HHS Public Access

Author manuscript

Child Dev Perspect. Author manuscript; available in PMC 2016 September 01.

Published in final edited form as:

Child Dev Perspect. 2015 September 1; 9(3): 158–163. doi:10.1111/cdep.12125.

The Temporal Dynamics of Childhood Economic Deprivation and Children's Achievement

Robert L. Wagmiller Jr.

University at Buffalo

Abstract

Economic deprivation during childhood adversely affects achievement in adolescence and early adulthood. Economically disadvantaged children tend to achieve less than their more advantaged peers on a variety of measures of educational and socioeconomic achievement. Researchers recognize that what matters for achievement is not merely exposure to economic deprivation during childhood but also the temporal dynamics of deprivation. Recent studies have found that the effects of childhood economic disadvantage on achievement depend on the timing of deprivation (early childhood versus middle or late childhood), the sequencing of deprivation (whether family income is rising or falling), and the overall duration of exposure to deprivation. In this article, I describe conceptual and methodological advances in understanding the temporal dynamics of childhood economic disadvantage, and address the implications of these improvements for our knowledge of how deprivation affects children's achievement.

Keywords

poverty; methodology; achievement

Children experience different patterns of family economic deprivation during childhood. Many children are born into and raised in families that never experience economic deprivation, while some children are exposed chronically to economic deprivation. Other children's family economic circumstances change over the course of their childhood. For example, some children experience economic deprivation during early childhood but see their families' economic fortunes improve as they age, while others are born to economically stable or advantaged families but find their families' fortunes deteriorating as they grow older. Yet other children's family economic circumstances are volatile, with their families slipping unpredictably into and out of economic deprivation. These kinds of mobility in family economics during childhood are fairly common (1).

A growing body of research seeks to understand the links between patterns of family economic deprivation during childhood and achievement in adolescence and adulthood (2–5). Understanding these relationships requires reconsidering how childhood economic deprivation has traditionally been conceptualized and operationalized. New approaches to

Correspondence concerning this article should be addressed to: Robert L. Wagmiller, Jr., Department of Sociology, University at Buffalo, 468 Park Hall, Buffalo, NY 14260-4140; rw26@buffalo.edu.

assessing economic deprivation during childhood aim to describe more accurately the temporal dynamics of family economic deprivation over the course of childhood. These approaches seek to describe how children's overall experiences of economic deprivation differ in terms of the length of time deprivation is experienced (i.e., temporary versus chronic deprivation; 6), the timing of deprivation in the child's life (i.e., early versus middle versus late childhood; 2, 4), and the sequencing of deprivation during childhood (i.e., whether family income is stable, increasing, or decreasing; 7, 8).

In this article, I discuss advances in conceptualizing and operationalizing childhood economic deprivation that aim to describe more accurately the temporal dynamics of deprivation during childhood. In the first section, I describe traditional variable-based approaches to measuring children's experiences of economic deprivation. In the second section, I note some shortcomings of these approaches and discuss an alternative approach that uses latent class analysis to classify people into groups based on their patterns of economic deprivation during childhood. In the final section, I discuss some of the strengths and limits of the latent class approach and note emerging issues in research that link childhood economic disadvantage and achievement.

Traditional Approaches to Conceptualizing Childhood Economic Deprivation Point-in-Time Measures of Economic Deprivation

Traditionally, studies linking economic deprivation during childhood to outcomes later in life examine correlations between single point-in-time indicators of childhood deprivation and measures of child development and achievement. In some studies, economic disadvantage is measured at the same time as achievement (9) while in others, it is measured earlier (10). Single point-in-time measures of economic deprivation define economic disadvantage during childhood in different ways. The most common approach is to link a single point-in-time measure of poverty status during childhood to outcomes in adolescence or adulthood (10), although some studies seek to develop more comprehensive measures of family economic deprivation by including indicators of food insecurity and material hardship (9), assets and debts (11), and consumption and expenditures (12). In studies that use the single point-in-time indicator approach, childhood poverty is generally associated weakly to moderately with outcomes in adolescence and adulthood, particularly after considering potentially confounding factors such as parents' cognitive ability and children's behavior (13, 14).

