Transportation Hardship: Are You Better off with a Car?

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ABSTRACT: Growing evidence demonstrates the importance of transportation in improving family economic well being. This article sheds light on the hardship that one important transportation asset, private vehicles, may exert on families. Data from the Iowa Transportation and Employment Survey provided a unique opportunity to understand how vehicle access enables households to meet their basic needs, but may exacerbate their problems through the creation of additional demands on resources. Approximately 26% of the sample reported having experienced transportation hardship. The strongest predictors of transportation hardship were the presence of children in the household, low income, driving less reliable vehicles, and the unavailability of transportation assistance from someone outside the household. How to help families meet their transportation needs in light of this evidence remains open to debate.

KEY WORDS: economic well being; material hardship; transportation.

Introduction

Measures of economic hardship based on income, such as the official poverty measure in the United States, infer that greater income leads to greater well being. However, a significant body of literature finds that some aspects of economic well being can be gauged more accurately by measuring consumption or other dimensions of living conditions (see Citro & Michael, 1995; Jencks & Torrey, 1988). Federman et al. (1996), for example, note that income measures ignore homeownership and other assets that can be important sources of consumption. Missing from consumption-based measures of well being

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is the recognition that utilizing many durable goods requires additional expenditures, e.g., monthly phone service for use of telephones; water, electricity and detergent for running washing machines. This article sheds light on the material hardship that one important asset, private vehicles, exerts on families.

Indicators of material hardship have focused primarily on the assessment of consumption of food, housing, utilities, and medical care (Beverly, 2001; Ouellette, Burstein, Long, & Beecroft, 2004). We study private vehicles for several reasons. First, U.S. households are highly dependent on private vehicles for transportation. Pucher and Renne (2003) reported that more than 86% of all trips, regardless of purpose, were made in automobiles and concluded that "Indeed, it is probably unique to the United States that three-fourths of even its poorest households own a car. That reflects the extent to which the car has become a virtual necessity" (p. 55). Second, policy changes have shifted the emphasis of social programming from assisting welfare recipients to providing work supports and incentives for the broader population of low-income families (Bok & Simmons, 2002; Coffield, 2002; Curtis, 2002). Further, employment now is stressed as the key to achieving economic self-sufficiency. Increases in the minimum wage, the expansion of the Earned Income Tax Credit, the creation of the State Child Health Insurance Program, and the expansion of work requirements for Temporary Assistance for Needy Families (TANF) and some Food Stamp Program recipients have been important policies that create incentives for low-income families to seek employment (Danziger, Heflin, Corcoran, Oltmans, & Wang, 2002). Third, recent studies have demonstrated that access to reliable transportation improved economic outcomes (Blumenberg, 2002; Danziger, Corcoran, Danziger, & Heflin, 2000; Ong, 1996, 2002; Raphael & Rice, 2002; Raphael & Stoll, 2001; Stoll, 1999) and that households without cars were more likely to experience material hardships (Children's Health Fund, 2001; Corcoran, Heflin, & Siefert, 1999). Despite growing evidence of the importance of transportation in improving economic well being, little is known about how the consumption demands of private vehicles may increase the hardships faced by families.

This paper extends research on material hardship using a survey of Iowa households to answer the following questions: (1) what proportion of households that have access to private vehicles experience transportation hardship; and (2) to what extent do demographic, socioeconomic, household composition, social support, and vehicle characteristics predict transportation hardship? In the next section of the paper, we first review the theoretical basis and empirical

literature on transportation and economic outcomes. Second, in order to support our argument that transportation should be conceptualized as an important domain in the material hardship literature, we summarize a growing body of research related to transportation and material well being with particular focus placed on low-income populations. The dataset, sample, variables, and the empirical methods used in our analyses are described in the third section. The results section follows and reports that about one in four surveyed households experience transportation hardship. Chi-square analyses assess bivariate relationships and a logistic regression model identifies significant predictors of transportation hardship. The paper concludes with a discussion of implications for the design of public policies.

