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How Strong Is the Association?**

John Iceland
University of Maryland

Kurt Bauman
U.S. Census Bureau

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Income Poverty and Material Hardship: How Strong Is the Association? *

John Iceland

University of Maryland

Kurt Bauman

U.S. Census Bureau

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* Direct correspondence to John Iceland, 2112 Art/Sociology Building, Sociology Department, University of Maryland, College Park, MD 20742-1315, jiceland@umd.edu. This paper is released to inform interested parties of ongoing research and to encourage discussion. The views expressed on technical and operational issues are those of the authors and not necessarily those of the U.S. Census Bureau.

Income Poverty and Material Hardship

Abstract

Many have argued that “poverty” should represent more than just a shortfall of income in a given time period, as it is most often currently measured. While researchers have generally assumed that more severe experiences of income poverty are more strongly associated with other, perhaps intrinsically more important, material well-being outcomes, this paper is one of the first to empirically examine the extent of these relationships. Using data from the 1996 Survey of Income and Program Participation, We find that income poverty is strongly associated with food insecurity, difficulty meeting basic needs, and possession of consumer durables. While poverty had a significant association with the three other hardship measures considered—housing problems, neighborhood problems, and fear of crime—these associations were not as strong, as the latter are likely more affected by other factors such as assets and location of residence. Our findings therefore suggest that various measures of material hardship should not be considered monolithically either conceptually or even from a policy perspective, where, for example, short-term income transfers would likely have different effects on different basic capabilities.

Key Words: poverty, hardship, poverty measurement, poverty dynamics

Introduction

Researchers have at their disposal a number of measures designed to capture the well-being of people facing economic deprivation of one sort or another. Among the most widely-used measures is *poverty*, which typically gauges shortfalls in family or household income available to meet basic needs in a given time period. Past research using longitudinal data has revealed that people experience poverty in very different ways: many people are poor for short periods of time while others are mired in poverty; some have incomes just below the poverty line while others are in “extreme” poverty; some experience a single bout of poverty while others have multiple spells (Proctor and Dalaker 2003; Iceland 2003a; Bane and Ellwood 1986; Gottschalk et al. 1994; Rank and Hirschl 2001; Stevens 1999).

Some researchers, however, have argued that poverty should be viewed as more than merely the lowness of income, as income only indirectly captures people’s capabilities and material deprivation (e.g., Sen 1999; Brady 2003). Other, perhaps more direct, measures of deprivation fall under the general rubric of *well-being* measures, where respondents are asked about their well-being along a variety of dimensions, including housing and neighborhood conditions, ability to pay bills, food security, and possession of basic consumer durables.

Past research has shown only a moderate association between poverty and hardship measures (Mayer and Jencks 1989, 1993; Mayer 1995; Rector et al. 1999; Beverly 2000; Boushey et al. 2001; Perry 2002; Bradshaw and Finch 2003). This is not wholly surprising since these measures are, by design, meant to capture different dimensions of well-being. Poverty is usually a measure of transitory income deprivation, while reports of some types of material hardship (such as neighborhood problems) are likely to be more affected by longer-term income,

while others (such as reports of food insecurity) are more affected by very short-term income flows.

This paper tests the extent to which indicators of hardship are associated with income poverty. Using data from the 1996 Survey of Income and Program Participation (SIPP), a longitudinal survey that followed respondents for four years, we explore how reports of material hardship varied by poverty spell length, timing, depth, and frequency of occurrence. We find that some measures of material hardship are indeed significantly associated with income poverty and by variations in its severity, and that the association is considerably stronger for some measures of material hardship than others. In addition, we find that short-term poverty's association with hardship is stronger than what would be predicted from its impact on longer-term income flows.

Poverty Measurement

Poverty is usually defined and operationalized by researchers in terms of income deprivation. The “official” U.S. poverty measure—the focus of this analysis—has two components: poverty thresholds and the definition of family income that is compared to these thresholds. Basically, the thresholds were originally devised in the 1960s to represent the cost of a minimum diet multiplied by three to allow for expenditures on other goods and services. The thresholds vary by family size and composition and have been updated yearly for inflation using the Consumer Price Index (CPI). The poverty threshold for a family of two adults and two children was \$18,660 in 2003. The definition of family resources used consists of gross annual cash income from all sources, such as earnings, pensions, interest income, rental income, asset

income, and cash welfare. A family and its members are considered poor if their income falls below the poverty threshold for a family of that size and composition.

It is important to note that official poverty statistics are based on an annual reference period—one year’s worth of income is compared to annual threshold to determine a family or person’s poverty status. Most past research on poverty has also relied on data that came from studies conducted at one point in time, or from annual studies conducted on a different set of people every year. It has mainly been since the 1970s and 1980s that researchers analyzed information from newer longitudinal studies—which follow the same set of people for several years—that a dynamic view of poverty began to emerge. Some of these studies, particularly those that used data from the SIPP (which collects monthly data), calculated poverty using a different reference period, such as a month (e.g., Iceland 2003a; Ruggles and Williams 1989).

In general, longitudinal data show that a majority of poor individuals in the U.S. actually remain poor for only short periods of time and relatively high proportion of people have experienced poverty at one point or another (Bane and Ellwood 1986; Gottschalk et al. 1994; Stevens 1994, 1999; Rank and Hirschl 2001; Rank 2003). One study found that one in three Americans experienced at least one year in poverty between 1979 and 1991 (Blank 1997), and another estimated that about half of Americans will experience at least one year of poverty between the ages of 25 and 75 (Rank and Hirschl 2001).

