Poverty and the Distribution of Material Hardship

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ABSTRACT

Public concern with poverty derives in large part from the assumption that low income families cannot afford necessities. Yet official poverty statistics focus on measuring income, not on measuring material hardship.

Two surveys of Chicago residents measure whether families could afford food, housing and medical care. A family's official income-to-needs ratio explained 24 percent of the variance in the amount of material hardship it reported. Adjustments for family size, age, health, noncash benefits, home ownership, and access to credit explain another 15 percent. Variations in permanent income explain almost none of the remaining variance in hardship. Among families with the same official income-to-needs ratio, material hardship varies by age, family size and composition.

I. Introduction

Judging by newspaper stories, television shows, congressional speeches, and actual legislation, most Americans are more concerned with whether their fellow citizens are getting adequate food, shelter, and medical care than with whether they have adequate incomes. Legislators, journalists, and ordinary citizens assume, of course, that hunger, malnutrition, homelessness, dilapidated housing, and untreated illness are to a great extent products of poverty. But if a poor family is getting adequate food, shelter, and medical care, few Americans worry about whether it can afford other amenities, such as new clothes, a television set, or an automobile. And if families do not get adequate food, shelter, or medical care, most Americans seem to think the government should try to help in some way, even if the problem is caused by incompetence, profligacy, perversity, mental illness, or alcoholism rather than low income. Our impulse to ensure that every family's "basic needs" are met is especially strong when the family includes children.

These political priorities have become increasingly obvious since the mid-1970s. During the late 1960s and early 1970s and United States substantially increased the cash benefits available to the poor. But after 1973 legislators let means-tested cash benefits lag behind inflation. At the same time they expanded programs like Food Stamps, Medicaid, and housing subsidies, whose purpose was to ensure that families got adequate food, housing, and medical care even if their income remained below the poverty line. Means-tested cash and noncash programs have both been trimmed since 1980, but noncash benefits still seem to enjoy more legislative support than cash benefits.

While legislators have devoted a growing share of the anti-poverty budget to programs that provide food, housing, and medical care rather than cash, the nation's statistical agencies have not tried to monitor hardship in these three areas. The federal government collects detailed data every year on the level and distribution of family income, but no federal agency regularly tries to determine how many Americans are going to bed hungry, how many have had their gas or electricity cut off, how many have been evicted from their homes, how many live in housing that their fellow citizens judge unacceptably crowded or dilapidated, how many think they need medical care they are not getting, or how many have untreated toothaches.

This paper presents data on the distribution of such material hardships in Chicago during the early 1980s. We use these data to assess the effects of income and need on hardship and to compare the distribution of hardship to the distribution of poverty.

The rationale for looking at our particular measures of material well-being is not that they are of special concern to individual consumers but rather that they are of special concern to policymakers and the public. We will not address the question of whether adequate food, housing, or medical care contributes more to subjective well-being than an adequate television set or an adequate supply of beer does. We claim only that Americans expect their *government* to make some effort to ensure that everyone gets adequate food, housing, and medical care, while regarding television sets and beer as a private responsibility.

We must also emphasize that we are not claiming that government policy is—or should be—indifferent to the distribution of income. Rather, we claim that government policy has two distinct goals: reducing poverty and reducing specific forms of material hardship. We will show that these two goals are empirically as well as conceptually distinct. Our conclusion is not, therefore, that we should replace traditional poverty measures with hardship measures, but rather that we should measure both on a regular basis.

II. The Chicago Survey

In order to assess the relationship between poverty and material hardship, the Survey Research Laboratory at Northwestern University conducted telephone interviews with separate samples of Chicago residents in the fall of 1983 and the spring of 1985. In 1983 the sample included 992 randomly selected households and 430 additional households with incomes less than $12,000 per year. In 1985 the sample included 886 randomly selected households and 68 additional households with heads over 65 years old. The first survey asked respondents about their experiences during 1982–83, which was the end of the worst recession since World War II. The second survey asked about their experiences during 1984–85, which was a period of modest recovery in Chicago. Despite the economic recovery, the determinants of hardship did not differ appreciably in the two years.[1] Most of our analyses therefore pool the 1983 and 1985 data.

A telephone survey has obvious drawbacks for a study of material hardship, since eliminating households without telephones is likely to eliminate households experiencing other hardships as well. But roughly 93 percent of all Chicago households had telephones in the early 1980s.

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1. For details on changes between 1982–83 and 1984–85 see Cook et al. (1986).

Furthermore, the correlations among different hardships in our sample are quite low (see Appendix 1). Since not having a telephone is presumably like other hardships, we believe that excluding respondents without telephones has only a modest effect on our results.[2]

Because of language barriers, the Chicago surveys did not obtain representative samples of Hispanics or Asians. Our analysis therefore focuses on non-Hispanic blacks and whites. Twenty-two percent of these respondents failed to answer one or more of the questions that concern us in this paper (usually an income question). Fortunately, the distribution of race, age, and material hardship was roughly the same among respondents with complete data as among all respondents. We therefore dropped respondents with incomplete data rather than trying to estimate missing values. This left 1617 non-Hispanic blacks and whites with complete data. When we weighted these data to make them demographically representative of Chicago as a whole, none of our findings change, so we report only unweighted results.

III. Measuring Hardship

Table 1 lists the questions we used to measure material hardship in Chicago.