Review of Literature

Transportation and Economic Outcomes

Explanations of the behavior of individuals include theories of choice, expectancy, attitudes, motivation, and human capital, which as a group are best represented by neoclassical economic theories (Sherraden, 1991). Positive economics is an economic theory of behavior in which "people are typically assumed to respond favorably to benefits and negatively to costs. In this regard, positive economics closely resembles Skinnerian psychology…. The rewards in economic theory are pecuniary and nonpecuniary gains (benefits), while the punishments are foregone opportunities (costs)" (Ehrenberg & Smith, 1991, p. 3). Examinations of consumption behavior within the positive economic framework often are consistent with economic theories of investment. "Individuals purchase cars, houses, furniture, and other durables that are expected to yield a stream of utility (satisfaction) over a long period of time…. So long as the asset is expected to yield a higher rate of return (benefits) than it costs, the asset is purchased; if not, it is not purchased" (Ferguson & Maurice, 1978, p. 469). Benefits derived from an asset include both those received directly through its consumption (driving a car) and those received indirectly through the ability of the asset to generate greater benefits in the future (using a car to meet employment-related transportation needs) (Ehrenberg & Smith, 1991). Within the positive economics theoretical framework, this study provides an empirical examination of the often ignored costs of owning a specific asset, a private vehicle.

Consistent with the treatment of vehicles as investments, there is growing evidence that access to vehicles promotes positive economic

outcomes, and that a lack of access is correlated with negative outcomes. A number of studies find that access to reliable transportation leads to employment, higher wages, and greater job stability (Ong, 1996, 2002; Raphael & Stoll, 2001). Surveys of welfare recipients and employers consistently have reported transportation as a major barrier to employment (Danziger et al., 2000; Shelton et al., 2002), with vehicle ownership mediating against the spatial mismatch between jobs and low-income workers in urban and suburban areas (Stoll, 1999). In short, throughout the transportation access literature, vehicles are viewed as resources that help households gain or maintain jobs and, in turn, enhance economic well being.

Transportation and Material Hardship

Remarkably, little is known about the relationship between transportation and material hardship. We draw on material hardship studies to provide insight regarding predictors of transportation hardship, defined as the financial pressures related to using private vehicles to meet transportation needs. The strongest predictor of material hardship—typically defined as unmet food, housing and/or medical needs—in the general population is low income (see Bauman, 2002; Beverly, 2001; Federman et al., 1996; Long, 2003). Using data from the nationally representative Survey of Income and Program Participation (SIPP), Federman et al. (1996) found the majority (55%) of the poor lived with at least one aspect of material hardship compared with 13% of the nonpoor. Long's (2003) analysis of data from the National Survey of America's Families demonstrated the same pattern: 73% of low-income adults had experienced hardship, compared to 31% of moderate- and higher-income adults. Additionally, Bauman's (2002) multivariate analysis of SIPP data found household income, the number of asset types owned, and owning a home (vs. renting) to be negatively related to material hardship. However, analysis of data from a low-income population—the Women's Employment Survey, a study of urban welfare recipients in Michigan—did not find income to be a significant predictor of material hardship when controlling for other demographic, work, health, and human capital measures (Corcoran et al., 1999).

Several recent studies of material hardship reported that households without vehicles were more likely to experience food insufficiency or report unmet housing or medical needs (Briefel et al., 2003; Children's Health Fund, 2001; Corcoran et al., 1999). For example, Briefel et al. (2003) found that nearly half (49%) of the surveyed food pantry clients

reported no access to a working car, truck, or motorcycle. Corcoran et al. (1999) analyzed the prevalence of transportation barriers (measured as a lack of a car and/or driver's license) and their effects on food insufficiency and on a measure of material hardship operationalized as a self-assessment of unmet food and housing needs. Transportation barriers were prevalent in the Women's Employment Survey with nearly half (47%) of the respondents reporting that they had either no car or no driver's license. There was a significant bivariate relationship between transportation problems and the two dependent variables, as well. However, after controlling for other demographic, work, and human capital measures, transportation was not a significant predictor of food insufficiency or material hardship.

Studies suggest that household composition, work status, and other demographic characteristics are associated with hardship. Bauman (2002) reported higher levels of material hardship among households headed by younger individuals, households with children, single-parent households, and among African Americans and Hispanics. The number of adults in the household also was positively associated with hardship. Edin and Lein (1997) and Beverly (2000) found evidence that work did not improve the well being of single mothers. However, Bauman (1998) found household well being to be positively associated with labor force participation. In a subsequent analysis, Bauman (2002) reported that, after controlling for other variables with an impact on hardship, full-year work reduced hardship, but hardship increased for those reporting part-year employment. Also, the effect of work on hardship varied by parental status. Employment did not have the same beneficial impact on single parents that it did on other households. Bauman and Downs (2000) explored household characteristics associated with the expectation of informal support from social networks. They found that households with greatest access to social networks were higher-resource households that were less likely to actually use a support network.