Attesting to the relatively short nature of many poverty spells, Iceland (2003a) finds that among people who were poor in the first year of the 1996 SIPP panel, 35 percent were no longer poor in the following year, and about half were not poor in 1999, the last year of that panel. Another study has found that only 12 percent of poverty spells last ten years or more (Bane and

Ellwood 1986).¹ Despite the shortness of many of these spells, it is quite common for people who leave poverty to fall back in a short time later. About half of those who end poverty spells (based on annual data) return to poverty within four years (Stevens 1999).

If poverty is calculated using a monthly rather than an annual time frame, we see even higher poverty rates and more turnover in the poverty population (Iceland 2003a). About half of the poverty spells are over after four months when using monthly data. Of course, many of those who are poor for just a couple of months are people who may have higher annual incomes but who may work seasonally.

What is missing from past research is a good understanding of how different patterns of income dynamics affect material hardship. That is, while short spells of poverty may be common, it is not known whether and for whom these spells make an important difference in daily living, nor to what extent the number of spells, depth of poverty, or recency of poverty affect other aspects of hardship. Understanding these relationships will enable researchers to evaluate whether the prevalence of the poverty experience is a cause for concern, as argued by Rank (2004), or a cause for optimism, as argued by others. Gauging this requires an examination of measures of material hardship that stand apart from income itself.

Material Hardship

The current official poverty measure has been criticized for ignoring factors that are increasingly critical to the material well-being of families. For example, the measure of income in the official measure does not take into account factors such as the cost of work, the effect of health status, the cost of health care, taxes, non-cash benefits, and geographic differences in cost

¹ Bane and Ellwood's (1986) analysis excluded left-censored spells; this likely underestimates the actual length of all poverty spells, given that poverty spells whose beginning are not observed in a given longitudinal survey tend to

of living, among other issues (National Research Council 1995; Ruggles 1990; Short et al. 1999; Iceland 2003b).

Some also argue that income poverty only indirectly measures aspects of material well-being that are intrinsically important to people (Sen 1999; Brady 2003). That is, income matters only in that it allows people to attain basic capabilities, such as good health or adequate living conditions. Thus, researchers have looked toward other, direct non-monetary measures that may provide insights into other aspects of people's well-being or hardship.

The idea of pursuing a non-monetary measure of material hardship has led to a variety of approaches. One approach has been to treat housing and neighborhood conditions as a measure of hardship. In the U.S. context, neighborhoods have been associated with a number of individual and household problems such as dropout, unwed childbearing and weak labor force attachment (Wilson 1987; Rosenbaum and Popkin 1991; Crane 1993; Massey and Denton 1993). A more direct approach has been to measure the availability of essential material resources within a family or household. Some researchers have made use of expenditure data (Slesnick 1993; Mayer and Jencks 1993; Johnson and Smeeding 1998). Others have examined the degree to which families experienced financial problems and budget shortfalls (Cook et al. 1986; Mayer and Jencks 1989, 1993; Edin and Lein 1997; Bauman 1998; Beverly 1999).

Recently there have been attempts to systematize knowledge about material hardships (Mayer and Jencks 1989; Mayer 1995; Bauman 1998; Meyers et al. 2000; Beverly 2002; Ouellette et al. 2004). Bauman (1998) has shown that several indicators typically used to measure material hardship are related to household economic and social conditions in nearly identical ways. This implies that they tap into the same underlying set of processes, despite apparent differences. However, distinct differences between measures are sometimes apparent,

be longer in duration (Iceland 1997).

especially when a broader set of indicators is examined (Whelan et al. 2001a). Given the current state of research, material hardship should not be treated as a unitary phenomenon, nor should one measure, in isolation, be treated as an indicator of “material well-being.”

Association between Material Hardship and Poverty

Material hardship is only moderately correlated with income and poverty in the U.S. (Mayer and Jencks 1989, 1993; Mayer 1995; Rector et al. 1999; Beverly 2000; Boushey et al. 2001; Perry 2002; Bradshaw and Finch 2003). On the one hand, poor people are more likely than non-poor people to report a variety of material hardships. For example, Boushey et al. (2001) reported that while about 13 percent of respondents under 200 percent of the poverty level reported not having enough food to eat, only 2 percent of those over 200 percent of the poverty line said the same. While 25 percent of those under 200 percent of the poverty line were unable to make housing or utility payments, the figure for those about 200 percent of the poverty line was 8 percent. On the other hand, as these findings indicate, many people with low income do not report various types of material hardship, and some people who are not poor do. One of the best-developed measures of material hardship, the food security scale, correlates with income and poverty at approximately 0.33 (Hamilton et al. 1997).

Layte et al. (2001; Whelan et al. 2001b) examined the effect of length of time in poverty on measures of material hardship in Europe. They found that the overlap between poverty and hardship was greater among those who were in poverty for a longer time. Due to data constraints, they did not examine sub-annual poverty spells. Layte and his colleagues focused on a single measure of severity of poverty and a single hardship measure, which they termed “current life-style deprivation.”

Long-term poverty may affect material hardship for at least three reasons: 1) it creates a greater cumulative monetary shortfall in resources versus needs, 2) it creates a longer time span over which poverty occurs, leading to potential barriers as lack of accumulated monetary resources, lack of social connections or psychological problems, 3) it may reflect greater (or less) volatility of income, which, in turn, might increase or decrease material hardship. Little is known about how these three aspects of poverty – depth, duration and volatility – affect the material hardship experienced by individuals and families.

Consider the depth of poverty. It stands to reason that deeper poverty should lead to greater material hardship. However, Layte et al. (2001) found, unexpectedly, that families with moderate income-to-poverty ratios were sometimes more likely than families with lower ratios to experience hardship. Nonetheless, the simple logic of the situation dictates that more severe shortfalls in income should lead to more severe shortfalls in well-being.

