0.017	0.019	0.017	0.015	0.018
Child is Non-white	0.205**	0.176*	0.209**	0.213**	0.181**
Head's Education	0.201**	0.215**	0.199**	0.176*	0.210**
Age of Mother	0.369	0.386	0.366	0.284	0.369
Age of $Mother^2$	-0.501	-0.501	-0.500	-0.407	-0.487
Birth Order	-0.144	-0.134	-0.148	-0.004	-0.098
Birth Order×Age of Mother	0.189	0.159	0.194	0.052	0.142
Region (Ref: North East)					
North Central	0.062	0.008	0.014	0.013	0.013
South	0.223	0.043	0.058	0.049	0.050
West	0.242	0.047	0.042	0.038	0.046
Regression Statistics					
Obs	1,044	1,044	1,044	1,044	1,044
Pseudo R-squared	0.056	0.050	0.057	0.063	0.051
P-value	0.054	0.093	0.049	0.030	0.102
AIC	386.06	388.61	385.72	383.70	388.11

Notes: Dependent variable is a binary variable equal to 1 if an individual is in good health. This outcome is estimated using a logistic regression model. $\tau = 0.00$ for F; $\gamma = 1.2$ for BCD, δ=0.2 for HZ and cutoff fraction is 3/10 for the count index. North East is the baseline Region. Standardized coefficients are reported in each column; they represent the standard deviation changes in adult health status associated with a one standard deviation increase in a given covariate. All regressions include a constant term and birth cohort dummy variables which are not reported. See the Appendix for an explanation of all variables.
Source: Author, PSID Data 1968-2003.
* $p < .10$; ** $p < .05$; *** $p < .01$.

Table 5: Association between Childhood Chronic Poverty and Teen Birth

	Model 1	Model 2	Model 3	Model 4	Model 5
F Index	0.017				
BCD Index		-0.065*			
HZ Index			0.014		
Count Index				0.057	
APG					0.029
Child is a 'switcher'	0.048	0.055	0.049	0.041	0.046
Child is female	0.312***	0.311***	0.312***	0.312***	0.312***
Child is non-white	0.212***	0.231***	0.214***	0.200***	0.210***
Head's Education	-0.142***	-0.149***	-0.142***	-0.133**	-0.141***
Age of Mother	-0.992***	-1.019***	-0.993***	-0.972***	-0.987***
Age of $Mother^2$	0.886**	0.900**	0.887**	0.871**	0.884**
Birth Order	0.341	0.322	0.340	0.322	0.337
Birth Order×Age of Mother	-0.225	-0.186	-0.223	-0.215	-0.227
Region (Ref: North East)					
North Central	0.156**	0.157**	0.156**	0.155**	0.155**
South	0.149*	0.158*	0.150*	0.147*	0.147*
West	0.139**	0.135**	0.139**	0.144**	0.140**
Regression Statistics					
Obs	1,047	1,047	1,047	1,047	1,047
Pseudo R-squared	0.187	0.190	0.187	0.189	0.188
P-value	0.000	0.000	0.000	0.000	0.000
AIC	720.43	718.31	720.50	718.93	720.13

Notes: Dependent variable is a binary variable equal to 1 if an individual had a baby before age 20. This outcome is estimated using a logistic regression. $\tau = 0.00$ for F; $\gamma = 1.2$ for BCD, δ=0.2 for HZ and cutoff fraction is 3/10 for the count index. North East is the baseline Region. Standardized coefficients are reported in each column; they represent the standard deviation changes in the propensity of teen births associated with a one standard deviation increase in a given covariate. All regressions include a constant term and birth cohort dummy variables which are not reported. See the Appendix for an explanation of all variables.
Source: Author, PSID Data 1968-2003.
* $p < .10$; ** $p < .05$; *** $p < .01$.