In sum, economic theory and past research suggests that demographics, household composition, and income predict material hardship; there is mixed evidence that employment influences hardship. There is strong evidence that a high proportion of low-income households lack access to private transportation, but there are no studies that have directly measured characteristics of this important asset or the financial pressures associated with vehicles. This paper documents the prevalence of transportation problems and identifies predictors of the hardship associated with using private vehicles in a sample drawn from the general population.

Methods

Data and Sample Design

This study examined data from a survey of 768 Iowa households, the Iowa Transportation and Employment Survey (ITES), to assess transportation resources and barriers (Anderson, Nusser, & Anderson, 2001). Survey respondents resided in a cluster of five counties in northeast Iowa that included a small metropolitan county, two nonmetropolitan counties that are adjacent to the metro county, and two nonmetropolitan nonadjacent counties. County designations regarding metropolitan and adjacency status conformed with a standard rural–urban continuum coding scheme that was based on population and geographic location of counties (Butler & Beale, 1993). According to the 2000 Census, the metropolitan county had 127,858 residents; the four nonmetropolitan counties ranged in population from 13,061 to 23,298. Public transit options were very limited in these counties. The metro county had a fixed-route bus system, though few (6%) of the metro survey respondents reported that someone in the household used public transportation on a regular basis. In all five counties, the regional transit system operated van services that primarily assisted targeted populations—the disabled, elderly, and low-income children.

The dual frame sample design included a random digit dial (RDD) sample of the general population and an administrative list sample of individuals who received Family Investment Program (Iowa's TANF program) or Food Stamp benefits in November 2000 and lived within the five-county cluster. Both the RDD and the administrative list sampling frames were stratified by population density according to county rural–urban continuum codes (Butler & Beale, 1993). Also, in order to assure an adequate representation of those households that might be at greatest risk of experiencing transportation problems, low-income households were oversampled. The ITES telephone interviews were conducted from February to May 2001. Replicate weights (Brick, Broene, James, & Severynse, 1997) were calculated for each household to account for the unequal probability of selection. The analyses applied these replicate weights in order to allow the study sample to be representative of the population of all households in the five-county cluster.

Because our study focused on transportation hardship associated with private vehicles, we restricted our analyses to households with vehicle access (N = 707). We included households that owned or leased vehicles, as well as those that reported the availability of a vehicle on a regular basis. The ITES improves on past transportation and material hardship surveys in several ways. First, our sample was drawn from the general population with an oversampling of low-income households. Our survey design also allowed us to control for possible rural–urban differences. Finally, our survey instrument included a more detailed assessment of the vehicle inventory of each household by including measures of each vehicle's reliability and accessibility, an item on access to informal networks that might provide transportation assistance, and indicators of hardship associated with these assets.

Variables and Research Strategy

We limited our study sample to the 707 households who owned or had regular access to private vehicles. Fifty-four of these households were removed because of missing data, resulting in 653 cases for our analyses. Questions on transportation hardship were patterned after the indicators of material hardship reported by Mayer and Jencks (1989) in their analysis of poverty and material hardship in Chicago, and subsequently used in national surveys, including the SIPP and the National Survey of America's Families (U.S. Census Bureau, 2001; Wang, Dipko, & Vaden-Kiernan, 1999). Respondents were asked, "In the past 12 months, has there been a time when you or someone in your household (1) needed to go somewhere but did not have money for gasoline? (2) neglected necessary car repairs because they were too expensive? (3) let car insurance lapse because the payments were too high? (4) missed a car payment? or (5) had a vehicle repossessed?" Consistent with many previous analyses of material hardship, our study used a summary measure that indicated hardship if a respondent provided at least one affirmative response to the five transportation hardship items (see Table 1).

The number of vehicles available to the household included all vehicles owned or leased by a member of the household, as well as any vehicles that were available to household members on a regular basis (e.g., company cars). Vehicle reliability was assessed by a 5-point scale ranging from "very reliable" to "not working at all." Transportation assistance was measured on a 5-point scale ranging from "always" to "never" being able to count on getting help with transportation or car repairs from people outside the respondent's household. Metrics for these and other demographic and employment variables are summarized in Table 2.

TABLE 1

Transportation Hardship Variable

	% Yes
Questions	
In the past 12 months, has there been a time when you or someone in your household:	
(1) Needed to go somewhere but did not have money for gasoline?	9.2
(2) Neglected necessary car repairs because they were too expensive?	17.8
(3) Let car insurance lapse because the payments were too high?	5.2
(4) Missed a car payment?	5.4
(5) Had a vehicle repossessed?	1.0
Summary Transportation Hardship Variable	
Transportation hardship[a]	25.7

N = 653. Responses are weighted to be representative of the general population in the 5-county cluster.