Measures of Cumulative Exposure to Economic Deprivation

The now-widespread availability of detailed information about family economic characteristics throughout childhood has led researchers to develop measures that more fully characterize people's experiences of economic disadvantage during childhood. Many studies seek to describe the duration that a person experienced economic deprivation during childhood. For example, measures of cumulative poverty indicate the proportion of years during childhood that a person's family income was below the official poverty line (6, 15–18). In a similar vein, some studies construct measures representing the number and duration of poverty spells that children experience (19, 20). Other studies aim to identify people who

are chronically exposed to economic deprivation by classifying them into groups on the basis of the proportion of time in their childhood that they lived in poverty, with poverty defined in terms of income, consumption, assets, nutrition, or some combination of these indicators (21).

Outcomes in adolescence and adulthood are associated more strongly with the duration of exposure to childhood economic deprivation than with single point-in-time measures of childhood economic deprivation (6, 22, 23). Children in persistently poor families have lower IQs (6) and less optimal working memory as adults (17). They attain fewer years of formal schooling (24), have more behavior problems (6, 25) and have elevated allostatic load, a marker of chronic physiological stress (15).

Measuring Change in Economic Deprivation

Measures of cumulative or chronic deprivation offer a more complete portrait of a person's childhood experiences of economic disadvantage than do single point-in-time measures. Yet they do not fully exploit the advantages of longitudinal data for understanding the temporal dynamics of childhood deprivation because they fail to describe how people's family economic circumstances change over childhood. The most important recent development in the conception and measurement of childhood economic disadvantage is the creation of measures that describe how family economic circumstances change during childhood. This new class of measures distinguishes between the effects of deprivation in early, middle, and late childhood, and between families that experience upward and downward economic mobility. Some studies focusing on the timing of economic disadvantage in childhood construct indicators of poverty status at early, middle, and late childhood (26). Other studies compute measures of average family income (1, 4, 27) or family income-to-needs ratios (18), or construct composite measures of family social class and material conditions (28) for different stages of childhood.

Child development and achievement are influenced by the timing of economic deprivation during childhood in complex ways. Early childhood poverty is detrimental to child development and achievement. Limited parental resources during early childhood inhibit cognitive development and good health in childhood, and diminish educational attainment, success in the labor market, and health outcomes in adulthood (29). Poverty in early childhood is linked to lower earnings and work hours (4), obesity (1), and less optimal health in early adulthood (27), but not to behavioral outcomes such as nonmarital childbearing and imprisonment (4). In contrast, late childhood poverty is associated with reduced expectations for success in adulthood. Spending more time in poverty in late childhood is linked to lower expectations for employment in early adulthood (30), in part because adolescents become more aware of their families' disadvantaged status and restricted opportunities relative to their peers (28). In some studies, poverty is more detrimental when experienced in late childhood than in early childhood (1).

Studies focusing on the timing of poverty in childhood typically do not differentiate effects of timing (when deprivation occurs) from sequencing (whether family economic circumstances are improving, stable, or deteriorating) since they typically estimate the effects of economic deprivation at one stage of child development, controlling for

deprivation at other stages. To understand more completely how the sequencing of economic deprivation influences achievement, some studies include indicators of whether family income during childhood is stable, rising, or falling (7, 8). In such studies, people whose family economic circumstances deteriorated exhibited more behavioral problems and scored lower on cognitive tests than individuals who experienced stable but disadvantaged economic circumstances during childhood (8). Overall, declining family economic fortunes are associated with less optimal outcomes and rising fortunes are associated with improved outcomes (7).

A Latent Class Approach to Conceptualizing Childhood Economic Deprivation

Although the traditional indicator-based approach to representing patterns of childhood economic deprivation sheds light on how the temporal dynamics of economic deprivation influence child development and achievement, this approach is not well equipped to consider simultaneously how the duration, timing, and sequencing of exposure to deprivation during childhood influences outcomes later in life. In the traditional indicator-based approach, measures representing the duration, timing, or sequencing of economic deprivation during childhood or some combination of these measures are included as predictors in a standard regression model (1, 2, 4). Estimating the effect of one measure of economic deprivation (e.g., early childhood poverty) controlling for the effects of other economic deprivation measures (e.g., the total duration of poverty) reduces omitted-variable biases that compromise many models of poverty effects (1, 4). But this approach masks differences in children's experiences of economic deprivation. For example, some children who begin life in economically disadvantaged families escape such deprivation by middle childhood, while others remain in deprived circumstances through middle or late childhood, and yet others move into and out of deprivation over the course of childhood. Such income mobility during childhood is fairly common (1). For example, in one study (1), fewer than one-third of families with prenatal and birth-year incomes below $15,000 had incomes that low between ages 1 to 5 years or 6 to 15 years, and more than a quarter of such families had incomes greater than $25,000 between ages 1 to 5 years, and half of such families had incomes greater than $25,000 between ages 6 to 15. The traditional indicator-based approach to representing patterns of deprivation obscures the complex patterns of mobility children experience because the effect of a factor such as early childhood poverty is estimated controlling for the other factors such as middle and late childhood poverty.