Long-term poverty should produce greater material hardship than short-term poverty. However, income volatility may decrease hardship because of the ability to gain resources during good times that increase the ability to weather hard times. Conversely, spells of poverty may increase hardship due to difficulty of planning and adapting.

Another aspect of the relationship between poverty and material hardship is the period of time elapsed between the experience of poverty and hardship measurement. Presumably, poverty experienced many years ago would have a negligible impact on current material conditions. However, we have no knowledge of how fast (if at all) the relationship fades.

It is also important to note that different types material hardship may be associated with poverty in predictable ways. Some types of material hardship can change over a short period of time, such as food insecurity and difficulty meeting basic needs. Other hardship measures, such

as neighborhood conditions, fear of crime, and housing conditions, likely reflect longer-term changes. Short-term poverty spells, therefore, are likely to have a stronger relationship with food insecurity than with neighborhood conditions. Other ways in which types of material hardship are associated with poverty are unexplored and difficult to predict.

We feel it is important to follow-up on earlier analyses with data that allow more careful specification of the timing of poverty, indicators of assets, and a variety of measures of material hardship. Because our data allow us to examine various dimensions of the severity of poverty and various measures of hardship, we can ask more detailed questions than has been possible in earlier research. The data examined below shed light on the following four sets of questions:

1. How does the “intensity” of poverty and its recency relate to material hardship? In particular:
 - a. Does the length of time a family has spent in poverty affect their current measured hardship?
 - b. Do fluctuations in poverty, as represented by the experience of multiple spells, affect material hardship?
 - c. Does current poverty have a greater effect on hardship than poverty experienced in the recent past?
 - d. Is the overall monetary shortfall associated with poverty strongly associated with hardship?
2. How intense must the experience of poverty be in order to show a significant association with material hardship? Do short (sub-annual) spells, single spells, spells

taking place in the distant past, and spells where income barely dips below the threshold affect material hardship?

3. Finally, how are all types of material hardship affected by spells of poverty? Are types of hardship that likely reflect short-term shortfalls (food, bill payment) more affected by poverty spells than hardship measures associated with long-term conditions (neighborhood, housing)?

It is important to note that this analysis is to some extent exploratory in nature, given the relative dearth of research in this area. Our aim is to better understand the conceptual meaning of different measures of poverty and hardship, and to test, as the literature tends to indicate, whether the relationship between poverty and material hardship measures vary by the severity of poverty over time and the dimension of hardship considered.

Data

This research uses the 1996 panel of the Survey of Income and Program Participation (SIPP), a household survey conducted in the U.S. (U.S. Census Bureau 2001). Each interview in the panel consisted of a core interview, with standard questions on demographics, labor force and income, and a topical module interview, with questions on topics that changed from one interview (wave) to the next. Interviews (waves) are conducted every four months. The eighth wave of the 1996 panel, in the field in August through November of 1998, contained a topical module on “adult well-being.” This was an extensive battery of questions on consumer durables, housing conditions, neighborhood conditions, ability to meet basic needs, ability to get help when in need, and food security.

The unit of analysis for this research is the family.² Because families changed in their formation over time, the unit of analysis is perhaps more accurately described as the reference person for the family in the wave 8 topical module interview. For prior interviews, information is used on the family in each month that contained the family reference person identified in wave 8. Where possible, characteristics that applied to the family are used, although where data were only available at the household level, household data are used. When data are missing, the analysis uses information from available waves — which is to say, cases are not dropped. Other missing data were imputed by the Census Bureau. This final sample size consists of 30,247 individuals who were family reference people in wave 8.

We examine various measures of severity of poverty in this analysis. We use poverty measures indicating: 1) the proportion of time the wave 8 family reference person was poor over the course of the panel, 2) the number of spells experienced, 3) the amount of time since the end of the last spell, and 4) an adjusted poverty gap while poor. Because not all families were observed for the full 32-month period, a measure of the proportion of time poor was thought to be preferable to the absolute number of months (for example, two people with 3 months of poverty would presumably be different if one was observed 32 months and the other 4 months). Poverty “spells” are considered to occur only if family income is below the poverty line in at least 2 consecutive months, as is most common in studies that use monthly data (e.g., Iceland 2003a).³

² We also include single unrelated individuals in the study. Even though these individuals are not a “family,” per se, they are counted as a separate unit for the purposes of this analysis.

³ Spell information is used in the first three poverty items listed. The poverty gap measure (the fourth) does not depend on spell information—as it more directly refers to the gap between one’s family income and their family threshold in a given month (in the months when income is below the poverty threshold). The gap was then adjusted in such a way as to indicate the total monetary shortfall, rather than the average monthly shortfall. So a family with a four-month poverty-spell would have twice the poverty gap as an otherwise identical family with a two-month spell. However, the total gap was normalized so that the figure would be approximately on the scale of a monthly

For the purposes of this research, the numerous indicators of material hardship are grouped into six categories: possession of basic consumer durables, housing conditions, fear of crime, neighborhood conditions, material hardship, and food insecurity. Possession of consumer durables included such things as refrigerators, computers, air conditioners, clothes washers, and telephones. Housing conditions involved items such as problem with pests and unsatisfactory repair, questions about comfort, and whether the respondents would like to move. Fear of crime was measured by answers to questions about fear of leaving the home and feeling safe in the home. Neighborhood conditions included street noise, streets in need of repair, litter in the streets, rundown or abandoned buildings, industrial or other nonresidential uses, and smoke or fumes.