Table 6: Association between Childhood Chronic Poverty and Formation of Own Household

	Model 1	Model 2	Model 3	Model 4	Model 5
F Index	-0.017				
BCD Index		0.011			
HZ Index			-0.015		
Count Index				-0.010	
APG					-0.011
Child is a 'switcher'	0.049	0.047	0.048	0.050	0.048
Child is female	0.132***	0.131***	0.132***	0.132***	0.132***
Child is non-white	-0.213***	-0.220***	-0.214***	-0.213***	-0.215***
Head's Education	-0.053	-0.049	-0.053	-0.054	-0.052
Age of Mother	-0.885***	-0.882***	-0.885***	-0.890***	-0.883***
Age of $Mother^2$	0.748**	0.749**	0.748**	0.754**	0.748**
Birth Order	0.379	0.385	0.379	0.387	0.381
Birth Order×Age of Mother	-0.307	-0.319	-0.308	-0.316	-0.311
Region (Ref: North East)					
North Central	0.173***	0.172***	0.173***	0.173***	0.173***
South	0.182***	0.179***	0.182***	0.181***	0.181***
West	0.136***	0.138***	0.137***	0.136***	0.137***
Regression Statistics					
Obs	1,047	1,047	1,047	1,047	1,047
Pseudo R-squared	0.068	0.068	0.068	0.068	0.068
P-value	0.000	0.000	0.000	0.000	0.000
AIC	1230.60	1230.73	1230.68	1230.61	1230.75

Notes: Dependent variable is a binary variable equal to 1 if an individual formed their own household. This outcome is estimated using a logistic regression model. $\tau = 0.00$ for F; $\gamma = 1.2$ for BCD, δ=0.2 for HZ and cutoff fraction is 3/10 for the count index. North East is the baseline Region. Standardized coefficients are reported in each column; they represent the standard deviation changes in the formation of own households associated with a one standard deviation increase in a given covariate. All regressions include a constant term and birth cohort dummy variables which are not reported. See the Appendix for an explanation of all variables.
Source: Author, PSID Data 1968-2003.
* $p < .10$; ** $p < .05$; *** $p < .01$.

Table 7: Association between Childhood Chronic Poverty and Employment Status

	Model 1	Model 2	Model 3	Model 4	Model 5
F Index	-0.097*				
BCD Index		-0.107*			
HZ Index			-0.097*		
Count Index				-0.008	
APG					-0.082
Child is a 'switcher'	-0.083*	-0.087*	-0.084*	-0.094*	-0.084*
Child is female	-0.256***	-0.259***	-0.256***	-0.255***	-0.257***
Child is non-white	0.053	0.053	0.053	0.020	0.045
Child's Education	0.134**	0.139***	0.134**	0.135**	0.135**
Child is in good health	0.109***	0.109***	0.109***	0.104**	0.108***
Age of Mother	0.119	0.142	0.044	0.146	0.129
Age of $Mother^2$	-0.317	-0.336	-0.320	-0.320	-0.322
Birth Order	-0.722**	-0.746**	-0.723**	-0.689**	-0.708**
Birth Order×Age of Mother	0.786*	0.809**	0.788*	0.721*	0.771*
Region (Ref: North East)					
North Central	-0.016	-0.016	-0.016	-0.018	-0.015
South	-0.068	-0.067	-0.067	-0.079	-0.071
West	-0.101	-0.067	-0.101	-0.096	-0.099
Regression Statistics					
Obs	719	719	719	719	719
Pseudo R^2	0.111	0.114	0.111	0.106	0.110
P-value	0.000	0.000	0.000	0.000	0.000
AIC	668.01	666.1	668.00	671.6	669.2

Notes: Dependent variable is a binary variable equal to 1 if an individual is currently employed. This outcome is estimated using a logistic regression model. τ = 0.00 for F; γ = 1.2 for BCD, δ=0.2 for HZ and cutoff fraction is 3/10 for the count index. North East is the baseline Region. Standardized coefficients are reported in each column; they represent the standard deviation changes in employment status associated with a one standard deviation increase in a given covariate. All regressions include a constant term and birth cohort dummy variables which are not reported. See the Appendix for an explanation of all variables.
Source: Author, PSID Data 1968-2003.
* $p < .10$; ** $p < .05$; *** $p < .01$.

