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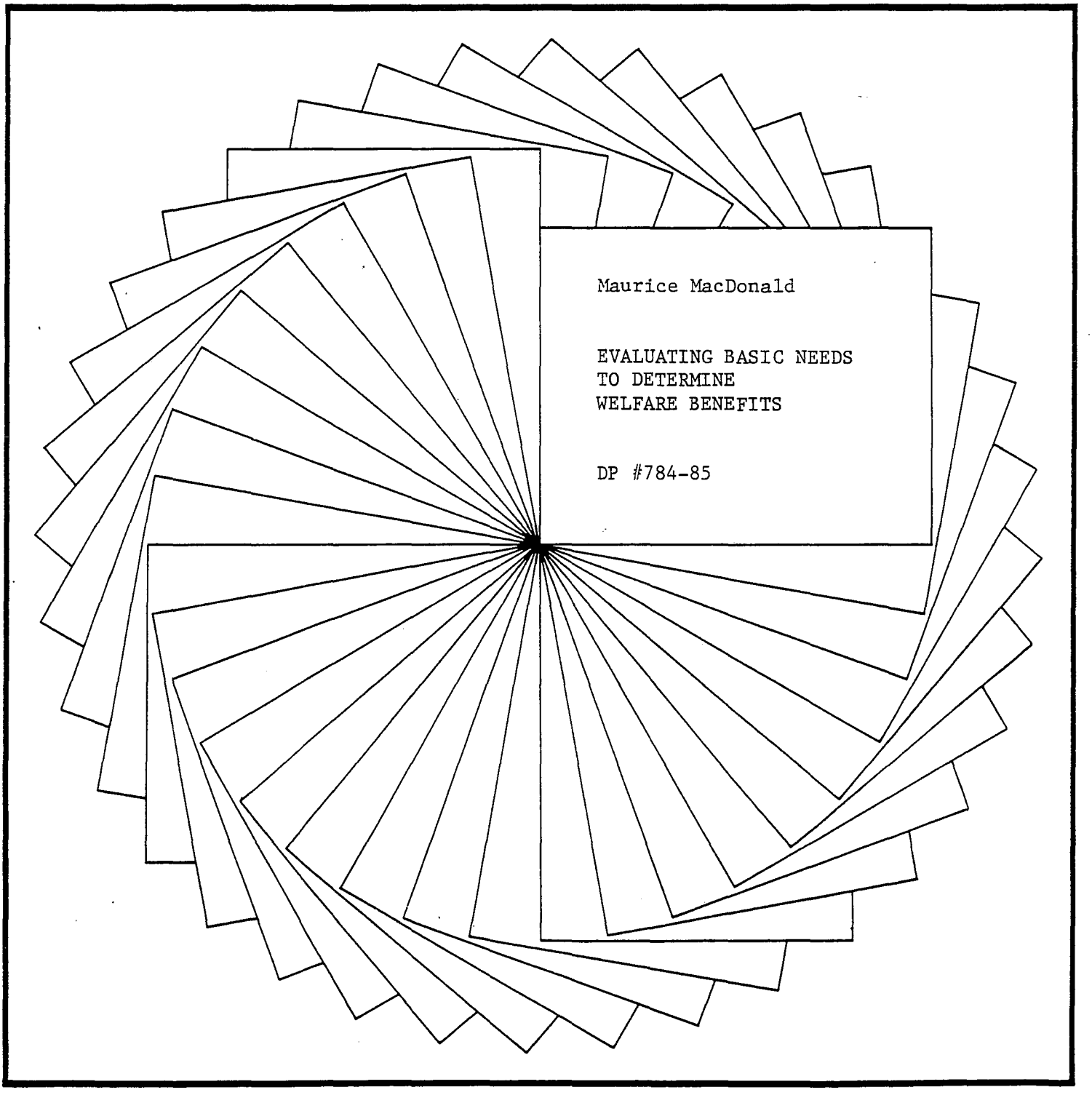

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EVALUATING BASIC NEEDS
TO DETERMINE
WELFARE BENEFITS

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Evaluating Basic Needs to Determine Welfare Benefits

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Abstract

The definition of economic well-being was evaluated for different household types in Wisconsin to recommend standards of need for Aid to Families with Dependent Children during 1985-87. Survey data for this purpose were obtained from the Wisconsin Basic Needs Study, in which the same households were interviewed five times and three two-week expenditure diaries were collected. The analysis compared respondents' subjective evaluations of minimum income needs to their objective economic circumstances. The subjective approach appeared to offer a promising alternative to the more costly collection of detailed expenditure information.

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Evaluating Basic Needs to Determine Welfare Benefits

1. BACKGROUND OF THE BASIC NEEDS STUDY

The definition of economic well-being and the procedure by which level of well-being is evaluated for specific households are central issues for policy analyses of income support programs and other social programs affecting the economic status of individuals. Welfare program administrators and policymakers confront the definition of economic well-being when they determine the costs of meeting the basic needs of program recipients in different types of households. During the past decade this task has been complicated by dramatic changes in the prices of necessities such as fuel and by better methods and data for analyzing household expenditure patterns. Hence in the late 1970s the Wisconsin Department of Health and Social Services (DHSS) decided it was time to reassess alternative concepts and measures of basic need and to gather data in Wisconsin for that purpose. The increasing attention to the conceptualization and use of existing measures of basic need was a primary motive for undertaking the Wisconsin Basic Needs Study (BNS). The BNS was conducted at the Institute for Research on Poverty with funding from the Social Security Administration. Its major findings and conclusions for welfare administration are reported here.

One example of a measure of basic need that has had numerous policy applications is the poverty line, developed by the Social Security Administration in 1964 and adopted, with revisions, by the federal government in 1969. This official measure is based on expert opinion about the nutritional needs of households and on information from surveys

of consumer behavior about the level of food expenditure required to maintain these nutritional standards. It provides a set of income thresholds adjusted for family size, age and sex of family head, number of children under age 18, and until recently, farm residence and sex of family head. Updated annually by the Consumer Price Index, the lines are specified in real dollar terms. Many observers have noted the deficiences of this widely used measure of economic well-being.[1] The dependence of the measure on judgments of nutritional needs and on assumptions about the stability of the proportion of income spent on food over time and across households of different type prompts serious questions about its validity. The use of Census income as the appropriate method by which to assess the poverty status of households is also questionable. Such income is vulnerable to transitory fluctuations and takes no account of in-kind transfers, which undoubtedly contribute to the well-being of a household.