Questions on difficulty meeting basic needs asked in the SIPP were very similar to those used by Mayer and Jencks (1989) in their analysis of poverty and material hardship in Chicago. Household heads were asked if during the past 12 months there had been a time when they did not meet its essential expenses. They were then asked about instances when the household did not pay the full amount of rent or mortgage, did not pay the full amount of utility bills, had telephone service cut off due to nonpayment, needed to go to the doctor or hospital but did not go, or needed to see a dentist but did not go. Finally, household heads were asked about food security, in terms of worry about food lasting, lack of balanced meals, or cutbacks in consumption. These questions were based on the food security scale developed by the U.S. Department of Agriculture (Hamilton et al. 1997). Table 1 shows the items used in each category of hardship, and the distribution of positive responses to each item.

shortfall. The average family with a spell of poverty had a four-month spell. If their income came to 80 percent of the poverty threshold each of those months, the “adjusted gap” would be 0.2, to indicate that it would take income equal to 20 percent of the poverty threshold to bring the family above the line for that period. If their income were lower or their spell of poverty longer, the “adjusted gap” would be correspondingly larger.

(Table 1 here)

To correct for the effects of multistage sampling, standard errors reported here are adjusted using an average design effect.

Results

Table 2 shows the distribution of poverty according to several measures of its severity, and the relation of these measures to types of material hardship. Roughly two-thirds of U.S. families did not experience at least two consecutive months of poverty during their time in the panel survey, which, for this analysis, extended for 32 months from early 1996 to autumn of 1998 when the well-being topical module was administered. The percentage of people who were never poor is slightly lower when using the poverty gap measure because even one-month poverty experiences were counted there, while the other measures used a two-month spell as a minimum as previously noted.

(Table 2 here)

The first measure of severity in the table is percent of time poor. About 11.0 percent of all families (or one third of poor families) were poor less than 20 percent of the time, and only 4.6 percent of all families (15 percent of poor families) were poor in all months they were observed. The second measure is number of spells. About 20.6 percent of all families had 1 spell only (two-thirds of poor families), another 8.5 percent had 2 spells (one quarter of poor families), and 2.6 percent of all families had 3 or more spells. The table also shows that the majority of poor families (19 of 32 percent) had their most recent spell end come to an end within 8 months of the final interview-- months 25 to 32. The balance of spell endings were fairly evenly spread among the three other 8-month periods from months 1 to 24. Finally, the adjusted poverty gap

was spread fairly evenly across three categories, with a slight plurality falling into the category indicating the smallest monetary shortfall during months when income was under the poverty threshold.

Across the top of table 2 are the six summary measures of material hardship. Each of these reflects the number of positive responses to questions on the topics described in table 1. The number of positive responses indicating material hardship is chosen so as to make the population falling short of the threshold as close as possible to 20 percent, within the constraints of the particular list of indicators available. (Twenty percent was chosen because it was the lowest value that could be represented in all 6 areas of concern while being reasonably close to the percent in poverty.) For example, according to Table 2, about 16.4 percent of the population lacked more than 4 of 8 consumer durables. Other summary indicators ranged from 13.5 percent of the population (food insecure) to 26.7 percent (housing problems).

Table 2 also compares the four indicators of severity of poverty to the six indicators of material hardship in terms of odds ratios (calculated using bivariate logistic regressions). These show that problems of material hardship were more likely for families that experienced poverty than for families that did not. All types of spells affected all types of hardship. For example, families who were poor only 1 to 20 percent of the time had odds of neighborhood problems that were 1.34 times those of families with no poverty. Thus, even very short spells affected material hardship.

The odds of material hardship generally increased across types of hardship in the expected pattern: problems that were assumed to be affected by poverty mainly in the long run-- neighborhood conditions, housing, fear of crime-- were less strongly related to spells of poverty than problems that were assumed to be sensitive to recent changes in income or need, such as

difficulty meeting basic needs and food insecurity. Lack of consumer durables fell in-between, but tended to be closer to basic needs and food insecurity than to the neighborhood and housing in terms of sensitivity to changes in income or need.

The *severity* of poverty had a pronounced impact on material hardship. For example, those who were poor 1 to 20 percent of the time were 2.38 times more likely to be food insecure than those who were never poor; this figure rises to 7.73 times among those who were always poor (versus those who were never poor). Similar patterns were found among other measures of the severity and recency of poverty.

Long-term poverty (being poor 100 percent of the time) tended to have the largest impact on all types of material hardship. One place where long-term poverty had a somewhat larger impact, interestingly, was on the lack consumer durables. This may indicate that long-term poor never get the opportunity to acquire these items because they don't have "flush" times in which to make these investments or because they have less access to credit. Long term poverty has a relatively small association with neighborhood conditions, indicating that the choice of one's neighborhood is more affected by other factors rather than variations in income flows.

To summarize, Table 2 shows that poverty is strongly associated with material hardship measured in several different ways. Poverty showed a stronger relationship with hardship when the poverty was more recent, more frequent, longer, or deeper. On the other hand, the way in which severity was measured did not affect the pattern of odds ratios as much as the way in which hardship was measured. Neighborhood conditions, fear of crime and housing problems were less impacted by spells of poverty than were consumer durables, food insecurity, and difficulty meeting basic needs.

Multivariate results

A structural model of the effects of poverty on material hardship is an undertaking that lies beyond the scope of this paper, and indeed is well beyond the current state of research on the subject (Ouellette et al. 2004, Mayer 1997). On the other hand, the bivariate relations examined in Table 2 do not tell the complete story because they do not completely account for patterns of income. Spells of poverty may relate to material hardship in part because of their link to broader income patterns in a household. For example, when a household has ample income but experiences poverty for several months, any hardship they report is likely to be due to the poverty experience. By contrast, if a household's income hovers around the poverty threshold, the same poverty experience may be no more responsible for hardship than their overall low income.