With my colleagues (5, 31), I have developed a latent class analysis approach for simultaneously considering how the duration, timing, and sequencing of exposure to economic deprivation during childhood influences achievement. Rather than differentiating short- and long-term exposure to economic deprivation; deprivation in early, middle, and late in childhood; or movement into and out of deprivation, this approach classifies people into a limited number of groups based on the overall pattern of economic deprivation they experience during childhood.

The latent class approach assumes that the population includes a mixture of distinct classes defined by their histories of exposure to economic deprivation during childhood, but that

class membership is unobserved. The latent class approach we proposed (5) uses finite mixture models to identify children with similar histories of economic deprivation. These models define economic deprivation in terms of poverty status (i.e., family income is below the official poverty threshold for the family) to illustrate the approach, although the approach could be adapted easily for use with other measures of deprivation. In the mixture model (5), measures of poverty status at different time points during childhood serve as indicators of a latent categorical variable that classifies individuals into groups on the basis of their family's movements into and out of poverty. The number and size of the childhood poverty classes, and the contours of each group's pattern of poverty exposure are determined empirically by comparing the fit of models with different numbers of economic deprivation classes and with different shapes (i.e., functional forms) specified for the class-specific economic deprivation trajectories. Family background and demographic characteristics are then linked directly to class membership to discern the social determinants of economic deprivation trajectories and class membership. In turn, family background, demographic characteristics, and class membership are related to achievement to evaluate how different patterns of exposure to economic deprivation during childhood affect later achievement.

Using the latent class approach and data from the Panel Study of Income Dynamics, my colleagues and I analyzed children's histories of economic disadvantage over 12 years, from 1968 (when the children were 0–3 years old) to 1979 (when they were 11–14 years old; 5). We identified four classes of childhood poverty exposure, shown in Figure 1. Most people (76%) are exposed negligibly to economic disadvantage during childhood, while a small group of people (7%) experiences high levels of exposure to poverty throughout childhood, and slightly larger groups grow up in families that move into (8%) and out of poverty (9%).

Linking people's patterns of exposure to poverty during childhood to their family background characteristics reveals factors that influence the temporal dynamics of poverty (5). Individuals from persistently poor families and from families that experience poverty early in children's lives are similar in many ways: They are equally likely to be headed by a woman, a high school dropout, or an unemployed parent, and they have larger family sizes. However, persistently poor families are more likely to be headed by an African American than are families that move out of poverty. Conversely, families that move into poverty and are at low risk of experiencing poverty during childhood are less likely to be headed by an African American, a high school dropout, or an unemployed person, and their average family sizes are smaller.

Patterns of exposure to poverty influence achievement in adulthood (5). Individuals with very little or no exposure to poverty during childhood have higher rates of high school graduation and employment at the age of 25 than do individuals who experienced more deprivation during childhood (see Figure 2). In contrast, individuals who experienced consistently high levels of exposure to poverty over childhood have the lowest rates of high school graduation and employment as young adults. Early adulthood achievement for those whose families moved into and out of poverty falls between these extremes: Individuals whose families moved out of poverty are more likely to graduate from high school than individuals whose families remained in poverty through adolescence. Individuals who

moved into poverty later in childhood are as likely as those who were never poor to graduate.

Conclusions and Looking Ahead

Theories linking developmental outcomes and achievement in adolescence and adulthood to childhood experiences of economic deprivation have increasingly emphasized the importance of the temporal dynamics of childhood disadvantage (18, 32). The impact of childhood economic deprivation from these perspectives depends on how long one experiences deprivation during childhood, when in childhood the deprivation occurs, and whether family economic circumstances during childhood improve or worsen. The traditional indicator-based approach to representing the temporal dynamics of childhood economic disadvantage is not well suited to test such theories because it does not consider simultaneously how the duration, timing, and sequencing of economic deprivation during childhood influences outcomes later in life. For this reason, this approach masks important differences in children's experiences of economic disadvantage, as well as how these differences influence child development and achievement.