[a]The summary outcome variable is coded 1 if the respondent reports that anyone in the household experienced one or more of the individual transportation hardship indicators.

TABLE 2

Individual and Household Characteristics

Variables	Value
Demographics	
Age (Mean in years)[a]	48.4
Race[a]	
White	95.1%
Non-White	4.9%
Households with 2 or more adults (age 18 and older)	68.5%
Number of adults in household (Mean)	1.9
Number of adults in households with two or more adults (Mean)	2.3
Households with children (age 17 or younger)	32.9%
Number of children in household (Mean)	.7
Number of children in households with children (Mean)	2.0
Total household income	
Less than $10,000	11.3%
$10,000–$19,999	16.6%
$20,000–$29,999	17.9%
$30,000–$39,999	12.5%
$40,000–$49,999	9.1%
$50,000–$59,999	11.9%
$60,000–$69,999	5.5%
$70,000–$79,999	5.7%
$80,000–$89,999	2.1%
$90,000 or more	7.6%
Employment	
One adult in household employed full or part time	32.5%
Two or more adults in household employed full or part time	44.2%
Number of adults in household employed full or part time (Mean)	1.3
Transportation	
Number of vehicles available to household (Mean)[b]	2.3
No "very reliable" vehicles available to household[c]	9.5%
Can get transportation help from others[d]	90.1%
Live in a metro county	63.3%
Live in an adjacent nonmetro county	20.5%
Live in a nonadjacent nonmetro county	16.2%
Outcome	
Transportation hardship[e]	25.7%

N = 653. Responses are weighted to be representative of the general population in the 5-county cluster.

[a]Characteristic of respondent.

[b]This value includes vehicles owned or leased by a member of the household, as well as any vehicles that are available to members of the household on a regular basis (e.g., company car).

[c]Vehicle reliability is reported on a 5-point scale where 1 equals "very reliable" and 5 equals "not working at all." This dummy variable equals 1 if a household has access, through ownership, lease, or other means, to a "very reliable" vehicle on a regular basis. The variable is coded 0 if the household does not have access to a "very reliable" vehicle.

TABLE 2 *(Continued)*

[d]Dummy variable equals 1 if a household can "always, often, or sometimes" and equals 0 if a household can "seldom or never" count on getting help with transportation or car repairs from people outside the household.
[e] Transportation hardship is coded 1 if the respondent reports that anyone in the household reported at least one of the following events in the previous 12 months: not having money for gasoline when a member of the household needed to travel, neglecting necessary car repairs because they were too expensive, allowing car insurance payments to lapse because payments were too high, missing a car payment, or having a vehicle repossessed.

To develop an understanding of transportation hardship among households in the ITES, a three-stage process was employed. First, respondent and household characteristics are described in Tables 1 and 2. Next, bivariate analyses are reported in Tables 3 and 4. The bivariate analyses tested for an association between transportation hardship and demographic, employment and transportation characteristics. Finally, Table 5 reports the results of a logistic regression equation that more fully explicates the correlates of transportation hardship.

Results

Descriptive Results

Table 1 shows the frequencies of responses to the five indicators of transportation hardship. Approximately 26% of the households reported having experienced one or more indicators of transportation hardship. The most common was neglecting necessary car repairs.

Our transportation hardship predictor variables included demographic, employment, and transportation characteristics. As shown in Table 2, ITES respondents averaged nearly 50 years of age and were predominantly white (95%). Respondents reported approximately 2 adults (age 18 or over) and less than 1 child (age 17 or younger) per household. Among the households with children, the average number of children was 2. Nearly half (46%) of the households in our study had total annual household incomes below $30,000. One out of three (33%) indicated that there was one adult in the household who was employed full or part time; approximately 44% of households had two or more adults who were employed full or part time.

Households in our sample had access to an average of about 2 vehicles. Ten percent of the respondents reported that the household

TABLE 3

Demographic Characteristics and Transportation Hardship[a]

	Percent reporting transportation hardship[b]
Age	
Quartile 1 (Age 18–34)	45.93 (4.92)
Quartile 2 (Age 35–46)	28.38 (4.35)
Quartile 3 (Age 47–61)	20.78 (3.97)
Quartile 4 (Age 62–90)	9.15 (2.71)
	$\chi^2 = 41.34$**
Race	
White	24.12 (2.11)
Non-white	55.98 (11.40)
	$\chi^2 = 7.54$**
Number of adults	
One adult in household	25.00 (3.61)
Two or more adults in household	26.02 (2.55)
	$\chi^2 = .05$
Presence of children	
No child in household	19.16 (2.38)
Children in household	39.05 (3.96)
	$\chi^2 = 29.85$**
Income	
Household income ≤2x poverty	36.93 (3.82)
Household income >2x poverty	20.09 (2.45)
	$\chi^2 = 14.02$**
Location	
Lives in metro county	26.78 (2.96)
Lives in adjacent or nonadjacent nonmetro county	23.84 (2.45)
	$\chi^2 = .588$