A. Food

We used the "thrifty" food budget published by the U.S. Department of Agriculture (USDA) as an indicator of adequate food consumption, partly because Orshansky (1965) used a similar food budget to construct the original poverty line and partly because Congress uses the thrifty budget to set federal Food Stamp allotments. In 1984 the thrifty budget averaged roughly $17 per week for adults and $13 per week for children under 18 years old.[3] Food expenditures are not a very reliable indicator of whether

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2. The 1980 Census shows that families without telephones were about as common and had roughly the same demographic characteristics as families in our sample whose utilities had been cut off during 1982–83 or 1984–85. Eliminating families whose utilities had been cut off from our Chicago sample lowered the correlation between a family's income-to-needs ratio and the number of hardships it reported by 5 percent. It had equally small effects on other relationships. We therefore believe that eliminating respondents without telephones also had small effects.

3. Since about a third of restaurant expenditures are for food, we divided a family's expenditure on food away from home by 3, added it to the family's expenditure for food at home, and compared this sum to USDA's thrifty budget (USDA 1975).

Table 1
Questions, Coding, Means, and Standard Deviations for Ten Hardships: Chicago, 1983–85

Variable	Question	Unweighted Mean (Standard Deviation)	Weighted Mean (Standard Deviation)
COULDN'T AFFORD FOOD	"Has there been a time in the last year when you needed food but couldn't afford to buy it or couldn't get out to get it?" (Yes, couldn't afford it = 1; all other responses = 0.)	.224 (.417)	.213 (.262)
LT USDA	A) "Counting both cash and any food stamps that you might get, about how much do you and your family spend each week on groceries?" B) "Thinking about yourself and the other people that you buy groceries for, could you guess about how much all of you spend in an average week on eating out, including breakfasts, lunches, dinners and snacks?" (LT USDA = 1 if $A + B/3 < T$, where T is the family's thrifty food budget; otherwise LT USDA = 0.)	.186 (.389)	.175 (.380)
RENT UNPAID	"In the last two years has there been a time when you couldn't afford a place to stay or when you couldn't pay the rent?" (Yes = 1; No = 0.) This question was not asked of home owners. Since almost all home owners were able to make their monthly housing payments, they were coded as 0.	.135 (.342)	.133 (.340)

Variable	Description		
CROWDED	"How many rooms are there in your home, not counting bathrooms?" (CROWDED = 1 if number of rooms < number of household members; otherwise = 0.)	.142 (.349)	.142 (.350)
EVICTED	"Have you been evicted from your home in the past two years for not being able to pay your rent?" (Yes = 1; No = 0.)	.011 (.099)	.009 (.097)
UTILITIES OFF	"Has your gas or electricity been turned off for not paying the bill any time during the last two years?" (Yes = 1; No = 0.)	.074 (.262)	.074 (.262)
HOUSING PROBLEMS	Now I'm going to name some problems with housing that sometimes cause people difficulty. Do any of these things cause you difficulty now? 1) A leaky roof or ceiling? 2) A toilet, hot water heater or other plumbing that doesn't work right? 3) Rats, mice, roaches or other insects? 4) Broken windows? 5) A heating system that doesn't work properly? 6) Exposed wires or other electrical problems? 7) A stove or refrigerator that doesn't work properly? For each "yes" answer: "Would you say that this hasn't been taken care of due to the high cost involved, lack of time, a problem with the landlord, or some other reason?" (HOUSING PROBLEMS = 1 if respondent has two or more problems due to cost or landlord; otherwise = 0.)	.122 (.328)	.116 (.320)

Table 1 (continued)
*Questions, Coding, Means, and Standard Deviations for
Ten Hardships: Chicago, 1983–85*

Variable	Question	Unweighted Mean (Standard Deviation)	Weighted Mean (Standard Deviation)
NO INSURANCE	"Is everyone in your household covered by health insurance such as Medicare, Medicaid, Veteran's benefits, Blue Cross, Prudential, an HMO, or any other program?" (No = 1; Yes = 0).	.159 (.366)	.153 (.360)
UNMET MEDICAL NEEDS	"Has there been any time in the last year when you or anyone else in your family needed to see a doctor or go to the hospital but didn't go?" (If yes) "Was that because of lack of money, lack of time, because you didn't know who to see or what?" (Yes, because of lack of money = 1; all others = 0.)	.090 (.287)	.086 (.280)
UNMET DENTAL NEEDS	"Has there been any time in the last year when you or any one else in your family needed to see a dentist but didn't go?" (If yes) "Was that because of lack of money, lack of time, because you didn't know who to see, because you are afraid of the dentist or some other reason?" (Yes, because of lack of money = 1; all others = 0.)	.167 (.373)	.163 (.369)

a family's diet contains what experts regard as desirable nutrients. None-theless families that routinely spend less than the thrifty budget are more likely to eat nutritionally inadequate diets than those that spend more (USDA 1972).

We also asked respondents whether there had been times in the past year when they needed food but could not afford to buy it. Answers to this question correlate only 0.20 with spending less than the USDA thrifty budget (see Appendix 1), partly because families' judgments about how much they need to spend are highly variable and partly because families who judged their usual expenditures adequate had sometimes had weeks when they could not spend this amount.[4]

B. Housing

There is no official analogue in the field of housing to the "thrifty" food budget, partly because housing costs vary more from place to place and partly because the cost of housing with specified qualities varies more within a given housing market. Nonetheless, there is an apparent public consensus that certain deficiencies make housing inadequate. We asked about the seven problems listed in Table 1. Ideally, outside observers should have estimated the severity of each problem, but since that was not feasible, we asked respondents whether each problem "causes you difficulty now." We coded all families with two or more of our seven potential problems as having "housing problems."[5]

We did not ask respondents whether they thought their housing unit was overcrowded, so we had to rely on the Census Bureau's crowding standard. The Bureau defines a unit as crowded if it has more than one person per room. So far as we know, this standard has no empirical rationale. We doubt that large families think they need as many rooms per person as small families do, but we have no empirical evidence to support this suspicion or to justify any alternative standard.