The latent class approach permits us to test more directly theories of childhood economic disadvantage that emphasize the importance of the timing, sequencing, and duration of deprivation in childhood. For example, if the duration of exposure to deprivation is more consequential for children than either the timing or sequencing of deprivation, we would expect children in the long-term exposure group to achieve the least. In contrast, if deprivation early in childhood is more detrimental than deprivation later in childhood, we would expect children in the group escaping deprivation to achieve less than children whose families become economically disadvantaged later in their childhood. If children are most harmed by downward economic mobility, we would expect children in families experiencing income losses to achieve the least. Using the latent class approach, we concluded that early and extended exposure to economic disadvantage is most detrimental to achievement in early adulthood and that deprivation early in childhood is more damaging than deprivation later in childhood (5).

By providing a more complete picture of the volatile and changing nature of experiences of economic deprivation during childhood than other approaches (26), the latent class approach results in less biased estimates of the effects of family economic deprivation on later outcomes. Even with the more complete and comprehensive representation of childhood economic deprivation that the latent class approach allows, estimating the causal effects of economic deprivation during childhood on later achievement is challenging because both families' economic resources and children's achievement are likely to be determined, at least in part, by factors such as parents' cognitive ability, personality characteristics, mental health, and stress that are difficult to measure or unavailable in many secondary data sets (4). In studies using econometric techniques to adjust for omitted variable bias, the estimated effects of family economic resources on child development and achievement are reduced substantially by such adjustments (4, 13, 14, 29), although in some studies, gains in family income are associated with significant improvements in achievement even after considering omitted variable bias (33). The latent class approach is limited, like most studies using the

traditional indicator-based regression approach, in that it does not allow estimates of the causal effects of family economic deprivation on achievement. To the extent that siblings' histories of economic deprivation over their childhoods (i.e., their latent class assignments) differ, the latent class approach described here could be extended to use sibling difference models that exploit within-family differences to estimate the average treatment effect of childhood economic deprivation histories. In recent studies using sibling fixed effects models, the estimated effect of income on child development and achievement is reduced substantially when we consider omitted variable bias (4, 29). Alternatively, the latent class approach could be used in conjunction with propensity score matching techniques for many treatments to estimate the average treatment effect of different childhood family economic deprivation trajectories on outcomes in later life (34).

Over the last several decades, researchers have progressed considerably in describing the temporal dynamics of childhood family economic deprivation. Today, we know more than we did a decade ago about patterns of economic deprivation during childhood and how these patterns affect child development and achievement. While our understanding of the systematic components of childhood family economic resources has increased and our knowledge of the causal effects of childhood family economic deprivation continues to grow (4, 29, 33), our understanding remains limited about the nonsystematic components of family income and how these transitory fluctuations in family resources during childhood influence child development and achievement in later life (35). The next advances in our understanding of the link between childhood family economic resources and achievement will most likely come from improvements in our ability to measure and assess the consequences of family income instability for individuals.

Acknowledgments

I want to thank my collaborator, Mary Clare Lennon, for her contributions to the research project described in this article and the three anonymous reviewers for their feedback. This work was supported by grants from the Eunice Kennedy Shriver National Institute of Child Health and Human Development (5 R01HD042144) and the Robert Wood Johnson Foundation (JHNSON 04779).

References

1. Ziol-Guest KM, Duncan GJ, Kalil A. Early childhood poverty and adult body mass index. American Journal of Public Health. 2009; 99:527–532. [PubMed: 19106427]
2. Duncan GJ, Brooks-Gunn J, Yeung W, Smith J. How much does childhood poverty affect the life chances of children? American Sociological Review. 1998; 63:406–423.
3. Duncan GJ, Magnuson K, Kalil A, Ziol-Guest K. The importance of early childhood poverty. Social Indicators Research. 2012; 108:87–98.
4. Duncan GJ, Ziol-Guest K, Kalil A. Early-childhood poverty and adult attainment, behavior, and health. Child Development. 2010; 81:306–325. [PubMed: 20331669]
5. Wagmiller RL Jr, Lennon MC, Kuang L, Alberti PM, Aber JL. The dynamics of economic disadvantage and children's life chances. American Sociological Review. 2006; 71:847–866.
6. Duncan G, Brooks-Gunn J, Klebanov P. Economic deprivation and early childhood development. Child Development. 1994; 65:296–318. [PubMed: 7516849]
7. Dearing E, McCartney K, Taylor BA. Change in family income-to-needs matters more for children with less. Child Development. 2001; 72:1779–1793. [PubMed: 11768145]
8. Moore KA, Glei DA, Driscoll AK, Zaslow MJ, Redd Z. Poverty and welfare patterns: Implications for children. Journal of Social Policy. 2002; 31:207–227.

