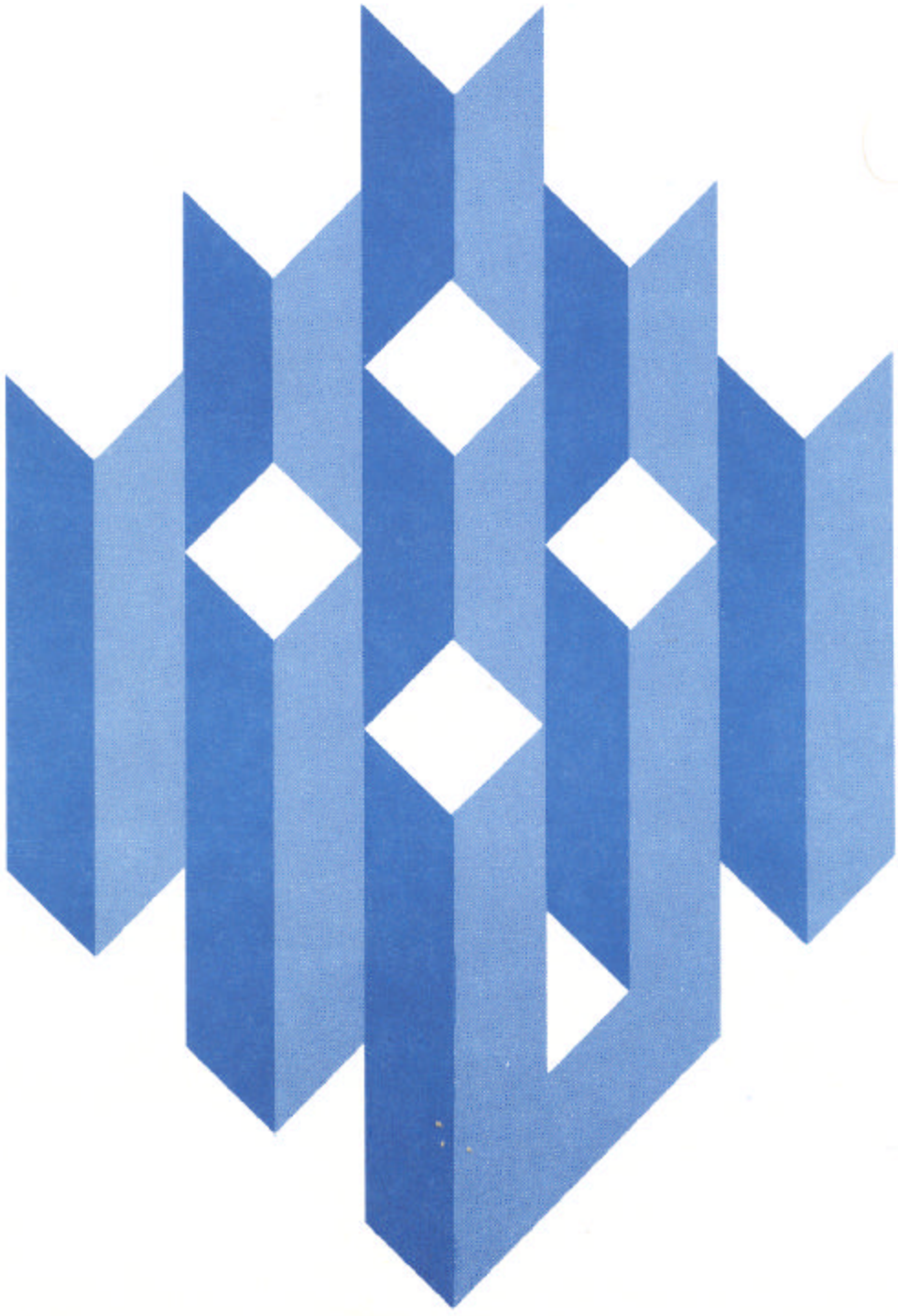
Changes in Spending Patterns Following Unemployment

Unemployment Insurance
Occasional Paper 81-3

U.S. Department of Labor
Employment and Training Administration



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Occasional Paper 81-3

U.S. Department of Labor
Ray Marshall, Secretary

Employment and Training Administration
Ernest G. Green, Assistant Secretary for
Employment and Training

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This report was prepared by Paul L. Burgess and Jerry L. Kingston, Associate Professors of Economics, Arizona State University, and Robert D. St. Louis, Manager, UI Research and Reports Section, and Joseph T. Sloane, Manager, Contract Research Unit, UI Research and Reports Section, Arizona Department of Economic Security, under sponsorship of the Unemployment Insurance Service of the Employment and Training Administration, U.S. Department of Labor.

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This study is the sixth in a series of reports based on the Arizona Benefit Adequacy (ABA) Study. The first report emphasized the measurement of benefit adequacy under the prevailing and selected alternative weekly benefit amount formulas. The second report focused on the adjustments undertaken by beneficiary households during periods of thirteen and twenty-five consecutive weeks of compensated unemployment. The third study analyzed the labor market experiences of those study group claimants who exhausted their entitlement to unemployment insurance (UI) benefits. In the fourth report, estimates of the changes in regular UI program costs associated with changes in the weekly benefit amount formula were provided, and a general procedure was developed for assessing the impact of changes in the weekly benefit amount formula on UI program costs and benefit adequacy. The fifth report provided an analysis of the possibility of predicting benefit adequacy values for individual claimants on the basis of information normally available from UI agency records and on the basis of information available from the Continuous Wage and Benefit History files.

The present report represents a direct extension of the analysis provided in the second report on this study. A brief summary of some portions of this earlier report is provided in this paper as background for the analysis. Whereas the second report dealt with a wide variety of adjustments made by persons unemployed for thirteen and twenty-five consecutive weeks, this report provides detail on the changes in spending on thirteen categories of expenditures made by the study group between the preunemployment month and the month prior to the thirteenth week of unemployment.

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The major purpose of unemployment insurance (UI) is to provide some measure of income security during temporary spells of unemployment for workers who become involuntarily unemployed and have an established record of employment during the period immediately prior to unemployment. The degree of income security provided by UI benefits has been limited by the cost of providing benefits and by the stronger disincentives to return to work that presumably result from higher UI benefits. Thus, it is accepted by nearly all observers that UI benefits "should" provide considerably less than "full" income security by replacing considerably less than 100 percent of the wages lost by insured workers. The exact portion of lost wages that "should" be insured by UI benefits is, of course, a subjective issue. However, a goal commonly accepted is to replace about half of the weekly wages lost by UI claimants, up to some maximum weekly benefit.

One way to assess the degree of income security provided by UI benefits is to analyze the adjustments undertaken by unemployment insurance beneficiaries (and their households) following the onset of their unemployment spells. A wide variety of the adjustments made by the study group was analyzed in a previous report,[1] and these findings are summarized briefly below as background for the analysis presented in this report. Among the adjustments previously investigated was the reduction in total payments made by the study group for "necessary/obligated" expenditures during the interval between the "preunemployment month" and the month prior to the thirteenth consecutive week of compensated unemployment.[2]

Expenditure adjustments undertaken by UI claimants and their households certainly are of major importance in assessing the extent to which UI benefits cushion the loss of income that results from the beneficiary's unemployment.

Such adjustments also serve as an indication of the overall consequences of continued unemployment. For these reasons, this report provides additional detail not contained in earlier ABA study reports on the expenditure adjustments made by beneficiaries and their households. The analysis presented here focuses on spending adjustments undertaken in each of the ten categories that comprise necessary/obligated expenses, and in three specific expenditure categories not included in necessary/obligated expenses.

This additional analysis addresses three main issues. First, as noted above, additional detail on the magnitude and composition of expenditures adjustments undertaken by UI beneficiaries and their households is of use in assessing the overall consequences of continued unemployment and the extent to which UI benefits alleviate the financial hardships that result from the beneficiary's unemployment. Second, detailed information on expenditure changes for individual categories of expenditures provides one basis for determining how "important" spending in various categories is to the insured unemployed; this information then could be utilized to determine which expenditure groups would be most appropriate for inclusion in a conventionally defined benefit adequacy measure. Third, the data provide a basis for evaluating the hypothesis that the magnitudes of the spending reductions in given expenditure categories are inversely related to the degree of benefit adequacy provided by the beneficiary's weekly UI benefit payment. This hypothesis is based on the assumption that the financial pressures experienced by beneficiary households as a consequence of the beneficiary's unemployment are inversely related to the adequacy of UI benefits for the beneficiary.

As noted above, the spending adjustments considered here are based on the difference between paid expenses during a "typical" preunemployment month and paid expenses during the month prior to the thirteenth consecutive week of

compensated unemployment.[3] No attempt is made to determine whether the adjustments made by this group would have been quite different, had these persons been unemployed for a much shorter or longer period.[4]

STUDY BACKGROUND

Information on study design and the definitions of the household unit and the benefit adequacy measure utilized in this report are summarized in this section. The characteristics of the claimants analyzed are discussed in Appendix A.

Design of Original Study

The Arizona Benefit Adequacy Study was initiated in the summer of 1975 to investigate the adequacy of UI benefits relative to the preunemployment standard of living established by the beneficiary household. The study also was designed to assess adjustments undertaken by beneficiaries and their households during an unemployment spell of up to twenty-five consecutive weeks in duration. Three sets of household interviews were conducted. The first, which was administered after five consecutive weeks of compensated unemployment, was designed to obtain information about each beneficiary household's preunemployment income and expenditure levels during a month of typical employment. The second and third interviews occurred following thirteen and twenty-five consecutive weeks of compensated unemployment; these interviews were designed to obtain information about the adjustments undertaken by each beneficiary household in response to the beneficiary's prolonged unemployment spell. Study group claimants who had exhausted their entitlement to all benefits also were surveyed by mail at the end of the second, fourth and sixth months following benefit exhaustion. The survey work for all phases of the study was completed in February 1978.

The Household Definition

Definition of an appropriate household unit concept is of major importance in benefit adequacy research because income and expenses are obtained for this entire unit; as a result, the measure of benefit adequacy itself depends importantly on who is and is not included in the beneficiary's household. The definition of the household unit used in the ABA study revolves around the beneficiary, rather than around the "head" of the household as is commonly done in the other survey research. The basis for this distinction is that the beneficiary is the focus of interest for the UI program and for benefit adequacy research, and the beneficiary is not the household "head" in many instances. The household definition used in the ABA study and in this report includes the beneficiary and, if present, the spouse and all persons who reside with the beneficiary/spouse and receive at least 50 percent of their monthly support from the beneficiary/spouse. Spouses are included in the household unit on the assumption that they share expenses and income with the beneficiary. The appropriate basis for including/excluding other persons in the household unit is somewhat more subjective, and it is recognized that the 50 percent criterion is somewhat arbitrary. Overall, this definition was chosen because it: 1) facilitated the collection of accurate income and expense data for the entire household unit; and 2) was useful in analyzing the adequacy of weekly UI benefit payments and the adjustments made by household units following unemployment.

The Measure of Benefit Adequacy

Previous benefit adequacy studies consistently have focused on a benefit adequacy measure that is based upon a comparison of the claimant's WBA with the expenditures for specific types of goods and services. The expenses that

should form the benchmark against which the WBA is compared has been a matter of judgment. The larger is this expenditure set, the less adequate UI benefits would appear to be, unless some offsetting reduction in the proportion of these expenditures that the WBA "should" replace is considered. For the purposes of this study, the relevant expenditure set encompasses paid expenses for "necessary/obligated" goods or services during the preunemployment month--a month of employment prior to unemployment selected by the claimant as most "typical" of his/her usual employment situation. This expenditure set consists of "necessary" expenses for goods and services acquired and consumed by the household on a regular basis, and "obligated" expenses that are expected to be met on a regular basis because of established commitments. The rationale for this definition is that it is based on the standard of living established by the beneficiary household. Expenses which meet the above criteria are assumed to constitute the "core" component of the household living standard. Generally, the household unit becomes accustomed to this standard of living, and rapid downward adjustments in it are difficult to make following the onset of the beneficiary's unemployment spell.

The items included in the necessary/obligated expense definition are the following:[5]

1) housing (including utilities and necessary maintenance);

2) food purchased in grocery stores;

3) medical care (including prescriptions and payments on past medical care);

4) credit and loan payments;

5) clothing;

6) transportation (including gasoline and maintenance);

7) insurance (including union dues);

8) services and other regular payments;

9) continuing and regular support of persons outside of the household; and

10) lump-sum payments for property and income taxes.

It should be emphasized that the beneficiary's share of these necessary and obligated expenses may be considerably less than the total for the entire household. Because UI benefits are wage-related, it reasonably can be argued that the weekly UI benefit payment should be expected to sustain (at most) the same share of total necessary/obligated expenses that the beneficiary's wages sustained while the beneficiary was employed. On this basis, the total of the beneficiary household's necessary/obligated expenses in the preunemployment month were adjusted by the ratio of the beneficiary's gross wage in the preunemployment month to the total of gross recurring household income in the preunemployment month. Accordingly, the measure of benefit adequacy employed in this analysis is the ratio of the WBA to the beneficiary's "proportionate share" of the (weekly) necessary and obligated household expenses that were paid during the preunemployment month. This measure is given by:

$$\text{BENAD} = \frac{\text{WBA}}{(\text{EXPENSES}) \times (\text{BEN. SHARE})}$$

where:

BENAD is the measure of the adequacy of the weekly benefit payment for an individual beneficiary;

WBA is the maximum UI weekly benefit payment to which the beneficiary is entitled on the basis of earnings in the high quarter of the base period;[6]

EXPENSES is the total of the (weekly) necessary/obligated expenses of the beneficiary household during the preunemployment month; and

BEN. SHARE is the ratio of the beneficiary's gross wages in the preunemployment month to total gross recurring household income during the same month; this ratio defines the beneficiary's "proportionate share" of the necessary and obligated expenses of the beneficiary household.

INTERPRETING ADJUSTMENTS TO UNEMPLOYMENT

As noted above, the adjustments undertaken by beneficiaries and other household members in response to the beneficiary's unemployment provide an indication of the overall impact of short-term unemployment. It should be emphasized, however, that whether any household undertakes a particular adjustment depends on both the overall pressures to make some adjustments and the relative ease with which the particular adjustment under consideration can be made. Given the relevant constraints confronted by the household, the rational response of each household obviously would be to choose an optimal pattern of adjustments, based upon the (monetary and nonmonetary) benefits and costs of the alternative adjustments available.

Many of the major adjustments made by households in response to unemployment are undertaken in an attempt to maintain household living standards following unemployment, and these adjustments and the resulting consumption patterns may be interpreted within the framework of a commonly accepted theory of consumption developed by Friedman.[7] According to this theory of consumption:

1) household members are able to make fairly accurate estimates of the total and intertemporal pattern of their lifetime earnings;
2) household members choose a pattern and level of consumption that maximizes utility over their lifetimes;
3) current consumption spending is affected very strongly by changes in "permanent" income; and
4) current consumption spending is affected very little by changes in "transitory" income.

The directly applicable implications of Friedman's theory of consumption for the present analysis are quite clear. The onset of the beneficiary's unemployment spell causes a significant reduction in the flow of measured income to the household. Large reductions in household consumption spending following the beneficiary's unemployment would reflect large reductions in

estimated permanent household income, whereas very small reductions (or no changes) in household consumption would reflect very small reductions (or no changes) in estimated permanent household income. These implications are reasonable ones in the present context because preunemployment month expenses serve as the benchmark against which expenditure changes are measured, and these preunemployment month expenditures are the payments made by these households during a month of "typical" employment by the beneficiary. Hence, these preunemployment month expenses may be viewed as a reasonable proxy for consumption that depends on permanent income.[8] In this context, fully anticipated unemployment spells would be expected to have little effect on current consumption patterns.[9] Moreover, within this framework, one way to evaluate the severity of unemployment spells and the extent of income security provided by UI benefits would be to measure the magnitude of consumption changes made by UI claimants, and the extent to which UI benefits helped to maintain prior levels of consumption spending.[10]

The above framework provides a basis for evaluating adjustments to unemployment (particularly consumption changes) for the study group as a whole. Also analyzed below are the adjustments made by households, classified by the adequacy of UI benefits received by the beneficiary in each household. Within the above framework of optimal adjustment patterns, the basic hypothesis examined is that the relative size of consumption reductions made by beneficiary households following the beneficiary's unemployment will be inversely related to the relative degree of UI benefit adequacy recorded for the beneficiaries in these households. This hypothesis is based on the assumption that a reasonable index of the pressures experienced by the entire beneficiary household to adjust to the beneficiary's unemployment is provided by the extent to which weekly UI benefits cover the proportion of household (necessary/obligated) expenses

previously covered by the beneficiary's earnings. Within the context of the consumption theory described above, very adequate vs. very inadequate benefits would imply that households would have to make few/smaller vs. more/larger adjustments in attempting to maintain their preunemployment living standards which were based on (expected) permanent income. In addition, it would be expected that very adequate vs. very inadequate benefits would be associated with small or no reductions vs. larger reductions in the consumption spending that made up the preunemployment living standard.

It should be emphasized that the above hypothesis on adjustments, benefit adequacy, and consumption spending is strictly valid only under ceteris paribus conditions. Nonetheless, we believe it is appropriate for the purposes of the subsequent analysis to interpret the hypothesis as applying to the "average" household in a particular benefit adequacy category. However, in this latter context, it must be recognized that two beneficiaries with the same measured level of benefit adequacy could reside in households in which quite different pressures to adjust to the beneficiary's unemployment would be experienced. Even if the two beneficiaries had the same level of UI benefit adequacy, the level of total recurring household income replaced by UI benefits could be greater for one beneficiary than for the other. This may occur because one household spent more of its household income on necessary/obligated expenses than did the other, or because one household had lower nonbeneficiary earnings than another. However, across the households analyzed, it is assumed that these other factors essentially can be ignored as long as adjustments are analyzed only for groups of households, classified by the level of benefit adequacy experienced by the individual beneficiaries who reside in the households.

Another important point to recognize in the subsequent analysis of expenditure adjustments by groups of households (classified into different

benefit adequacy categories) is that consumption adjustments undertaken in response to the beneficiary's unemployment very likely are directly related to the capability of the household to make a variety of compensating nonconsumption adjustments. It previously has been shown that, for persons unemployed for thirteen consecutive weeks, those classified into lower (vs. higher) benefit adequacy categories tended to have: (1) higher gross beneficiary earnings in the preunemployment month; (2) higher gross recurring household income during the preunemployment month; and (3) higher levels of necessary/obligated expenses, both for the entire household and for the beneficiary's share of such expenses.[11] Presumably, the capability of households to make nonconsumption adjustments to unemployment--especially financial adjustments such as borrowing money or liquidating assets--tends to increase directly with income (and wealth). Thus, the above findings suggest that households with relatively low benefit adequacy also tended to be household units that had a relatively greater capability to undertake nonconsumption adjustments.[12]

The above discussion indicates that the adjustments actually undertaken by a group of households likely reflect both the pressures to make consumption adjustments (because of the degree of benefit adequacy for the group) and the capability of households in that group to make nonconsumption adjustments (because of accumulated household wealth, for example). Obviously, it is not possible to determine whether any particular adjustment was undertaken by a group of households primarily because of the overall pressure on the household living standard or because of the relative ease with which that particular adjustment could be made. As noted above, both the costs and benefits of various adjustments interact to determine the optimal adjustment pattern actually selected.