We also asked respondents if there had been times when they could not pay their rent, when they were evicted for not paying the rent, or when their utilities were cut off because they could not afford to pay the bill. We counted each of these misfortunes as a separate hardship.

4. In 1985 we asked those who said they had sometimes been unable to buy food they needed whether they had gone hungry as a result. Two-fifths said they had. Unfortunately, we did not ask 1983 respondents whether they had gone hungry, so we cannot use this measure in the pooled sample.

5. We experimented with treating housing problems as a continuous rather than a dichotomous variable. This change had almost no effect on our results. Since all other hardships are dichotomous, we kept this one dichotomous in order to make our results more understandable.

C. Medical Care

Respondents' judgments about whether they or their family needed medical or dental care may not coincide with professional judgments. We assume, however, that not being able to consult a doctor when you think you are sick constitutes a hardship regardless of whether the doctor could actually help you. Indeed, one major reason for consulting doctors is to determine that "it's nothing serious."

A family's having a member with no health insurance correlated only 0.20 with having been unable to afford medical care, but it had a strong effect on respondents' assessments of their standard of living. We assume that this is because the uninsured worry about not being able to pay major hospital bills, even if they are currently getting all the care they think they need.

To determine whether variations in subjective standards of "need" were seriously distorting our results, we re-interviewed respondents who reported that there had been a time when they could not afford food or medical care they needed and asked them to describe what had happened in some detail.[6] Almost all respondents described situations that seemed to us to represent real hardship. This does not mean that all households have the same subjective "need threshold." But these interviews do suggest that individual definitions of need do not vary enough to produce *major* classification errors.

Ideally, we would have liked to weight these ten hardships according to their relative importance in the eyes of legislators and the general public, but we have no reliable basis for doing this. We can, however, say something about their relative importance to the families that experience them. The Chicago survey asked respondents:

> Could you tell me how you feel about your standard of living—your food, housing, medical care, furniture, recreation, and things like that? Would you say that you feel delighted, pleased, mostly satisfied, mixed, mostly dissatisfied, unhappy, or terrible?

We regressed respondents' answers to this question on our ten hardship measures.[7] Table 2 shows the OLS coefficients. CROWDED has little effect on respondents' assessments of their living standards, perhaps because the Census Bureau measure does not coincide with subjective stan-

6. Katherine Edin of Northwestern University's Department of Sociology conducted these interviews.
7. When we treated the seven response categories to this question as discrete dichotomous variables and calculated their canonical correlation with our hardship measure, we found that the seven response categories constituted essentially an interval scale. We therefore scored them from 1 to 7, with a score of 7 representing a high level of satisfaction.

Table 2

Effect of Specific Hardships on Satisfaction with Living Standards: Chicago, 1983–85

Variable	Equation	
	1	2
	b	b
	(SE)	(SE)
COULDN'T AFFORD FOOD	− .653	− .652
	(.087)	(.087)
LT USDA	− .280	− .280
	(.085)	(.083)
NO INSURANCE	− .417	− .419
	(.092)	(.091)
UNMET MEDICAL NEEDS	− .224	− .229
	(.127)	(.126)
UNMET DENTAL NEEDS	− .411	− .412
	(.098)	(.098)
HOUSING PROBLEMS	− .529	− .530
	(.104)	(.104)
RENT UNPAID	− .381	− .373
	(.105)	(.101)
UTILITIES OFF	− .389	− .383
	(.128)	(.127)
CROWDED	− .007	—
	(.094)	
EVICTED	(.120)	—
	(.333)	
CONSTANT	4.966	4.966
	(.040)	(.040)
R^2	.223	.223

dards. EVICTED has only a small effect after we control RENT UN-PAID, and its standard error is very large, because so few respondents had been evicted.[8] Neither CROWDED nor EVICTED is strongly cor-related with a family's income-to-needs ratio or with the other eight hard-

8. Less than two percent of our respondents had been evicted within the past two years. Since those who have been recently evicted have special difficulty getting telephones, the rate of eviction in Chicago as a whole may be considerably higher than in our sample.

ships. We therefore decided to omit both CROWDED and EVICTED in subsequent analyses.

Equation 2 in Table 2 shows the coefficients of the eight remaining hardships after we drop CROWDED and EVICTED. Although the relative weights of these eight hardships vary somewhat, a scale that weights all eight hardships equally correlates 0.98 with one that uses the weights in Equation 2. Since unit weighting is easier to interpret, the remainder of this paper concentrates on the total number of hardships a respondent reports (ignoring crowding and eviction).[9]

A family's first hardship has more effect on satisfaction with living standards than the second does, the second hardship has more effect than the third, and so on.[10] If we were ultimately interested in subjective well-being, we might want to transform our hardship measure so that its effects on subjective well-being were linear. But we are ultimately interested in the likelihood that families will experience what the public regards as hardship, not in the subjective consequences of this experience. We therefore focus on the actual number of hardships, not on a transformation of this number.

We have no way of estimating the validity of this measure. Our open-ended interviews convinced us that the questions were reasonably valid, but they do not allow us to quantify this impression.[11]

IV. The Demographic Distribution of Hardship and Poverty

Like the Census Bureau, we defined a family as including all individuals living in the same household who were related by blood, marriage, or adoption. To estimate total family income we asked about each family member's income from nine specific transfer programs (Social Security, General Assistance, Aid to Families with Dependent Children, and

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9. Because our scale includes eight hardships, a variable that increases total hardships by, say, 0.40 increases the probability of experiencing a "typical" hardship by $0.40/8 = 0.05$.