N = 653. Responses are weighted to be representative of the general population in the 5-county cluster.
*$p \leq .05$, **$p \leq .01$.
[a]Chi-square tests of independence between the report of experiencing transportation hardship and demographic characteristics are calculated using Rao–Scott chi-square approximation to account for the sampling design.
[b] The standard error of the estimate is reported in the parentheses.

did not have regular access to a vehicle that was “very reliable.” In terms of their residential location, 63% of the households lived in the metropolitan county, while 21% and 16% lived in adjacent and non-adjacent nonmetro counties, respectively.

TABLE 4

Employment, Vehicles, and Transportation Hardship[a]

	Percent reporting transportation hardship[b]
Adult employment	
No adult(s) working	16.52 (3.16)
One or more adults working	28.48 (2.51)
	$\chi^2 = 8.09$**
Number of vehicles	
One vehicle in household	25.14 (3.82)
Two or more vehicles in household	25.91 (2.50)
	$\chi^2 = .03$
Reliability of vehicles	
No "very reliable" vehicle in household	51.63 (7.60)
One or more "very reliable" vehicles in household	22.99 (2.15)
	$\chi^2 = 12.88$**
Can get help with transportation or repairs	
Seldom or never count on assistance	40.38 (7.17)
Always, often, or sometimes count on assistance	24.08 (2.18)
	$\chi^2 = 5.23$*

$N = 653$. Responses are weighted to be representative of the general population in the 5-county cluster.
*$p \leq .05$, **$p \leq .01$.
[a]Chi-square tests of independence between the report of experiencing transportation hardship and demographic characteristics are calculated using Rao-Scott Chi-square approximation to account for the sampling design.
[b]The standard error of the estimate is reported in the parentheses.

Bivariate Results

The chi-square analyses tested for an association between demographic characteristics and transportation hardship. As shown in Table 3, there was evidence of an association between transportation hardship and four demographic characteristics: the respondent's age and race, the presence of children in the household, and annual household income.

Individuals in the first age quartile, ages 18–34, were the most likely to report having experienced transportation hardship (46%). Reports of transportation hardship were less likely among older respondents, with only 9% of those in the oldest quartile reporting hardship. Transportation hardship also was more frequent among minority households. Twenty-four percent of White respondents reported experiencing transportation hardship, compared to 56% of non-White households. We found that the presence of children was

associated with transportation hardship. Approximately 19% of households without children reported having experienced transportation hardship, compared to 39% of households with children. As one would expect, annual household income also was associated with transportation difficulties. We defined low-income households as those with incomes below 200% of the official U.S. poverty threshold (Fisher, 1992). Approximately 37% of the low-income households reported experiencing transportation hardship, compared to 20% of households with income above 200% of poverty. Our bivariate findings were consistent with analyses of demographic correlates of other measures of material hardship conducted using nationally representative SIPP data (Bauman, 1995, 2002; Beverly, 2001).

Chi-square tests of employment, transportation characteristics, and hardship are shown in Table 4. There was evidence of associations between hardship and the number of employed adults, vehicle reliability, and whether or not the household could count on transportation assistance from others outside the household.

The presence of at least one employed adult in the household was associated with transportation hardship. Approximately 17% of households without an employed adult reported experiencing transportation hardship, compared to about 28% of households with an adult in the workforce. Our measure of employment status did not differentiate between full- and part-time work which may explain this anomaly. Beverly (2001) found highest levels of material hardship among SIPP respondents that were working part-time, slightly lower levels of hardship among those not working, and incidences of hardship among full-time workers to be about half the rate of part-time workers. Transportation hardship was associated with vehicle reliability. Among those households with access to one or more "very reliable" vehicles, 23% reported experiencing transportation hardship compared to 52% of the households that did not have a "very reliable" vehicle. Consistent with Bauman and Downs' (2000) research on access to social networks and reported material hardship, households with greater access to social support reported less transportation hardship. Forty percent of the households expecting they could "seldom or never" get help with transportation or car repairs from people outside the household reported transportation hardship compared to 24% of those that "sometimes, often, or always" could count on assistance from others. In the next section of the paper, these relationships are examined further in a multivariate model.