Table 8: Association between Childhood Chronic Poverty and Adult Poverty Status

	Model 1	Model 2	Model 3	Model 4	Model 5
F Index	0.121**				
BCD Index		0.044			
HZ Index			0.119**		
Count Index				0.226***	
APG					0.110*
Child is a 'switcher'	0.075	0.088*	0.078	0.054	0.076
Child is female	0.188**	0.184**	0.187**	0.177**	0.189**
Child is non-white	0.167**	0.202***	0.167**	0.115	0.176**
Child's Education	-0.252***	-0.257***	-0.252***	-0.227***	-0.254***
Child is working	-0.141***	-0.147***	-0.142***	-0.164***	-0.145***
Child is in good health	-0.102**	-0.095**	-0.102**	-0.107**	-0.101**
Age of Mother	-0.840	-0.866	-0.847	-0.654	-0.837
Age of $Mother^2$	0.801	0.793	0.807	0.640	0.795
Birth Order	0.180	0.141	0.180	0.111	0.155
Birth Order×Age of Mother	-0.021	0.052	-0.020	0.014	-0.004
Region (Ref: North East)					
North Central	0.088	0.090	0.089	0.086	0.086
South	0.065	0.082	0.065	0.070	0.067
West	0.069	0.057	0.068	0.094	0.066
Regression Statistics					
Obs	728	728	728	728	728
Pseudo R-squared	0.255	0.246	0.254	0.277	0.252
P-value	0.000	0.000	0.000	0.000	0.000
AIC	363.97	368.70	364.45	356.89	364.70

Notes: Dependent variable is a binary variable equal to 1 if an individual is currently poor. This outcome is estimated using a logistic regression model. $\tau = 0.00$ for F; $\gamma = 1.2$ for BCD, δ=0.2 for HZ and cutoff fraction is 3/10 for the count index. North East is the baseline Region. Standardized coefficients are reported in each column; they represent the standard deviation changes in adult poverty status associated with a one standard deviation increase in a given covariate. All regressions include a constant term and birth cohort dummy variables which are not reported. See the Appendix for an explanation of all variables.
Source: Author, PSID Data 1968-2003.
* $p < .10$; ** $p < .05$; *** $p < .01$.

Appendix

Description of Data

The Panel Study of Income Dynamics (PSID) of the United States is an ongoing study which began in 1968 with a nationally representative sample of 5000 families consisting of 15,000 individuals. This survey has now followed siblings and parents for over thirty years. Questions about educational attainment, labor supply, health, income levels, household wealth, among others are posed in each round. Interviews are conducted either by telephone, in person or by mail. The average length of an interview is 20 minutes. The interview period is roughly between February and October of each year. A majority of interviews are conducted in Spring.

Total family income in the PSID is defined as the sum of taxable income from all sources of the husband, wife and all other earners in the household plus transfer incomes. Transfer income includes aid to dependent children (ADC), aid to families with dependent children (AFDC), aid to dependent children with unemployed fathers (ADCU), social security, retirement compensation, unemployment compensation, workmen's compensation, alimony, child support, gifts from relatives, etc. Any form of non-cash benefits such as food stamps, housing subsidies, etc are excluded from the definition of total income.

I follow children from birth to age 30. Only children with complete information are included in this study. If a household head withdraws from the survey, then information on every member of the household (including children) becomes unavailable. However, children who move from their original birth households to other households due to several reasons are still followed and their information are available.

Description of variables

Years of completed schooling - Equal to the most recent report of highest schooling years completed by an individual at age 25.
Good health - Equal to 1 if health status is reported as excellent, very good or good, and 0 if health status is reported as poor or fair at age 25.
Working now - Equal to 1 if an individual is currently working and 0 if the status of employment is reported as unemployed/looking for work/student/housewife/living in an institution/disabled/other at age 30.
Teen birth - Equal to 1 if an individual had a child before age 20, and 0 otherwise.
Form own households - Equal to 1 if an individual is the head of the household or wife (including cohabitants), and 0 otherwise by age 25.
Currently poor - Equal to 1 if an individual's equivalent household income is below the appropriate poverty line (i.e., poor), and 0 otherwise (i.e., non-poor) at age 30.
Household Head's Education - Equal to 1 if the household head of an individual completed at least a high school degree, and 0 otherwise.
Switcher - Equal to 1 if an individual experienced disruptions in the household environment due to parental marital divorce/separation during the first ten years of life and 0 otherwise.
Age of mother - It is a continuous measure of the age of mother at time of birth of an individual.
Second generation citizens - Equal to 1 if at least one parent of an individual is an immigrant (i.e., born outside the United States), and 0 otherwise.
Completed High School - Equal to 1 if an individual completed at least 12 grades of school, and 0 otherwise.