10. The linear regression of satisfaction (S) on hardships (H) is:

$$S = 4.964 - .428H \qquad R^2 = .217$$

The quadratic is:

$$S = 5.042 - .658H + .050H^2 \qquad R^2 = .228$$

The coefficient of H^2 is 4.5 times its standard error.

11. The items that compose the hardship measures are not supposed to measure the same underlying construct, so we cannot estimate the measure's reliability from the inter-item correlations, any more than we could estimate the reliability of an income measure from the intercorrelations among various kinds of income.

so forth), about each family member's earnings from all sources, and about each family member's total income from dividends, interest, rent, pensions, gifts, bonuses, alimony, child support, and "other sources." Finally, we asked about "irregular jobs" and "other things people do to "make ends meet," in the hope of getting some information on illegal income. We then summed all family members' income from all sources and divided this sum by the family's official poverty threshold in the relevant year to obtain what economists usually label an "income-to-needs ratio." (As we shall see, this is something of a misnomer, since the poverty thresholds are not a very good measure of families' relative needs.)

The number of hardships a family reports is a continuously declining function of the family's income-to-needs ratio, with no clear breakpoints (see Table 3).[12] The logarithm of the family's income-to-needs ratio explains 23.6 percent of the variance in the number of hardships reported. Dummy variables for specific income-to-needs ratios add almost nothing to the predictive power of a logarithmic model.

A family's income-to-needs ratio has more impact on the adequacy of its food consumption than on the adequacy of its housing or medical care. The family's income-to-needs ratio also explains more of the variation in the family's total number of hardships than in any particular hardship.[13] Nonetheless, it explains less than a quarter of the variation in the total number of hardships families report.[14]

Table 4 shows the correlation of families' demographic attributes with the number of hardships they reported, their total income, and their income-to-needs ratio. Comparing these correlations suggests four substantive conclusions:

1) The elderly report far less hardship than younger families, even though their income-to-needs ratios make them look poorer.

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12. The results in Table 3 are similar to Townsend's (1979) results for Britain, although he stresses the fact that the correlation between income and hardship is greater than zero whereas we stress the fact that it is less than unity.

13. Readers may suspect that the weak association between the income-to-needs ratio and particular hardships is due to the fact that the hardship measures are dichotomous. When we converted housing problems into a continuous variable, however, its correlation with the income-to-needs ratio only rose by 0.025. Substituting the ratio of food expenditures to the USDA thrifty budget for our dichotomous measure of whether food expenditures exceed the USDA thrifty food budget also increased the correlation with the income-to-needs ratio by 0.025.

14. Sceptics may suspect that the correlation would be higher if the distribution of hardships were not truncated at the bottom. (Half the sample reports no hardships at all.) To see how important this bias was, we recoded the income-to-needs ratio so that no family had a value in excess of 3.5. This makes the shape of the income and hardship distributions quite similar. This change lowered the correlation by 0.01.

Table 3

Percent of Respondents Reporting Hardships by Income-to-Needs Ratio: Chicago, 1983–85

	All	LT 50%	50–99%	100–149%	150–249%	250–349%	GT 350%	Eta[2a]
				Income-to-Needs Ratio				
LT USDA	18.6	42.9	36.4	24.1	19.0	11.6	6.2	.0985
HOUSING PROB-LEMS	12.2	31.0	20.3	15.9	13.9	8.3	3.8	.0594
CROWDED	14.2	31.0	21.7	15.9	13.6	14.8	6.6	.0402
UNMET MEDICAL NEEDS	9.0	19.0	16.1	13.8	10.6	6.9	1.9	.0429
UNMET DENTAL NEEDS	16.7	33.3	23.0	25.6	19.6	16.2	5.3	.0585
COULDN'T AFFORD FOOD	22.4	55.6	44.7	28.7	23.6	16.7	4.7	.1525
NO INSUR-ANCE	15.9	37.3	31.8	26.2	14.8	7.4	4.7	.0998
RENT UNPAID	13.5	34.1	24.0	17.9	12.4	10.6	4.5	.0670
UTILITIES OFF	7.4	19.0	17.1	8.2	6.6	6.5	1.3	.0518
EVICTED	1.0	3.2	1.8	0.5	0.9	1.4	0.2	.0075
ONE OR MORE HARDSHIPS	50.5	87.3	81.1	64.6	56.5	48.2	21.2	.2180
TWO OR MORE HARDSHIPS	29.5	70.6	53.9	41.5	32.0	21.3	6.4	.2007
THREE OR MORE HARDSHIPS	18.0	51.6	36.4	27.7	17.2	9.3	3.0	.1552
FOUR OR MORE HARDSHIPS	10.8	38.1	22.6	16.4	9.4	4.2	1.1	.1218
NUMBER OF HARDSHIPS	1.2	2.7	2.1	1.6	1.2	0.8	0.3	.2426
N	1,617	126	217	195	331	216	532	

a. Percent of variance in the hardship measure explained by the six poverty levels in the table.

2) Family heads without much formal education report more material hardship than better educated heads, but education has far less effect on hardship than on either family income or a family's income-to-needs ratio. This is the opposite of what we would expect if, as Michael (1972) has argued, education enhances consumer efficiency independent of its effect on income.

Table 4

*Correlations of Income, the Income-to-Needs Ratio, and Hardship
With Family Characteristics: Chicago 1983–85*

	Ln Family Income	Ln Income-to-Needs Ratio	Absence of Hardships[a]
Head Over 65	− .281	− .142	.162
Head's Years of Schooling	.471	.490	.197
Children in the Home	.078	− .198	− .262
Single Mother	− .237	− .368	− .342
Black	− .238	− .334	− .351

a. Recoded as (8—number of hardships) to keep signs comparable to those for income
and the income-to-needs ratio.