Multivariate Results

A multivariate logistic regression was estimated to more fully explore the associations between demographic, transportation, and employment characteristics, and transportation hardship. We estimated the model

$$y_i^* = ß + \sum_{j=1}^{k} ß_j x_{ij} + u_j,$$

where y_i^* was not observed. What was observed was a dichotomous variable y_i defined by

$$\begin{aligned} y_i &= 1 \quad \text{if } y^* > 0 \\ &= 0 \quad \text{otherwise.} \end{aligned}$$

We assumed that the distribution of u_i was logistic noting that for the logit model

$$log(Pi/(1-Pi)) = ß_0 + \sum_{j=1}^{k} ß_j x_{ij}, \tag{1}$$

where P_i equaled the probability that y_i equaled 1 (i.e., the respondent experienced transportation hardship in the last 12 months). The left-hand side of Equation 1 is called the log-odds ratio and is a linear function of the explanatory variables (Maddala, 1992).

In Table 5, for each explanatory variable x_j, we reported its estimated coefficient $ß_j$, and its corresponding t-statistic and marginal effect on the log-odds ratio. The coefficient and the log-odds ratio marginal effect both provide estimates of the change in the likelihood of experiencing transportation hardship associated with a change in the value of that predictor variable, controlling for all the other independent variables in the model (Kleinbaum, 1994). As with any nonlinear regression, however, a marginal effect calculated from an estimated coefficient varies across the range of values of that independent variable. Alternatively, the marginal effect of a unit change in value of a predictor variable on the log-odds ratio of the dependent variable is a constant over the full range of predictor variable values (Greene, 2000; Maddala, 1992). The discussions that follow focus on the marginal effects on the log-odds ratio. We provide t-statistics to demonstrate the statistical significance of the estimated coefficients.

TABLE 5

Logistic Regression Predicting Transportation Hardship[a]

Variable	Coefficient estimate[b]	*t*-statistic	Marginal effect on log-odds ratio
Intercept	1.59 (1.30)	1.225	
Demographic variables			
Age[c]	.01 (0.05)	.307	1.02
Age-squared	−.00 (0.00)	−1.243	1.00
White[c]	−.91 (0.61)	−1.488	.40
Number of other adults in household	.22 (0.28)	.769	1.24
Children present in household	.27 (0.14)	1.998*	1.31
Household income[d]	−.21 (0.07)	−3.153**	.81
Live in an adjacent Nonmetro county[e]	.07 (0.29)	.246	1.07
Live in a nonadjacent nonmetro county[e]	.01 (0.31)	.033	1.01
Transportation and employment variables			
Number of vehicles available to household[f]	.01 (0.15)	.089	1.01
No "very reliable" vehicle in household[g]	1.28 (0.410)	3.136**	3.61
Number of adults in household employed full or part time	.09 (0.24)	.371	1.09
Can get transportation help from others[h]	−.92 (0.36)	−2.533*	.40
Likelihood ratio (Cox−Snell): 0.198 −2 log likelihood: 60538.129 Negative log-likelihood: 0.193			

N = 653. Responses are weighted to be representative of the general population in the 5-county cluster.

*$p \leq .05$, ** $p \leq .01$.

[a]Transportation hardship is coded 1 if the respondent reports that a member of the household experienced any of the following in the previous 12 months: not having money for gasoline when a member of the household needed to travel, neglecting necessary car repairs because they were too expensive, allowing car insurance payments to lapse because payments were too high, missing a car payment, or having a vehicle repossessed.

[b]The standard error of the estimate is reported in the parentheses.

[c] Characteristic of respondent.

[d]Household income is a 10-category variable where 1 equals household income less than $10,000, 2 equals household income from $10,000 to $19,999, and so forth.

[e]The omitted category in this series of dummy variables is "live in a metro county."

[f]This value includes vehicles owned or leased by a member of the household, as well as any vehicles that are available to members of the household on a regular basis (e.g., company car).

[g]Vehicle reliability is reported on a 5-point scale where 1 equals "very reliable" and 5 equals "not working at all." This dummy variable equals 1 if a household has access, through ownership, lease, or other means, to a "very reliable" vehicle on a regular basis. The variable is coded 0 if the household does not have access to a "very reliable" vehicle.

[h]This dummy variable equals 1 if a household can "always, often, or sometimes" count on getting help with transportation or car repairs from people outside the household. The variable equals 0 if outside help is "seldom or never" available.