In light of these considerations, a brief summary of some of the adjustments undertaken by study group households is provided to indicate the overall pattern of adjustments they made during the first three consecutive months of the beneficiary's unemployment. The purpose is to provide some perspective for evaluating the detailed picture of spending changes presented in the next section. Some of the major adjustments were the following:[13]

1. Approximately one-third (31%) of the beneficiary households recorded some increase in the amount of nonbeneficiary household income (including any nonwage income attributable to the beneficiary) from the employed month to the month prior to the thirteenth week interview. Also, a greater proportion of the households for which benefits were less vs. more adequate had increases in nonbeneficiary household income.

2. Two-thirds of the households reduced the total of their paid necessary, obligated expenses from the employed month to the month prior to the thirteenth week interview. Almost one-fifth of the total sample reduced these payments by 40 percent or more and over two-fifths of the total sample cut paid expenses by 20 percent or more. The pattern by benefit adequacy category is very pronounced: a much greater proportion of the households for which benefits were less vs. more adequate undertook reductions in these expenses. Analysis of the changes in the sum of paid + due-but-not-paid expenses (an approximation to the "basic" standard of living as it related to the consumption of goods and services) reveals that, for most households, reductions in paid expenses were not offset by increases in due-but-not-paid expenses from the employed month to the month prior to the thirteenth week interview. Rather, changes in paid expenses, both for the total sample and for the benefit adequacy categories analyzed, closely approximated the changes in consumption (as measured by the change in the sum of paid + due-but-not-paid expenses).

3. Approximately three-fifths of the sample had some savings at the onset of the beneficiary's unemployment spell, and about three-fourths of these households utilized these savings to help meet household expenses because of the beneficiary's spell of unemployment. About one-fourth of the households with savings had exhausted their savings by the end of the month prior to the thirteenth week interview. Furthermore, a greater proportion of those for whom benefits were less vs. more adequate tended to utilize (and exhaust) these savings.

4. The principal sources of cash (other than savings) utilized by beneficiary households to meet household expenses because of the beneficiary's unemployment were loans from friends and relatives and the sale of personal property, each of which was utilized by one-tenth or more of the households. The most striking pattern among the benefit adequacy categories was the tendency for a larger proportion of the beneficiary households for which benefits were less vs. more adequate to obtain funds from these and the other sources analyzed.

5. The amount of cash used from savings and other sources to help meet household expenses because of the beneficiary's unemployment was quite substantial for a number of these households. Over one-sixth of the total sample used $1,000 or more and one-third used $500 or more from the onset of unemployment through the month prior to the thirteenth week interview. A much larger percentage of the households for which benefits were less vs. more adequate used relatively large amounts of cash from these sources to help meet household expenses.

6. Approximately one-fifth (18%) of the beneficiary households had one or more nonbeneficiary household members who began to work more hours from the onset of the beneficiary's unemployment to the month prior to the thirteenth week interview. Just over one-fifth (22%) of the households had one or more nonbeneficiary household members who began to look for work during this interval, and almost one-eighth of the total sample had one or more nonbeneficiary house-

hold members who began working during this period. The labor market adjustments by nonbeneficiary household members that involved either seeking or accepting a job occurred more frequently in those households for which benefits were less vs. more adequate.

The above results obviously indicate that three consecutive months of unemployment led UI beneficiaries and their households to make a large number of adjustments. As expected, the magnitude of these adjustments tended to be inversely related to the level of benefit adequacy recorded for the beneficiary. Given this perspective on the overall adjustment pattern for the study group, the next section provides detail on the adjustments made in specific expenditure categories.

SPENDING CHANGES FOLLOWING UNEMPLOYMENT

The changes in paid expenses for each of the ten necessary/obligated expenses, for each of three other expenditure categories and for the total of all thirteen of these categories are analyzed in this section.[14] It should be emphasized that only payments in each expenditure category are analyzed; changes in due-but-not-paid expenses are not analyzed.[15]

Before examining these expenditure adjustments, it is useful to review the levels of gross recurring income for these beneficiary households during the preunemployment month and during the month prior to thirteen weeks of unemployment. Before unemployment, mean gross recurring household income for the study group was $1,111; following unemployment, mean income fell to $636 (see Table 1). The percentage decline in mean recurring household income between these two months was approximately 43 percent; the 95% confidence intervals for this percentage decline in income and for the absolute decline in income also are reported in Table 1. Within the context of the consumption

TABLE 1

CHANGES IN MEAN SPENDING BY CATEGORY FROM THE PREUNEMPLOYMENT MONTH TO MONTH PRIOR TO THIRTEEN CONSECUTIVE WEEKS OF UNEMPLOYMENT: TOTAL SAMPLE

Expenditure Category	Mean Amount Spent During Preunemployment Month	Mean Amount Spent During Month Prior to 13 Weeks of Unemployment	Dollar Change in Mean Amount Spent From Preunemployment Month to Month Prior to 13 Weeks of Unemployment			Per C
			Dollar Change (a)	Limits of 95% Confidence Interval: Lower Limit (b)	Limits of 95% Confidence Interval: Upper Limit (c)	
Components of Necessary/ Obligated Expenses:						
Housing	$ 209.56	$197.38	$- 12.17*	$- 16.97	$- 7.38	
Loans	120.48	102.36	- 18.12*	- 23.51	- 12.73	
Food	156.46	133.14	- 23.31*	- 26.83	- 19.80	
Transportation	78.91	69.73	- 9.19*	- 13.80	- 4.57	
Clothing	23.47	14.22	- 9.26*	- 11.31	- 7.21	
Support Outside Persons	9.68	7.78	- 1.89	- 3.90	0.12	
Medical	42.70	33.57	- 9.13*	- 13.81	- 4.45	
Insurance	49.47	44.80	- 4.68*	- 8.80	- 0.55	
Taxes	6.93	14.71	7.78	- 0.28	15.83	
Services/Other	25.93	14.33	- 11.60*	- 14.07	- 9.14	
Total Necessary/Obligated Expenses	$ 723.59	$632.02	$- 91.58*	$-108.24	$- 74.91	
Other Expense Categories:						
Education	8.54	6.14	- 2.40	- 7.17	2.38	
Charity/Gifts	54.82	51.49	- 3.33	- 21.41	14.75	
Travel/Entertainment/Snacks & Meals Away from Home	77.87	44.13	- 33.74*	- 38.65	- 28.83	
Total Other Expenses	$ 141.23	$101.76	$- 39.47*	$- 58.92	- 20.02	
Total All Expenses	$ 864.81	$733.78	$-131.05*	$-158.12	$-103.97	
(Mean Monthly Gross Recurring Household Income)	($1,111.36)	($635.90)	$-475.45)*	($-499.83)	($-451.08)	(

[a]The percentage change for any category is defined as the change in the mean for that category from the preunemployment m of unemployment divided by the mean amount spent in that category during the preunemployment month. This percentage cha a ratio estimator. Thus, the usual formula for constructing confidence intervals is modified to be:

$$r \pm 1.96 \sqrt{\left(\frac{1}{n}\right)\left(\frac{1}{\bar{X}^2}\right)\left(\frac{\Sigma(Y_i - rX_i)^2}{n-1}\right)}$$ where:

n = the sample size;
$\bar{X}$ = the mean amount spent during the preunemployment month;
Y_i = the difference for the ith individual between the actual amount spent during the preunemployment month and during the of unemployment;
X_i = the actual amount spent during the preunemployment month by the ith individual; and
r = the sample ratio = $\Sigma Y_i / \Sigma X_i$.

Unlike "simple" estimators, ratio estimators are often biased. For sample sizes greater than 30 and for cases where th the mean to the mean is less than or equal to .10, the bias is negligible. In all cases, the maximum bias can be estimat the product of the standard error of the mean and the standard error of the sample ratio divided by the sample mean. App values for the percentage changes in Table 1. For more information on ratio estimators and their associated confidence i Mendenhall and OTT, Elementary Survey Sampling; North Scituate, Mass.: Wadsworth Publishing, 1979 (2nd ed.); and Kish, S Wiley and Sons, 1965.

*95% confidence interval does not include zero.

theory discussed above, such a large reduction in recurring household income would not be expected to result in as large a reduction in household consumption purchases. In addition, the consumption reduction would be expected to be smaller than the decline in gross income because the UI benefits included in gross income following unemployment were not taxable, whereas preunemployment wage income was taxable.[16]

Spending Levels Before and After Unemployment

The mean amounts spent by the study group during the preunemployment month and during the month prior to thirteen consecutive weeks of unemployment also are reported in Table 1.[17] Prior to unemployment, mean spending was $865 for all thirteen categories and $724 for the ten necessary/obligated categories. During the month prior to thirteen consecutive weeks of compensated unemployment, mean spending for the same expenditure categories fell to $734 and $632, respectively. The percentage reductions in consumption spending following unemployment amounted to 13 percent for necessary/obligated expenditures and 15 percent for total expenses (vs. a cut in gross income of 43%); the narrowness of the 95% confidence intervals for both the percentage reductions in necessary/obligated expenditures and total expenses indicates that the point estimates for these percentage cuts in spending are quite precise.

Housing, food and loan payments dominated the budgets of these beneficiary households, both before the beneficiary's unemployment spell began, and during the month prior to the thirteenth consecutive week of unemployment. Mean spending on these three items totalled about $487 during the preunemployment month and fell by $54 (to $433) following unemployment. The next largest expenditure category in each month was transportation ($79 before unemployment and $70 following unemployment). An interesting pattern revealed for necessary/

obligated expenditures is that, excluding taxes, the ranking (in terms of the absolute amount spent in each period) of the other nine necessary/obligated expenditure categories is identical for both the preunemployment month and the month prior to thirteen consecutive weeks of unemployment. The ranking from the largest to the smallest mean amount spent in each of these months is: (1) housing; (2) food; (3) loans; (4) transportation; (5) insurance; (6) medical; (7) services/other; (8) clothing; and (9) support of outside persons.

On the basis of the consumption theory discussed above, it can be concluded that many of these households did not fully anticipate the beneficiary's unemployment spell, because of the reductions in consumption spending reported in Table 1 (and in Appendix Table B-1). Because mean spending on just the ten necessary/obligated expenses following unemployment ($632) nearly equalled mean gross recurring household income ($636) during the same month,[18] it can be concluded that UI support (which is included in gross income) was relied on by many of these households to help maintain the "core" component of the household living standard following unemployment.[19] In addition, as noted earlier, these households also made a number of financial and labor market adjustments in attempting to maintain the household living standard following unemployment.

Spending Changes by Expenditure Category

The expenditure adjustments of the study group can be viewed in terms of either the proportion of households that made some reduction in spending in any category or the average size of the spending change made. The percentage of households that cut spending in each category is reported in Table 2. These results show that, following unemployment, over one-half of all households reduced expenditures in the following four categories: housing, food, transportation, and travel/entertainment/etc.(which was cut by more households than any other separate category). At least two-fifths of all households made some

TABLE 2

PERCENTAGE OF HOUSEHOLDS THAT REDUCED SPENDING BY CATEGORY FOLLOWING U

Expenditure Category	Percent of Households That Reduced Spending From the Preunemployment Month to the Month Prior to 13 Weeks of Unemployment
Components of Necessary/Obligated Expenses	
Housing	55.0*
Loans	43.9*
Food	56.4*
Transportation	51.7*
Clothing	42.9*
Support Outside Persons	5.6*
Medical	45.9*
Insurance	43.2*
Taxes	4.3*
Services/Other	48.5*
Total Necessary/Obligated Expenses	67.4*
Other Expense Categories:	
Education	5.8*
Charity/Gifts	43.9*
Travel/Entertainment/Snacks & Meals Away From Home	66.2*
Total Other Expenses	66.5
Total All Expenses	71.3*

*95% confidence interval does not include zero.

spending cuts in ten of the thirteen expenditure categories following the beneficiary's unemployment. Overall, 71 percent of all households made some cut in total spending from the preunemployment month to the month prior to thirteen weeks of unemployment. Conversely, the remaining 29 percent of the households spent as much or more after unemployment as they did during the preunemployment month.

For convenience of reference, the percentage reductions in spending reported in Table 1 are presented in Table 3, with the categories ranked from the smallest to the largest percentage reduction.[20] Reductions in mean spending from the preunemployment month to the month prior to thirteen weeks of unemployment were recorded in twelve of the thirteen categories.[21] The only category in which mean spending did not fall after unemployment was taxes; in this case, spending actually increased by 112 percent, but the 95% confidence interval indicates that this point estimate actually does not differ significantly from zero. In addition, the 95% confidence intervals reported in Table 3 indicate that the point estimates for two of the categories in which mean spending fell--charity/gifts and education--actually do not differ significantly from zero. The largest percentage cuts in mean spending were recorded for the services/other category (a decline of 44.7%) and for travel/entertainment/etc. category (a decline of 43.3%). However, the percentage cuts in most individual categories were considerably smaller than was the case for services/other and travel/entertainment/etc. Reductions in mean spending of less than 20 percent were recorded for seven of the thirteen expenditure groups considered, and an actual increase was recorded for the tax category (although this increase does not differ significantly from zero).

TABLE 3

PERCENTAGE CHANGES IN MEAN SPENDING BY CATEGORY FROM THE PREUNEMPLOY
TO THE MONTH PRIOR TO THE THIRTEENTH WEEK INTERVIEW: TOTAL SA

Expenditure Category	Percentage Change in Mean Amount Spent from the Preunemployment Month to the Month Prior to 13 Weeks of Unemployment[a]
Taxes	112.30
Housing	- 5.80*
Charity/Gifts	- 6.10
Insurance	- 9.40*
Transportation	-11.60*
Food	-14.90*
Loans	-15.00*
Support Outside Persons	-19.60*
Medical	-21.40*
Education	-28.10
Clothing	-39.40*
Travel/Entertainment/Snacks and Meals Eaten Away From Home	-43.30*
Services/Other	-44.70*
Total Necessary/Obligated Expenses	-12.70*
Total Other Expenses	-28.00*
Total All Expenses	-20.64*
Total Recurring Monthly Income	-42.80*

(footnotes continued on next page)

TABLE 3 (continued)

[a]The percentage change for any category is defined as the change in the mean for that unemployment month to the month prior to 13 weeks of unemployment divided by the mea category during the preunemployment month. This percentage change is not a "simple' estimator. Thus, the usual formula for constructing confidence intervals is modifie

$$r \pm 1.96 \sqrt{(\frac{1}{n})(\frac{1}{\bar{X}^2})\ (\frac{\Sigma(Y_i - rX_i)^2}{n-1})}$$

where: n = the sample size;

$\bar{X}$ = the mean amount spent during the preunemployment month;

Y_i = the difference for the ith individual between the actual amount spent c month and during the month prior to 13 consecutive weeks of unemploymer

x_i = the actual amount spent during the preunemployment month by the ith inc

r = the sample ratio = $\Sigma Y_i / \Sigma X_i$.

Unlike "simple" estimators, ratio estimators are often biased. For sample sizes gre where the ratio of the standard error of the mean to the mean is less than or equal ble. In all cases, the maximum bias can be estimated and is less than or equal to t error of the mean and the standard error of the sample ratio divided by the sample m on ratio estimators and their associated confidence intervals, see: Scheaffer, Mend Survey Sampling; North Scituate, Mass: Wadsworth Publishing, 1979 (2nd ed.); and Ki York: John Wiley and Sons, 1965.

* 95% confidence interval does not include zero.

Spending Changes by Benefit Adequacy Category

As suggested above, one hypothesis that can be tested with the data available is that those with very adequate vs. very inadequate benefits would make small or no vs. larger reductions in consumption spending following unemployment. Evidence for evaluating this hypothesis is summarized in Table 4 for those in the lowest and highest benefit adequacy categories (50 percent or less vs. 86 percent or more).[22] These results provide support for the above hypothesis. Except for charity/gifts and education, the point estimates indicate that a larger reduction in mean spending (in both dollar and percentage terms) for each of the eleven remaining expenditure categories was made by those in the lowest benefit adequacy category than by those in the highest adequacy category. In fact, an actual increase in mean spending was found in eight of the thirteen categories for those in the highest benefit adequacy category. The reduction in total spending following unemployment also was far larger for those in the lowest benefit adequacy category (a cut of 30%) than for those in the highest benefit adequacy category (a cut of just 0.5%).[23] The 95% confidence intervals reported in Table 4 indicate that the mean spending cuts estimated for this sample must be cautiously interpreted, because the "true" differences between these two groups in the population are not as large as might be inferred from the means reported in Table 4. For example, these 95% confidence intervals indicate that there may be no differences between the spending changes of those in the lowest and highest adequacy categories for taxes, charity/gifts, support of outside persons, education, travel/entertainment/etc., and services/other. Nonetheless, these 95% confidence intervals also indicate that those in the lowest adequacy category most likely made larger spending cuts than those in the highest adequacy category in each of the other seven categories.

TABLE 4

PERCENTAGE CHANGE IN SPENDING BY CATEGORY FROM THE PREUNEMPLOYMENT MONTH TO THE MONTI
PRIOR TO THE THIRTEENTH WEEK INTERVIEW FOR THE LOWEST AND HIGHEST BENEFIT ADEQUACY GRO

Expenditure Category	Percentage Change[b] in Mean Amount Spent		Limits of 95% Confidence Interval			
			BENAD LE 50%		BENAD GT 85%	
	BENAD LE 50%	BENAD GT 86%	Lower Limit	Upper Limit	Lower Limit	Up Li
Taxes	-65.7	932.5	-91.95	-39.45	-204.68	2,0
Housing	-15.4	4.1	-19.19	-11.61	- 0.91	
Charity/Gifts	-17.8	-38.1	-67.15	31.55	- 58.49	-1
Insurance	-30.4	40.6	-40.86	-19.94	12.10	
Transportation	-36.3	30.0	-43.17	-29.43	16.18	
Food	-23.9	2.0	-27.24	-20.56	- 2.70	
Loans	-28.7	5.5	-34.85	-22.55	- 2.77	
Support Outside Persons	-44.0	28.1	-64.88	-23.12	- 39.42	
Medical	-46.0	23.5	-56.70	-35.30	- 2.05	
Education	4.4	-57.9	-72.38	81.18	-102.70	-1
Clothing	-51.4	- 4.1	-62.42	-40.38	- 23.94	
Travel/Entertainment/Snacks and Meals Eaten Away From Home	-51.0	-34.8	-59.01	-42.99	- 45.20	
Services/Other	-53.5	-28.3	-63.48	-43.52	- 50.78	-
Total Necessary/Obligated Expenses	-29.1	10.6	-31.90	-26.30	6.58	
Total Other Expenditures	-35.4	-38.0	-56.19	-14.61	- 49.01	-2
Total All Expenditures	-30.0	0.5	-34.23	-25.77	- 3.95	
Total Recurring Household Income	-54.6	-28.6	-57.31	-51.89	- 31.57	-2

[a]Benefit adequacy was less than or equal to 50 percent for the lowest adequacy group and greater than or equal to 86 perc adequacy group. The dollar and percentage changes in spending for these two benefit adequacy groups and for the middle reported in Appendix Tables D-1, D-2 and D-3.