3) Families with children are slightly more likely to report material
hardship than to report a low income-to-needs ratio.
4) Blacks and single mothers are about as likely to report material
hardship as to report a low income-to-needs ratio.

These findings suggest that official poverty statistics are an unreliable
guide to the distribution of material hardship across demographic groups.

V. Errors in the Official Poverty Thresholds

The official U.S. poverty line compares a measure of eco-
nomic resources (annual money income) to a measure of economic need
(a threshold based on the number and age of current family members).
Both the measure of resources and the measure of need have been sub-
jected to a steady stream of criticism since Orshansky proposed them in
1965. The fact that a family's income-to-needs ratios explains less than a
quarter of the variance in reports of material hardship suggests that these
criticisms have some merit. The remainder of the paper investigates how
well a revised income-to-needs ratio would predict material hardship if we
improved our measures of families' needs and resources. We begin by
looking at measures of need.

A. Family Size

The official poverty thresholds are based largely on family size, with small
adjustments for age. Orshansky (1965) set the thresholds for families of

three or more at three times USDA's "economy" food budget (which was almost identical to today's "thrifty" budget). For families of two, she increased the multiplier to 3.7. She set the threshold for a single individual at 80 percent of the threshold for families of two.

This procedure had quite bizarre results. The marginal cost of each additional family member increases as family size rises from one to four. Doubling a family's size raises its estimated need for money income by 29 percent when it grows from one member to two, by 52 percent when it grows from two to four, and by 68 percent when it grows from four to eight.

Dissatisfaction with Orshansky's theoretical rationale for her "equivalence scale" has led scholars to propose numerous alternatives, based on public opinion, on subjective well-being, and on expenditure patterns. These three criteria for deciding when families of different sizes are equally well off yield quite different equivalence scales.

B. Public Opinion

Rainwater (1974) asked Boston residents how much income families of different sizes needed in order not to be "poor," to "get along," to be "comfortable," to be "prosperous," and so forth. The size elasticity of the resulting equivalence scales ranged from 0.25 to 0.37, averaging 0.31. The size elasticity of Orshansky's scale is also around 0.31 for families of one to three, but it rises to 0.85 once family size passes three.

C. Subjective Well-Being

Van Praag and Kapteyn (1973), Goedhart et al. (1977), Dubnoff et al. (1981), Danziger et al. (1983), Vaughn (1984), and Colassanto et al. (1984) constructed scales based on respondents' assessments of their own income. These scales are also relatively inelastic with respect to family size, suggesting that adults expect to make tradeoffs between extra children and material comfort.

D. Expenditure Patterns

Lazear and Michael (1980) and van der Gaag and Smolensky (1982) used overall expenditure patterns as their welfare criterion. Their equivalence scales vary with age but are considerably more elastic with respect to family size than scales based on either public opinion or subjective assessments of income adequacy.

If our goal is to predict material hardship, however, none of these three approaches is theoretically appropriate. Instead, we need a scale that

equalizes the likelihood that familiies of different sizes will experience the kinds of material hardship that concern the public. This is what Orshansky's scale purports to do.

To see whether Orshansky's thresholds accomplish this in Chicago, we regressed the number of hardships that a family reported (H) on the log of its income-to-needs ratio ($\ln P$), the log of its size ($\ln S$), and a dummy variable for having a head over the age of 65 (E). This yields:

$$H = 1.672 - .831\ln P + .345\ln S - .801E \qquad R^2 = .310.$$
$$(.068) \quad (.035) \qquad (.055) \qquad (.088)$$

where the numbers in parentheses are standard errors. The highly significant coefficient of $\ln S$ tells us that large families report far more material hardships than small families with the same official income-to-needs ratio. If the purpose of the official poverty line is to predict hardship, the size elasticity of the official thresholds is too low.

Table 5 allows us to estimate the size elasticity of thresholds that would make families equally likely to report the kinds of hardships we measured. To do this we regress hardship on the log of family income (divided by mean family income), the log of family size (divided by mean family size), and a dummy variable for having an elderly head.[15] Comparing the coefficient of family income to the coefficient of family size in Equation 1 of Table 5, we see that a one percent increase in family size must be matched by an 0.799/0.876 = 0.91 percent increase in family income for hardship to remain constant.[16]

These results imply that Orshansky's original equivalence scale was roughly correct for families of three or more but was too flat for families of less than three. Had Orshansky multiplied the "economy" food budget by 3.0 for families of *all* sizes, her thresholds would have had an overall size elasticity of 0.85 and would have come very close to equalizing the amount of hardship reported by large and small families.

To see whether these results hold for families with incomes near the poverty line, Equation 2 shows the multiplicative interaction between income and size. The coefficient of this interaction is negative and highly significant, which means that it takes a larger percentage increase in in-

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15. Substituting dummy variables for ln family size does not improve the fit significantly.
16. The amount of income required to offset a change in family size varies significantly from one hardship to another. The ratio of the size coefficient to the income coefficient is significantly greater than 0.91 for three hardships (LT USDA, UTILITIES OFF, and NO INSURANCE). It is significantly less than 0.91 for one (RENT UNPAID). But this ratio does not vary systematically from one domain to another (i.e., from food to housing to medical care). This suggests that so long as we look at a fairly broad array of hardships from all three domains any equivalence scale that equalizes hardship for large and small families will have a size elasticity fairly close to unity.