The results in Table 3 show that the relation between poverty and hardship is, in fact, greatly diminished when controls are added for other income. The table shows sets of logistic regressions where the effects of indicators of poverty are measured, with control for longer-term income, which is operationalized as the average ratio of income to poverty threshold observed while not poor over the 32-month period.⁴

(Table 3 here)

The first set of regressions in Table 3 show the association between the proportion of time poor in the panel with indicators of material hardship. Being poor a longer proportion of time is positively associated with the measures of hardship, though the effect is often not linear and the differences in the effects across categories are not large, except in comparison with the reference category—never poor. The odds ratio associated with the “Poor 50-99% of the time”

variable in the top panel in the food insecurity equation indicates, for example, that people who were poor this proportion of time were 2.9 times more likely to report food insecurity than those who were never poor. Note that this odds ratio is considerably smaller than the analogous one in table 2 (6.2); the only difference in the regressions is that Table 3 includes a control for average income while not poor while Table 2 does not. Thus, longer-term income during the periods when a family is not poor mediates a significant share of the association between poverty and material hardship.

In the second set of regressions in Table 3, we find that people who had spells that ended more closely to the time of the interview when experiences with hardships were queried (in month 32) were more likely to report hardships. The odds of reporting food insecurity was 2.6, compared with 5.6 when there were no controls in table 2.

The third set of regressions show the effects of number of spells on hardship. Many of the same patterns again emerge. Having spells of poverty is positively associated with hardship and the relationship tends to be stronger when more spells are considered, but the magnitude of the effect is not as large as in the bivariate case. People having 3 or more spells were 2.9 times more likely to report difficulty meeting basic needs when average income while not poor was controlled for, down from 5.5 in table 2 when no controls were included.

Finally, the bottom panel shows the effect of the poverty gap on hardship. All coefficients are significant; moreover, the greater the depth of poverty, the more likely people were to report various types of hardship in many of the equations. However, once again, the odds ratios were not nearly as large as those in Table 2.

⁴ We also ran regressions controlling for total income (including income during months in poverty), and found that the parameters were substantively similar.

Across all four sets of regressions in Table 3, the odds ratios tended to be stronger in the regressions of consumer durables, difficulty meeting basic needs, and food insecurity than in the regressions of neighborhood problems, housing problems, and fear of crime. This was similar to the pattern found when there was no control for income while not poor.

Further analysis

That the relationship between poverty and hardship is diminished by control for income while not poor does not necessarily diminish the meaning we attach to spells of poverty. Poverty is part of the overall income pattern affecting a household, and income patterns do have a large impact on material hardship. What we have found here is that the experience of poverty and the severity of poverty do not stand out as strongly from other aspects of the income situation as it seemed from the bivariate relationship shown in Table 2.

It remains true, however, that very short, very small, and even very distant (in time) spells of poverty correlate significantly with nearly every type of material hardship after control for income while not in poverty. In many cases, the odds of experiencing hardship for households with very mild or distant poverty experiences are nearly as large as the odds of experiencing hardship for households with the longest and deepest poverty spells.

It is helpful to put these findings into more concrete terms. Table 4 illustrates the impact of poverty and income while not poor on hardship measures in several hypothetical situations. For purposes of discussion, we will focus on the bottom rows that illustrate the effects on food insecurity, although the same points apply for the other rows as well. The examples assume the household has 4 members; in 1998, the poverty threshold for such a family was \$16,660. If the household income were \$20 thousand, the household would have a 19 percent probability of

food insecurity, calculated from the parameter estimates from the model used to produce Table 3. Next we look at the situation where the household maintained the same income in most months, but experienced a 4-month spell of poverty in which income was 80 percent of the poverty threshold (corresponding to an “adjusted poverty gap greater than 0.0 but under 2.0” in Table 3). Using the estimate for a spell of poverty from the model, we estimate the probability of food insecurity to be 31 percent. Yet if the family had suffered a decline in income of the same magnitude as would result from this short spell of poverty (\$1,100 on an annual basis), but did not cross below the poverty threshold, the estimated probability of food insecurity would be 20 percent.

(Table 4 here)

What this shows is that drawing a straight line from the effect of variations in income when households are above the poverty line does not account for the experience of poverty on material hardship.⁵ There is something about experiencing a spell of time when income is extremely low that has a distinct impact above and beyond its impact on income alone. In other words, the experience of poverty seems to entail more than just the loss of income.

One may suspect, however, that the simple linear (in log odds) measure of the impact of income, and the single set of coefficients for poverty may not be enough to capture the complexity of the relationships being observed. In order to address these suspicions, we performed additional regressions using a flexible form (a spline function) to represent income for those who experienced poverty and those who did not. The results are plotted in Figure 1. The dependent variable in this regression is food insecurity and the independent variables are income-to-poverty ratio and an indicator of poverty experience, similar to the regressions whose

results are shown in Table 3. The continuous line shows the relation of income to the odds of food insecurity for households that did not experience any poverty; the dotted line shows the relation for households that did. Although these lines are curved, they turn out to be almost perfectly straight when we plot the log odds of hardship against the log of the income-poverty ratio -- which means our simple linear parameterization was quite adequate. In addition, there is a clear gap between households with poverty experience and those without, confirming what we observed from Table 3 and Table 4.

Why would households that experience poverty be worse off than households with the same long-term income but no poverty experience? We can think of three explanations. First, the experience of poverty may represent an extreme burden that makes it difficult to maintain acceptable living standards. A household with a steady, low income may be able to more consistently pay the rent and afford more durables than a better-off household whose income occasionally dips down to very low levels.