[b]The percentage change for any category is defined as the change in the mean for that category from the preunemployment m weeks of unemployment divided by the mean amount spent in that category during the preunemployment month. This percenta estimator but a ratio estimator. Thus, the usual formula for constructing confidence intervals is modified to be:

$$r \pm 1.96 \sqrt{\left(\frac{1}{n}\right)\left(\frac{1}{\bar{X}^2}\right)\left(\frac{\Sigma(Y_i - rX_i)^2}{n-1}\right)} \quad \text{where:}$$

n = the sample size;
$\bar{X}$ = the mean amount spent during the preunemployment month;
Y_i = the difference for the ith individual between the actual amount spent during the preunemployment month and during th weeks of unemployment;
X_i = the actual amount spent during the preunemployment month by the ith individual; and
r = the sample ratio = $\Sigma Y_i / \Sigma X_i$.

Unlike "simple" estimators, ratio estimators are often biased. For sample sizes greater than 30 and for cases where the of the mean to the mean is less than or equal to .10, the bias is negligible. In all cases, the maximum bias can be est to the product of the standard error of the mean and the standard error of the sample ratio divided by the sample mean. estimators and their associated confidence intervals, see: Scheaffer, Mendenhall and OTT, Elementary Survey Sampling; N Publishing, 1979 (2nd ed.); and Kish, Survey Sampling; New York: John Wiley and Sons, 1965.

*95% confidence intervals for the BENAD LE 50% and BENAD GT 86% groups do not overlap.

The differences between those in the lowest and highest benefit adequacy categories in the seven spending categories for which significant differences in spending were found perhaps deserve emphasis. For those in the lowest benefit adequacy category, mean spending for those in the sample fell by at least 30 percent in four of these seven categories and by at least 20 percent in six of these seven categories. In contrast, for those in the highest benefit adequacy category, mean spending for those in the sample actually increased in six of these seven categories, and these increases amounted to at least 20 percent in three of these six categories.

Ranking Expenditure Categories by Importance

The summary results in Table 3 show the ranking for these thirteen expenditure categories, with the ranking based on the percentage reductions in mean spending in each category made by the total sample following unemployment. This ranking could be utilized as a basis for assessing the "importance" of each expenditure category. At least in terms of short-run expenditure adjustments, it could be argued that the smallest percentage reductions would be made in the most "important" categories and the largest percentage reductions would be made in the least "important" categories. It should be emphasized, of course, that the ranking might well be different for other groups of unemployed workers. Different rankings also might result if permanent income elasticities were utilized to rank expenditure categories. Nonetheless, ordering these categories from the smallest to the largest percentage reduction in spending results in the following ranking for the total sample:[24]

(1) taxes;
(2) housing;
(3) charity/gifts;
(4) insurance;
(5) transportation;

(6) food;
(7) loans;
(8) support of persons outside the household;
(9) medical services;
(10) education;
(11) clothing;
(12) travel/entertainment/etc.; and
(13) services/other.

As shown in Table 4 and in Appendix Tables D-1, D-2, and D-3, this ranking for the total sample reflects an averaging of quite different rankings for those in the households that comprise the three benefit adequacy categories.

The above ranking for the total sample indicates that two of the items defined as necessary/obligated expenses in developing the benefit adequacy measure utilized in this study rank low in importance, at least in the sense that the study group cut spending substantially in each category. These two categories are clothing (with a rank of 11 and a spending cut of 39%) and services/other (with a rank of 13 and a spending cut of 45%). In contrast, one of the categories excluded from necessary/obligated expenditures was charity/gifts, but this category ranked third and mean spending for this category was cut by only 6 percent following unemployment; however, as shown in Appendix Table B-1, median spending in this category fell sharply, from $15.66 before unemployment to $1.81 after unemployment. Thus, the mean change for charity/gifts is not at all representative of the changes typically made in this category following unemployment. In any case, other factors than percentage changes in spending presumably would enter into any determination of what expenditures should be included in a benefit adequacy measure. Nonetheless, these results suggest that consideration might be given to removing the clothing and services/other categories from this set of expenditures. The rationale for removing these two categories would be that the unemployed are able to substantially reduce

spending in each category, at least on a temporary basis. In large part, this probably reflects the fact that an "adequate" stock of clothing was available at the start of unemployment and that the unemployed substitute their time to perform services previously purchased. Exactly which of these thirteen categories should be included in a benefit adequacy measure is a subjective issue in any case.

SUMMARY

Spending changes undertaken by a group of beneficiary households following the onset of the beneficiary's unemployment spell are analyzed in this report. These changes were measured by differences in spending levels for thirteen different expenditure categories between the preunemployment month and the month prior to thirteen consecutive weeks of unemployment.

The permanent income hypothesis serves as a useful framework in interpreting the expenditure adjustments made by the study group. As expected, the mean reduction in consumption spending was less than the reduction in mean gross recurring household income. For the study group as a whole, monthly expenditures in the thirteen categories combined fell by 15 percent (from $865 to $734), whereas monthly gross recurring household income fell by 43 percent (from $1,111 to only $636). Moreover, spending on the ten necessary/obligated expenditures during the month prior to thirteen consecutive weeks of unemployment ($632) nearly equalled gross recurring household income of $636 (which includes UI benefits) during the same month. Even though the decline in monthly spending was much less than the decline in gross recurring household income, the results suggest that, on average, the beneficiary's unemployment spell was not fully anticipated by the beneficiary household. Thus, even the provision of UI benefits was not sufficient to allow many of these households to maintain their preunemployment

standards of living over this three-month interval. This was the case even though these households also undertook a number of other adjustments to maintain their living standards, such as reducing their savings or having other family members work more hours or begin to work.

The results also show that spending reductions were not concentrated in one or a few of the thirteen expenditure categories. In fact, mean spending for the sample fell in all but one of the thirteen expenditure categories following unemployment. The smallest percentage reductions in spending were for housing (5.8%) and charity/gifts (6.1%), whereas the largest percentage cuts were for services/other (44.7%), travel/etc. (43.3%), and clothing (39.4%). In addition, some reduction in spending was made by a substantial proportion of all households for most of these categories. For example, over 40 percent of all households made some spending cuts in ten of the thirteen categories following the beneficiary's unemployment.

The results provide support for the hypothesis that those with very inadequate benefits would make larger percentage reductions in consumption spending than those with very adequate benefits. The sample claimants in the lowest benefit adequacy category made significantly larger cuts in spending in seven of the thirteen expenditure categories, and there was no significant difference between the spending changes of the two groups in the other six categories. Moreover, in the seven categories in which significant differences were found, the spending reductions for those in the lowest adequacy category amounted to at least 30 percent in four of these seven categories and to at least 20 percent in six of these seven categories. In contrast, the sample claimants in the highest benefit adequacy category actually increased mean spending in six of these seven categories, and these increases amounted to at least 20 percent in three cases.

The results of this study also provide one basis for ranking the "importance" of various expenditure categories. The ranking (from the smallest to largest percentage reduction in spending) for the total sample indicates that two of the ten items defined as necessary/obligated expenses in developing the benefit adequacy measure utilized in this study rank low in importance, at least in the sense that the study group cut spending substantially in each category. These two categories are clothing (with a rank of 11th and a spending cut of 39%) and services/other (with a rank of 13th and a spending cut of 45%). These results indicate that some consideration might be given to altering the expenditure categories included in future benefit adequacy studies.

FOOTNOTES

[1]Jerry L. Kingston, Paul L. Burgess and Chris Walters, *The Adequacy of Unemployment Insurance Benefits: An Analysis of Adjustments Undertaken Through Thirteen and Twenty-Five Weeks of Unemployment,* U.S. Department of Labor, Unemployment Insurance Service, Washington, D.C.: Government Printing Office, 1978.

[2]The precise definition of "necessary/obligated" vs. other expenditures is provided in the next section of the report.

[3]The only other related information available is for the expenditures made during the month prior to the twenty-fifth consecutive week of unemployment by those study group persons who were unemployed for at least twenty-five consecutive weeks.

[4]However, analysis of adjustments made through twenty-five weeks of unemployment is contained in Kingston, Burgess and Walters, op. cit., Chapter 3.

[5]Further perspective on this expense concept is provided by indicating what items were excluded from the necessary/obligated criterion. The following expenditures were excluded:

(1) expenses for remodeling, rather than maintaining a home;
(2) contributions to charity;
(3) payments for gifts;
(4) purchases of meals/snacks away from home;
(5) entertainment expenses;
(6) out-of-town travel or vacation expenses;
(7) educational expenses;
(8) other important payments (e.g., legal or accounting fees); and
(9) lump-sum payoffs of past debts or purchases of major consumer durables.

[6]The weekly benefit for the study group was equal to the lesser of $85 or 1/25 of "high quarter" earnings. The high quarter is the calendar quarter of highest earnings during the first four of the last five calendar quarters completed prior to a claim for benefits by the unemployed worker. Half of the group analyzed qualified for the maximum WBA of $85.

[7]This theory of consumption is presented by Milton Friedman, *A Theory of the Consumption Function.* Princeton, N.J.: Princeton University Press, 1957.

[8]Strictly interpreted, this theory of consumption implies that current consumption in virtually any month is based primarily on permanent income, with transitory income changes exerting little influence on current consumption patterns.

[9]As noted above, consumption is not directly analyzed here. Rather, current monthly payments for various consumption categories are analyzed. However, previous analysis of expenditure adjustments undertaken by the study group has indicated that reductions in paid expenditures were not offset by increases in due-but-not-paid expenditures from the employed month to the

month prior to the thirteenth week of compensated unemployment. Thus, changes in paid expenses should be a reasonably good proxy for changes in consumption for this group of households. See Kingston, Burgess and Walters, op. cit., pp. 22-26.

[10]In fact, Hamermesh argues that "benefit adequacy", as he defines it, should be evaluated by the "objective standard" of whether UI benefits are spent as one would expect permanent or transitory income to be spent. If UI benefits are spent to maintain consumption, (as would be the case for permanent income), he argues UI benefits are inadequate. In contrast, if UI benefits are saved instead of being spent to maintain consumption (as would be the case for transitory income), he argues UI benefits are adequate. Based on this definition of benefit adequacy, Hamermesh expects UI benefits to be more adequate for high vs. low income households, because they more easily can maintain consumption by borrowing and drawing on (larger) past savings. In addition, Hamermesh expects consumption cuts to be made for "luxuries" rather than "necessities" in those cases where UI recipients must reduce their living standards. For the complete development of Hamermesh's position, see: Daniel S. Hamermesh, *Unemployment Insurance and the Older American*. Kalamazoo: W. E. Upjohn Institute, 1980, Ch. 3. (forthcoming).

[11]See Kingston, Burgess and Walters, op. cit., Chapter 1 and Appendix A-2.

[12]Another dimension of the capability of beneficiary households to make certain types of adjustments is related to the possibility of other household members obtaining a job or increasing work effort on an existing job as a result of the beneficiary's unemployment. Obviously, the possibilities for making such adjustments depend importantly on the composition of the beneficiary household. Furthermore, a fairly strong relationship between household type and benefit adequacy was shown in a prior report for those unemployed for thirteen consecutive weeks of unemployment. (See: ibid., Chapter 1, footnote 4.) This prior analysis revealed, for example, that one-person households accounted for only 9 percent of the household units classified into the lowest benefit adequacy category; in contrast, one-person households accounted for 41 percent of the household units classified into the highest benefit adequacy category. Since one-person households cannot adjust to the beneficiary's unemployment by having an additional household member seek work or work more hours (at least not without first adding another household member), these results suggest that beneficiary households in the lowest vs. highest benefit adequacy category also tended to have more vs. less chance of making such adjustments because of their household compositions.

[13]These adjustments were analyzed in a previous report, and the results are based upon the 1,634 respondents analyzed in that earlier report. See ibid., Chapters 2 and 5. As noted in Appendix A to this report, only 1,581 of these 1,634 persons are analyzed in this report. The difference arises because all persons for whom complete information on each of thirteen expenditure categories was not available were excluded from the analysis in the present report.

[14]As noted above, one of the purposes of the analysis is to evaluate whether some necessary/obligated expenses might be excluded from the set of expenditures used to develop a benefit adequacy measure, and whether some

expenses excluded from necessary/obligated expenditures might be included in the set of expenditures used to develop a benefit adequacy measure. The three other expenditure categories analyzed are: education, charity/gifts, and travel/entertainment/snacks and meals eaten away from home; the basis for analyzing these three is that each of these categories might merit consideration for inclusion in the expense set used to form a benefit adequacy measure in some future study. Other categories for which information was available were: (1) remodeling expenditures for residences; (2) lump-sum payoffs of past debts; (3) lump-sum payments for major consumer durables; and (4) other important but irregular payments. Items (1) through (3) essentially represent changes in capital accounts, rather than current consumption expenditures; accordingly these items were not analyzed. Item (4) was a miscellaneous category for large and unusual payments that was relevant for only a few households and hence this category was not considered appropriate for possible inclusion among the consumption expenses normally considered in conventional benefit adequacy studies.

[15]As noted above, increases in due-but-not-paid expenses did not offset reductions in paid expenses in the categories analyzed. Thus, changes in paid expenses should provide a reasonably good proxy for changes in consumption for the group analyzed. For a discussion and analysis of due-but-not-paid expenses, see Kingston, Burgess and Walters, op. cit., Chapter 2.

[16]Gross recurring income, rather than net recurring income, is reported because an accurate figure for the net income received by the entire household is not available for the study group.

[17]The text focuses on mean spending by the study group. The median amounts spent before and after unemployment are reported in Appendix Table B-1.

[18]The results in Appendix Table B-1 show that median spending on necessary/obligated items was $560 following unemployment, whereas median income during the same month was $432.

[19]These findings contrast sharply with the conclusion reached by Hamermesh, op. cit., Chapter 3. He concluded that, for the older workers analyzed by him, UI benefits generally were not spent to maintain household living standards. A main difference between the two approaches is that Hamermesh's results are indirectly inferred from estimated equations, whereas the results in this study are based on expenditures actually made by a group of unemployment insurance claimants.

[20]Income elasticities for each category, defined as the percentage change in spending in that category divided by the percentage change in income, deliberately are not computed or discussed. The reason is that income elasticities should be computed only under ceteris paribus conditions. As discussed above, the study group made a large number of adjustments following unemployment. Although it would be possible to estimate an equation in which controls were included for these other factors, it is highly questionable whether the results for income and expenditure changes could be interpreted as income elasticities. First, permanent vs. transitory income changes would have to be identified in estimating appropriate income elasticities. An even more difficult task would be how to include appropriate ceteris paribus controls to reflect the full impact of unemployment and the other changes that occurred during the three

months following unemployment. Thus, no attempt is made to directly relate expenditure changes to income changes in this report, or to interpret such relationships as income elasticities. If the interest were in estimating income elasticities for the study group, it appears that the appropriate approach would be to estimate these elasticities on the basis of cross-section data for the study group during the preunemployment month. For an excellent discussion of the many pitfalls that arise in estimating income elasticities with time series data and of the difficulties encountered in attempting to reconcile theory with empirical estimation for either cross-section or time-series data, see L. Philips, *Applied Consumption Analysis*. New York: American Elsevier Publishing Co., Inc., 1974.

[21]Median spending by category during the preunemployment month and the median change in spending from the preunemployment month to the month prior to thirteen weeks of unemployment are reported in Appendix Table C-1.

[22]The same information for those in the middle benefit adequacy category (51-85%) is reported in Appendix Table D-2, but the text focuses only on those in the two extreme benefit adequacy categories; the pattern is much less clear if those in the middle benefit adequacy category are included in the comparisons.

[23]It also should be noted that, consistent with the relative expenditure cuts, the largest reduction in mean (gross) income (a cut of 55%) was recorded for those in the lowest benefit adequacy category, compared with a cut of 29 percent for those in the highest benefit adequacy category.

[24]This ranking is based on the point estimates of the percentage changes in spending for each category calculated from the sampled group of households. As may be noted in Table 3, the confidence intervals constructed about these point estimates indicate that these point estimates are not significantly different from zero for taxes, charity/gifts and education. Hence, even though education is ranked tenth in terms of the point estimate of the percentage changes in expenditures (-28.10%), less confidence is associated with the sign for this point estimate than with those signs estimated to be significantly different from zero.

APPENDIX A

CHARACTERISTICS OF CLAIMANT SAMPLE

The sample for this study was drawn throughout the twelve-month period beginning in mid-September of 1975. During this period, approximately one-fourth of those who filed the first claims in their benefit years and had the necessary earnings to qualify for benefits under Arizona's benefit formula were selected randomly for potential inclusion in the study. Those who previously had initated a benefit year were excluded, because adjustments to unemployment after thirteen and twenty-five consecutive weeks of compensated unemployment were to be analyzed as one part of the study. Claimants just beginning their benefit years were screened further seven weeks after the effective dates of their new initial claims. At this screening, those who had served a valid waiting week and had received payment for five consecutive weeks of unemployment were selected for the preunemployment month interview, with the following exceptions:

(1) those who had moved out of state, because household interviews could not be conducted for them;

(2) those who had entered "approved training," because their adjustments to unemployment most likely would reflect their unusual circumstances;

(3) those who had delayed filing for benefits for more than 21 days after their job separation dates, because of the possible difficulty involved in accurately obtaining information about income and expenditures in a "typical" month of employment prior to unemployment;

(4) those whose new initial claims were transitional claims, because their adjustments to unemployment likely would differ substantially from those of persons just beginning unemployment; and

(5) those who filed "true partial" claims (such persons continue to work for their last employer but receive partial UI benefits since their earnings have been reduced sufficiently to meet the UI qualifying requirements), because their adjustments to unemployment would reflect their "partial" earnings.