The standard family budgets of the Bureau of Labor Statistics were another widely used measure of economic well-being until they were discontinued recently. These were constructed from expert opinion concerning requirements for shelter and nutrition and from analyses of consumer behavior to determine appropriate quantities of other goods and services. As was the case for the poverty measure, objections have been made regarding the use of the budgets as measures of basic need in state welfare programs. In its final report, the Bureau of Labor Statistics Expert Committee on Family Budget Revisions summarized and concurred with these objections. The committee concluded that "in a society as diverse and as far above subsistence as ours, we believe that the specification

of technical physical standards is no longer even conceptually appropriate as a way of arriving at living norms."[2] It further suggested that the appropriate measure of economic well-being should be a relative, but quantitative, standard derived from surveys of actual consumer behavior. The committee also found it appropriate and appealing to consider standards based on subjective evaluation of living levels. They stated "that people themselves are the experts when it comes to living norms--and that their assessment of what it takes to get along, what it takes to be comfortably well off, and so on, be tapped directly."[3]

These conclusions and the criticisms of the poverty line set the stage for planning the BNS. A series of meetings with DHSS personnel and periodic consultation with a national advisory committee for planning BNS led to the development of a sample design and survey instruments during 1980.[4] The survey collected detailed information on the demographic composition, financial situation and subjective well-being of 1817 households at five points during the time period March 1981 through June 1982. Field work for the survey was performed by the University of Wisconsin Survey Research Laboratory. The BNS sample was selected to represent a cross section of the state's population as well as to represent several populations of particular policy interest.

A unique aspect of the survey was that it collected both objective and subjective measures of economic well-being. The objective measures include the conventional economic approach that examines the complete distribution of consumer expenditures. The respondents' subjective evaluations of their incomes included responses to questions about the minimum necessary to make ends meet as well as other questions on subjective income needs. Variations in the objective and subjective measures by

household size, location, and other characteristics were to be examined for recommendations about the efficiency and quality of each approach.

Although the BNS has been used for a variety of research purposes,[5] we focus here on the main policy analysis of the BNS data, which was conducted during 1984. The specific interest of that analysis for DHSS was to revise and update the need standards for the Wisconsin AFDC program. DHSS then used the study recommendations to prepare its budget proposals to the legislature for 1985-87. The first task of the project was to identify and evaluate existing concepts and definitions of basic need. Four main approaches were identified and studied to determine what data to collect in the BNS survey. In the remainder of this section we describe and critique these four approaches. Section 2 explains how the findings of that evaluation were applied in structuring and conducting the BNS survey. Data preparation and sample characteristics are also described, to prepare for Section 3, which reports the procedures and results for revising and updating Wisconsin's AFDC standards. In the final section we summarize and consider how the findings may generalize nationwide.

For the purpose of administering income support programs such as Aid to Families with Dependent Children, state policy involves determining the amount of income necessary to meet minimal consumption needs. In the AFDC program this determination sets the need standard, from which the household's countable income is subtracted to determine the assistance payment amount. Usually there is one need standard for a selected household type, such as a 3-person household, and related standards for other household types (of size 1, 2, etc.). Once a set of need standards is

established it remains effective until policymakers update it in response to changes that influence the cost of basic needs. Thus for welfare policy purposes there are three main aspects to basic needs evaluation.

1. Setting the Reference Standard, or developing a method for determining the dollar amount necessary to supply the reference household type with sufficient income to meet its basic needs.

2. Deriving Family Equivalency Scales, or determining how much more or less households of types other than the reference household need.

3. Updating the Need Standards, or deciding how to revise the standards to account for changes in social and economic circumstances that affect the basic needs of the reference household type, and which might also change the relative needs of the different types of recipient households. The usual concern in this regard is how to adjust for changes in the price level, i.e., inflation.

For Wisconsin it was decided that the main task would be to recommend a set of need standards and a plan for updating them according to family size, residential location, and other household characteristics. These recommendations were to be used in the biennial Wisconsin budget process to determine AFDC assistance payment levels. The initial phase of the project involved evaluating four main approaches to basic needs definition.

Market-Basket Pricing. Two applications of the market-basket approach were discussed in the introductory remarks as examples of widely used measures of economic well-being. These were the official poverty line and the Bureau of Labor Statistics standard family budgets. In this approach the judgments of experts are used to select a market basket of specific quantities and types of goods and services which will provide the household's basic needs. In deciding which quantities of what goods to price, this process also considers a variety of households with different age-sex composition. For example the poverty line is based on the

specific food plans devised for individuals in a range of age-sex categories. Representative combinations of individuals can then be used to establish the food needs of households of various types. These food requirements are then priced to obtain the main element of the poverty-line need standards. The need standards are updated periodically by repricing the relevant goods.

Implementing this approach at the state level would be costly, since it would require periodically training and fielding pricetakers, who would collect data in all regions and representative localities. In addition to the expense, we judged that an important problem with the market-basket approach is that it relies too heavily on an expert's knowledge or attitudes about the spending patterns of low-income households. Unless actual spending patterns in Wisconsin were studied, there could be substantial discrepancies between the market baskets to be priced and what households actually buy.

For these reasons, we decided not to price selected items, nor to collect data on specific quantities of the goods consumed by BNS survey respondents. Instead, all information about consumption came from a detailed survey of dollar expenditures in particular categories.

Relative Income Approach. The relative income approach was suggested as a favored alternative by the BLS Expert Committee. It involves picking some point in the distribution of household incomes or total expenditures below which basic needs are not likely to be met, and above which they would be. To illustrate, suppose one-half the median income were chosen as the basic needs standard. In later periods, as the median income increased, the same relative point in the income distribution would define the basic needs standard. Hence this approach is easily

updated. However it would require recourse to other methods to define family equivalency scales, and the decision for choosing a particular reference point in the income distribution would have to be based on existing standards for measuring economic well-being, such as the official poverty line. Still, it is possible to demonstrate the validity of a particular relative income standard by determining what those below it cannot buy. With respect to the specifics of the BNS survey, this need to validate any proposed relative income standard meant that both income and expenditure data would be necessary.

Expenditure Analysis Approach. The need to justify any relative income standard in terms of what the standard permits households to buy led us to consider how expenditure data could be used for that purpose, as well as to set absolute standards for different household types. The economics literature provided considerable guidance for both setting a reference standard based on expenditure data and for deriving equivalency scales.[6]

With respect to the reference standard, the empirical studies of income effects on total expenditure allocation among goods in the tradition of Engel provided the useful insight that there is some income level at which the percentage of income devoted to necessities declines rapidly. Engel's original finding that food expenditures as a percentage of income decline dramatically after increasing fairly steadily over the lower range of incomes has been replicated often. Hence determining the level of income at which the share of total expenditures for basic necessities begins to decline markedly was seen as a practical method for selecting the income level at which basic needs are met for a reference household.