Table A1: Equivalence scales by different family sizes

Family size	Poverty Line	Implied equivalence scale
1	5,593	1.00
2	7,231	1.29
3	8,573	1.53
4	10,989	1.96
5	13,007	2.33
6	14,696	2.63
7	16,656	2.98
8	18,512	3.31
9 or more	22,083	3.95

Source: Author's calculation of Equivalence scales derived from 1985 poverty thresholds published by the United States Census Bureau.

Supporting Information/ Online Appendix

Additional supporting information may be found here. References to these tables have been provided in the main paper.

Table A1: Correlation between Pairs of Poverty Indices

	$F_{0.00}$	$F_{0.25}$	$F_{0.50}$	$F_{0.75}$	$F_{1.00}$	$BCD_{1.2}$	$BCD_{1.5}$	$BCD_{1.7}$	$BCD_{2.0}$	$HZ_{0.2}$	$HZ_{0.5}$	$HZ_{0.8}$	$HZ_{1.0}$	HCI_1	HCI_2	HCI_3	APG
$F_{0.00}$	1.00																
$F_{0.25}$	0.98	1.00															
$F_{0.50}$	0.94	0.95	1.00														
$F_{0.75}$	0.78	0.79	0.83	1.00													
$F_{1.00}$	0.56	0.57	0.59	0.71	1.00												
$BCD_{1.2}$	0.88	0.89	0.90	0.88	0.82	1.00											
$BCD_{1.5}$	0.74	0.75	0.77	0.86	0.93	0.95	1.00										
$BCD_{1.7}$	0.69	0.70	0.73	0.83	0.96	0.92	0.99	1.00									
$BCD_{2.0}$	0.65	0.66	0.69	0.80	0.97	0.90	0.99	0.99	1.00								
$HZ_{0.2}$	0.99	0.98	0.93	0.78	0.56	0.89	0.74	0.69	0.65	1.00							
$HZ_{0.5}$	0.98	0.96	0.92	0.77	0.56	0.88	0.74	0.69	0.65	0.99	1.00						
$HZ_{0.8}$	0.97	0.95	0.91	0.76	0.56	0.86	0.72	0.68	0.64	0.98	0.99	1.00					
$HZ_{1.0}$	0.96	0.94	0.90	0.75	0.55	0.86	0.72	0.67	0.64	0.98	0.99	0.99	1.00				
HCI_1	0.62	0.53	0.45	0.30	0.17	0.40	0.27	0.23	0.21	0.62	0.62	0.61	0.61	1.00			
HCI_2	0.78	0.81	0.68	0.45	0.25	0.57	0.40	0.35	0.32	0.78	0.77	0.76	0.75	0.66	1.00		
HCI_3	0.80	0.82	0.87	0.58	0.32	0.66	0.50	0.45	0.41	0.80	0.80	0.78	0.78	0.51	0.78	1.00	
APG	0.96	0.95	0.90	0.73	0.49	0.83	0.68	0.63	0.59	0.95	0.92	0.90	0.88	0.60	0.77	0.79	1.00

Notes: The table presents the correlation (pearson) coefficients between pairs of poverty indices. $F_{0.00}$, $F_{0.25}$, $F_{0.50}$, $F_{0.75}$ and $F_{1.00}$ represent the F Index for duration cutoff fractions, τ equal 0.00, 0.25, 0.50, 0.75 and 1.00 respectively. $BCD_{1.2}$, $BCD_{1.5}$, $BCD_{1.7}$ and $BCD_{2.0}$ represent the BCD Index for different sensitivity parameters, γ equal 1.20, 1.50, 1.70 and 2.00. $HZ_{0.2}$, $HZ_{0.5}$, $HZ_{0.8}$ and $HZ_{1.0}$ represent the HZ Index for different sensitivity parameters, δ equal 0.2, 0.5, 0.8 and 1.0. HCI_1, HCI_2 and HCI_3 represent the head count index for three duration cutoff fractions; 1/10, 3/10 and 5/10 respectively.
Source: Author, PSID Data 1968-2003.