A total of 4,452 beneficiaries were selected for inclusion in the study over the twelve-month sampling interval.[a] From this group, completed household interviews that contained consistent data for preunemployment month expenses and income were obtained for 3,196 persons, or 72 percent of the total. It has been shown in a prior report that there were few statistically significant differences between the respondents and nonrespondents to this preunemployment month interview.[b] A total of 2,057 persons recorded thirteen consecutive weeks of compensated unemployment, and completed interviews were obtained for 1,732 (or 84%) of these 2,057 persons.[c] A check for the consistency of income and expenses eliminated 96 (or 5.5%) of these 1,732 completed interviews.[d] An additional 55 cases (or 3.2%) of the 1,732 completed interviews were removed from the data base for this analysis because complete information was not available for each of the thirteen expenditure categories analyzed in this report. As a result of nonresponse and the above exclusions, a total of 476 persons are excluded from this analysis. Thus, this report is based on the remaining 1,581 persons or 77 percent of those who completed thirteen consecutive weeks of compensated unemployment.

Provided in Appendix Table A-1 is a comparison of the characteristics of the 1,581 persons analyzed and the characteristics of the 476 persons excluded because of nonresponse, missing data or other problems. Because these groups can be viewed as independent, random samples (one from the population of claimants for whom "complete/accurate" information can be gathered, and the other from the population of claimants for whom "complete/accurate"

APPENDIX TABLE A-1

CHARACTERISTICS OF THE GROUP ANALYZED/NOT ANALYZED

Characteristic	Percentage Distributions for[a] Group Analyzed	Group Not Analyzed	Probability of Obtaining Observed Difference Due to Chance Alone[b]
SEX			
Male	63.9	67.9	.1096
Female	36.1	32.1	.1096
AGE			
Less than 25 years	20.4	21.2	.7184
25-34 years	30.0	31.5	.5352
35-44 years	18.3	20.6	.2584
45-54 years	18.0	13.9	.0366
55 years and up	13.3	12.8	.7794
WEEKLY BENEFIT AMOUNT:			
$15-$44	10.2	13.9	.0238
$ 5-$54	8.5	8.8	.8414
$55-$64	9.9	11.3	.3788
$65-$74	10.2	9.2	.5222
$75-$84	11.4	7.1	.0072
$85	49.8	49.7	.9680
POTENTIAL DURATION:			
13-15 weeks	6.5	10.5	.0036*
16-18 weeks	6.9	9.0	.1236
19-21 weeks	7.9	9.0	.4412
22-25 weeks	12.2	11.8	.8180
26 weeks	66.5	59.7	.0064

[a]The analyzed group totals 1,581; the group not analyzed totals 476 persons.

[b]These values indicate the probability of obtaining, due to chance alone, a difference between the two sample proportions that is as large or larger than the one actually observed, if the two samples were drawn from the same population. The probability is at least .05 that one or more of the probability values would be less than or equal to .05/14 = .0036 due to chance alone. Hence, only those probability coefficients that are .0036 or less are identified with an * in the table to indicate statistically significant differences.

information can not be gathered), the appropriate statistical test is one which permits an assessment of whether these two samples were drawn from the same or different populations. Given the 18 tests reported in Appendix Table A-1, the probability is at least .05 that one or more of these results would be less than or equal to .05/14 or .0036 due to chance alone, even if the two samples were drawn from the same population.[e] Thus, only those proportions tests for which the probability is less than or equal to .0036 are denoted with an asterisk in Appendix Table A-1 to call attention to instances in which the difference betwee the sample proportions is statistically significant at the .05 level.

The results of the tests summarized in Appendix Table A-1 indicate that there were no statistically significant differences (at the .05 level) between the group analyzed and the group not analyzed for sex, age, weekly benefit amount, and for four of the five potential duration categories. However, a significantly greater percentage of the group not analyzed than of the group analyzed had potential benefit duration of 13-15 weeks (10.5% vs. 6.5%). Moreover, the other results for potential benefit duration also indicate that the group analyzed tended to have somewhat longer potential benefit durations than the group not analyzed (although no other differences are statistically significant at the .05 level). Nonetheless, it is doubtful that this slight bias (in terms of potential duration) would limit inferences to the broader population from which the 1,581 persons analyzed were selected.

FOOTNOTES TO APPENDIX A

[a]Some earlier project reports have shown this total to be 4,468 persons. In the subsequent processing of data from the benefit year history files, 16 cases were found not to satisfy the original criterion for inclusion in the ABA study data base. In most instances, revised wage statements (not available at the time the sample first was drawn) indicated that claimants were not entitled to benefits under the Arizona Employment Security Law. In a few other cases, benefits were paid under SUA or other special programs not encompassed by the ABA study.

[b]See Paul L. Burgess, Jerry L. Kingston and Chris Walters, *The Adequacy of Unemployment Insurance Benefits: An Analysis of Weekly Benefits Relative to Preunemployment Expenditure Levels*. U.S. Department of Labor, Unemployment Insurance Service. Washington, D.C.: Government Printing Office, 1978.

[c]The earlier report on the thirteenth week sample indicated that only 2,055 (not 2,057) persons completed thirteen consecutive weeks of unemployment. The total of 2,057 shown in this report resulted from the discovery of two coding errors in the earlier data tape.

[d]Because extensive information was obtained on both the income and the expenditures of the beneficiary household during the month prior to the thirteenth consecutive week of unemployment, it was possible to obtain a rough check on the accuracy of the data obtained by conducting a "balancing differences" test. For this month, the total itemized cash outlays of each beneficiary household were compared with the household's total cash resources available to meet those outlays. If the ratio of cash outlays to cash resources available to meet those outlays fell between 0.75 and 1.25, the information was accepted as given (unless obvious problems were found by the project staff during the editing process). Any questionnaire with a ratio outside of these bounds was subjected to additional verification with the beneficiary to account for the apparently large discrepancy. Large discrepancies between household outlays and cash resources could not be reconciled for 96 cases, and these cases were excluded from the analysis.

[e]Since the differences across any variable must sum to zero, only 14 of the 18 tests reported in Appendix Table A-1 are independent. Thus, the probability is at least .05 that one or more of the probability values reported in Appendix Table A-1 would be less than or equal to .05/14 = .0036, even if the true value for all of the differences were 0. See Leo A. Goodman, "Simultaneous Confidence Intervals for Contrasts Among Multinominal Populations," *Annals of Mathematical Statistics*, Vol. 35, 1964, pp. 716-720.

APPENDIX TABLE B-1

MEDIAN AMOUNT SPENT BY CATEGORY DURING THE PREUNEMPLOYMENT MONTH AND THE MONTH PRIOR TO THIRTEEN CONSECUTIVE WEEKS OF UNEMPLOYMENT

Expenditure Category	Median Amount Spent During Preunemployment Month	Median Amount Spent During Month Prior to 13 Weeks of Unemployment
Components of Necessary/Obligated Expenses:		
Housing	$203.63	$190.55
Loans	93.33	59.29
Food	141.91	119.14
Transportation	58.19	47.61
Clothing	7.77	0.00
Support Outside Persons	0.00	0.00
Medical	20.72	12.03
Insurance	29.40	16.96
Taxes	0.00	0.00
Services/Other	19.60	10.52
Total Necessary/Obligated Expenses:	$673.35	$560.25
Other Expense Categories:		
Education	0.00	0.00
Charity/Gifts	15.66	1.81
Travel/Entertainment/Snacks & Meals Away From Home	48.75	29.89
Total Other Expenses	$ 83.85	$ 43.55
(Median Gross Monthly Recurring Household Income	($982.86)	($432.26)

APPENDIX TABLE C-1

CHANGES IN MEDIAN SPENDING BY CATEGORY FROM THE PREUNEMPLOYMENT MONTH TO THE MONTH PRIOR TO THIRTEEN CONSECUTIVE WEEKS OF UNEMPLOYMENT

Expenditure Category	Median Amount Spent During Preunemployment Month	Median Change in Dollar Amount Spent From Preunemployment Month to Month Prior to 13 Weeks of Unemployment
Components of Necessary/Obligated Expenses:		
Housing	$203.63	$ -11.89
Loans	93.33	0.00
Food	141.91	-15.45
Transportation	58.19	- 4.87
Clothing	7.77	0.00
Support Outside Persons	0.00	0.00
Medical	20.72	0.00
Insurance	29.40	0.00
Taxes	0.00	0.00
Services/Other	19.60	0.00
Total Necessary/Obligated Expenses	$673.35	$ -84.03
Other Expense Categories:		
Education	0.00	0.00
Charity/Gifts	15.66	0.00
Travel/Entertainment/Snacks & Meals Away From Home	48.75	-30.56
Total Other Expenses	$ 83.85	$ -38.78
Total All Expenses	$783.66	$-124.59

APPENDIX TABLE D-1

DOLLAR AND PERCENTAGE CHANGES IN SPENDING BY CATEGORY FROM THE PREUNEMPLOYMENT MONTH TO THE MO
THIRTEEN WEEKS OF UNEMPLOYMENT FOR HOUSEHOLDS IN WHICH BENEFIT ADEQUACY WAS LESS THAN OR EQUAL TO 50 PERC

Expenditure Category	Mean Amount Spent During Preunemployment Month	Mean Amount Spent During Month Prior to 13 Weeks of Unemployment	Dollar Change in Mean Amount Spent From Preunemployment Month to Month Prior to 13 Weeks of Unemployment			Per Ch (
			Dollar Change (a)	Limits of 95% Confidence Interval: Lower Limit (b)	Limits of 95% Confidence Interval: Upper Limit (c)	
Components of Necessary/ Obligated Expenses:						
Housing	$ 264.99	$224.21	$- 40.79*	$- 51.65	$- 29.92	
Loans	174.14	124.17	- 49.97*	- 62.51	- 37.43	
Food	204.75	155.74	- 49.01*	- 56.82	- 41.20	
Transportation	116.31	74.12	- 42.18*	- 52.90	- 31.45	
Clothing	33.46	16.27	- 17.19*	- 22.36	- 12.03	
Support	14.99	8.40	- 6.59*	- 10.74	- 2.45	
Medical	76.33	41.22	- 35.11*	- 47.63	- 22.59	
Insurance	79.97	55.67	- 24.30*	- 34.20	- 14.41	
Taxes	17.06	5.85	- 11.21*	- 21.52	- 0.90	
Services/Other	36.89	17.14	- 19.75*	- 25.41	- 14.10	
Total Necessary/Obligated Expenes	$1,018.89	$722.79	$-296.10*	-328.44	-263.76	
Other Expense Categories:						
Education	6.31	6.59	- 0.29	- 4.42	4.99	
Charity/Gifts	73.16	60.16	- 13.00*	- 50.66	- 24.65	
Travel/Entertainment/Snacks & Meals Away From Home	97.99	47.99	- 50.01*	- 61.91	- 38.10	
Total Other Expenses	177.46	114.73	- 62.73*	-103.59	- 21.86	
Total All Expenses	$1,196.35	$837.52	$-358.83*	$-414.86	$-302.80	
(Total Recurring Household Income)	($1,316.75)	($597.49)	($-719.25)*	($-777.16)	($-661.34)	(

[a]The percentage change for any category is defined as the change in the mean for that category from the preunemployment of unemployment divided by the mean amount spent in that category during the preunemployment month. This percentage c a ratio estimator. Thus, the usual formula for constructing confidence intervals is modified to be:

$$r \pm 1.96 \sqrt{(\frac{1}{n})(\frac{1}{\bar{X}^2})\ (\frac{\Sigma(Y_i - rX_i)^2}{n-1})}$$ where:

n = the sample size;
$\bar{X}$ = the mean amount spent during the preunemployment month;
Y_i = the difference for the ith individual between the actual amount spent during the preunemployment month and during weeks of unemployment;
X_i = the actual amount spent during the preunemployment month by the ith individual; and
r = the sample ratio = $\Sigma Y_i / \Sigma X_i$.

Unlike "simple" estimators, ratio estimators are often biased. For sample sizes greater than 30 and for cases where t the mean to the mean is less than or equal to .10, the bias is negligible. In all cases, the maximum bias can be esti the product of the standard error of the mean and the standard error of the sample ratio divided by the sample mean. estimators and their associated confidence intervals, see: Scheaffer, Mendenhall and OTT, Elementary Survey Sampling; Publishing, 1979 (2nd ed.); and Kish, Survey Sampling; New York: John Wiley and Sons, 1965.
*95% confidence interval does not include zero.

APPENDIX TABLE D-3

DOLLAR AND PERCENTAGE CHANGES IN SPENDING BY CATEGORY FROM THE PREUNEMPLOYMENT MONTH TO THE M
THIRTEEN WEEKS OF UNEMPLOYMENT FOR HOUSEHOLDS IN WHICH BENEFIT ADEQUACY WAS 86 PERCENT OR MORE F

Expenditure Category	Mean Amount Spent During Preunemployment Month	Mean Amount Spent During Month Prior to 13 Weeks of Unemployment	Dollar Change in Mean Amount Spent From Preunemployment Month to Month Prior to 13 Weeks of Unemployment			Pe C
			Dollar Change (a)	Limits of 95% Confidence Interval: Lower Limit (b)	Limits of 95% Confidence Interval: Upper Limit (c)	
Components of Necessary/Obligated Expenses:						
Housing	$ 162.96	$169.71	$ 6.75	$- 1.26	$ 14.76	
Loans	84.10	88.75	4.65	- 2.22	11.53	
Food	113.68	115.90	2.22	- 3.09	7.53	
Transportation	51.75	67.26	15.51*	8.87	22.14	
Clothing	14.99	14.38	- 0.62	- 3.65	2.42	
Support	5.23	6.70	1.47	- 1.82	4.76	
Medical	20.93	25.84	4.91	- 0.19	10.01	
Insurance	32.08	45.11	13.03*	4.69	21.36	
Taxes	1.14	11.77	10.63*	3.43	17.83	
Services/Other	17.84	12.80	- 5.04*	- 9.39	- 0.69	
Total Necessary/Obligated Expenses	$ 504.70	$558.21	$ 53.51*	$ 33.37	$ 73.65	
Other Expense Categories:						
Education	11.18	4.71	- 6.46	5.01	- 17.93	
Charity/Gifts	50.13	31.01	- 19.12*	- 32.85	- 5.39	
Travel/Entertainment/Snacks & Meals Away From Home	71.49	46.63	- 24.86*	- 33.92	- 15.81	
Total Other Expenses	$ 132.80	$ 82.35	$- 50.45*	- 70.50	- 30.39	
Total All Expenses	$ 637.50	$640.57	$ 3.06	- 25.25	31.38	
(Total Recurring Household Income)	($1,012.29)	($723.27)	($-289.02)*	($-323.92)	($-254.12)	(

[a]The percentage change for any category is defined as the change in the mean for that category from the preunemployment of unemployment divided by the mean amount spent in that category during the preunemployment month. This percentage c a ratio estimator. Thus, the usual formula for constructing confidence intervals is modified to be:

$$r \pm 1.96 \sqrt{(\frac{1}{n})(\frac{1}{\bar{X}^2})\ (\frac{\Sigma(Y_i - rX_i)^2}{n-1})}$$ where:

n = the sample size;
$\bar{X}$ = the mean amount spent during the preunemployment month;
Y_i = the difference for the ith individual between the actual amount spent during the preunemployment month and during weeks of unemployment;
X_i = the actual amount spent during the preunemployment month by the ith individual; and
r = the sample ratio = $\Sigma Y_i / \Sigma X_i$.

Unlike "simple" estimators, ratio estimators are often biased. For sample sizes greater than 30 and for cases where t mean to the mean is less than or equal to .10, the bias is negligible. In all cases, the maximum bias can be estimate product of the standard error of the mean and the standard error of the sample ratio divided by the sample mean. For and their associated confidence intervals, see: Scheaffer, Mendenhall and OTT, Elementary Survey Sampling; North Scit 1979 (2nd ed.); and Kish, Survey Sampling; New York: John Wiley and Sons, 1965.

*95% confidence interval does not include zero.

APPENDIX TABLE D-2

DOLLAR AND PERCENTAGE CHANGES IN SPENDING BY CATEGORY FROM THE PREUNEMPLOYMENT MONTH TO THE MONT
THIRTEEN WEEKS OF UNEMPLOYMENT FOR HOUSEHOLDS IN WHICH BENEFIT ADEQUACY WAS 51-85 PERCENT FOR THE

Expenditure Category	Mean Amount Spent During Preunemployment Month	Mean Amount Spent During Month Prior to 13 Weeks of Unemployment	Dollar Change in Mean Amount Spent From Preunemployment Month to Month Prior to 13 Weeks of Unemployment			Pe
			Dollar Change (a)	Limits of 95% Confidence Interval: Lower Limit (b)	Limits of 95% Confidence Interval: Upper Limit (c)	Perce Char (d)
Components of Necessary/ Obligated Expenses:						
Housing	$ 201.33	$196.07	$- 5.25*	$- 11.63	$- 1.13	-
Loans	107.96	96.66	- 11.30*	- 18.89	- 3.71	-1
Food	150.43	128.88	- 21.55*	- 26.30	- 16.79	-1
Transportation	71.13	68.43	- 2.71	- 8.88	3.47	-
Clothing	22.03	12.93	- 9.11*	- 11.69	- 6.53	-4
Support	8.88	7.99	- 0.89	- 3.89	2.12	-1
Medical	34.32	33.10	- 1.21	- 7.00	4.58	-
Insurance	40.65	38.26	- 2.39	- 6.98	2.19	-
Taxes	4.02	21.44	17.43*	2.06	32.80	43
Services/Other	23.71	13.47	- 10.24	- 13.48	7.00	-4
Total Necessary/Obligated Expenses	$ 664.45	$617.23	$- 47.23*	$- 71.15	- 23.30	-
Other Expense Categories:						
Education	8.48	6.62	- 1.86	- 9.47	5.76	-2
Charity/Gifts	46.51	57.09	10.58	- 19.62	40.79	2
Travel/Entertainment/Snacks & Meals Away From Home	69.39	40.56	- 28.83*	- 34.76	- 22.90	-4
Total Other Expenses	$ 124.37	$104.26	$- 20.10*	$- 51.63	$- 11.43	-1
Total All Expenses	788.82	721.49	- 67.33*	-109.02	- 25.64	-
(Total Recurring Household Income)	($1,042.51)	($621.89)	($-429.62)*	($-459.21)	($-400.02)	(-4

[a]The percentage change for any category is defined as the change in the mean for that category from the preunemployment m of unemployment divided by the mean amount spent in that category during the preunemployment month. This percentage cha a ratio estimator. Thus, the usual formula for constructing confidence intervals is modified to be:

$$r \pm 1.96 \sqrt{(\frac{1}{n})(\frac{1}{\bar{X}^2})\ (\frac{\Sigma(Y_i - rX_i)^2}{n-1})}$$ where:

n = the sample size;
$\bar{X}$ = the mean amount spent during the preunemployment month;
Y_i = the difference for the ith individual between the actual amount spent during the preunemployment month and during t weeks of unemployment;
X_i = the actual amount spent during the preunemployment month by the ith individual; and
r = the sample ratio = $\Sigma Y_i / \Sigma X_i$.