To derive equivalency scales to meet basic needs of different household types required a method that could be readily understood by policymakers. The iso-prop index proposed by Harold Watts offered a procedure that was conceptually consistent with the Engel rationale for the reference standard.[7] According to Watts, households that use the same percentage of total expenditures for necessities are equally well-off. Given an appropriate definition of necessities, it follows that adjustments in the amount of income required for households with different characteristics can be obtained by analyzing how much income is needed to permit the same expenditure share for necessities as the reference household.

In summary, the expenditure analysis approach would provide a basic needs definition in terms of the consumption share for basic necessities. For the survey the main implication was that measures of total expenditures would be required. Also there needed to be as much detail as feasible on categories of expenditure to permit distinctions between necessities and other goods.

Subjective Income Evaluation Approach. By contrast the subjective income evaluation approach to the measurement of basic need is derived from individuals' own assessments of the adequacy of their economic resources. Presumably individuals who are relatively well off and individuals who find it difficult to meet the needs of their families will be able to correctly identify and express their own situations.

The issue of the political feasibility of this approach was problematic. Legislators and the public may question whether low-income households' responses about what they need should serve as a guide for setting assistance standards. Insofar as it is based on the assumption that

subjective income responses alone would be used for setting the standards this skepticism seems reasonable. However the analytic methods for evaluating subjective income evaluations also use objective information on household size, income, and other circumstances to derive need standards. Hence we decided to use the subjective evaluation approach in the BNS survey to permit evaluation of its validity, and as a potential method for corroborating the results of analyses based only on objective income and expenditure reports. An early analysis of two subjective definitions of poverty with the BNS survey data provided important guidance for this decision.[8]

Several techniques have been used to ask respondents about their subjective definition of basic need. On the advice of the BNS national advisory panel a wide variety of these questions were administered in the BNS survey. However the main interest in the literature on basic needs has focused on techniques developed by Bernard van Praag and his colleagues.[9]

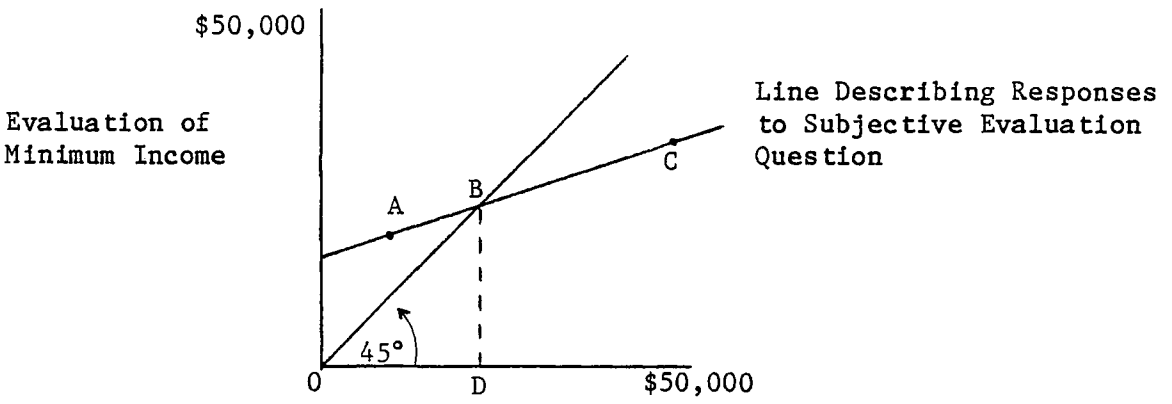
European economists have typically used two questions to obtain subjective evaluations of income. One asks that individuals identify the income amounts that correspond to nine different verbal evaluations of income; for example, "What amount of money would provide a good standard of living?"; "An excellent standard of living?" Once the incomes which correspond to these evaluations have been identified, a curve can be fit for each individual. Over many replications of this procedure, it has been determined that a lognormal distribution function adequately describes the individual curves. While these evaluations are obviously dependent on how well off the individual currently is, it is possible to use them to derive needs standards. For example, by considering those

families at the lower end of the income distribution, one could choose as a minimum standard the income level identified by these families as being "sufficient" or "good," reasoning that it is unwise to require families to exist on budgets that are less favorably subjectively evaluated.

The second technique simply asks what the respondents would consider the minimum necessary to make ends meet. Specifically the BNS question for this was, "Living where you do now and and meeting the expenses you consider necessary, what would be the very smallest amount of income per month--after taxes--your household would need to make ends meet?" The responses to this question were the ones analyzed for the AFDC recommendations.

Prior research had determined that the responses to the minimum income question are a function of current income. This linear function has interesting properties when compared to a line describing equivalence between current and minimum income needs responses. Consider the following diagram, in which the 45-degree line depicts current incomes equal to the minimum income response and the line connecting points A and C represents the actual relationship between current and minimum income derived in earlier studies.

Diagram



Point A represents a person whose subjective minimum income is greater than current income, i.e., this person is having trouble making ends meet. Point C represents a person who recognizes that he or she could get along with less income. The interesting part of the diagram is around point B--those people at or near the perceived minimum income levels. According to this subjective definition, point D would represent the basic need standard. This procedure has been used to measure and compare the levels of living in all countries of the European Economic Community[10] and for the entire U.S.[11] By analyzing the effect of other objective characteristics such as household size on subjective income responses, it is also possible to derive the equivalency scales needed for determining assistance payments.

With respect to updating the need standards, a valid subjective evaluation method offers the possibility of substantial cost savings relative to the expenditure analysis approach. Although both approaches require information on income and household demographics, the subjective questions are much less expensive to administer than those necessary to obtain detailed expenditure data. Furthermore, collecting expenditure data involves the extra respondent burden of keeping diaries, which has the potential for creating added problems of respondent cooperation. Hence another reason for pursuing the subjective approach in the AFDC needs standard analysis was to determine its value as a device to update need standards.

In summary, the evaluation of four alternatives for defining basic needs led to the conclusion that the BNS survey questionnaire would focus on household demographic characteristics, household incomes, household

expenditures in detailed categories, and subjective income evaluation questions. It also became clear that the AFDC need standards analysis for DHSS would probably require some combination of these approaches.