Table 5
Effect of Economic Needs and Resources on Number of Hardships:
Chicago 1983–85

Variables	Coefficients (Standard Errors)				Mean (SD)
	(1)	(2)	(3)	(4)	
Ln family income	−.876	−.874	−.711	−.603	.000
	(.038)	(.038)	(.043)	(.046)	(.902)
Ln family size	.799	.799	.680	.772	.000
	(.056)	(.055)	(.077)	(.079)	(.611)
Age greater than 65	−.901	−.815	−.833	−.635	.179
	(.090)	(.090)	(.091)	(.094)	(.384)
Ln income *		−.357	−.318	−.279	.130
Ln size		(.061)	(.063)	(.062)	(.534)
Children in home			.068	−.030	.337
			(.106)	(.105)	(.473)
Female head			.050	.058	.290
			(.083)	(.082)	(.454)
Single mother			.463	.324	.130
			(.117)	(.119)	(.336)
Family member has			.223	.234	.130
health problems			(.102)	(.100)	(.336)
Health self-rating			−.226	−.219	2.976
			(.042)	(.042)	(.868)
Food stamps				.547	.126
				(.117)	(.331)
Public housing				−.254	.074
				(.128)	(.261)
Medicaid				−.167	.072
				(.130)	(.258)
Owns home				−.343	.411
				(.085)	(.492)
Owns home,				−.174	.178
no mortgage				(.102)	(.382)
Constant	1.319	1.350	1.896	2.014	
	(.036)	(.036)	(.142)	(.146)	
R^2	.305	.320	.346	.372	

Note: All variables except family income, family size, and the health self-rating are dichotomous.

come to offset the effects of an increase in family size if you are poor than if you are affluent. When a couple with an income of $8,000 has a baby, they need to raise their income by 63 percent ($5,040) to keep their expected level of hardship constant. If their initial income is $16,000, they have to raise it by only 45 percent ($7,200) in order to keep their hardship level constant. Equation 2 suggests that if we are concerned exclusively with hardship among the poor, the size elasticity of the poverty thresholds should be about 1.00.

E. Age

Because Orshansky's poverty thresholds were based on the USDA "economy" food budget, they were 8 to 10 percent lower for families with heads over 65 than for younger families. Equation 1 in Table 5 shows that with income and size held constant, families with heads over the age of 65 need only $\exp(-0.901/0.876) = 36$ percent as much income as younger families of the same size in order to end up with the same number of hardships.

Elderly individuals and couples are better off than younger individuals and couples on every hardship measure except grocery expenditures. The elderly need less than half as much income as the nonelderly in order to end up with the same chance of reporting these hardships. This means that we cannot use the official poverty line to estimate the age distribution of material hardship (see Table 4 as well).

When we look at grocery expenditures, however, we find that individuals and couples are less likely to spend what USDA's "thrifty" food budget requires if they are over 65 than if they are under 65. Since the elderly are more likely than the young to judge their expenditures adequate, we assume that their expenditures fall below the USDA standard because appetite declines more in old age than the USDA standard does.[17] We have no way of assessing the nutritional consequences of this decline.

F. Children

The official poverty thresholds for families of four are slightly lower if the family has no children or two chidren than if it has one child or three children. We have not been able to discover any theoretical rationale for these fluctuations, and we ignored them in computing income-to-needs ratios. Our Chicago sample is not large enough to determine whether such fluctuations make empirical sense, but it does allow us to test the more general hypothesis that families with children need less income than

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17. USDA's food budgets make no adjustments for declines in appetite after the age of 55.

families of the same size composed entirely of adults. Equation 3 in Table 5 shows that with income and family size controlled the presence of children has a substantively trivial and statistically unreliable effect on hardship.

G. Female Heads

Since women weigh less than men, USDA assumes that women can get by on a smaller food budget than men. Orshansky's poverty thresholds were therefore lower for families headed by women than for two-parent families of the same size. In 1980, however, a federal interagency committee decided to eliminate this distinction. Equation 3 suggests that the committee's decision was correct. Among families with children, single mothers report significantly *more* hardships than two-parent families with the same official income-to-needs ratio. This suggests that official thresholds should perhaps be higher for single mothers than for two-parent families of the same size. Among families without children, the sex of the head has a substantively trivial and statistically unreliable effect on the head's chances of reporting hardship.[18]

H. Health

The official poverty thresholds make no adjustment for family members' health, even though poor health clearly increases a family's need for money income. Equation 3 in Table 5 shows that household heads who said they were in poor health reported substantially more hardships than those who were in good health.[19] This is only partly because poor health increases the chances of not having been able to afford medical care. Poor health also increases the chances of reporting most other hardships.

Equation 3 also includes a dichotomous measure of whether any household member had health problems that kept him or her from performing normal daily activities more than once a month. Families with such a member report significantly more hardships than families without such a member.

Taken as a whole, Equation 3 suggests that the official poverty thresholds are not very good indicators of how much income different families need in order to end up with the same amount of hardship. To

18. Among couples, the sex of the respondent has no effect on the reported number of hardships.
19. Health ratings were on a four point scale (excellent, good, fair, or poor). The coefficient of −0.226 thus implies that family heads who reported that their health was "good" reported 0.226 more hardships than those who reported that their health was "excellent." Deviations from linearity were not statistically significant.

quantify their efficiency relative to an improved measure, note first that the log of a family's money income explains 14 percent of the variance in the number of hardships it reports. The log of a family's official income-to-needs ratio explains 24 percent. If we were to replace the official thresholds with thresholds based on the coefficients of family size, age, single motherhood, and poor health in Equation 3, we could explain 35 percent of the variance in hardship. The improvement in R-squared when we use the official thresholds (0.10) is thus only half the improvement when we use the thresholds implied by our results (0.21).