Unlike "simple" estimators, ratio estimators are often biased. For sample sizes greater than 30 and for cases where the mean to the mean is less than or equal to .10, the bias is negligible. In all cases, the maximum bias can be estimated a product of the standard error of the mean and the standard error of the sample ratio divided by the sample mean. For mor and their associated confidence intervals, see: Scheaffer, Mendenhall and OTT, Elementary Survey Sampling; North Scituat 1979 (2nd ed.); and Kish, Survey Sampling; New York: John Wiley and Sons, 1965.

*95% Confidence interval does not include zero.

APPENDIX TABLE E-1

MAXIMUM BIASES FOR THE PERCENTAGE CHANGES REPORTED IN TABLE 1 [a]

Expenditure Category	$\bar{X}$ [b]	$\sigma_{\bar{X}}$ [c]	σ_r [d]	$\frac{\sigma_{\bar{X}}}{\bar{X}}$	$\frac{\sigma_{\bar{X}}\,\sigma_r}{\bar{X}}$
Components of Necessary/ Obligated Expenses:					
Housing	$ 209.56	3.108	.01137	.0148	.00016
Loans	120.48	3.174	.02153	.0263	.00056
Food	156.46	2.324	.01061	.0149	.00015
Transportation	78.91	1.932	.02801	.0245	.00068
Clothing	23.47	.950	.03479	.0405	.00140
Support Outside Persons	9.68	1.104	.09928	.1140	.01132
Medical	42.70	2.041	.04918	.0478	.00235
Insurance	49.47	1.721	.04076	.0348	.00141
Taxes	6.93	1.484	.42928	.2141	.09192
Services/Other	25.93	1.215	.03653	.0469	.00171
Total Necessary/Obligated Expenses	$ 723.59	9.261	.01122	.0128	.00014
Other Expense Categories:					
Education	8.54	2.294	.21852	.2686	.05869
Charity/Gifts	54.82	3.849	.16658	.0702	.01169
Travel/Entertainment/Snacks & Meals Away From Home	77.87	2.387	.02316	.0307	.00070
Total Other Expenses	$ 141.23	5.270	.06591	.0373	.00245
Total All Expenses	$ 864.81	11.812	.01530	.0137	.00020
(Mean Monthly Gross Recurring Household Income)	($1,111.36)	(14.702)	(.00816)	(.0132)	(.00010)

[a] The maximum bias of r, $E\,|\,\hat{r} - r\,|$, is less than or equal to $\frac{\sigma_{\bar{X}}\,\sigma_r}{\bar{X}}$

[b] $\bar{X}$ = mean amount spent

[c] $\sigma_{\bar{X}}$ = standard error of the mean amount spent.

[d] σ_r = standard error of the percentage change in the mean amount spent.

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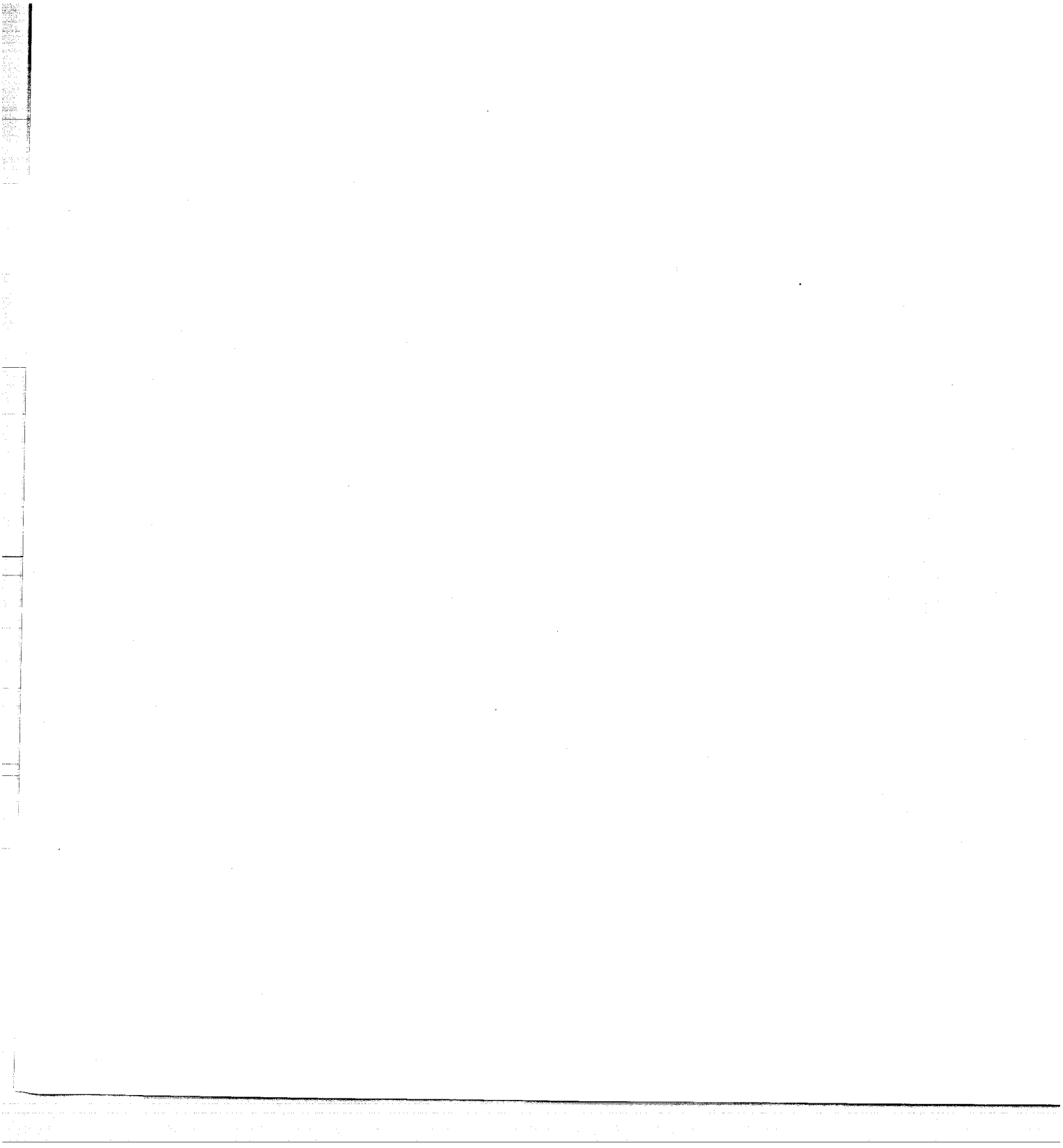

Changes in Spending Patterns Following Unemployment

Unemployment Insurance
Occasional Paper 81-3

U.S. Department of Labor
Ray Marshall, Secretary

Employment and Training Administration
Ernest G. Green, Assistant Secretary for
Employment and Training

Unemployment Insurance Service
1981

This report was prepared by Paul L. Burgess and Jerry L. Kingston, Associate Professors of Economics, Arizona State University, and Robert D. St. Louis, Manager, UI Research and Reports Section, and Joseph T. Sloane, Manager, Contract Research Unit, UI Research and Reports Section, Arizona Department of Economic Security, under sponsorship of the Unemployment Insurance Service of the Employment and Training Administration, U.S. Department of Labor. Because researchers are encouraged to express their own viewpoints, the opinions offered in this document do not necessarily represent the official position or policy of the Department of Labor.

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The major purpose of unemployment insurance (UI) is to provide some measure of income security during temporary spells of unemployment for workers who become involuntarily unemployed and have an established record of employment during the period immediately prior to unemployment. The degree of income security provided by UI benefits has been limited by the cost of providing benefits and by the stronger disincentives to return to work that presumably result from higher UI benefits. Thus, it is accepted by nearly all observers that UI benefits "should" provide considerably less than "full" income security by replacing considerably less than 100 percent of the wages lost by insured workers. The exact portion of lost wages that "should" be insured by UI benefits is, of course, a subjective issue. However, a goal commonly accepted is to replace about half of the weekly wages lost by UI claimants, up to some maximum weekly benefit.

One way to assess the degree of income security provided by UI benefits is to analyze the adjustments undertaken by unemployment insurance beneficiaries (and their households) following the onset of their unemployment spells. A wide variety of the adjustments made by the study group was analyzed in a previous report,[1] and these findings are summarized briefly below as background for the analysis presented in this report. Among the adjustments previously investigated was the reduction in total payments made by the study group for "necessary/obligated" expenditures during the interval between the "preunemployment month" and the month prior to the thirteenth consecutive week of compensated unemployment.[2]

Expenditure adjustments undertaken by UI claimants and their households certainly are of major importance in assessing the extent to which UI benefits cushion the loss of income that results from the beneficiary's unemployment.

Such adjustments also serve as an indication of the overall consequences of continued unemployment. For these reasons, this report provides additional detail not contained in earlier ABA study reports on the expenditure adjustments made by beneficiaries and their households. The analysis presented here focuses on spending adjustments undertaken in each of the ten categories that comprise necessary/obligated expenses, and in three specific expenditure categories not included in necessary/obligated expenses.

This additional analysis addresses three main issues. First, as noted above, additional detail on the magnitude and composition of expenditures adjustments undertaken by UI beneficiaries and their households is of use in assessing the overall consequences of continued unemployment and the extent to which UI benefits alleviate the financial hardships that result from the beneficiary's unemployment. Second, detailed information on expenditure changes for individual categories of expenditures provides one basis for determining how "important" spending in various categories is to the insured unemployed; this information then could be utilized to determine which expenditure groups would be most appropriate for inclusion in a conventionally defined benefit adequacy measure. Third, the data provide a basis for evaluating the hypothesis that the magnitudes of the spending reductions in given expenditure categories are inversely related to the degree of benefit adequacy provided by the beneficiary's weekly UI benefit payment. This hypothesis is based on the assumption that the financial pressures experienced by beneficiary households as a consequence of the beneficiary's unemployment are inversely related to the adequacy of UI benefits for the beneficiary.

As noted above, the spending adjustments considered here are based on the difference between paid expenses during a "typical" preunemployment month and paid expenses during the month prior to the thirteenth consecutive week of

This study is the sixth in a series of reports based on the Arizona Benefit Adequacy (ABA) Study. The first report emphasized the measurement of benefit adequacy under the prevailing and selected alternative weekly benefit amount formulas. The second report focused on the adjustments undertaken by beneficiary households during periods of thirteen and twenty-five consecutive weeks of compensated unemployment. The third study analyzed the labor market experiences of those study group claimants who exhausted their entitlement to unemployment insurance (UI) benefits. In the fourth report, estimates of the changes in regular UI program costs associated with changes in the weekly benefit amount formula were provided, and a general procedure was developed for assessing the impact of changes in the weekly benefit amount formula on UI program costs and benefit adequacy. The fifth report provided an analysis of the possibility of predicting benefit adequacy values for individual claimants on the basis of information normally available from UI agency records and on the basis of information available from the Continuous Wage and Benefit History files.

The present report represents a direct extension of the analysis provided in the second report on this study. A brief summary of some portions of this earlier report is provided in this paper as background for the analysis. Whereas the second report dealt with a wide variety of adjustments made by persons unemployed for thirteen and twenty-five consecutive weeks, this report provides detail on the changes in spending on thirteen categories of expenditures made by the study group between the preunemployment month and the month prior to the thirteenth week of unemployment.

The authors gratefully acknowledge the cooperation and support provided by the UI Research and Reports Section of the Arizona Department of Economic Security; Mr. Richard Porterfield, Coordinator of Contract Research, was especially helpful in project administration. We also wish to express our appreciation to Mr. John Robinson, Ms. Helen Manheimer and Dr. Mamoru Ishikawa of the Unemployment Insurance Service for their valuable suggestions during the course of the project. Mrs. Lynnette Winkelman reduced the difficulty of preparing the report by expertly typing its drafts.

compensated unemployment.[3] No attempt is made to determine whether the adjustments made by this group would have been quite different, had these persons been unemployed for a much shorter or longer period.[4]

STUDY BACKGROUND

Information on study design and the definitions of the household unit and the benefit adequacy measure utilized in this report are summarized in this section. The characteristics of the claimants analyzed are discussed in Appendix A.

Design of Original Study

The Arizona Benefit Adequacy Study was initiated in the summer of 1975 to investigate the adequacy of UI benefits relative to the preunemployment standard of living established by the beneficiary household. The study also was designed to assess adjustments undertaken by beneficiaries and their households during an unemployment spell of up to twenty-five consecutive weeks in duration. Three sets of household interviews were conducted. The first, which was administered after five consecutive weeks of compensated unemployment, was designed to obtain information about each beneficiary household's preunemployment income and expenditure levels during a month of typical employment. The second and third interviews occurred following thirteen and twenty-five consecutive weeks of compensated unemployment; these interviews were designed to obtain information about the adjustments undertaken by each beneficiary household in response to the beneficiary's prolonged unemployment spell. Study group claimants who had exhausted their entitlement to all benefits also were surveyed by mail at the end of the second, fourth and sixth months following benefit exhaustion. The survey work for all phases of the study was completed in February 1978.

The Household Definition

Definition of an appropriate household unit concept is of major importance in benefit adequacy research because income and expenses are obtained for this entire unit; as a result, the measure of benefit adequacy itself depends importantly on who is and is not included in the beneficiary's household. The definition of the household unit used in the ABA study revolves around the beneficiary, rather than around the "head" of the household as is commonly done in the other survey research. The basis for this distinction is that the beneficiary is the focus of interest for the UI program and for benefit adequacy research, and the beneficiary is not the household "head" in many instances. The household definition used in the ABA study and in this report includes the beneficiary and, if present, the spouse and all persons who reside with the beneficiary/spouse and receive at least 50 percent of their monthly support from the beneficiary/spouse. Spouses are included in the household unit on the assumption that they share expenses and income with the beneficiary. The appropriate basis for including/excluding other persons in the household unit is somewhat more subjective, and it is recognized that the 50 percent criterion is somewhat arbitrary. Overall, this definition was chosen because it: 1) facilitated the collection of accurate income and expense data for the entire household unit; and 2) was useful in analyzing the adequacy of weekly UI benefit payments and the adjustments made by household units following unemployment.

The Measure of Benefit Adequacy

Previous benefit adequacy studies consistently have focused on a benefit adequacy measure that is based upon a comparison of the claimant's WBA with the expenditures for specific types of goods and services. The expenses that

should form the benchmark against which the WBA is compared has been a matter of judgment. The larger is this expenditure set, the less adequate UI benefits would appear to be, unless some offsetting reduction in the proportion of these expenditures that the WBA "should" replace is considered. For the purposes of this study, the relevant expenditure set encompasses paid expenses for "necessary/obligated" goods or services during the preunemployment month--a month of employment prior to unemployment selected by the claimant as most "typical" of his/her usual employment situation. This expenditure set consists of "necessary" expenses for goods and services acquired and consumed by the household on a regular basis, and "obligated" expenses that are expected to be met on a regular basis because of established commitments. The rationale for this definition is that it is based on the standard of living established by the beneficiary household. Expenses which meet the above criteria are assumed to constitute the "core" component of the household living standard. Generally, the household unit becomes accustomed to this standard of living, and rapid downward adjustments in it are difficult to make following the onset of the beneficiary's unemployment spell.

The items included in the necessary/obligated expense definition are the following:[5]

1) housing (including utilities and necessary maintenance);

2) food purchased in grocery stores;

3) medical care (including prescriptions and payments on past medical care);

4) credit and loan payments;

5) clothing;

6) transportation (including gasoline and maintenance);

7) insurance (including union dues);

8) services and other regular payments;

9) continuing and regular support of persons outside of the household; and

10) lump-sum payments for property and income taxes.

It should be emphasized that the beneficiary's share of these necessary and obligated expenses may be considerably less than the total for the entire household. Because UI benefits are wage-related, it reasonably can be argued that the weekly UI benefit payment should be expected to sustain (at most) the same share of total necessary/obligated expenses that the beneficiary's wages sustained while the beneficiary was employed. On this basis, the total of the beneficiary household's necessary/obligated expenses in the preunemployment month were adjusted by the ratio of the beneficiary's gross wage in the preunemployment month to the total of gross recurring household income in the preunemployment month. Accordingly, the measure of benefit adequacy employed in this analysis is the ratio of the WBA to the beneficiary's "proportionate share" of the (weekly) necessary and obligated household expenses that were paid during the preunemployment month. This measure is given by:

$$\text{BENAD} = \frac{\text{WBA}}{(\text{EXPENSES}) \times (\text{BEN. SHARE})}$$

where:

BENAD is the measure of the adequacy of the weekly benefit payment for an individual beneficiary;

WBA is the maximum UI weekly benefit payment to which the beneficiary is entitled on the basis of earnings in the high quarter of the base period;[6]

EXPENSES is the total of the (weekly) necessary/obligated expenses of the beneficiary household during the preunemployment month; and

BEN. SHARE is the ratio of the beneficiary's gross wages in the preunemployment month to total gross recurring household income during the same month; this ratio defines the beneficiary's "proportionate share" of the necessary and obligated expenses of the beneficiary household.

INTERPRETING ADJUSTMENTS TO UNEMPLOYMENT

As noted above, the adjustments undertaken by beneficiaries and other household members in response to the beneficiary's unemployment provide an indication of the overall impact of short-term unemployment. It should be emphasized, however, that whether any household undertakes a particular adjustment depends on both the overall pressures to make some adjustments and the relative ease with which the particular adjustment under consideration can be made. Given the relevant constraints confronted by the household, the rational response of each household obviously would be to choose an optimal pattern of adjustments, based upon the (monetary and nonmonetary) benefits and costs of the alternative adjustments available.

Many of the major adjustments made by households in response to unemployment are undertaken in an attempt to maintain household living standards following unemployment, and these adjustments and the resulting consumption patterns may be interpreted within the framework of a commonly accepted theory of consumption developed by Friedman.[7] According to this theory of consumption:

1) household members are able to make fairly accurate estimates of the total and intertemporal pattern of their lifetime earnings;
2) household members choose a pattern and level of consumption that maximizes utility over their lifetimes;
3) current consumption spending is affected very strongly by changes in "permanent" income; and
4) current consumption spending is affected very little by changes in "transitory" income.