2. THE BNS SURVEY AND AFDC ANALYSIS SAMPLE

Because household income and expenditure patterns vary by season it was necessary to obtain information from the same respondents at selected intervals during all seasons. Therefore the BNS survey was a longitudinal study of Wisconsin households. Respondents, whose selection is described below, were interviewed five times over the course of 18 months. They also recorded daily expenses in diaries for three two-week periods.

A first personal interview (March-May 1981) collected background information on the respondent and other household members. After determining which other household members shared expenses for at least two of three necessity categories (food, shelter, clothing and transportation) the first interview collected information on the following: 1980 household income (separate amounts for 30 sources); household goods and vehicles; housing; personal well-being; criteria for income evaluation; demographic information on all household members; household assets and debt; medical insurance coverage; and subjective income evaluation.

Upon completion of the personal interview, respondents were randomly assigned to one of four panels to get three telephone interviews, each with the previous month as a reference period (see Table 1). During June through August 1982 a fourth and final telephone interview was also

Table 1

Basic Needs Survey Interview Panels and Monthly Telephone Interview Reference Periods

Interview Panel	First Monthly Interview	Second Monthly Interview	Third Monthly Interview
I	May 1981	September 1981	January 1982
II	June 1981	October 1981	February 1982
III	July 1981	November 1981	March 1982
IV	August 1981	December 1981	April 1982

obtained from all panels.[12] The data from the last interview were not used for the AFDC analysis.

Four main topics were addressed in the first three monthly telephone interviews--changes in household demographics, monthly expenses, monthly income, debt balances, and subjective evaluation of income and well-being. Expenses for the previous month were recorded within these expenditure categories: utility expenses, housing, loan payments, new vehicles, tools, photographic equipment, exercise or recreational equipment, major appliances and furniture, small electrical appliances, medical services, insurance, household services, alimony, child support, education, trips or vacation, repairs or maintenance, and clothing and other household items. Income received by each household member in the previous month was recorded for 16 income categories. Finally, the questions from the personal interview on current household debt, evaluation of life circumstances, and income evaluation were repeated in the monthly telephone interviews.

Respondents also completed three two-week diaries of all expenses during the months to which their telephone interviews referred. This procedure was mainly intended to measure food expenditures and other frequently recurring outlays, such as for personal care products and gasoline. Each day's expenses were divided among 17 categories--8 for food and 9 for nonfood.

The 2718 households originally selected for the BNS sampling were distributed among five subsamples. About half (1220) are from an area probability sample of the entire Wisconsin population and thus constitute a cross-section sample. Three hundred and thirty households were drawn by random sampling from a list of current AFDC recipients. Telephone

screening of households selected through random-digit-dialing within pre-specified geographic areas was conducted to locate households where either (a) the head of household was 65 years or older, (b) the head of the household was female and there were children but no male adult present, or (c) the monthly income of the household fell below 144 percent of the 1980 Food Stamp eligibility level. As shown in Table 2, the numbers of households sampled to represent each of these three special populations were 485, 226, and 457, respectively. Based on the known sampling fractions used to select the four oversamples, the Wisconsin Survey Lab developed a set of sample weights to produce a representative sample of Wisconsin households.

The number of completed first personal interviews was 1816, or 67 percent of the entire original sample. The table also shows the rate of personal interview completion for the five subsamples and the subsequent cumulative response rates for the four telephone interviews.[13] By the end of the BNS, about half of the entire original sample had attrited. Nevertheless, there were 1383 respondents to the final interview. Furthermore, 1307 respondents had completed at least three of the five interviews. The completion rate for the diaries was about 70 percent of those who responded to the monthly telephone interviews. Thus in addition to the loss of respondents who did not respond to interviews, diary nonresponse had to be considered for selecting a sample for basic needs analysis.

The analysis sample for AFDC standards represented the population of interest, i.e., families demographically eligible for AFDC exclusive of the income eligibility requirements. This criterion was fulfilled by 715

Table 2

BNS Cumulative Response Rates

Sample and Number Selected		First Personal (1980)	First Telephone (Monthly)	Second Telephone (Monthly)	Third Telephone (Monthly)	Final Telephone (1981)
Cross-section	1,220	72%	63%	60%	56%	57%
AFDC	330	43	36	33	31	31
Female head	226	73	65	63	58	58
Aged head	485	63	52	48	43	43
Low-income	457	72	63	59	56	57
Total	2,718	67	58	54	49	51

households, or 39 percent of the 1816 who responded to the first interview. Within this group it was decided to include respondents who had completed the first personal interview and at least two of the three monthly telephone interviews and the expenditure diaries. This reflected a decision to use the income and demographic data from the first interview and the income, expenditure, and subjective income needs responses from the monthly data. Of the 715 demographically appropriate cases, 413 had cooperated with the BNS sufficiently for use in the final analysis sample.[14] For the analysis of expenditures and subjective income responses, averages of expenditures and minimum income needs responses were used from the 1981-82 monthly interview data. Similarly the monthly income data were averaged to provide 1981-82 income averages. However preliminary analysis revealed that 1980 total income from the first personal interview provided more plausible results when substituted for the 1981-82 monthly income averages. The household size reported in the first personal interview was used for this variable in all analyses. While this misrepresents households that lost or gained members in 1981-82, the overall bias would be small.

3. ANALYSIS FOR WISCONSIN AFDC STANDARDS

Because there was uncertainty about how soon another survey could be conducted in Wisconsin to update 1985-87 need standards established from the BNS, DHSS wanted a reference standard that could be linked to periodically available indicators of the cost of living. Two types of indicators of changing consumption needs that mainly reflect the impact of inflation were evaluated as potential sources of information for updating the reference standard. These were the market-basket pricing

data from the CPI and changes in average wages, such as for Wisconsin manufacturing workers. Compared to the CPI, average wage changes for Wisconsin workers had the appeal of being specific to Wisconsin and of treating the AFDC population the same as the workers who help finance their benefits. As Wisconsin wages rise to counteract inflation Wisconsin AFDC benefits could rise to the same extent. However, DHSS rejected average wage changes because the standard of need may not be closely related to wages. For example average wages could rise because of productivity increases and thus have little relationship to inflation in the cost of basic needs. This logic led to the choice of the CPI as the device for adjusting for changes in the cost of living. The fact that the CPI is used to update the official poverty line was seen as a precedent for this recommendation.

Although CPI indices are published for Green Bay and Milwaukee, DHSS expected to use the national CPI in the belief that it more accurately reflected both the urban and rural spending patterns than the indices for these two Wisconsin urban areas. However it was left for the BNS analysis of family equivalency scales to determine whether there were differentials in basic needs between Wisconsin's urban and nonurban areas.