VI. Errors in Measuring Resources

A. Noncash Benefits

While there is general agreement that Food Stamps, Medicare, Medicaid, and government housing subsidies ought to be taken into account when reckoning a family's overall economic resources, there is no general agreement about how they should be valued. If we plan to use poverty statistics to understand the distribution of material hardship, the right way to value noncash benefits is to estimate their effect on the hardships that concern us. We can then calculate the amount of money income required to reduce hardship by the same amount and can assign each noncash benefit this monetary value.

Equation 4 in Table 5 estimates the effect of Food Stamps, public housing, and Medicaid on material hardship.[20] Receiving Food Stamps appears to *increase* hardship, even with income, family size, and home ownership controlled. This paradoxical result presumably derives from our inability to control all the variables that affect a family's chances of applying for and receiving Food Stamps. Perhaps the kinds of poor families that do not apply for Food Stamps also manage their money more efficiently than the average poor family. Or perhaps poor families only apply for Food Stamps when they are experiencing hardship. Or perhaps the families that report very little income but do not receive Food Stamps have unreported income or assets that make them reluctant to apply for Food Stamps or make them ineligible. Whatever the explanation, the fact that Food Stamps have the wrong sign warns us that some kind of selection bias is at work. This is likely to be true for public housing and Medicaid as well.

Living in public housing appears to reduce hardship by as much as a 52

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20. Medicare is almost perfectly collinear with being over 65 in our sample, so we were unable to look at its effect. Part of the effect of being over 65 is, however, surely attributable to Medicare.

percent income increase. Unfortunately, the 95 percent confidence interval for this estimate includes both zero and 100 percent, so we cannot draw any policy conclusions from it. If we could adjust for selection bias, the estimated value might be either higher or lower.

Medicaid appears to reduce hardship by as much as a 32 percent income increase. If eligible families do not apply for Medicaid until they experience severe hardship, the true effect may be even larger. But here, too, the confidence interval around the estimate is so large that we cannot draw any firm conclusions about the true value.

B. Home Ownership

Chicago homeowners with mortgages spend about the same fraction of their income on housing as tenants do. Nonetheless, Equation 4 shows that owners with mortgages report fewer hardships than tenants with the same income and other needs. Homeowners' advantage arises partly because they almost never say they were unable to make their mortgage payments, whereas tenants often say they were unable to pay their rent. But homeowners also report fewer medical and food hardships. This suggests that home ownership may be a proxy for unmeasured economic resources. But since home ownership correlated only 0.14 with respondents' reports of whether they could borrow $500 if they needed it, we suspect that it is also a proxy for unmeasured forms of household efficiency.

Chicago homeowners without mortgages spend much less on housing than other families, yet they have no more housing problems. They therefore have far fewer hardships than other families with the same income and needs. Equation 4 shows that owning a home outright (rather than with a mortgage) reduces hardship as much as a 33 percent increase in money income.[21]

C. Access to Credit

While the Chicago surveys did not obtain a measure of liquid assets, the 1983 survey did ask respondents whether they could borrow $500 if they needed it. Among those with incomes below the poverty line, 34 percent said they could borrow this amount. The proportion rose to 60 percent among those with incomes one to two times the poverty line, 79 percent among those with incomes two to three times the poverty line, and 96

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21. Homeowners with mortgages in our sample typically devote 21 percent of their income to their mortgage payments. If homeowners without mortgages did the same before their mortgage was paid off, paying off their mortgage would have been equivalent to a 27 percent increase in money income. The estimated effect of paying off a mortgage is thus reasonable.

percent among those with incomes more than three times the poverty line. Low income families usually said they would borrow from a relative or (less often) from a friend. The affluent usually said they would borrow from a bank.

All else equal, a family's ability to borrow $500 had as much effect on hardship as multiplying its current income by a factor of three. Including this measure also raised R^2 by 0.033. The extraordinary importance of access to credit is consistent with our unstructured interviews, in which many respondents imputed their hardships to unforseen changes in income or expenses. Both liquid assets and access to credit clearly require more attention if we want more realistic measures of families' economic resources.

D. Permanent Income

Forty-three percent of Chicagoans with incomes below the official poverty line reported annual expenditures on food, housing, and medical care in excess of their annual income.[22] Had we collected more complete expenditure data, the fraction of poor respondents with expenditures in excess of income would have been even higher. Most of these families must either have underreported their current income or have had past or future incomes substantially higher than their current income.

To estimate the effect of past and future income, we looked at a subsample of respondents whom we had interviewed in both the fall of 1983 and the spring of 1985.[23] The first interview asked respondents to estimate their 1983 income. The second asked them to estimate their 1984 income. We used mean income for these two years to estimate "permanent" income. The deviation of 1983 or 1984 income from the two-year average is the "transitory" component of income.

Friedman (1957) and his successors argue that current consumption depends largely on permanent rather than current income. Our data on respondents' usual weekly grocery expenditures, monthly rent or mort-

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22. The imbalance between annual income and expenditures on food, housing, and medical care is not peculiar to our Chicago sample. In a 1 in 10,000 sample of 1980 Census respondents, for example, families with 1979 incomes less than half the poverty line typically reported spending more on rent alone than they reported receiving in income.

23. We tried to reinterview all 1983 respondents in 1985, but following up telephone respondents for whom one has no addresses is very difficult. After eliminating those we were unable to find, those who refused to be reinterviewed, and those who provided incomplete data on one or more item in either year, we had complete longitudinal data on only 529 of the original 1422 repondents. We did *not* use the data that we collected from these respondents in 1985 in the 1983–85 sample discussed elsewhere in the paper. The correlation between reports of total family income in 1983 and 1984 was 0.783. The correlation between hardships in 1983 and 1985 was 0.636.

gage payments, and annual medical spending all support this hypothesis. When we regressed expenditure of a given kind in a given year on both permanent income and the transitory component of income, the coefficient of the transitory component never approached statistical significance, and its average value was only one-sixth the average for permanent income. The same pattern recurs when we use both permanent and transitory income to predict whether the respondent could borrow $500.