The directly applicable implications of Friedman's theory of consumption for the present analysis are quite clear. The onset of the beneficiary's unemployment spell causes a significant reduction in the flow of measured income to the household. Large reductions in household consumption spending following the beneficiary's unemployment would reflect large reductions in

estimated permanent household income, whereas very small reductions (or no changes) in household consumption would reflect very small reductions (or no changes) in estimated permanent household income. These implications are reasonable ones in the present context because preunemployment month expenses serve as the benchmark against which expenditure changes are measured, and these preunemployment month expenditures are the payments made by these households during a month of "typical" employment by the beneficiary. Hence, these preunemployment month expenses may be viewed as a reasonable proxy for consumption that depends on permanent income.[8] In this context, fully anticipated unemployment spells would be expected to have little effect on current consumption patterns.[9] Moreover, within this framework, one way to evaluate the severity of unemployment spells and the extent of income security provided by UI benefits would be to measure the magnitude of consumption changes made by UI claimants, and the extent to which UI benefits helped to maintain prior levels of consumption spending.[10]

The above framework provides a basis for evaluating adjustments to unemployment (particularly consumption changes) for the study group as a whole. Also analyzed below are the adjustments made by households, classified by the adequacy of UI benefits received by the beneficiary in each household. Within the above framework of optimal adjustment patterns, the basic hypothesis examined is that the relative size of consumption reductions made by beneficiary households following the beneficiary's unemployment will be inversely related to the relative degree of UI benefit adequacy recorded for the beneficiaries in these households. This hypothesis is based on the assumption that a reasonable index of the pressures experienced by the entire beneficiary household to adjust to the beneficiary's unemployment is provided by the extent to which weekly UI benefits cover the proportion of household (necessary/obligated) expenses

previously covered by the beneficiary's earnings. Within the context of the consumption theory described above, very adequate vs. very inadequate benefits would imply that households would have to make few/smaller vs. more/larger adjustments in attempting to maintain their preunemployment living standards which were based on (expected) permanent income. In addition, it would be expected that very adequate vs. very inadequate benefits would be associated with small or no reductions vs. larger reductions in the consumption spending that made up the preunemployment living standard.

It should be emphasized that the above hypothesis on adjustments, benefit adequacy, and consumption spending is strictly valid only under ceteris paribus conditions. Nonetheless, we believe it is appropriate for the purposes of the subsequent analysis to interpret the hypothesis as applying to the "average" household in a particular benefit adequacy category. However, in this latter context, it must be recognized that two beneficiaries with the same measured level of benefit adequacy could reside in households in which quite different pressures to adjust to the beneficiary's unemployment would be experienced. Even if the two beneficiaries had the same level of UI benefit adequacy, the level of total recurring household income replaced by UI benefits could be greater for one beneficiary than for the other. This may occur because one household spent more of its household income on necessary/obligated expenses than did the other, or because one household had lower nonbeneficiary earnings than another. However, across the households analyzed, it is assumed that these other factors essentially can be ignored as long as adjustments are analyzed only for <u>groups</u> of households, classified by the level of benefit adequacy experienced by the individual beneficiaries who reside in the households.

Another important point to recognize in the subsequent analysis of expenditure adjustments by groups of households (classified into different

benefit adequacy categories) is that consumption adjustments undertaken in response to the beneficiary's unemployment very likely are directly related to the capability of the household to make a variety of compensating nonconsumption adjustments. It previously has been shown that, for persons unemployed for thirteen consecutive weeks, those classified into lower (vs. higher) benefit adequacy categories tended to have: (1) higher gross beneficiary earnings in the preunemployment month; (2) higher gross recurring household income during the preunemployment month; and (3) higher levels of necessary/obligated expenses, both for the entire household and for the beneficiary's share of such expenses.[11] Presumably, the capability of households to make nonconsumption adjustments to unemployment--especially financial adjustments such as borrowing money or liquidating assets--tends to increase directly with income (and wealth). Thus, the above findings suggest that households with relatively low benefit adequacy also tended to be household units that had a relatively greater capability to undertake nonconsumption adjustments.[12]

The above discussion indicates that the adjustments actually undertaken by a group of households likely reflect both the pressures to make consumption adjustments (because of the degree of benefit adequacy for the group) and the capability of households in that group to make nonconsumption adjustments (because of accumulated household wealth, for example). Obviously, it is not possible to determine whether any particular adjustment was undertaken by a group of households primarily because of the overall pressure on the household living standard or because of the relative ease with which that particular adjustment could be made. As noted above, both the costs and benefits of various adjustments interact to determine the optimal adjustment pattern actually selected.

In light of these considerations, a brief summary of some of the adjustments undertaken by study group households is provided to indicate the overall pattern of adjustments they made during the first three consecutive months of the beneficiary's unemployment. The purpose is to provide some perspective for evaluating the detailed picture of spending changes presented in the next section. Some of the major adjustments were the following:[13]

1. Approximately one-third (31%) of the beneficiary households recorded some increase in the amount of nonbeneficiary household income (including any nonwage income attributable to the beneficiary) from the employed month to the month prior to the thirteenth week interview. Also, a greater proportion of the households for which benefits were less vs. more adequate had increases in nonbeneficiary household income.

2. Two-thirds of the households reduced the total of their paid necessary/obligated expenses from the employed month to the month prior to the thirteenth week interview. Almost one-fifth of the total sample reduced these payments by 40 percent or more and over two-fifths of the total sample cut paid expenses by 20 percent or more. The pattern by benefit adequacy category is very pronounced: a much greater proportion of the households for which benefits were less vs. more adequate undertook reductions in these expenses. Analysis of the changes in the sum of paid + due-but-not-paid expenses (an approximation to the "basic" standard of living as it related to the consumption of goods and services) reveals that, for most households, reductions in paid expenses were not offset by increases in due-but-not-paid expenses from the employed month to the month prior to the thirteenth week interview. Rather, changes in paid expenses, both for the total sample and for the benefit adequacy categories analyzed, closely approximated the changes in consumption (as measured by the change in the sum of paid + due-but-not-paid expenses).

3. Approximately three-fifths of the sample had some savings at the onset of the beneficiary's unemployment spell, and about three-fourths of these households utilized these savings to help meet household expenses because of the beneficiary's spell of unemployment. About one-fourth of the households with savings had exhausted their savings by the end of the month prior to the thirteenth week interview. Furthermore, a greater proportion of those for whom benefits were less vs. more adequate tended to utilize (and exhaust) these savings.

4. The principal sources of cash (other than savings) utilized by beneficiary households to meet household expenses because of the beneficiary's unemployment were loans from friends and relatives and the sale of personal property, each of which was utilized by one-tenth or more of the households. The most striking pattern among the benefit adequacy categories was the tendency for a larger proportion of the beneficiary households for which benefits were less vs. more adequate to obtain funds from these and the other sources analyzed.

5. The amount of cash used from savings and other sources to help meet household expenses because of the beneficiary's unemployment was quite substantial for a number of these households. Over one-sixth of the total sample used $1,000 or more and one-third used $500 or more from the onset of unemployment through the month prior to the thirteenth week interview. A much larger percentage of the households for which benefits were less vs. more adequate used relatively large amounts of cash from these sources to help meet household expenses.

6. Approximately one-fifth (18%) of the beneficiary households had one or more nonbeneficiary household members who began to work more hours from the onset of the beneficiary's unemployment to the month prior to the thirteenth week interview. Just over one-fifth (22%) of the households had one or more nonbeneficiary household members who began to look for work during this interval, and almost one-eighth of the total sample had one or more nonbeneficiary house-

hold members who began working during this period. The labor market adjustments by nonbeneficiary household members that involved either seeking or accepting a job occurred more frequently in those households for which benefits were less vs. more adequate.

The above results obviously indicate that three consecutive months of unemployment led UI beneficiaries and their households to make a large number of adjustments. As expected, the magnitude of these adjustments tended to be inversely related to the level of benefit adequacy recorded for the beneficiary. Given this perspective on the overall adjustment pattern for the study group, the next section provides detail on the adjustments made in specific expenditure categories.

SPENDING CHANGES FOLLOWING UNEMPLOYMENT

The changes in paid expenses for each of the ten necessary/obligated expenses, for each of three other expenditure categories and for the total of all thirteen of these categories are analyzed in this section.[14] It should be emphasized that only payments in each expenditure category are analyzed; changes in due-but-not-paid expenses are not analyzed.[15]

Before examining these expenditure adjustments, it is useful to review the levels of gross recurring income for these beneficiary households during the preunemployment month and during the month prior to thirteen weeks of unemployment. Before unemployment, mean gross recurring household income for the study group was $1,111; following unemployment, mean income fell to $636 (see Table 1). The percentage decline in mean recurring household income between these two months was approximately 43 percent; the 95% confidence intervals for this percentage decline in income and for the absolute decline in income also are reported in Table 1. Within the context of the consumption

TABLE 1

CHANGES IN MEAN SPENDING BY CATEGORY FROM THE PREUNEMPLOYMENT MONTH TO MONTH PRIOR TO THIRTEEN CONSECUTIVE WEEKS OF UNEMPLOYMENT: TOTAL SAMPLE

Expenditure Category	Mean Amount Spent During Preunemployment Month	Mean Amount Spent During Month Prior to 13 Weeks of Unemployment	Dollar Change in Mean Amount Spent From Preunemployment Month to Month Prior to 13 Weeks of Unemployment: Dollar Change (a)	Limits of 95% Confidence Interval: Lower Limit (b)	Limits of 95% Confidence Interval: Upper Limit (c)	Percentage Change in Mean Amount Spent From Preunemployment Month to Month Prior to 13 Weeks of Unemployment[a]: Percentage Change (d)	Limits of 95% Confidence Interval: Lower Limit (e)	Limits of 95% Confidence Interval: Upper Limit (f)
Components of Necessary/ Obligated Expenses:								
Housing	$ 209.56	$197.38	$- 12.17*	$- 16.97	$- 7.38	- 5.8*	- 8.03	- 3.57
Loans	120.48	102.36	- 18.12*	- 23.51	- 12.73	-15.0*	-19.22	-10.78
Food	156.46	133.14	- 23.31*	- 26.83	- 19.80	-14.9*	-16.98	-12.82
Transportation	78.91	69.73	- 9.19*	- 13.80	- 4.57	-11.6*	-17.09	- 6.11
Clothing	23.47	14.22	- 9.26*	- 11.31	- 7.21	-39.4*	-46.22	-32.58
Support Outside Persons	9.68	7.78	- 1.89	- 3.90	0.12	-19.6*	-39.06	- 0.14
Medical	42.70	33.57	- 9.13*	- 13.81	- 4.45	-21.4*	-31.04	-11.76
Insurance	49.47	44.80	- 4.68*	- 8.80	- 0.55	- 9.4*	-17.39	- 1.41
Taxes	6.93	14.71	7.78	- 0.28	15.83	112.3	-28.16	252.76
Services/Other	25.93	14.33	- 11.60*	- 14.07	- 9.14	-44.7*	-51.86	-37.54
Total Necessary/Obligated Expenses	$ 723.59	$632.02	$- 91.58*	$-108.24	$- 74.91	-12.7*	-14.90	-10.50
Other Expense Categories:								
Education	8.54	6.14	- 2.40	- 7.17	2.38	-28.1	-70.93	14.73
Charity/Gifts	54.82	51.49	- 3.33	- 21.41	14.75	- 6.1	-38.75	26.55
Travel/Entertainment/Snacks & Meals Away from Home	77.87	44.13	- 33.74*	- 38.65	- 28.83	-43.3*	-47.84	-38.76
Total Other Expenses	$ 141.23	$101.76	$- 39.47*	$- 58.92	- 20.02	-28.0*	-40.92	-15.08
Total All Expenses	$ 864.81	$733.78	$-131.05*	$-158.12	$-103.97	-15.2*	-18.20	-12.20
(Mean Monthly Gross Recurring Household Income)	($1,111.36)	($635.90)	$-475.45)*	($-499.83)	($-451.08)	(-42.8)*	(-44.40)	(-41.20)

[a]The percentage change for any category is defined as the change in the mean for that category from the preunemployment month to the month prior to 13 weeks of unemployment divided by the mean amount spent in that category during the preunemployment month. This percentage change is not a "simple" estimator but a ratio estimator. Thus, the usual formula for constructing confidence intervals is modified to be:

$$r \pm 1.96 \sqrt{\left(\frac{1}{n}\right)\left(\frac{1}{\bar{X}^2}\right)\left(\frac{\Sigma(Y_i - rX_i)^2}{n-1}\right)}$$ where:

n = the sample size;
$\bar{X}$ = the mean amount spent during the preunemployment month;
Y_i = the difference for the ith individual between the actual amount spent during the preunemployment month and during the month prior to 13 consecutive weeks of unemployment;
X_i = the actual amount spent during the preunemployment month by the ith individual; and
r = the sample ratio = $\Sigma Y_i / \Sigma X_i$.

Unlike "simple" estimators, ratio estimators are often biased. For sample sizes greater than 30 and for cases where the ratio of the standard error of the mean to the mean is less than or equal to .10, the bias is negligible. In all cases, the maximum bias can be estimated and is less than or equal to the product of the standard error of the mean and the standard error of the sample ratio divided by the sample mean. Appendix Table E-1 contains these values for the percentage changes in Table 1. For more information on ratio estimators and their associated confidence intervals, see: Scheaffer, Mendenhall and OTT, Elementary Survey Sampling; North Scituate, Mass.: Wadsworth Publishing, 1979 (2nd ed.); and Kish, Survey Sampling; New York: John Wiley and Sons, 1965.

*95% confidence interval does not include zero.

theory discussed above, such a large reduction in recurring household income would not be expected to result in as large a reduction in household consumption purchases. In addition, the consumption reduction would be expected to be smaller than the decline in gross income because the UI benefits included in gross income following unemployment were not taxable, whereas preunemployment wage income was taxable.[16]

Spending Levels Before and After Unemployment

The mean amounts spent by the study group during the preunemployment month and during the month prior to thirteen consecutive weeks of unemployment also are reported in Table 1.[17] Prior to unemployment, mean spending was $865 for all thirteen categories and $724 for the ten necessary/obligated categories. During the month prior to thirteen consecutive weeks of compensated unemployment, mean spending for the same expenditure categories fell to $734 and $632, respectively. The percentage reductions in consumption spending following unemployment amounted to 13 percent for necessary/obligated expenditures and 15 percent for total expenses (vs. a cut in gross income of 43%); the narrowness of the 95% confidence intervals for both the percentage reductions in necessary/obligated expenditures and total expenses indicates that the point estimates for these percentage cuts in spending are quite precise.

Housing, food and loan payments dominated the budgets of these beneficiary households, both before the beneficiary's unemployment spell began, and during the month prior to the thirteenth consecutive week of unemployment. Mean spending on these three items totalled about $487 during the preunemployment month and fell by $54 (to $433) following unemployment. The next largest expenditure category in each month was transportation ($79 before unemployment and $70 following unemployment). An interesting pattern revealed for necessary/

obligated expenditures is that, excluding taxes, the ranking (in terms of the absolute amount spent in each period) of the other nine necessary/obligated expenditure categories is identical for both the preunemployment month and the month prior to thirteen consecutive weeks of unemployment. The ranking from the largest to the smallest mean amount spent in each of these months is: (1) housing; (2) food; (3) loans; (4) transportation; (5) insurance; (6) medical; (7) services/other; (8) clothing; and (9) support of outside persons.

On the basis of the consumption theory discussed above, it can be concluded that many of these households did not fully anticipate the beneficiary's unemployment spell, because of the reductions in consumption spending reported in Table 1 (and in Appendix Table B-1). Because mean spending on just the ten necessary/obligated expenses following unemployment ($632) nearly equalled mean gross recurring household income ($636) during the same month,[18] it can be concluded that UI support (which is included in gross income) was relied on by many of these households to help maintain the "core" component of the household living standard following unemployment.[19] In addition, as noted earlier, these households also made a number of financial and labor market adjustments in attempting to maintain the household living standard following unemployment.

Spending Changes by Expenditure Category

The expenditure adjustments of the study group can be viewed in terms of either the proportion of households that made some reduction in spending in any category or the average size of the spending change made. The percentage of households that cut spending in each category is reported in Table 2. These results show that, following unemployment, over one-half of all households reduced expenditures in the following four categories: housing, food, transportation, and travel/entertainment/etc.(which was cut by more households than any other separate category). At least two-fifths of all households made some

TABLE 2

PERCENTAGE OF HOUSEHOLDS THAT REDUCED SPENDING BY CATEGORY FOLLOWING UNEMPLOYMENT

Expenditure Category	Percent of Households That Reduced Spending From the Preunemployment Month to the Month Prior to 13 Weeks of Unemployment	Limits of 95% Confidence Interval	
		Lower Limit	Upper Limit
Components of Necessary/Obligated Expenses			
Housing	55.0*	52.5	57.5
Loans	43.9*	41.5	46.3
Food	56.4*	54.0	58.8
Transportation	51.7*	49.2	54.2
Clothing	42.9*	40.5	45.3
Support Outside Persons	5.6*	4.4	6.8
Medical	45.9*	43.4	48.4
Insurance	43.2*	40.8	45.6
Taxes	4.3*	3.3	5.3
Services/Other	48.5*	46.0	51.0
Total Necessary/Obligated Expenses	67.4*	65.0	69.8
Other Expense Categories:			
Education	5.8*	4.6	7.0
Charity/Gifts	43.9*	41.5	46.3
Travel/Entertainment/Snacks & Meals Away From Home	66.2*	63.8	68.6
Total Other Expenses	66.5	64.1	68.9
Total All Expenses	71.3*	69.1	73.5

*95% confidence interval does not include zero.

spending cuts in ten of the thirteen expenditure categories following the beneficiary's unemployment. Overall, 71 percent of all households made some cut in total spending from the preunemployment month to the month prior to thirteen weeks of unemployment. Conversely, the remaining 29 percent of the households spent as much or more after unemployment as they did during the preunemployment month.

For convenience of reference, the percentage reductions in spending reported in Table 1 are presented in Table 3, with the categories ranked from the smallest to the largest percentage reduction.[20] Reductions in mean spending from the preunemployment month to the month prior to thirteen weeks of unemployment were recorded in twelve of the thirteen categories.[21] The only category in which mean spending did not fall after unemployment was taxes; in this case, spending actually increased by 112 percent, but the 95% confidence interval indicates that this point estimate actually does not differ significantly from zero. In addition, the 95% confidence intervals reported in Table 3 indicate that the point estimates for two of the categories in which mean spending fell--charity/gifts and education--actually do not differ significantly from zero. The largest percentage cuts in mean spending were recorded for the services/other category (a decline of 44.7%) and for travel/entertainment/etc. category (a decline of 43.3%). However, the percentage cuts in most individual categories were considerably smaller than was the case for services/other and travel/entertainment/etc. Reductions in mean spending of less than 20 percent were recorded for seven of the thirteen expenditure groups considered, and an actual increase was recorded for the tax category (although this increase does not differ significantly from zero).