Ultimately the expenditure analysis approach was chosen for setting the reference standard and for deriving equivalency scales because of its objective nature and intuitive appeal. For the reference standard analysis, the specific task was to select an income level which could be referred to the CPI for updating.

Because the official poverty line is stated in terms of a specific income threshold and is also updated annually by the CPI, it seemed best to translate BNS sample household incomes into fractions of the poverty

line. This establishes an explicit link between observed Wisconsin expenditure patterns and the national poverty line, to help understand the implications of the findings. The income/poverty line brackets for analysis were constructed such that one bracket would center on the income level of the current AFDC need standard. In Wisconsin, the existing need standard for an 4-person reference family was 85 percent of the poverty line.

It was assumed initially that food, shelter, clothing, medical care, and transportation expenses represented a core of essential expenditures. However households recorded an unexpected amount of nonessential travel-related expenses in the diaries (e.g., car accessories and recreational equipment), which made it difficult to evaluate what total transportation expenditures truly reflected. Medical care expenses were also problematic because households with Medicare or Medicaid benefits receive them at little cost. To reduce the effect of confounding essentials and nonessentials, the definition of necessities was limited to food, shelter, and clothing--three categories for which there is little disagreement regarding their status as essential needs.

Table 3 summarizes the results with respect to the reference standard of need. Although it shows expenditures for an exhaustive set of categories, the discussion here focuses on food, shelter, and clothing. Taken together expenditures on these necessities behave as hypothesized. Households in the first two income categories spent nearly 60 percent of their income on the three basic need categories. Households in the other income categories spent declining proportions of their income (48.0 percent, 44.5 percent, and 38.9 percent respectively) on those goods. Also the single largest shift in consumption patterns occurs between the

Table 3

Percentage of Total Expenditures in Consumption Categories for AFDC Analysis Sample, by Income/Poverty Line

Expenditure Category	Ratio of Income to Poverty Line				
	0-0.75 (n = 9)	0.76-1.25 (n = 110)	1.26-1.75 (n = 101)	1.75-2.25 (n = 80)	Above 2.25 (n = 113)
Food	29.5%	22.2%	19.6%	18.4%	15.6%
Shelter	25.7	31.3	25.1	22.5	20.0
Clothing	3.8	3.5	3.3	3.6	3.3
Transportation	6.5	14.4	14.8	15.5	14.0
Medical care	0.2	2.4	2.6	3.4	2.5
Day care	0.0	0.5	1.0	0.9	1.1
Personal care	2.3	1.5	1.6	2.0	1.5
Household goods	10.9	5.0	6.6	7.2	8.4
Recreation	2.5	3.9	6.9	7.0	7.0
Debt service	2.1	3.3	4.7	4.3	6.7
Miscellaneous[1]	16.5	12.0	13.8	15.2	19.9
Total	100.0	100.0	100.0	100.0	100.0

[1]Miscellaneous: Insurance; educational expenses; alcohol; pet expenses; gifts; tobacco; reading material; and child support or alimony payments.

second and third categories, i.e., expenditure on food, shelter, and clothing drops by 15.8 percent for households with incomes between 125 and 175 percent of the poverty line. Overall, the findings indicated an expenditure pattern that was much more fixed for the first two income categories.

It was recommended to DHSS that setting the Wisconsin standard of need at the national poverty line would be a conservative response to the findings. Raising the need standard from 85 percent of the poverty line would still restrict recipients to a fixed expenditure pattern dominated by essentials. And until another survey was conducted in Wisconsin, it would be simple to update the reference standard with respect to annual changes in the official poverty line from the CPI.

However, this recommendation was not meant to imply that DHSS should adopt the family equivalency scale used in the national poverty line for different types of households. The question of what family equivalency scales should be used to adjust need standards for varying household circumstances was resolved by further analysis of BNS expenditure data.

The 1984 Wisconsin AFDC standards of need recognize differences in family size and residence in an urban area (county population of more than 70,000). These need standards were originally based on the BLS family budgets and have been revised on a judgmental basis since they were first adopted in 1974. For the 1985-87 biennium DHSS wanted information on the impact of four family characteristics: family size; location in an urban area; presence of a teenager; and one-parent versus two-parent households.

The choice of which expenditures to study further was resolved after considering the conceptual reasons for expecting that there would be different amounts of need associated with different household types. For the most part, this issue can be discussed with reference to household size.

The key concept that applies to household size as it affects basic needs is that larger households are expected to spend more in total but that there are economies of scale in consumption such that the addition of another member to an already large household will be less costly than an addition to a smaller household. This theory, corroborated often by previous research, holds that there are quantity discounts in buying more goods (food) and/or greater opportunities for spreading costs by sharing goods (housing). However, there is no reason to expect that the economies of scale in food consumption should be the same as in shelter, transportation, or other goods. Thus it is potentially necessary to analyze expenditure patterns for a variety of expenditure categories.

Yet without some method to account for the overall effects of household size, the analysis of separate categories is likely to provide different answers about scale economies for each category. And there would be no simple answer to what importance should be attached to the various equivalency scales. To resolve this issue economists have relied on utility theory and advanced econometrics in linear expenditure system (LES) models of family equivalency scales.[15] A key assumption in these LES models is that households of different size and composition have the same preferences in consumption. From that assumption (of a given utility function) it becomes possible to obtain a single set of equivalency

scales as a summary measure of the effects of household characteristics on consumption needs.

Despite its computational and theoretical advantages, the LES technique was not applied for DHSS. The reasoning was that policymakers might not accept the explicit assumption of similar preferences across households of different types, nor be able to understand the complexities of the LES econometric techniques sufficiently to trust the results. Instead we analyzed how different household characteristics affected total expenditures to get a single answer to the question of the effects of a particular characteristic on need. This avoided the problem of weighting the relative importance of various expenditure categories, but its obvious disadvantage is that the results reflect differences in expenditures on nonessentials as well as for basic needs. Still the fact remained that the reference standard of basic need was based only on expenditures for necessities. Hence the trade-off was to tolerate some ambiguity in the basic needs definition for the equivalency scale analysis to get results that could be easily explained to policymakers. Another implication of analyzing total expenditures out of income was that any differences due to household characteristics imply differences in the ability to save and to pay taxes, because total income is the sum of total expenditures, taxes, and saving.