9. Gershoff ET, Aber JL, Raver CC, Lennon MC. Income is not enough: Incorporating material hardship into models of income associations with parent mediators and child outcomes. Child Development. 2007; 78:70–95. [PubMed: 17328694]
10. Lipina S, Segretin S, Hermida J, Prats L, Fracchia C, Lopez Camelo J, Colombo J. Linking childhood poverty and cognition: Environmental mediators of non-verbal executive control in an argentine sample. Developmental Science. 2013; 16:697–707. [PubMed: 24033575]
11. Conley, D. Being black, living in the red. Berkeley, CA: University of California; 1999.
12. Haskins, R. Welfare in a society of permanent work. Washington, DC: U.S. House of Representatives, Committee on Ways and Means; 1999.
13. Blau D. The effect of income on child achievement. The Review of Economics and Statistics. 1999; 67:144–151.
14. Mayer, SE. What money can't buy: Family income and children's life chances. Cambridge, MA: Harvard University Press; 1997.
15. Evans GW, Kim P. Early childhood poverty and young adults' allostatic load: The mediating role of childhood cumulative risk exposure. Psychological Science. 2012; 23:979–983. [PubMed: 22825357]
16. Evans GW, Fuller-Rowell TE. Childhood poverty, chronic stress, and young adult working memory: The protective role of self-regulatory capacity. Developmental Science. 2013; 16:688–696. [PubMed: 24033574]
17. Evans GW, Schamberg MA, McEwen BS. Childhood poverty, chronic stress, and adult working memory. Proceedings of the National Academy of Sciences of the United States of America. 2009; 106:6545–6549. [PubMed: 19332779]
18. Guo G. The timing of the influences of cumulative poverty on children's cognitive ability and achievement. Social Forces. 1998; 77:247–287.
19. Ashworth K, Hill M, Walker R. Patterns of childhood poverty: New challenges for policy. Journal of Policy Analysis and Management. 1994; 13:658–680.
20. Bane MJ, Ellwood D. Slipping into and out of poverty: The dynamics of spells. Journal of Human Resources. 1986; 21:1–23.
21. Hulme D, Shepherd A. Conceptualizing chronic poverty. World Development. 2003; 31:403–424.
22. Duncan G, Rodgers W. Has child poverty become more persistent? American Sociological Review. 1991; 56:538–550.
23. Korenman S, Miller JE, Sjaastad JE. Long-term poverty and child development in the United States: Results from the NLSY. Children and Youth Services Review. 1995; 17:127–155.
24. Haveman, R.; Wolfe, B. Succeeding generations: On the effects of investments in children. New York, NY: Russell Sage Foundation; 1994.
25. Ackerman BP, Brown ED, Izard CE. The relations between persistent poverty and contextual risk and children's behavior in elementary school. Developmental Psychology. 2004; 3:367–377. [PubMed: 15122963]
26. Duncan, G. The volatility of family income over the life course. In: Baltes, P.; Featherman, D.; Lerner, RM., editors. Life-span development and behavior. Vol. 9. Hillsdale, NJ: Lawrence Erlbaum; 1988. p. 317-358.
27. Ziol-Guest KM, Duncan GJ, Kalil A, Boyce WT. Early childhood poverty, immune-mediated disease processes, and adult productivity. Proceedings of the National Academy of Sciences of the United States of America. 2012; 109:17289–17293. [PubMed: 23045664]
28. Schoon I, Bynner J, Joshi H, Parsons S, Wiggins RD, Sacker A. The influence of context, timing and duration of risk experiences for the passage from childhood to early adulthood. Child Development. 2002; 73:1486–1504. [PubMed: 12361314]
29. Johnson RC, Schoeni RF. The influence of early-life events on human capital, health status, and labor market outcomes over the life course. The BE Journal of Economic Analysis and Policy. 2011; 11:1–57.
30. Haveman R, Wolfe B, Spaulding J. Childhood events and circumstances influencing high-school completion. Demography. 1991; 28:133–157. [PubMed: 2015940]

31. Wagmiller RL Jr, Lennon MC, Kuang L. Parental health and children's economic well-being. Journal of Health and Social Behavior. 2008; 49:37–55. [PubMed: 18418984]

32. Duncan, GJ.; Brooks-Gunn, J., editors. Consequences of growing up poor. New York, NY: Russell Sage Foundation; 1997.

33. Dahl, G.; Lochner, L. The impact of family income on child achievement: Evidence from the Earned Income Tax Credit. Cambridge, MA: National Bureau of Economic Research; 2008. NBER Working Paper No. 14599

34. Tchernis R, Horvitz-Lennon M, Normand SLT. On the use of discrete choice models for causal inference. Statistics in Medicine. 2005; 24:2197–2212. [PubMed: 15887310]

35. Hill H, Morris P, Gennetian LA, Wolf S, Tubbs C. The consequences of income instability for children's well-being. Child Development Perspectives. 2013; 7:85–90.