Table A2: AIC FOR DIFFERENT PARAMETER VALUES OF THE POVERTY INDEXES

	Schooling (years)	Good Health	Teen Birth	Form own Household	Currently Working	Currently Poor
Panel A: F Index						
$F_{0.0}$	**4966.12**	**386.06**	721.20	1230.64	668.02	**347.66**
$F_{0.25}$	4967.45	386.61	720.48	1230.74	668.27	348.03
$F_{0.50}$	4970.69	387.24	720.14	1230.81	668.16	349.27
$F_{0.75}$	4972.91	389.54	719.32	**1230.09**	**667.73**	351.96
$F_{1.0}$	4975.67	389.45	**717.67**	1230.63	668.57	351.96
Panel B: BCD Index						
$BCD_{1.2}$	**4973.06**	**388.61**	718.31	1230.73	**666.14**	**351.49**
$BCD_{1.5}$	4975.08	389.33	716.58	1230.63	666.28	351.96
$BCD_{1.7}$	4975.39	389.47	**716.34**	**1230.62**	666.51	351.97
$BCD_{2.0}$	4975.55	389.54	716.35	**1230.62**	666.81	351.96
Panel C: HZ Index						
$HZ_{0.2}$	**4966.09**	385.72	**720.50**	**1230.68**	**668.00**	**347.83**
$HZ_{0.5}$	4966.19	385.30	720.56	1230.72	668.12	348.11
$HZ_{0.8}$	4966.46	385.02	720.59	1230.73	668.35	348.40
$HZ_{1.0}$	4966.54	**384.81**	720.60	1230.74	668.50	348.57
Panel D: Count Index						
Poor $\geq$ once	4965.95	**382.64**	716.68	1230.78	671.62	343.52
Poor $\geq$ thrice	**4963.13**	383.70	718.93	**1230.61**	671.61	**338.30**
Poor $\geq$ five times	4970.23	385.86	**716.02**	1230.63	**671.53**	342.57

Notes: The Akaike Information Criterion (AIC) is used to select the parameter value for each poverty index to report in the main paper. The parameters with the least AIC for each outcome are in bold. The F index is estimated for τ = 0.00, 0.25, 0.50, 0.75 & 1.00. The BCD index is estimated for γ = 1.20, 1.50, 1.70 & 2.00. The HZ index is estimated δ = 0.20, 0.50, 0.80 & 1.00. For the count index, a chronically poor child is identified using three criteria, poor at least once, poor at least thrice and poor at least five times. With the exception of the education outcome which is estimated using a Ordinary Linear Regression model, all other outcome variables are estimated using a Logistic Regression model. *Source*: Author, PSID Data 1968-2003.

Table A3: Unadjusted Associations between Childhood Chronic Poverty and Adult Outcomes

	Schooling (years)	Good Health	Teen Birth	Form Own Households	Working Now	Currently Poor
F Index	-0.197***	-0.143**	0.176***	-0.035	-0.133***	0.302***
R^2	0.038	0.013	0.022	0.001	0.012	0.083
BCD Index	-0.129***	-0.098**	0.067**	-0.020	-0.127**	0.190**
R^2	0.016	0.007	0.003	0.000	0.012	0.035
HZ Index	-0.197***	-0.147***	0.174***	-0.034	-0.132***	0.296***
R^2	0.038	0.014	0.022	0.001	0.012	0.080
Count Index	-0.227***	-0.186***	0.253***	-0.020	-0.101**	0.422***
R^2	0.051	0.018	0.043	0.000	0.006	0.147
APG	-0.190***	-0.113**	0.182***	-0.020	-0.119**	0.293***
R^2	0.035	0.007	0.024	0.000	0.009	0.081
No. of Obs	1,041	1,044	1,047	1,047	720	728

Notes: Standardized coefficients are reported in each column; they represent the standard deviation changes in a given outcome associated with a one standard deviation increase in a given covariate. All other covariates and the constant term are included in the regressions but not reported in this table. The education outcome is estimated using a Linear Regression model. All other outcome variables are estimated using a Logistic Regression model. Employment and Adult poverty status are measured at age 30.
Source: Author, PSID Data 1968-2003.
* $p < .10$; ** $p < .05$; *** $p < .01$.