Multiple regression was used to estimate models of 1981-82 monthly expenditures with variables for 1980 income, household size, and the other family characteristics as independent variables. The regression coefficient estimates of the influence of these characteristics were then used to calculate family equivalency scales.[16] All of the regression

models included variables for family sizes 2, 3, 5, and 6 or greater, 1980 annual income, and a sample selection term to account for any differences in expenditure that were associated with systematic differences in the characteristics of sample households excluded because they did not provide enough interviews or diary data (see note 14). Four models were analyzed. The first included only the family size, income, and sample selection variables. Each of the other three added an additional variable to prior models. Model 2 examined the area differential issue by including a variable for households residing in an urban county (Area I). Model 3 added another for the presence of a teenager (Teen), while Model 4 also included an indicator for two-parent households (AFDC-U).

In general the effects measured for family size, Area I, Teen, and AFDC-U were as expected, and the models had reasonable predictive ability. About 40 percent of total expenditure variation was explained, which is quite respectable for cross-section analysis. On the other hand, many of the regression coefficients were only marginally statistically significant. Given their reasonable magnitude and general agreement with previous research on equivalency scales, this was attributed to the fact that only about 400 households were in the analysis sample. We judged that in a larger sample the results would be statistically significant.

Table 4 presents the equivalency scales from the BNS regression analysis of total expenditures. Three other equivalency scales are also presented in Table 4 for comparison purposes: the one used in the official poverty line (for food); the one used in determining 1984 AFDC benefits in Wisconsin (based primarily on the BLS family budgets); and one

Table 4

Implied Family Equivalency Scales
(4-person family = 100)

	BNS, Model				Existing AFDC[a] Standards	LES[b]	Poverty Line
	1	2	3	4			
Family Size							
2	80	81	81	84	71	73	66
3	91	94	94	95	84	92	78
4	100	100	100	100	100	100	100
5	107	106	106	106	115	106	118
Other Differentials							
AFDC-U	--	--	--	6%	0%	31%	--
Teen	--	--	8%	8%	0%	17%	--
Area I	--	18%	18%	18%	3%	--	--

Source: Interviews with 413 families for the Wisconsin Basic Needs Study.

[a]Derived originally from BLS family budgets.

[b]Synthesized from the linear expenditure system results of van der Gaag and Smolensky from the 1972-73 BLS Consumer Expenditure Survey.

synthesized from the linear expenditure system findings of van der Gaag and Smolensky. The four family equivalency scales from our four regression models are shown on the left side of Table 4.

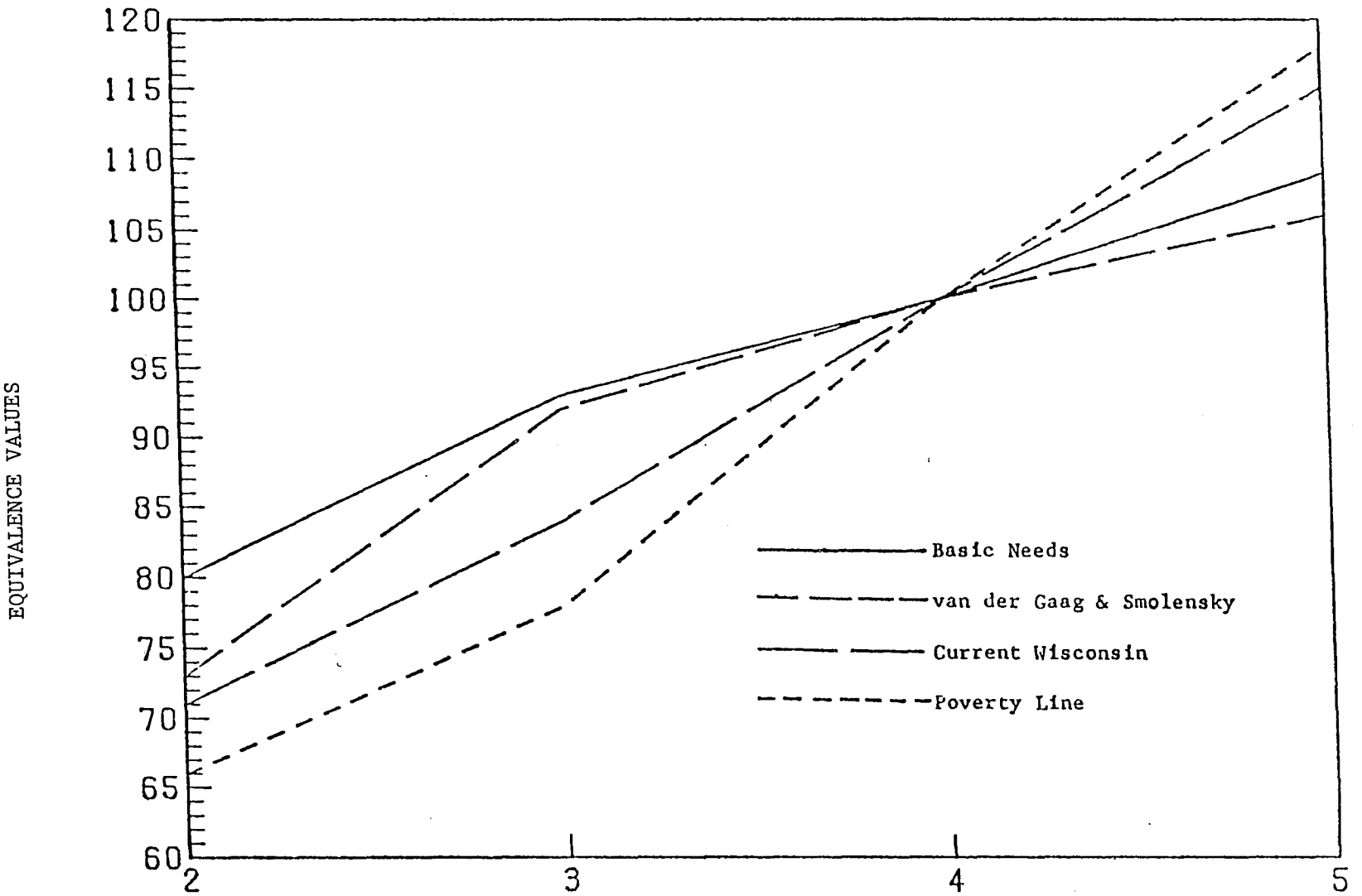
The numbers in Table 4 are indices of the cost of providing for basic needs relative to that for households of size 4. Hence the index is always 100 for 4-person families. In BNS Model 1, a family of size 3 has an equivalency of 91, which indicates that a 3-person household needs 9 percent less income. In that model, the 107 for families of size 5 indicates the need for 7 percent more income than for size 4.