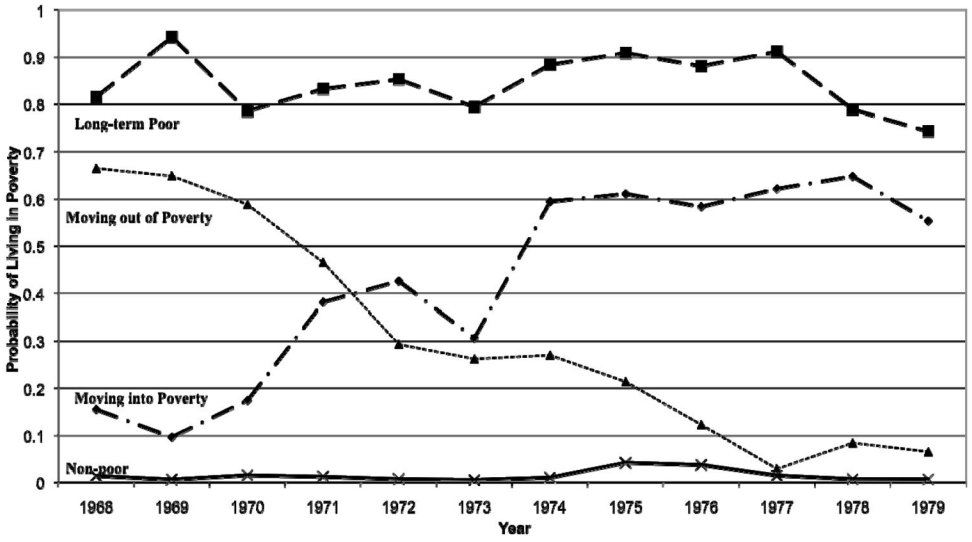

Figure 1. Estimated Probability of Living In Poverty for Four-Class Longitudinal Latent Class Model of Poverty Exposure, by Class and Year

* Adapted from (5).

Note: Sample children were between 0–3 years old in 1968 and 11–14 years old in 1979.

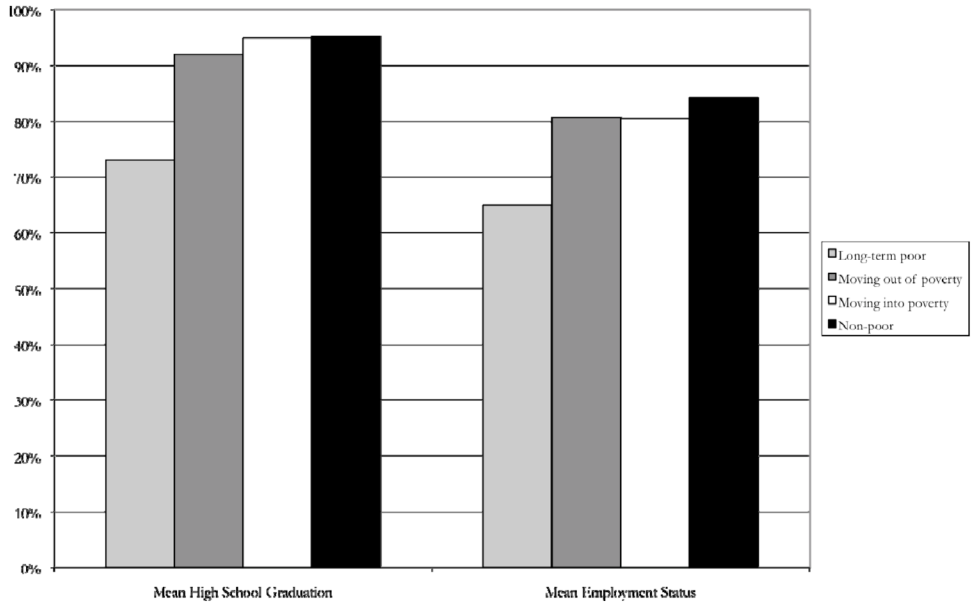

Figure 2. Predicted Probability of High School Graduation and Employment at Age 25, by Latent Poverty Class

Adapted from (5).