The chi-square associations suggested a relationship between demographic, transportation, and employment characteristics, and reports of transportation hardship. Our multivariate findings clarify these relationships. Two demographic characteristics were significant in the multivariate model: the presence of children in the household and annual household income were significant predictors of transportation hardship. Each additional child increased the likelihood that transportation hardship was reported by 31% (odds ratio = 1.31). Each $10,000 increase in annual household income was associated with a 19% decrease in the likelihood of reporting transportation hardship (odds ratio = 0.81). Bauman (1998, 2002) also found presence of children and low income to have significant effects across a number of different specifications of multivariate models. The significant effect of income was expected given the conceptualization of hardship as an alternative way of assessing economic well being. Bauman (1998) speculated that the influence of children, above and beyond the effect of income, may reflect the willingness of households with children to report hardship. Those with children may perceive these issues more acutely than those without children, and may feel more justified in not paying bills in order to meet other expenses when the latter are for the benefit of others with in the household. Our findings supported Bauman's hypothesis. The other demographic variables included in this model—age, race, the number of adults present in the household, and the location control variables—were not statistically significant correlates of transportation hardship after controlling for other factors.

The reliability of the vehicles was a strong predictor of transportation hardship. Respondents who reported that they did not have access to a vehicle that was "very reliable" were more than three times as likely to report transportation hardship than those who had access to a "very reliable" vehicle (odds ratio = 3.61). One interpretation of this finding is that unreliable vehicles are those in need of unaffordable repairs, one of the specific indicators in our measurement of transportation hardship. Finally, access to transportation assistance from others also was a significant predictor of hardship. Once again, we draw on analyses of SIPP data and find consistency in our results. The SIPP asked respondents several questions that tapped their ability to draw on social network support to meet needs. Bauman and Downs (2000) found that households with greater resources were more likely to expect help. Poor households and households having difficulty meeting basic needs were less likely to expect help than other households. Similarly, our analysis suggested that if the household could count on others who lived outside the household for help with transportation or car repairs, transporta-

tion hardship was reduced by 60% (odds ratio = 0.40). Regarding the other transportation and employment measures, the number of adults working in the household and the number of vehicles were not statistically significantly related to transportation hardship.

Summary and Policy Implications

Much has changed in the last 40 years regarding how social scientists and policy makers view economic well being and the roles of government and individuals in achieving it. The 1960s saw researchers attempting to conceptualize measures of need and hardship. Orshansky's (1965) studies of nutritional need became the basis for the official measurement of poverty in the United States. The War on Poverty focused on structural problems that hindered families in their efforts to achieve economic self-sufficiency (DiNitto, 2000). Federal programs were initiated and expanded at that time to assist families in meeting their basic needs. Today, many researchers argue that income-and consumption-based measures of well being are incomplete (Citro & Michael, 1995; Federman et al., 1996; Jencks & Torrey, 1988). Several federal programs and block grants for low-income families have been enacted or revised in the last decade as well. "These changes have (1) shifted program emphases from cash assistance to services that promote employment and economic independence and (2) provided states greater authority and flexibility to use funds and structure the design of program benefits and service delivery" (General Accounting Office, 2004, p. 1). The role of transportation in meeting needs has evolved over this period, too. Changes in employment, shopping, services, and transportation patterns suggest that today private transportation is a key component of meeting basic household needs and avoiding material hardship (Pucher & Renne, 2003). If this is true, efforts to enhance family economic well being hinge on researchers and policy makers understanding the role transportation plays in moderating, or contributing to, material hardship.

This study extended the conceptualization of material hardship to include transportation, employing analyses of a unique survey-based dataset. We found that transportation hardship is not uncommon in the general population. One-in-four surveyed households in the full sample and more than one-in-three low-income households reported one or more the following financial problems: needing to go somewhere but not having money for gasoline, neglecting car repairs, letting car

insurance lapse, missing a car payment, or having a vehicle repossessed.

Our bivariate analyses found a negative relationship between income and experiencing transportation hardship. That is, as household income increased, the likelihood the household had incurred transportation hardship decreased. Meeting the financial needs of vehicle ownership clearly requires income. Also, we found that young households, households with non-White survey respondents, and families with children were at greater risk of experiencing transportation hardship. Along with these demographic characteristics, we found that the likelihood of reporting transportation hardship increased if one or more adults in the household worked, if household members did not have access to a "very reliable" vehicle, or if household members could seldom or never count on getting help with transportation or vehicle repairs from others outside of the household. Our multivariate logistic regression analyses supported some, but not all, of our bivariate findings. Our regression results indicated that families with children and those with unreliable vehicles were more likely to experience transportation hardship; households with greater income and those with access to transportation-related support from others were less likely to report transportation hardship. Our other bivariate findings were statistically insignificant in our multivariate analyses.