Family Size. Because Model 2 used only the variables considered in the existing AFDC standard, it was used for comparison to the other three sets of family equivalency scale (FES) results. Figure 1 presents the graphical comparison of our BNS scale and the others with respect to family size. As evident there, the line representing the poverty line (food only) FES rises at an increasing rate of expenditure over the range of family sizes. However the BNS scale and the others (all based on total expenditures) rise more gradually.

Excluding the food-based poverty line, the BNS results were not that dissimilar from the other total expenditure scales. The difference at the low end is less than 10 percent, and less than 6 percent at the upper end. On the other hand, the BNS scale does have some unique attributes. Over the range of family sizes it only varies 29 points, compared to 44 points for the current Wisconsin scale, and over 50 points for the LES scale derived by van der Gaag and Smolensky. Compared to these, the BNS scale also has the highest equivalency value for family size 2.

FIGURE 1

FAMILY EQUIVALENCE SCALES



In budgetary implications of the BNS were of some concern in evaluating the results, particularly in regard to the issue of holding harmless those who would receive reduced benefits under the BNS scale. Any AFDC household with more than 4 persons would receive less than would be provided on the basis of the current Wisconsin scale. In addition to the probable cost of this, adopting the BNS scale would have the added effect of raising the equivalency value for those households with 2 or 3 members, i.e., 64 percent of the caseload. Thus insofar as household size alone was concerned, DHSS chose to emphasize the general similarity be-tween the existing AFDC equivalency scale and the BNS results. In brief, the DHSS interpretation was that the existing standard balanced the interests of the larger and smaller household sizes well enough.

Other Variables

The results from the models including the residence variable indicated a substantial effect on total expenditure associated with living in a county of more than 70,000 persons. This difference was surprisingly large--18 percent--whereas the existing Wisconsin need standards provide for a 3 percent increase for urban AFDC residents. Because this point estimate of an 18 percent differential lies within a confidence interval range that would include an area differential as low as 3 percent, this BNS result clearly implies that the existing differential is justified. And it was used by DHSS to decide that continuing with an area differential was necessary.

Holding other variables constant, the presence of a teenager increases the equivalency index by 8 percent. This finding suggested that DHSS was correct in its assumption that a "teenager bonus" might be

warranted. However it should be noted that confidence in this finding was shaky because of the correlation between larger household sizes and the presence of a teenager.

Because Wisconsin provides AFDC benefits to eligible households in which both natural parents are present, the extent to which two-parent families require more resources than one-parent families is an important issue. The implied equivalency scales for a two-parent household is 18 percent greater than for a one-parent household. Hence it was recommended that DHSS determine the cost implications and incentive effects of providing greater benefits for two-parent recipient households.

Analysis of Minimum Income Responses

Sample respondents' subjective assessments of the minimum income they needed per month were substituted for total expenditures in further regression analysis of equivalency scales. The same sets of variables used to analyze total expenditures were regressed on minimum income needs. For that extension the question at issue was whether subjective income evaluation could be used as an alternative to a total expenditure approach to basic needs for different types of households.

Models 2 and 4 are compared in Table 5 for the minimum income needs results and for the total expenditure scales shown earlier (Table 4). With respect to family size the results of the subjective analysis were remarkably similar to those for the objective measures of total expenditure. On that basis alone one could argue that the subjective approach is a promising option for surveys intended to obtain data to update equivalency scales for AFDC need standards. However the differentials

Table 5

Comparing Family Equivalency Scales from Regressions on Total Expenditures and Minimum Income Responses (4-person family = 100)

	Model 2		Model 4	
	Total Expenditure	Minimum Income	Total Expenditure	Minimum Income
Family Size				
2	81	85	84	86
3	94	93	95	94
4	100	100	100	100
5	106	110	106	110
Other Differentials				
AFDC-U	--	--	6%	1%
Teen	--	--	8%	1%
Area I	18%	9%	18%	10%

in minimum incomes associated with area, two parents, and teenagers were much smaller than those derived from total expenditure analysis. For example, the teen differential was about one percent in the minimum income results, as compared to the 8 percent implied by the total expenditures analysis. Therefore the minimum income analysis did not produce the same conclusions for all household characteristics as found for the objective expenditure measures. Yet for family size and area identical policy conclusions would be obtained from either the subjectively or objectively derived BNS equivalency scales.

4. CONCLUSION

It was initially decided that the reference standard of basic need would have to be selected to permit easy linkage to the national CPI for the purpose of updating that reference standard. The CPI was chosen instead of an average wage index for Wisconsin because the CPI is a more reliable indicator of changes in the price level than are wage changes. Thus incomes of BNS households were categorized relative to the poverty line for expenditure analysis. The level of income relative to the poverty line at which BNS households who were demographically eligible for AFDC spent a noticeably smaller proportion of their incomes on food, shelter, and clothing was found to be above 1.25 times the poverty line. Because the existing AFDC need standard was set at 85 percent of the poverty line, a conservative approach to defining basic need in Wisconsin would be to set the reference standard at the official poverty line. And, as the official poverty line rises with the CPI, this new reference standard could be readily updated.

The remainder of the BNS analysis was devoted to deriving family equivalencies to adjust for the different needs of varying household types. Analyses of both subjective minimum income needs and objective total expenditure variables were conducted to determine the practicality of the subjective approach, in which respondents are asked directly about income needs. The logic of the expenditure analysis of equivalency scales is that differences in the proportion of income spent reflect what different families need to meet basic needs. Thus we conducted regression analyses of the effects on total expenditures of income and household characteristics, with households of size 4 as the reference household. Comparisons of the equivalency scale for family size that resulted from the BNS analysis to those derived from national data revealed that the BNS scale was in general agreement. On the other hand, there were important differences between the BNS scale and the official poverty line equivalencies based on food expenditures. Thus although the poverty line can serve as a reference standard of need, its food-based equivalency scales could be very misleading for adjusting payments to account for different household sizes.

The finding that there were greater total expenditures by urban households led to the recommendation that the existing area differential should at least be retained, if not increased. The equivalency scales also indicated that DHSS should consider differentials to account for the presence of teenagers and two adults in the family.

Although the results for teens and two-adult households in the minimum income needs analysis did not agree with those from the expenditure analysis, the findings from minimum income responses provided similar

conclusions for family size and urban residence. In particular the family size equivalencies for minimum income were remarkably similar to those for total expenditures.