TABLE 3

PERCENTAGE CHANGES IN MEAN SPENDING BY CATEGORY FROM THE PREUNEMPLOYMENT MONTH TO THE MONTH PRIOR TO THE THIRTEENTH WEEK INTERVIEW: TOTAL SAMPLE

Expenditure Category	Percentage Change in Mean Amount Spent from the Preunemployment Month to the Month Prior to 13 Weeks of Unemployment[a]	Limits of 95% Confidence Interval	
		Lower Limit	Upper Limit
Taxes	112.30	-28.16	+256.76
Housing	- 5.80*	- 8.30	- 3.57
Charity/Gifts	- 6.10	-38.75	+26.55
Insurance	- 9.40*	-17.39	- 1.41
Transportation	-11.60*	-17.09	- 6.11
Food	-14.90*	-16.98	-12.82
Loans	-15.00*	-19.22	-10.78
Support Outside Persons	-19.60*	-39.06	- 0.14
Medical	-21.40*	-31.04	-11.76
Education	-28.10	-70.93	+14.73
Clothing	-39.40*	-46.22	-32.58
Travel/Entertainment/Snacks and Meals Eaten Away From Home	-43.30*	-47.84	-38.76
Services/Other	-44.70*	-51.86	-37.54
Total Necessary/Obligated Expenses	-12.70*	-14.90	-10.90
Total Other Expenses	-28.00*	-40.92	-15.08
Total All Expenses	-20.64*	-18.20	-12.20
Total Recurring Monthly Income	-42.80*	-44.40	-41.20

(footnotes continued on next page)

TABLE 3 (continued)

[a]The percentage change for any category is defined as the change in the mean for that category from the preunemployment month to the month prior to 13 weeks of unemployment divided by the mean amount spent in that category during the preunemployment month. This percentage change is not a "simple" estimator but a ratio estimator. Thus, the usual formula for constructing confidence intervals is modified to be:

$$r \pm 1.96 \sqrt{(\frac{1}{n})(\frac{1}{\overline{X}^2}) \ (\frac{\Sigma(Y_i - rX_i)^2}{n-1})}$$

where: n = the sample size;

$\overline{X}$ = the mean amount spent during the preunemployment month;

Y_i = the difference for the ith individual between the actual amount spent during the preunemployment month and during the month prior to 13 consecutive weeks of unemployment;

x_i = the actual amount spent during the preunemployment month by the ith individual; and

r = the sample ratio = $\Sigma Y_i / \Sigma X_i$.

Unlike "simple" estimators, ratio estimators are often biased. For sample sizes greater than 30 and for cases where the ratio of the standard error of the mean to the mean is less than or equal to .10, the bias is negligible. In all cases, the maximum bias can be estimated and is less than or equal to the product of the standard error of the mean and the standard error of the sample ratio divided by the sample mean. For more information on ratio estimators and their associated confidence intervals, see: Scheaffer, Mendenhall and OTT, Elementary Survey Sampling; North Scituate, Mass: Wadsworth Publishing, 1979 (2nd ed.); and Kish, Survey Sampling; New York: John Wiley and Sons, 1965.

* 95% confidence interval does not include zero.

Spending Changes by Benefit Adequacy Category

As suggested above, one hypothesis that can be tested with the data available is that those with very adequate vs. very inadequate benefits would make small or no vs. larger reductions in consumption spending following unemployment. Evidence for evaluating this hypothesis is summarized in Table 4 for those in the lowest and highest benefit adequacy categories (50 percent or less vs. 86 percent or more).[22] These results provide support for the above hypothesis. Except for charity/gifts and education, the point estimates indicate that a larger reduction in mean spending (in both dollar and percentage terms) for each of the eleven remaining expenditure categories was made by those in the lowest benefit adequacy category than by those in the highest adequacy category. In fact, an actual increase in mean spending was found in eight of the thirteen categories for those in the highest benefit adequacy category. The reduction in total spending following unemployment also was far larger for those in the lowest benefit adequacy category (a cut of 30%) than for those in the highest benefit adequacy category (a cut of just 0.5%).[23] The 95% confidence intervals reported in Table 4 indicate that the mean spending cuts estimated for this sample must be cautiously interpreted, because the "true" differences between these two groups in the population are not as large as might be inferred from the means reported in Table 4. For example, these 95% confidence intervals indicate that there may be no differences between the spending changes of those in the lowest and highest adequacy categories for taxes, charity/gifts, support of outside persons, education, travel/entertainment/etc., and services/other. Nonetheless, these 95% confidence intervals also indicate that those in the lowest adequacy category most likely made larger spending cuts than those in the highest adequacy category in each of the other seven categories.

TABLE 4

PERCENTAGE CHANGE IN SPENDING BY CATEGORY FROM THE PREUNEMPLOYMENT MONTH TO THE MONTH PRIOR TO THE THIRTEENTH WEEK INTERVIEW FOR THE LOWEST AND HIGHEST BENEFIT ADEQUACY GROUPS[a]

Expenditure Category	Percentage Change[b] in Mean Amount Spent		Limits of 95% Confidence Interval				Overlapping Confidence Intervals
			BENAD LE 50%		BENAD GT 85%		
	BENAD LE 50%	BENAD GT 86%	Lower Limit	Upper Limit	Lower Limit	Upper Limit	
Taxes	-65.7	932.5	-91.95	-39.45	-204.68	2,069.68	Yes
Housing	-15.4	4.1	-19.19	-11.61	- 0.91	9.11	No*
Charity/Gifts	-17.8	-38.1	-67.15	31.55	- 58.49	-17.71	Yes
Insurance	-30.4	40.6	-40.86	-19.94	12.10	69.10	No*
Transportation	-36.3	30.0	-43.17	-29.43	16.18	43.82	No*
Food	-23.9	2.0	-27.24	-20.56	- 2.70	6.70	No*
Loans	-28.7	5.5	-34.85	-22.55	- 2.77	13.76	No*
Support Outside Persons	-44.0	28.1	-64.88	-23.12	- 39.42	95.62	Yes
Medical	-46.0	23.5	-56.70	-35.30	- 2.05	49.05	No*
Education	4.4	-57.9	-72.38	81.18	-102.70	-13.10	Yes
Clothing	-51.4	- 4.1	-62.42	-40.38	- 23.94	15.74	No*
Travel/Entertainment/Snacks and Meals Eaten Away From Home	-51.0	-34.8	-59.01	-42.99	- 45.20	24.40	Yes
Services/Other	-53.5	-28.3	-63.48	-43.52	- 50.78	- 5.82	Yes
Total Necessary/Obligated Expenses	-29.1	10.6	-31.90	-26.30	6.58	14.62	No*
Total Other Expenditures	-35.4	-38.0	-56.19	-14.61	- 49.01	-26.99	Yes
Total All Expenditures	-30.0	0.5	-34.23	-25.77	- 3.95	4.95	No*
Total Recurring Household Income	-54.6	-28.6	-57.31	-51.89	- 31.57	-25.57	No*

[a]Benefit adequacy was less than or equal to 50 percent for the lowest adequacy group and greater than or equal to 86 percent for those in the highest adequacy group. The dollar and percentage changes in spending for these two benefit adequacy groups and for the middle benefit adequacy group are reported in Appendix Tables D-1, D-2 and D-3.

[b]The percentage change for any category is defined as the change in the mean for that category from the preunemployment month to the month prior to 13 weeks of unemployment divided by the mean amount spent in that category during the preunemployment month. This percentage change is not a "simple" estimator but a ratio estimator. Thus, the usual formula for constructing confidence intervals is modified to be:

$$r \pm 1.96 \sqrt{\left(\frac{1}{n}\right)\left(\frac{1}{\bar{X}^2}\right)\left(\frac{\Sigma(Y_i - rX_i)^2}{n-1}\right)}$$ where:

n = the sample size;
$\bar{X}$ = the mean amount spent during the preunemployment month;
Y_i = the difference for the ith individual between the actual amount spent during the preunemployment month and during the month prior to 13 consecutive weeks of unemployment;
X_i = the actual amount spent during the preunemployment month by the ith individual; and
r = the sample ratio = $\Sigma Y_i / \Sigma X_i$.

Unlike "simple" estimators, ratio estimators are often biased. For sample sizes greater than 30 and for cases where the ratio of the standard error of the mean to the mean is less than or equal to .10, the bias is negligible. In all cases, the maximum bias can be estimated and is less than or equal to the product of the standard error of the mean and the standard error of the sample ratio divided by the sample mean. For more information on ratio estimators and their associated confidence intervals, see: Scheaffer, Mendenhall and OTT, Elementary Survey Sampling; North Scituate, Mass: Wadsworth Publishing, 1979 (2nd ed.); and Kish, Survey Sampling; New York: John Wiley and Sons, 1965.

*95% confidence intervals for the BENAD LE 50% and BENAD GT 86% groups do not overlap.

The differences between those in the lowest and highest benefit adequacy categories in the seven spending categories for which significant differences in spending were found perhaps deserve emphasis. For those in the lowest benefit adequacy category, mean spending for those in the sample fell by at least 30 percent in four of these seven categories and by at least 20 percent in six of these seven categories. In contrast, for those in the highest benefit adequacy category, mean spending for those in the sample actually increased in six of these seven categories, and these increases amounted to at least 20 percent in three of these six categories.

Ranking Expenditure Categories by Importance

The summary results in Table 3 show the ranking for these thirteen expenditure categories, with the ranking based on the percentage reductions in mean spending in each category made by the total sample following unemployment. This ranking could be utilized as a basis for assessing the "importance" of each expenditure category. At least in terms of short-run expenditure adjustments, it could be argued that the smallest percentage reductions would be made in the most "important" categories and the largest percentage reductions would be made in the least "important" categories. It should be emphasized, of course, that the ranking might well be different for other groups of unemployed workers. Different rankings also might result if permanent income elasticities were utilized to rank expenditure categories. Nonetheless, ordering these categories from the smallest to the largest percentage reduction in spending results in the following ranking for the total sample:[24]

(1) taxes;
(2) housing;
(3) charity/gifts;
(4) insurance;
(5) transportation;

(6) food;
(7) loans;
(8) support of persons outside the household;
(9) medical services;
(10) education;
(11) clothing;
(12) travel/entertainment/etc.; and
(13) services/other.

As shown in Table 4 and in Appendix Tables D-1, D-2, and D-3, this ranking for the total sample reflects an averaging of quite different rankings for those in the households that comprise the three benefit adequacy categories.

The above ranking for the total sample indicates that two of the items defined as necessary/obligated expenses in developing the benefit adequacy measure utilized in this study rank low in importance, at least in the sense that the study group cut spending substantially in each category. These two categories are clothing (with a rank of 11 and a spending cut of 39%) and services/other (with a rank of 13 and a spending cut of 45%). In contrast, one of the categories excluded from necessary/obligated expenditures was charity/gifts, but this category ranked third and mean spending for this category was cut by only 6 percent following unemployment; however, as shown in Appendix Table B-1, median spending in this category fell sharply, from $15.66 before unemployment to $1.81 after unemployment. Thus, the mean change for charity/gifts is not at all representative of the changes typically made in this category following unemployment. In any case, other factors than percentage changes in spending presumably would enter into any determination of what expenditures should be included in a benefit adequacy measure. Nonetheless, these results suggest that consideration might be given to removing the clothing and services/other categories from this set of expenditures. The rationale for removing these two categories would be that the unemployed are able to substantially reduce

spending in each category, at least on a temporary basis. In large part, this probably reflects the fact that an "adequate" stock of clothing was available at the start of unemployment and that the unemployed substitute their time to perform services previously purchased. Exactly which of these thirteen categories should be included in a benefit adequacy measure is a subjective issue in any case.

SUMMARY

Spending changes undertaken by a group of beneficiary households following the onset of the beneficiary's unemployment spell are analyzed in this report. These changes were measured by differences in spending levels for thirteen different expenditure categories between the preunemployment month and the month prior to thirteen consecutive weeks of unemployment.

The permanent income hypothesis serves as a useful framework in interpreting the expenditure adjustments made by the study group. As expected, the mean reduction in consumption spending was less than the reduction in mean gross recurring household income. For the study group as a whole, monthly expenditures in the thirteen categories combined fell by 15 percent (from $865 to $734), whereas monthly gross recurring household income fell by 43 percent (from $1,111 to only $636). Moreover, spending on the ten necessary/obligated expenditures during the month prior to thirteen consecutive weeks of unemployment ($632) nearly equalled gross recurring household income of $636 (which includes UI benefits) during the same month. Even though the decline in monthly spending was much less than the decline in gross recurring household income, the results suggest that, on average, the beneficiary's unemployment spell was not fully anticipated by the beneficiary household. Thus, even the provision of UI benefits was not sufficient to allow many of these households to maintain their preunemployment

standards of living over this three-month interval. This was the case even though these households also undertook a number of other adjustments to maintain their living standards, such as reducing their savings or having other family members work more hours or begin to work.

The results also show that spending reductions were not concentrated in one or a few of the thirteen expenditure categories. In fact, mean spending for the sample fell in all but one of the thirteen expenditure categories following unemployment. The smallest percentage reductions in spending were for housing (5.8%) and charity/gifts (6.1%), whereas the largest percentage cuts were for services/other (44.7%), travel/etc. (43.3%), and clothing (39.4%). In addition, some reduction in spending was made by a substantial proportion of all households for most of these categories. For example, over 40 percent of all households made some spending cuts in ten of the thirteen categories following the beneficiary's unemployment.

The results provide support for the hypothesis that those with very inadequate benefits would make larger percentage reductions in consumption spending than those with very adequate benefits. The sample claimants in the lowest benefit adequacy category made significantly larger cuts in spending in seven of the thirteen expenditure categories, and there was no significant difference between the spending changes of the two groups in the other six categories. Moreover, in the seven categories in which significant differences were found, the spending reductions for those in the lowest adequacy category amounted to at least 30 percent in four of these seven categories and to at least 20 percent in six of these seven categories. In contrast, the sample claimants in the highest benefit adequacy category actually increased mean spending in six of these seven categories, and these increases amounted to at least 20 percent in three cases.

The results of this study also provide one basis for ranking the "importance" of various expenditure categories. The ranking (from the smallest to largest percentage reduction in spending) for the total sample indicates that two of the ten items defined as necessary/obligated expenses in developing the benefit adequacy measure utilized in this study rank low in importance, at least in the sense that the study group cut spending substantially in each category. These two categories are clothing (with a rank of 11th and a spending cut of 39%) and services/other (with a rank of 13th and a spending cut of 45%). These results indicate that some consideration might be given to altering the expenditure categories included in future benefit adequacy studies.

FOOTNOTES

[1]Jerry L. Kingston, Paul L. Burgess and Chris Walters, *The Adequacy of Unemployment Insurance Benefits: An Analysis of Adjustments Undertaken Through Thirteen and Twenty-Five Weeks of Unemployment,* U.S. Department of Labor, Unemployment Insurance Service, Washington, D.C.: Government Printing Office, 1978.

[2]The precise definition of "necessary/obligated" vs. other expenditures is provided in the next section of the report.

[3]The only other related information available is for the expenditures made during the month prior to the twenty-fifth consecutive week of unemployment by those study group persons who were unemployed for at least twenty-five consecutive weeks.

[4]However, analysis of adjustments made through twenty-five weeks of unemployment is contained in Kingston, Burgess and Walters, op. cit., Chapter 3.

[5]Further perspective on this expense concept is provided by indicating what items were excluded from the necessary/obligated criterion. The following expenditures were excluded:

(1) expenses for remodeling, rather than maintaining a home;
(2) contributions to charity;
(3) payments for gifts;
(4) purchases of meals/snacks away from home;
(5) entertainment expenses;
(6) out-of-town travel or vacation expenses;
(7) educational expenses;
(8) other important payments (e.g., legal or accounting fees); and
(9) lump-sum payoffs of past debts or purchases of major consumer durables.

[6]The weekly benefit for the study group was equal to the lesser of $85 or 1/25 of "high quarter" earnings. The high quarter is the calendar quarter of highest earnings during the first four of the last five calendar quarters completed prior to a claim for benefits by the unemployed worker. Half of the group analyzed qualified for the maximum WBA of $85.

[7]This theory of consumption is presented by Milton Friedman, *A Theory of the Consumption Function.* Princeton, N.J.: Princeton University Press, 1957.

[8]Strictly interpreted, this theory of consumption implies that current consumption in virtually any month is based primarily on permanent income, with transitory income changes exerting little influence on current consumption patterns.

[9]As noted above, consumption is not directly analyzed here. Rather, current monthly payments for various consumption categories are analyzed. However, previous analysis of expenditure adjustments undertaken by the study group has indicated that reductions in paid expenditures were <u>not</u> offset by increases in due-but-not-paid expenditures from the employed month to the

month prior to the thirteenth week of compensated unemployment. Thus, changes in paid expenses should be a reasonably good proxy for changes in consumption for this group of households. See Kingston, Burgess and Walters, op. cit., pp. 22-26.

[10]In fact, Hamermesh argues that "benefit adequacy", as he defines it, should be evaluated by the "objective standard" of whether UI benefits are spent as one would expect permanent or transitory income to be spent. If UI benefits are spent to maintain consumption, (as would be the case for permanent income), he argues UI benefits are inadequate. In contrast, if UI benefits are saved instead of being spent to maintain consumption (as would be the case for transitory income), he argues UI benefits are adequate. Based on this definition of benefit adequacy, Hamermesh expects UI benefits to be more adequate for high vs. low income households, because they more easily can maintain consumption by borrowing and drawing on (larger) past savings. In addition, Hamermesh expects consumption cuts to be made for "luxuries" rather than "necessities" in those cases where UI recipients must reduce their living standards. For the complete development of Hamermesh's position, see: Daniel S. Hamermesh, *Unemployment Insurance and the Older American*. Kalamazoo: W. E. Upjohn Institute, 1980, Ch. 3. (forthcoming).

[11]See Kingston, Burgess and Walters, op. cit., Chapter 1 and Appendix A-2.

[12]Another dimension of the capability of beneficiary households to make certain types of adjustments is related to the possibility of other household members obtaining a job or increasing work effort on an existing job as a result of the beneficiary's unemployment. Obviously, the possibilities for making such adjustments depend importantly on the composition of the beneficiary household. Furthermore, a fairly strong relationship between household type and benefit adequacy was shown in a prior report for those unemployed for thirteen consecutive weeks of unemployment. (See: ibid., Chapter 1, footnote 4.) This prior analysis revealed, for example, that one-person households accounted for only 9 percent of the household units classified into the lowest benefit adequacy category; in contrast, one-person households accounted for 41 percent of the household units classified into the highest benefit adequacy category. Since one-person households cannot adjust to the beneficiary's unemployment by having an additional household member seek work or work more hours (at least not without first adding another household member), these results suggest that beneficiary households in the lowest vs. highest benefit adequacy category also tended to have more vs. less chance of making such adjustments because of their household compositions.

[13]These adjustments were analyzed in a previous report, and the results are based upon the 1,634 respondents analyzed in that earlier report. See ibid., Chapters 2 and 5. As noted in Appendix A to this report, only 1,581 of these 1,634 persons are analyzed in this report. The difference arises because all persons for whom complete information on each of thirteen expenditure categories was not available were excluded from the analysis in the present report.