Second, poverty is sometimes accompanied by loss of job, moving, divorce, the onset of illness or other setbacks. These may contribute to hardship as much or more than the decline of income, in itself.

Finally, people who fall into poverty may have other characteristics, such as low education, illness or handicap that contribute to both material hardship and the occasional decline into poverty. It also may be that the experience of poverty itself leads to a pattern of repeated crises and setbacks that are responsible for hardship and cyclical poverty.

In one test, we examined the difference in the effect of poverty spells among households with different levels of assets. Following the logic of the first explanation above, we expected

⁵ The predictions from a model with a control for total income produces the same substantive results as the predictions from the model with a control for income while not poor (shown here).

households with higher assets would be able to survive short periods of poverty-level income without experiencing great hardship. Instead, using various ways to represent asset levels, we found that the effect of poverty on material hardship was the same or even higher for high-asset households. This may represent their greater monetary loss from a fall into poverty experienced by higher-income households (as shown in Table 4 in the rows illustrating the effects of poverty spells and income loss for households with \$60 thousand income). In separate work, we also examined the effect of changes in household circumstances on material hardship, with mixed results (see Bauman 2002, 2003). It will require further research to address this question in a satisfactory way.

Conclusion

We have found that poverty is significantly associated with experiences of various types of material hardship. The magnitude of these associations is reduced when controlling for average income while not in poverty, as might be expected. Poor people are more likely to report various types of hardship in part because they have low incomes even in times when they are not poor. It should be noted that the “true” association between poverty and material hardship is not necessarily the one shown when we control for this other income, as the experience of poverty might in fact affect the level of income in other times (Lichter and Crowley 2002).

The effects of poverty are largest when considering reports of food insecurity, difficulty meeting basic needs (such as meeting expenses and paying rent), and possession of various types of consumer durables. The effects are smaller when considering housing problems, fear of crime and neighborhood problems. This finding supports the view that the second group of measures is

less affected by shorter-term income flows (i.e., poverty) and more affected by other factors, such as assets, geographic location, human capital and others.

When we examined the association between indicators of the severity of poverty and hardship measures, we found that people with more severe experiences of poverty (such as the proportion of time poor, the size of the poverty gap, number of spells, and duration since last spell) were considerably more likely to report hardships than those with less severe experiences. However, in the models that contained control for income while not in poverty, the main effect seemed to stem more from the experience of poverty in general rather than the precise measure of the severity of poverty. This suggests that there is something about having one's family income fall below a very low level that makes people particularly vulnerable to multiple types of hardship, particularly food insecurity, difficulty meeting basic needs, and lack of various basic consumer durables.

A contribution of Amartya Sen's capabilities approach has been the increasing use of multiple indicators to characterize poverty. The current study has shown that, because they can be compared one against the other, multiple indicators can be used to deepen our knowledge about the broader phenomenon of poverty itself. Our study indicates that measures of hardship should not be considered monolithically. There are important differences in the relationship of income poverty to food insecurity, difficulty meeting basic needs, lack of consumer durables, fear of crime, and problems with housing and neighborhoods. We have reinforced the conviction that these should not be thrown together into an overall index of well-being without taking into account their different qualities and characteristics.

From a policy perspective, this also suggests that different interventions would have different effects on well-being outcomes. For example, because food insecurity is sensitive to

shorter-term income flows, a program such as food stamps, which in essence is meant to increase income through near-cash transfers in a particular time period, is indeed appropriate. On the other hand, neighborhood problems and fear of crime in particular are probably not simply resolved through short-term cash transfers, such as a temporary housing subsidy. They are more a function of longer-term income, assets, and various other factors.

Our study also indicates that income poverty does not work in as simple a fashion as we imagined. We were initially interested in measuring the consequences of the severity of poverty on material hardship. We found the expected strong relationship between poverty and hardship, but the particular way in which severity was measured was not as important as we thought it might be.

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Table 1. Construction of Material Well-Being Indicators

Percent of U.S. Households Reporting Problems with Components of Well-Being in 1998

Consumer Durables		Housing Conditions		Fear of Crime	
Component	Percent	Component	Percent	Component	Percent
No Computer	58.0	Insect, Pest Problems	12.7	Nearby Place Afraid to Walk	28.8
No Dishwasher	44.0	Would Like to Move	7.9	Stay at Home for Fear	12.9
No Air Conditioner	22.3	Unsatisfactory State of Repair	7.5	Goes Out With Others	11.5
No Clothes Dryer	22.2	Roof Leaks	6.9	Neighborhood is Unsafe	8.6
No Clothes Washer	18.0	Broken Windows	4.1	Carries Something for Protection	7.5
No Microwave Oven	9.3	Cracks in Wall	4.0	Unsatisfied with Crime	4.4
No Telephone	3.8	Plumbing Problems	2.6	Home is Unsafe	4.1
No Refrigerator	0.7	Holes in Floor	0.9		
		Exposed Wires	0.8		

Neighborhood Conditions		Difficulty Meeting Basic Needs		Food Insecurity	
Component	Percent	Component	Percent	Component	Percent
Noise Problems	21.4	Did Not Meet Expenses	14.0	Food Didn't Last	11.5
Street Repair Problems	16.4	Did Not Pay Utility Bill	9.2	Did Not Eat Balanced Meals	9.7
Trash, Litter	8.2	Did Not Visit Dentist	7.9	Ate Less Than Should	4.6
Abandoned Buildings	8.0	Did Not Visit Doctor	6.1	Skipped Meals	4.4
Problem with Industry	7.3	Did Not Pay Rent	5.4	Didn't Eat Whole Day	1.2
Would Like to Move	5.8	Phone Disconnected	3.9		
Smoke, Odors	4.9	Utility Disconnection	1.3		

Source: 1996 Survey of Income and Program Participation, wave 8.