The link between having access to a reliable vehicle and having a reduced likelihood of experiencing transportation hardship is important because current welfare policies in most states limit the value and/or the number of vehicles for TANF recipients (Urban Institute, 2002). As Ong (2002) pointed out, relatively low asset limits increased the likelihood that the vehicle would be an older, less reliable vehicle. Vehicle asset limits should be reconsidered in light of our results. In addition, strategies that are available currently in some states to assist low-income individuals with the purchase of more reliable vehicles, such as providing alternative financing or enhanced transportation-related cash assistance, should be expanded. The United States General Accounting Office (2004) reported that while 31 states offered used car purchasing programs in Spring 2003 in at least one location in their state, only four states indicated that more than half of the eligible applicants received support from this program. In lieu of increasing vehicle asset limits in assistance programs and expanding vehicle purchasing programs, alternative strategies for assuring that low-income households have access to reliable vehicles and affordable car repair assistance need to be considered. For example, financial management education has been shown to be a component of

successful car ownership programs and can be an important way to help families budget for the costs of owning and operating a vehicle (Office of Port JOBS, 2001).

Consistent with our findings that being able to count on others for transportation assistance relieves transportation hardship, researchers have linked access to social support networks with positive outcomes in other areas. For example, Ceballo and McLoyd (2002) found that access to a social support network led to improved parenting behavior. Similarly, evaluations of mentoring programs have found that a positive outcome of these programs has been an enhancement of the mentee's ability to develop a support network (Sipe, 1996). We argue that programs that allow for regular, frequent interactions among participants and program staff may have similar affects. We encourage transportation support program administrators to consider not only the tangible (financial and in-kind) benefits provided to participants through their programs, but also to seek ways to enhance the intangible (networking) benefits to individuals from taking part in a program.

The relationship between the presence of children in the household and the increased likelihood of experiencing transportation related hardship deserves further exploration. We did not find employment to be related to transportation hardship in our multivariate analyses. While we expected working to increase travel demands and thus create more financial pressures, it may be the case that the demands of nonwork trips, especially those for children, override any differential effects of employment-related travel. A more thorough examination of the causal relationships between household composition, employment, car ownership, and transportation hardship is a topic for future research and will require longitudinal data. Should the presence of children be found to create unique transportation needs for families, transportation assistance program administrators and policy makers would be wise to consider the number of children in the household in their program eligibility and benefit determination criteria.

To conclude, federal and state governments are increasingly recognizing that families seeking to achieve economic self-sufficiency have transportation-related needs that have to be met. A variety of support programs have been established to address these needs. Of the states responding to a GAO survey, the majority indicated that at least 1 location in their state provided public transportation subsidies (e.g., bus passes) (43 states of the 49 states responding), assistance with car repairs (43 of 46 states), van/shuttle service (39 of 47 states), car insurance assistance (37 of 41 states), fuel vouchers (33 of 46 states), and assistance with used car purchases (31 of 44 states) (General

Accounting Office, 2004). Additionally, the majority of states that responded indicated that between state fiscal year 2000 and Spring 2003, they had experienced an increase in the number of recipients of transportation assistance (23 of 37 states responding) and an increase in either the number or type of transportation assistance services they provided (22 of 37 states).

How to meet the transportation needs of families in light of the evidence from this study remains open to debate. The fragmented nature of the programs currently providing transportation services to low-income families perhaps indicates that policy makers either recognize the complexity of this issue or have not reached agreement on the best approach. Clearly, ownership of a personal vehicle offers the most flexibility in meeting daily transportation needs, but vehicle ownership typically entails significant financial commitments for families. Public transportation, on the other hand, can be much less costly for families monetarily. In light of society's reliance on personal vehicles, however, those who must rely on public transportation are at a disadvantage. Public transit users face greater travel time costs relative to private vehicle owners because of the sparse availability of public transportation in many areas of the country. Further, car ownership offers unique benefits over public transportation even in urban areas with extensive public transportation systems (Ong, 2002). Given the fiscal crises that states currently face, many states are considering future programmatic changes that would likely limit the availability of support programs to low-income families, perhaps eroding the progress that has been made in recent years (General Accounting Office, 2004). The challenge facing public policy makers is the three-way balancing of the costs associated with providing families with greater access to private vehicles, the costs related to expanding their access to public transportation, and the benefits these programs provide to families seeking jobs, education, and basic services.

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