More validation is needed, but the subjective minimum income approach to determining family equivalencies appeared to be a promising alternative to the more costly procedure of collecting total expenditures. At the least this means that other states considering any basic needs survey research should also use subjective minimum income questions. Beyond this the advantages of the minimum income approach might encourage some to rely on it for setting the reference standard as well as deriving equivalency scales. In considering this, analysts must be mindful of the importance of communicating the fact that objective data on household incomes and other demographic characteristics must also be used to evaluate the subjective needs responses. The key point in this regard is that low-income households tend to say they need more than their current income and for high-income households say the reverse. Regression analysis to control for this income effect and for other influences thus requires collecting those objective data. This fact can be used to convince policymakers there is an important objective element in the subjective income evaluation method.

Despite some merit in the argument that there are offsetting cost-of-living disadvantages to living in both urban and nonurban areas, the BNS data showed that total expenditures and minimum income needs are greater in urban Wisconsin counties. Conveying how this area differential arises was difficult. In part this problem was overcome by emphasizing that the regression procedure holds income differences between areas constant.

Our results counter the common view that urban residents spend more simply because they have more income. The interpretation for DHSS also stressed that the population density of urban areas generates costs of living (e.g., increased rents) that are not as important elsewhere. The evidence for Wisconsin thus suggests that there may be important area differentials in other states, and that the magnitude of these will depend on the areal distribution of each state's population.

Finally, because there is some subjective element in all approaches to defining and measuring basic need, it was important that we were in constant communication with DHSS analysts and administrators, and that they provided clear indications of their views. Because there is more than one answer to the subjective aspects that arise in any approach, decision-making can be greatly enhanced by this close communication. We were fortunate to hear the diverse views of DHSS staff members in the planning phase as well as the advice from national advisory panel members. When it came time to produce the main analysis, DHSS wisely chose a single adviser with the authority and experience to provide unambiguous reaction to tentative decisions about the analysis techniques. This helped greatly to design methods that were defensible theoretically, but which could be evaluated by policymakers.

Notes

[1]See U.S. Department of Health, Education, and Welfare, The Measure of Poverty: A Report to Congress as Mandated by the Education Amendments of 1974 (Washington, D.C.: GPO, 1976); and Marilyn Moon and Eugene Smolensky, Improving Measures of Economic Well-Being (New York: Academic Press, 1977).

[2]BLS Expert Committee on Family Budget Revisions, New American Family Budgets (New York: Center for Social Sciences at Columbia University, 1980), pp. 35-36.

[3]Ibid., p. iv.

[4]The members of the BNS national advisory committee were Eugene Smolensky (Chair), Institute for Research on Poverty; Lee Rainwater, Harvard Department of Sociology; Daniel Friedman, Cambridge, Mass.; Robert Lang, Wisconsin Fiscal Bureau; Robert Klein, Social Security Administration; Eva Jacobs, Bureau of Labor Statistics; Edward Maher, Connecticut Department of Income Maintenance; Halliman Winsborough, Wisconsin Department of Sociology; Nancye Campbell, Social Security Administration; Bernard Stumbras, Wisconsin Department of Health and Social Services; Mary Ann Cook, Wisconsin Department of Health and Social Services; and Gary Chamberlain, University of Wisconsin Department of Economics.

[5]This work included a contract to evaluate the impacts of the Omnibus Reconciliation Act of 1981 from the Food and Nutrition Service, USDA; eight interim reports on a variety of topics to DHSS: three journal articles; and five masters' theses. For citation see Maurice MacDonald,

"Evaluating Alternative Approaches to Measuring Basic Needs," Wisconsin Basic Needs Study, Final Report to the Social Security Administration, Madison, Wis., September 1984, mimeo.

[6]Angus Deaton and John Muellbauer, Economics and Consumer Behavior (New York: Cambridge University Press, 1980).

[7]Harold Watts, "The Iso-Prop Index: An Approach to the Determination of Differential Poverty Income Thresholds," Journal of Human Resources (Winter 1967), 3-18.

[8]Diane Colasánto, Arie Kapteyn, and Jacques van der Gaag, "Two Subjective Definitions of Poverty: Results from the Wisconsin Basic Needs Study," Journal of Human Resources, 19, (Spring 1984), 127-138.

[9]T. Goedhart, V. Halberstadt, A. Kapteyn, and B. Van Praag, "The Poverty Line: Concept and Measurement," Journal of Human Resources, 12 (Fall 1977), 503-520.

[10]B. Van Praag, A. Kapteyn, and F. Herwaarden, "The Individual Welfare Function of Income: A Lognormal Function," European Economic Review, 11 (1979), 395-402.

[11]Sheldon Danziger, Jacques van der Gaag, Eugene Smolensky, and Michael Taussig, "The Direct Measurement of Welfare Levels: How Much Does it Take to Make Ends Meet?" Review of Economics and Statistics, 66 (August 1984), 500-505.

[12]The final telephone interview updated the household roster, as well as the data on assets, debts, and consumer durables. However, more information about durables was obtained, i.e., the year of purchase and purchase price. Detailed income questions for each person in the household referred to calendar year 1981, as did extensive questions on

household state and federal income taxes. A final set of subjective evaluations of income and well-being was obtained, and the survey concluded by eliciting a complete marital history for the respondent.

[13]Although the response rate among the sample groups was fairly random, the AFDC oversample had a much lower response rate. Still there is no apparent reason to assume that the AFDC respondents are different from those in the list they were selected from. This problem was also mitigated in that the female-head and low-income sampling groups also contained AFDC recipients.

[14]The issue of potential selection bias with respect to the characteristics of the 413 versus the 715 was handled by incorporating Heckman's sample selection term. This accounts for any differences in expenditures that were associated with systematic differences between the excluded households and those we analyzed. The results indicated that the excluded households had characteristics more like those in the analysis sample who spent more out of total income. However, including the Heckman selection term controlled for this bias. See James J. Heckman, "The Common Structure of Statistical Models of Truncation, Sample Selection, and Limited Dependent Variables and a Simple Estimator for Such Models," Annals of Economic and Social Measurement 5 (Fall 1976), 475-492.

[15]Jacques van der Gaag and Eugene Smolensky, "True Household Equivalence Scales and Characteristics of the Poor in the United States," Review of Income and Wealth, 28 (March 1982), 17-28.

[16]As explained earlier, the reference standard of need can also be derived from minimum income needs. DHSS did not view this as a politically feasible option for recommendations about that reference standard. However, see Colasanto, et al. for an analysis of a reference standard based on BNS data for all Wisconsin households.