Table 2. Percent in Categories of Poverty and Material Hardship, and Odds Ratios Relating the Two

	Percent in row category	Material Well-Being Indicators					
		Neighborhood problems: at least 2 of 7 indicators	Fear of crime: at least 3 of 7 indicators	Housing problems: at least 1 of 9 indicators	Lacks more than 4 of 8 consumer durables	Difficulty meeting at least 2 of 7 basic needs	Food insecure: at least 1 of 5 indicators
Percent in column category		18.1	19.0	26.7	16.4	20.0	13.5
		Odds Ratios					
Never poor (reference category)	68.3						
Poor 1-20% of the time	11.0	1.34	1.27	1.45	2.16	2.44	2.38
Poor 20- 50% of the time	7.6	1.41	1.68	1.65	2.98	3.21	3.72
Poor 50-99 % of the time	8.5	1.90	2.15	2.25	5.33	4.75	6.20
Poor 100 % of the time	4.6	2.28	3.09	2.44	8.55	4.41	7.73
No spells (reference category)	68.3						
1 spell	20.6	1.58	1.77	1.69	3.54	2.90	3.60
2 spells	8.5	1.63	1.85	2.06	4.20	4.36	5.55
3 or more spells	2.6	2.00	2.15	2.29	4.77	5.50	6.08
No spells (reference category)	68.2						
Last spell ended in months 1-8	3.8	1.36	1.20	1.32	2.17	2.38	2.41
Last spell ended in months 9-16	4.0	1.59	1.46	1.63	2.60	2.68	2.88
Last spell ended in months 17-24	5.3	1.40	1.66	1.62	2.46	2.84	2.86
Last spell ended in months 25-32	18.7	1.77	2.09	2.07	5.02	4.10	5.59
Never poor (reference category)	62.8						
Adjusted gap gt 0.0 but under 0.2	16.4	1.44	1.42	1.57	2.48	2.81	2.99
Adjusted gap gt 0.2 but under 0.8	13.9	1.67	1.83	1.92	4.16	3.71	4.69
Adjusted gap gt 0.8	7.0	2.08	2.54	2.39	6.63	5.81	7.62

Source: 1996 Survey of Income and Program Participation, wave 8.

Table 3. Odds Ratios from Logistic Regressions of Material Hardship on Measures of Depth and Duration of Poverty, with Control for Income-to-Poverty Ratio when Not Poor

	Neighbor- hood problems	Fear of crime	Housing problems	Lacks consumer durables	Difficulty meeting basic needs	Food insecurity
Proportion of time poor						
Poor 1-20% of the time	1.200 ***	1.077	1.293 ***	1.560 ***	1.889 ***	1.744 ***
Poor 20-50% of the time	1.159 ***	1.271 ***	1.356 ***	1.688 ***	2.045 ***	2.180 ***
Poor 50-99% of the time	1.449 ***	1.447 ***	1.702 ***	2.382 ***	2.493 ***	2.893 ***
Poor 100% of the time	1.843 ***	1.352 *	2.226 ***	3.050 ***	2.542 ***	4.286 ***
Log avg income-to-poverty ratio during months not poor	0.699 ***	0.589 ***	0.691 ***	0.311 ***	0.402 ***	0.333 ***
Model likelihood	457.1	873.1	791.1	3288.5	2729.4	2917.5
Degrees of freedom	6	6	6	6	6	6
Duration since last spell						
Last spell ended in months 1-8	1.192 **	0.987	1.147 **	1.468 ***	1.757 ***	1.656 ***
Last spell ended in months 9-16	1.353 ***	1.152 *	1.375 ***	1.617 ***	1.845 ***	1.828 ***
Last spell ended in months 17-24	1.176 **	1.294 ***	1.354 ***	1.470 ***	1.913 ***	1.750 ***
Last spell ended in months 25-32	1.307 ***	1.308 ***	1.574 ***	2.182 ***	2.390 ***	2.704 ***
Log avg income-to-poverty ratio during months not poor	0.688 ***	0.577 ***	***	0.300 ***	0.396 ***	0.318 ***
Model likelihood	444.7	864.3	781.2	3282.1	2742.0	2913.6
Degrees of freedom	6	6	6	6	6	6
Number of poverty spells						
1 spell	1.239 ***	1.198 ***	1.333 ***	1.752 ***	1.855 ***	1.909 ***
2 spells	1.256 ***	1.257 ***	1.582 ***	1.949 ***	2.480 ***	2.731 ***
3 or more spells	1.515 ***	1.425 ***	1.721 ***	2.082 ***	2.944 ***	2.800 ***
Log avg income-to-poverty ratio during months not poor	0.688 ***	0.575 ***	0.680 ***	0.294 ***	0.400 ***	0.316 ***
Model likelihood	444.4	855.2	775.3	3234.2	2757.8	2892.0
Degrees of freedom	5	5	5	5	5	5
Poverty gap						
Adjusted gap gt 0.0 but under 0.2	1.231 ***	1.105 **	1.335 ***	1.516 ***	1.977 ***	1.887 ***
Adjusted gap gt 0.2 but under 0.8	1.328 ***	1.271 ***	1.537 ***	2.098 ***	2.374 ***	2.542 ***
Adjusted gap gt 0.8	1.513 ***	1.477 ***	1.789 ***	2.582 ***	3.497 ***	3.481 ***
Log avg income-to-poverty ratio during months not poor	0.699 ***	0.576 ***	0.687 ***	0.301 ***	0.412 ***	0.320 ***
Model likelihood	463.7	868.6	811.5	3319.9	2928.8	2981.2
Degrees of freedom	5	5	5	5	5	5
Likelihood ratio, null model	28649.4	29448.4	35162.1	26977.8	30341.8	23935.2
Observations	30,247	30,247	30,247	30,247	30,247	30,247

* p<0.10 ** p<0.05 *** p<0.01

Poverty gap represents the log of the poverty gap while poor.