Table A4: Likelihood of Exiting the Psid Survey

Poor in the last wave (10th year)	0.517***
	(0.151)
Regression Statistics	
Pseudo R-squared	0.015
P value	0.000
No. of Obs	1,549

Notes: The dependent variable is a binary variable equal to 1 if an individual was present by the 10th year but left the PSID survey by age 25. This outcome is estimated using a logistic regression model. Birth cohort dummy variables are included but are not reported. Household level cluster-robust standard errors are reported in parentheses.
Source: Author, PSID Data 1968-2003.
* $p < .10$; ** $p < .05$; *** $p < .01$.

Table A5: Association between Childhood Chronic Poverty and Adult Outcomes

	Schooling (years)	Good Health	Teen Birth	Form Own Households	Working Now	Currently Poor
Panel A						
Poor in prenatal year	-0.039	-0.196**	0.039	0.020	-0.006	0.113*
R^2	0.096	0.059	0.188	0.068	0.106	0.250
Panel B (Age 0-5 years)						
F Index	-0.100***	-0.180***	-0.015	-0.014	-0.071	0.105**
R^2	0.103	0.061	0.187	0.068	0.109	0.237
BCD Index	-0.087**	-0.139**	-0.049	0.001	-0.054	0.066
R^2	0.101	0.056	0.189	0.068	0.108	0.232
HZ Index	-0.099***	-0.182***	-0.012	-0.015	-0.070	0.103**
R^2	0.102	0.061	0.187	0.068	0.109	0.236
Panel C (Age 6-10 years)						
F Index	-0.077***	-0.101*	0.041	-0.016	-0.090*	0.144**
R^2	0.099	0.049	0.188	0.0684	0.111	0.248
BCD Index	-0.062**	-0.069	0.010	-0.009	-0.100**	0.117*
R^2	0.098	0.046	0.187	0.068	0.113	0.243
HZ Index	-0.076***	-0.102*	0.039	-0.012	-0.093*	0.144**
R^2	0.099	0.049	0.188	0.068	0.111	0.248
Panel D (Age 0-10 years)						
F Index	-0.104***	-0.158**	0.017	-0.017	-0.097*	0.121**
R^2	0.087	0.054	0.187	0.068	0.111	0.255
BCD Index	-0.052**	-0.096**	-0.065*	0.011	-0.107*	0.044
R^2	0.081	0.050	0.190	0.068	0.114	0.246
HZ Index	-0.104***	-0.162***	0.014	-0.015	-0.097*	0.119**
R^2	0.087	0.057	0.187	0.068	0.111	0.254
No. of Obs	1,041	1,044	1,047	1,047	720	728

Notes: Standardized coefficients are reported in each column; they represent the standard deviation changes in a given outcome associated with a one standard deviation increase in a given covariate. All other covariates and the constant term are included in the regressions but not reported in this table. The education outcome is estimated using a Linear Regression model. All other outcome variables are estimated using a Logistic Regression model. Employment and Adult poverty status are measured at age 30.
Source: Author, PSID Data 1968-2003.
* $p < .10$; ** $p < .05$; *** $p < .01$.

Table A6: Association between Childhood Chronic Poverty and Adult Outcomes

	Completed High School	Good Health	Currently in the labor force
Panel A			
F Index	-0.141***	-0.060	-0.150**
R^2	0.113	0.036	0.124
Panel B			
BCD Index	-0.062*	-0.037	-0.163**
R^2	0.103	0.035	0.129
Panel C			
HZ Index	-0.142***	-0.062	-0.147**
R^2	0.113	0.036	0.123
Panel D			
Count Index	-0.196***	-0.113**	-0.018
R^2	0.121	0.040	0.111
Panel E			
APG	-0.142***	-0.062	-0.144**
R^2	0.113	0.036	0.122
No. of Obs	1,041	1,044	724

Notes: Standardized coefficients are reported in each column; they represent the standard deviation changes in a given outcome associated with a one standard deviation increase in a given covariate. All other covariates and the constant term are included in the regressions but not reported in this table. All outcome variables are estimated using a Logistic Regression model. Employment status is measured at age 30.
Source: Author, PSID Data 1968-2003.
* $p < .10$; ** $p < .05$; *** $p < .01$.