When we look at reports of hardship, however, the pattern changes. Denoting permanent income as P, transitory income as T_{83} or T_{84}, and hardship as H_{83} or H_{85}, we get:

$$H_{83} = 7.147 - .626P - .854T_{83}$$
$$(.719) \quad (.073) \quad (.190)$$

and

$$H_{85} = 7.008 - .632P - .140T_{84}$$
$$(.697) \quad (.071) \quad (.207)$$

The 1983 results show that if our aim is to understand material hardship, we cannot just substitute permanent income for current income. The transitory component of income is highly significant in 1983; indeed, its coefficient is larger than that of permanent income. This suggests that year-to-year variations in the flow of income can have real—and often unpleasant—consequences for those who experience them. The 1984 transitory component does not have a significant effect on hardship in 1985, but that may just be because the accounting periods for transitory income and hardship do not match as well in the 1985 survey as in the 1983 survey.

Nonetheless, hardship does not seem to depend entirely on current income. If we drop the permanent income model and simply regress hardship on total income (Y) in both 1983 and 1984, we get:

$$H_{83} = 7.228 - .714Y_{83} + .086Y_{84}$$
$$(.702) \quad (.111) \quad (.112)$$

and

$$H_{85} = 7.090 - .391Y_{84} - .230Y_{83}$$
$$(.679) \quad (.109) \quad (.107)$$

The first equation tells us that income in 1984 has no effect on hardship in 1983. Indeed, 1984 income has the wrong sign. This suggests that our respondents were seldom able to borrow against future income in order to avoid hardship.

In 1985, however, hardship depends on both 1983 and 1984 income. This suggests that families with relatively high incomes in 1984 had ac-

cumulated either savings or informal credit with others, against which they drew when the need arose. As a result, families whose income dropped in 1984 did not experience as much hardship as families with the same 1984 income whose 1983 income had also been low.[24]

These results suggest an important methodological conclusion. Rather than assuming that temporary poverty is relatively harmless and that what matters is long-term poverty, the Chicago data suggest that the sequence of affluence and poverty is crucial. Past affluence provides some cushion against the effects of current poverty; future affluence provides none.

VII. Implications

The Chicago surveys cast serious doubt on the widespread assumption that poverty statistics provide reliable information about the distribution of material hardship. They therefore strengthen the case for direct measurement of material hardship on a regular national basis. Skeptics may feel that we should not put too much weight on self-reported hardships, and we are sympathetic to this view. At a minimum, however, our findings suggest that we need systematic research on the relationship between reports of hardship and families' actual experiences.

Meanwhile, we should be especially cautious about assuming that official poverty statistics tell us anything useful about the age distribution of hardship. Official poverty statistics appear to exaggerate the extent of material hardship among the elderly and underestimate its extent among children. If we want to understand the age distribution of material well-being, we need to measure it directly (Jencks and Torrey 1988 attempt this).

Much poverty research also assumes that family income is the critical determinant of material well-being and that families' needs are relatively similar. Our results suggest that family income explains only about 14 percent of the variance in material hardship. Broader measures of economic resources explain only a little more. Better measures of both savings and credit would improve our ability to predict hardship, but probably not enough to alter our basic findings.

The Chicago data suggest that variations in "need," broadly construed, explain at least as much of the variation in hardship as variations in resources. Since social scientists have devoted far more attention to the determinants of families' resources than to the determinants of their needs, some reallocation of scholarly effort may be called for.

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24. Even in 1985, adding 1983 income to an equation that already contains 1984 income only raises R^2 by 0.008. We therefore doubt that even an ideal measure of permanent income would greatly improve our ability to predict material hardship.

If the link between income and material hardship is as loose as the Chicago data suggest, and if public officials are concerned with eliminating hardship rather than simply increasing family income, programs that focus on specific hardships may also be more efficient than economists have traditionally thought. If Congress wants to ensure that everyone gets enough food, has access to medical care, and lives in a home that meets specified criteria, for example, the Chicago data suggest that income-oriented strategies are a very expensive way of achieving these goals. Unfortunately, the Chicago data cannot tell us much about whether other approaches can achieve these goals more economically.

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Appendix 1

Correlations Among Measures of Income and Hardship

	LN Family Income	Poverty (0/1)	LN Income Need	Couldn't Afford Food	LT USDA	Unmet Medical Need	Unmet Dental Need	No Insurance	Rent Unpaid	Utilities Off	Housing Problems	Number of Hardships
LN Family income	1.000											
Poverty (0/1)	-.428	1.000										
LN income/need	.784	-.750	1.000									
Needed food	-.307	.324	-.385	1.000								
LT USDA	-.216	.269	-.304	.201	1.000							
Unmet medical need	-.163	.148	-.192	.315	.131	1.000						
Unmet dental need	-.222	.142	-.235	.316	.100	.433	1.000					
No insurance	-.222	.255	-.298	.218	.154	.200	.224	1.000				
Rent unpaid	-.218	.207	-.260	.338	.115	.217	.247	.208	1.000			
Utilities off	-.141	.196	-.211	.243	.131	.130	.209	.155	.193	1.000		
Housing problems	-.171	.186	-.235	.278	.092	.229	.252	.205	.251	.159	1.000	
Number of hardships	-.372	.395	-.485	.680	.457	.572	.627	.539	.574	.454	.543	1.000