All regressions include dummy variable for missing data on log poverty ratio (not shown)

Source: Survey of Income and Program Participation, 1996 Panel, Waves 1 to 8.

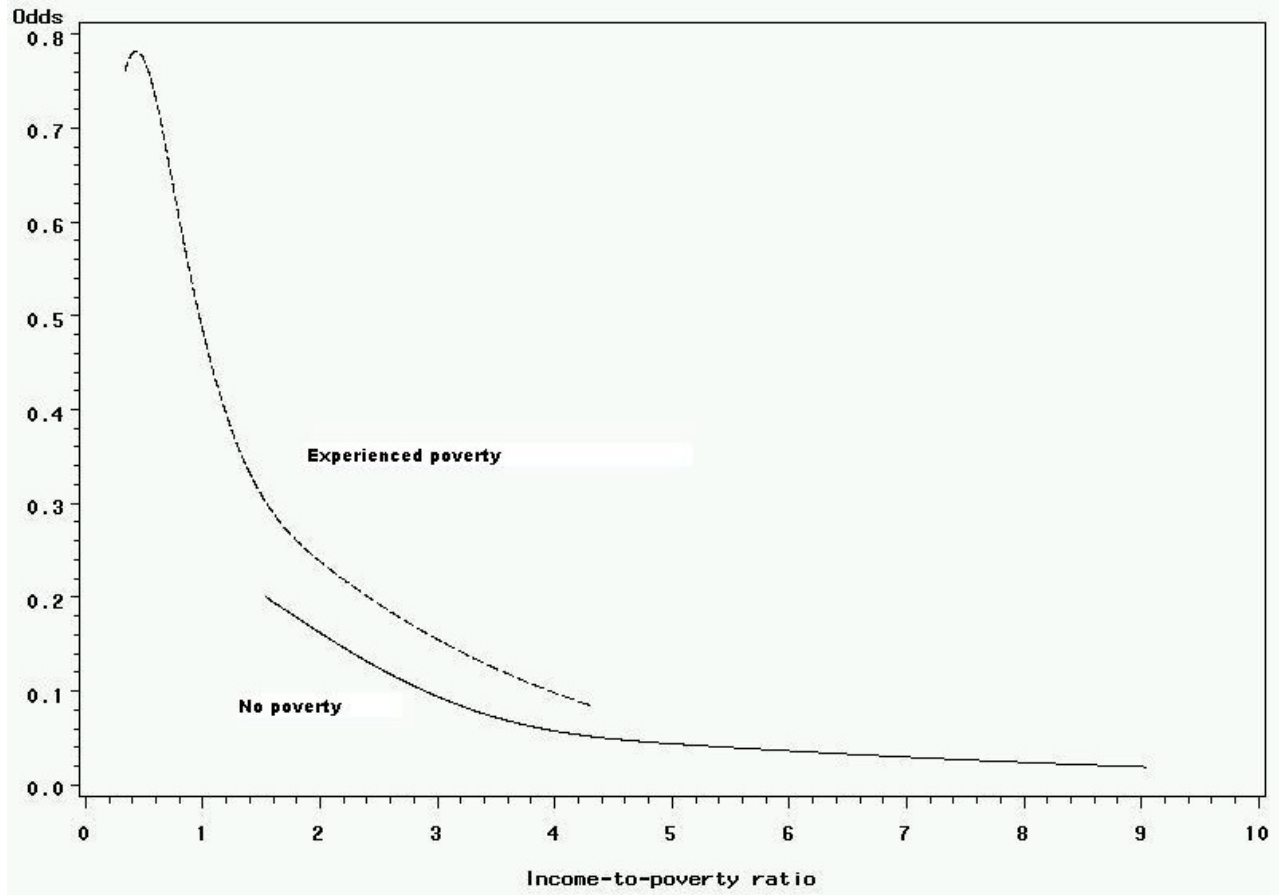
Table 4: Examples of the Effects of Income and Poverty on Material Hardship

Type of hardship	Income when not poor	No poverty spell experienced	Poverty spell	Income loss equivalent to poverty, but no poverty spell*	
		Hardship probability	Hardship probability	Income loss	Hardship probability
Neighborhood problems	20,000	0.21	0.25	1,100	0.22
	60,000	0.15	0.18	7,800	0.16
Fear of crime	20,000	0.25	0.27	1,100	0.26
	60,000	0.16	0.17	7,800	0.17
Housing problems	20,000	0.30	0.37	1,100	0.31
	60,000	0.22	0.28	7,800	0.23
Lacks consumer durables	20,000	0.26	0.35	1,100	0.28
	60,000	0.09	0.13	7,800	0.10
Difficulty meeting basic needs	20,000	0.26	0.41	1,100	0.27
	60,000	0.12	0.21	7,800	0.13
Food insecurity	20,000	0.19	0.31	1,100	0.20
	60,000	0.06	0.11	7,800	0.07

Source: Table 3 coefficients.

*The income loss in this example is equivalent to the loss experienced by the poor family, but the loss is spread sufficiently throughout the panel period such that no poverty spell is experienced. See text for further details.

Figure 1:
Odds of Food Insecurity versus Ratio of Income to Poverty, 1998



Source: Survey of Income and Program Participation, 1996 Panel, Waves 1 to 8.