[14]As noted above, one of the purposes of the analysis is to evaluate whether some necessary/obligated expenses might be excluded from the set of expenditures used to develop a benefit adequacy measure, and whether some

expenses excluded from necessary/obligated expenditures might be included in the set of expenditures used to develop a benefit adequacy measure. The three other expenditure categories analyzed are: education, charity/gifts, and travel/entertainment/snacks and meals eaten away from home; the basis for analyzing these three is that each of these categories might merit consideration for inclusion in the expense set used to form a benefit adequacy measure in some future study. Other categories for which information was available were: (1) remodeling expenditures for residences; (2) lump-sum payoffs of past debts; (3) lump-sum payments for major consumer durables; and (4) other important but irregular payments. Items (1) through (3) essentially represent changes in capital accounts, rather than current consumption expenditures; accordingly these items were not analyzed. Item (4) was a miscellaneous category for large and unusual payments that was relevant for only a few households and hence this category was not considered appropriate for possible inclusion among the consumption expenses normally considered in conventional benefit adequacy studies.

[15]As noted above, increases in due-but-not-paid expenses did not offset reductions in paid expenses in the categories analyzed. Thus, changes in paid expenses should provide a reasonably good proxy for changes in consumption for the group analyzed. For a discussion and analysis of due-but-not-paid expenses, see Kingston, Burgess and Walters, op. cit., Chapter 2.

[16]Gross recurring income, rather than net recurring income, is reported because an accurate figure for the net income received by the entire household is not available for the study group.

[17]The text focuses on mean spending by the study group. The median amounts spent before and after unemployment are reported in Appendix Table B-1.

[18]The results in Appendix Table B-1 show that median spending on necessary/obligated items was $560 following unemployment, whereas median income during the same month was $432.

[19]These findings contrast sharply with the conclusion reached by Hamermesh, op. cit., Chapter 3. He concluded that, for the older workers analyzed by him, UI benefits generally were not spent to maintain household living standards. A main difference between the two approaches is that Hamermesh's results are indirectly inferred from estimated equations, whereas the results in this study are based on expenditures actually made by a group of unemployment insurance claimants.

[20]Income elasticities for each category, defined as the percentage change in spending in that category divided by the percentage change in income, deliberately are not computed or discussed. The reason is that income elasticities should be computed only under ceteris paribus conditions. As discussed above, the study group made a large number of adjustments following unemployment. Although it would be possible to estimate an equation in which controls were included for these other factors, it is highly questionable whether the results for income and expenditure changes could be interpreted as income elasticities. First, permanent vs. transitory income changes would have to be identified in estimating appropriate income elasticities. An even more difficult task would be how to include appropriate ceteris paribus controls to reflect the full impact of unemployment and the other changes that occurred during the three

months following unemployment. Thus, no attempt is made to directly relate expenditure changes to income changes in this report, or to interpret such relationships as income elasticities. If the interest were in estimating income elasticities for the study group, it appears that the appropriate approach would be to estimate these elasticities on the basis of cross-section data for the study group during the preunemployment month. For an excellent discussion of the many pitfalls that arise in estimating income elasticities with time series data and of the difficulties encountered in attempting to reconcile theory with empirical estimation for either cross-section or time-series data, see L. Philips, *Applied Consumption Analysis*. New York: American Elsevier Publishing Co., Inc., 1974.

[21]Median spending by category during the preunemployment month and the median change in spending from the preunemployment month to the month prior to thirteen weeks of unemployment are reported in Appendix Table C-1.

[22]The same information for those in the middle benefit adequacy category (51-85%) is reported in Appendix Table D-2, but the text focuses only on those in the two extreme benefit adequacy categories; the pattern is much less clear if those in the middle benefit adequacy category are included in the comparisons.

[23]It also should be noted that, consistent with the relative expenditure cuts, the largest reduction in mean (gross) income (a cut of 55%) was recorded for those in the lowest benefit adequacy category, compared with a cut of 29 percent for those in the highest benefit adequacy category.

[24]This ranking is based on the point estimates of the percentage changes in spending for each category calculated from the sampled group of households. As may be noted in Table 3, the confidence intervals constructed about these point estimates indicate that these point estimates are not significantly different from zero for taxes, charity/gifts and education. Hence, even though education is ranked tenth in terms of the point estimate of the percentage changes in expenditures (-28.10%), less confidence is associated with the sign for this point estimate than with those signs estimated to be significantly different from zero.

APPENDIX A

CHARACTERISTICS OF CLAIMANT SAMPLE

The sample for this study was drawn throughout the twelve-month period beginning in mid-September of 1975. During this period, approximately one-fourth of those who filed the first claims in their benefit years and had the necessary earnings to qualify for benefits under Arizona's benefit formula were selected randomly for potential inclusion in the study. Those who previously had initated a benefit year were excluded, because adjustments to unemployment after thirteen and twenty-five consecutive weeks of compensated unemployment were to be analyzed as one part of the study. Claimants just beginning their benefit years were screened further seven weeks after the effective dates of their new initial claims. At this screening, those who had served a valid waiting week and had received payment for five consecutive weeks of unemployment were selected for the preunemployment month interview, with the following exceptions:

(1) those who had moved out of state, because household interviews could not be conducted for them;

(2) those who had entered "approved training," because their adjustments to unemployment most likely would reflect their unusual circumstances;

(3) those who had delayed filing for benefits for more than 21 days after their job separation dates, because of the possible difficulty involved in accurately obtaining information about income and expenditures in a "typical" month of employment prior to unemployment;

(4) those whose new initial claims were transitional claims, because their adjustments to unemployment likely would differ substantially from those of persons just beginning unemployment; and

(5) those who filed "true partial" claims (such persons continue to work for their last employer but receive partial UI benefits since their earnings have been reduced sufficiently to meet the UI qualifying requirements), because their adjustments to unemployment would reflect their "partial" earnings.

A total of 4,452 beneficiaries were selected for inclusion in the study over the twelve-month sampling interval.[a] From this group, completed household interviews that contained consistent data for preunemployment month expenses and income were obtained for 3,196 persons, or 72 percent of the total. It has been shown in a prior report that there were few statistically significant differences between the respondents and nonrespondents to this preunemployment month interview.[b] A total of 2,057 persons recorded thirteen consecutive weeks of compensated unemployment, and completed interviews were obtained for 1,732 (or 84%) of these 2,057 persons.[c] A check for the consistency of income and expenses eliminated 96 (or 5.5%) of these 1,732 completed interviews.[d] An additional 55 cases (or 3.2%) of the 1,732 completed interviews were removed from the data base for this analysis because complete information was not available for each of the thirteen expenditure categories analyzed in this report. As a result of nonresponse and the above exclusions, a total of 476 persons are excluded from this analysis. Thus, this report is based on the remaining 1,581 persons or 77 percent of those who completed thirteen consecutive weeks of compensated unemployment.

Provided in Appendix Table A-1 is a comparison of the characteristics of the 1,581 persons analyzed and the characteristics of the 476 persons excluded because of nonresponse, missing data or other problems. Because these groups can be viewed as independent, random samples (one from the population of claimants for whom "complete/accurate" information can be gathered, and the other from the population of claimants for whom "complete/accurate"

APPENDIX TABLE A-1

CHARACTERISTICS OF THE GROUP ANALYZED/NOT ANALYZED

Characteristic	Percentage Distributions for[a] Group Analyzed	Group Not Analyzed	Probability of Obtaining Observed Difference Due to Chance Alone[b]
SEX			
Male	63.9	67.9	.1096
Female	36.1	32.1	.1096
AGE			
Less than 25 years	20.4	21.2	.7184
25-34 years	30.0	31.5	.5352
35-44 years	18.3	20.6	.2584
45-54 years	18.0	13.9	.0366
55 years and up	13.3	12.8	.7794
WEEKLY BENEFIT AMOUNT:			
$15-$44	10.2	13.9	.0238
$ 5-$54	8.5	8.8	.8414
$55-$64	9.9	11.3	.3788
$65-$74	10.2	9.2	.5222
$75-$84	11.4	7.1	.0072
$85	49.8	49.7	.9680
POTENTIAL DURATION:			
13-15 weeks	6.5	10.5	.0036*
16-18 weeks	6.9	9.0	.1236
19-21 weeks	7.9	9.0	.4412
22-25 weeks	12.2	11.8	.8180
26 weeks	66.5	59.7	.0064

[a]The analyzed group totals 1,581; the group not analyzed totals 476 persons.

[b]These values indicate the probability of obtaining, due to chance alone, a difference between the two sample proportions that is as large or larger than the one actually observed, if the two samples were drawn from the same population. The probability is at least .05 that one or more of the probability values would be less than or equal to .05/14 = .0036 due to chance alone. Hence, only those probability coefficients that are .0036 or less are identified with an * in the table to indicate statistically significant differences.

information can not be gathered), the appropriate statistical test is one which permits an assessment of whether these two samples were drawn from the same or different populations. Given the 18 tests reported in Appendix Table A-1, the probability is at least .05 that one or more of these results would be less than or equal to .05/14 or .0036 due to chance alone, even if the two samples were drawn from the same population.[e] Thus, only those proportions tests for which the probability is less than or equal to .0036 are denoted with an asterisk in Appendix Table A-1 to call attention to instances in which the difference betweer the sample proportions is statistically significant at the .05 level.

The results of the tests summarized in Appendix Table A-1 indicate that there were no statistically significant differences (at the .05 level) between the group analyzed and the group not analyzed for sex, age, weekly benefit amount, and for four of the five potential duration categories. However, a significantly greater percentage of the group not analyzed than of the group analyzed had potential benefit duration of 13-15 weeks (10.5% vs. 6.5%). Moreover, the other results for potential benefit duration also indicate that the group analyzed tended to have somewhat longer potential benefit durations than the group not analyzed (although no other differences are statistically significant at the .05 level). Nonetheless, it is doubtful that this slight bias (in terms of potential duration) would limit inferences to the broader population from which the 1,581 persons analyzed were selected.

FOOTNOTES TO APPENDIX A

[a]Some earlier project reports have shown this total to be 4,468 persons. In the subsequent processing of data from the benefit year history files, 16 cases were found not to satisfy the original criterion for inclusion in the ABA study data base. In most instances, revised wage statements (not available at the time the sample first was drawn) indicated that claimants were not entitled to benefits under the Arizona Employment Security Law. In a few other cases, benefits were paid under SUA or other special programs not encompassed by the ABA study.

[b]See Paul L. Burgess, Jerry L. Kingston and Chris Walters, *The Adequacy of Unemployment Insurance Benefits: An Analysis of Weekly Benefits Relative to Preunemployment Expenditure Levels.* U.S. Department of Labor, Unemployment Insurance Service. Washington, D.C.: Government Printing Office, 1978.

[c]The earlier report on the thirteenth week sample indicated that only 2,055 (not 2,057) persons completed thirteen consecutive weeks of unemployment. The total of 2,057 shown in this report resulted from the discovery of two coding errors in the earlier data tape.

[d]Because extensive information was obtained on both the income and the expenditures of the beneficiary household during the month prior to the thirteenth consecutive week of unemployment, it was possible to obtain a rough check on the accuracy of the data obtained by conducting a "balancing differences" test. For this month, the total itemized cash outlays of each beneficiary household were compared with the household's total cash resources available to meet those outlays. If the ratio of cash outlays to cash resources available to meet those outlays fell between 0.75 and 1.25, the information was accepted as given (unless obvious problems were found by the project staff during the editing process). Any questionnaire with a ratio outside of these bounds was subjected to additional verification with the beneficiary to account for the apparently large discrepancy. Large discrepancies between household outlays and cash resources could not be reconciled for 96 cases, and these cases were excluded from the analysis.

[e]Since the differences across any variable must sum to zero, only 14 of the 18 tests reported in Appendix Table A-1 are independent. Thus, the probability is at least .05 that one or more of the probability values reported in Appendix Table A-1 would be less than or equal to .05/14 = .0036, even if the true value for all of the differences were 0. See Leo A. Goodman, "Simultaneous Confidence Intervals for Contrasts Among Multinominal Populations," *Annals of Mathematical Statistics*, Vol. 35, 1964, pp. 716-720.

APPENDIX TABLE B-1

MEDIAN AMOUNT SPENT BY CATEGORY DURING THE PREUNEMPLOYMENT MONTH AND THE MONTH PRIOR TO THIRTEEN CONSECUTIVE WEEKS OF UNEMPLOYMENT

Expenditure Category	Median Amount Spent During Preunemployment Month	Median Amount Spent During Month Prior to 13 Weeks of Unemployment
Components of Necessary/Obligated Expenses:		
Housing	$203.63	$190.55
Loans	93.33	59.29
Food	141.91	119.14
Transportation	58.19	47.61
Clothing	7.77	0.00
Support Outside Persons	0.00	0.00
Medical	20.72	12.03
Insurance	29.40	16.96
Taxes	0.00	0.00
Services/Other	19.60	10.52
Total Necessary/Obligated Expenses:	$673.35	$560.25
Other Expense Categories:		
Education	0.00	0.00
Charity/Gifts	15.66	1.81
Travel/Entertainment/Snacks & Meals Away From Home	48.75	29.89
Total Other Expenses	$ 83.85	$ 43.55
(Median Gross Monthly Recurring Household Income	($982.86)	($432.26)

APPENDIX TABLE C-1

CHANGES IN MEDIAN SPENDING BY CATEGORY FROM THE PREUNEMPLOYMENT MONTH TO THE MONTH PRIOR TO THIRTEEN CONSECUTIVE WEEKS OF UNEMPLOYMENT

Expenditure Category	Median Amount Spent During Preunemployment Month	Median Change in Dollar Amount Spent From Preunemployment Month to Month Prior to 13 Weeks of Unemployment
Components of Necessary/Obligated Expenses:		
Housing	$203.63	$ -11.89
Loans	93.33	0.00
Food	141.91	-15.45
Transportation	58.19	- 4.87
Clothing	7.77	0.00
Support Outside Persons	0.00	0.00
Medical	20.72	0.00
Insurance	29.40	0.00
Taxes	0.00	0.00
Services/Other	19.60	0.00
Total Necessary/Obligated Expenses	$673.35	$ -84.03
Other Expense Categories:		
Education	0.00	0.00
Charity/Gifts	15.66	0.00
Travel/Entertainment/Snacks & Meals Away From Home	48.75	-30.56
Total Other Expenses	$ 83.85	$ -38.78
Total All Expenses	$783.66	$-124.59

APPENDIX TABLE D-1

DOLLAR AND PERCENTAGE CHANGES IN SPENDING BY CATEGORY FROM THE PREUNEMPLOYMENT MONTH TO THE MONTH PRIOR TO THIRTEEN WEEKS OF UNEMPLOYMENT FOR HOUSEHOLDS IN WHICH BENEFIT ADEQUACY WAS LESS THAN OR EQUAL TO 50 PERCENT FOR THE BENEFICIARY

Expenditure Category	Mean Amount Spent During Preunemployment Month	Mean Amount Spent During Month Prior to 13 Weeks of Unemployment	Dollar Change in Mean Amount Spent From Preunemployment Month to Month Prior to 13 Weeks of Unemployment			Percentage Change in Mean Amount Spent From Preunemployment Month to Month Prior to 13 Weeks of Unemployment[a]		
			Dollar Change (a)	Limits of 95% Confidence Interval: Lower Limit (b)	Limits of 95% Confidence Interval: Upper Limit (c)	Percentage Change (d)	Limits of 95% Confidence Interval: Lower Limit (e)	Limits of 95% Confidence Interval: Upper Limit (f)
Components of Necessary/ Obligated Expenses:								
Housing	$ 264.99	$224.21	$- 40.79*	$- 51.65	$- 29.92	-15.4*	-19.19	-11.61
Loans	174.14	124.17	- 49.97*	- 62.51	- 37.43	-28.7*	-34.85	-22.55
Food	204.75	155.74	- 49.01*	- 56.82	- 41.20	-23.9*	-27.24	-20.56
Transportation	116.31	74.12	- 42.18*	- 52.90	- 31.45	-36.3*	-43.17	-29.43
Clothing	33.46	16.27	- 17.19*	- 22.36	- 12.03	-51.4*	-62.42	-40.38
Support	14.99	8.40	- 6.59*	- 10.74	- 2.45	-44.0*	-64.88	-23.12
Medical	76.33	41.22	- 35.11*	- 47.63	- 22.59	-46.0*	-56.70	-35.30
Insurance	79.97	55.67	- 24.30*	- 34.20	- 14.41	-30.4*	-40.86	-19.94
Taxes	17.06	5.85	- 11.21*	- 21.52	- 0.90	-65.7*	-91.95	-39.45
Services/Other	36.89	17.14	- 19.75*	- 25.41	- 14.10	-53.5*	-63.48	-43.52
Total Necessary/Obligated Expenes	$1,018.89	$722.79	$-296.10*	-328.44	-263.76	-29.1*	-31.90	-26.30
Other Expense Categories:								
Education	6.31	6.59	- 0.29	- 4.42	4.99	4.4	-72.38	81.18
Charity/Gifts	73.16	60.16	- 13.00*	- 50.66	- 24.65	-17.8	-67.15	31.55
Travel/Entertainment/Snacks & Meals Away From Home	97.99	47.99	- 50.01*	- 61.91	- 38.10	-51.0*	-59.01	-42.99
Total Other Expenses	177.46	114.73	- 62.73*	-103.59	- 21.86	-35.4*	-56.19	-14.61
Total All Expenses	$1,196.35	$837.52	$-358.83*	$-414.86	$-302.80	-30.0*	-34.23	-25.77
(Total Recurring Household Income)	($1,316.75)	($597.49)	($-719.25)*	($-777.16)	($-661.34)	(-54.6)*	(-57.31)	(-51.89)

[a]The percentage change for any category is defined as the change in the mean for that category from the preunemployment month to the month prior to 13 weeks of unemployment divided by the mean amount spent in that category during the preunemployment month. This percentage change is not a "simple" estimator but a ratio estimator. Thus, the usual formula for constructing confidence intervals is modified to be:

$$r \pm 1.96 \sqrt{(\frac{1}{n})(\frac{1}{\bar{X}^2})\ (\frac{\Sigma(Y_i - rX_i)^2}{n-1})}$$ where:

n = the sample size;
$\bar{X}$ = the mean amount spent during the preunemployment month;
Y_i = the difference for the ith individual between the actual amount spent during the preunemployment month and during the month prior to 13 consecutive weeks of unemployment;
X_i = the actual amount spent during the preunemployment month by the ith individual; and
r = the sample ratio = $\Sigma Y_i / \Sigma X_i$.

Unlike "simple" estimators, ratio estimators are often biased. For sample sizes greater than 30 and for cases where the ratio of the standard error of the mean to the mean is less than or equal to .10, the bias is negligible. In all cases, the maximum bias can be estimated and is less than or equal to the product of the standard error of the mean and the standard error of the sample ratio divided by the sample mean. For more information on ratio estimators and their associated confidence intervals, see: Scheaffer, Mendenhall and OTT, Elementary Survey Sampling; North Scituate, Mass: Wadsworth Publishing, 1979 (2nd ed.); and Kish, Survey Sampling; New York: John Wiley and Sons, 1965.

*95% confidence interval does not include zero.

APPENDIX TABLE D-3

DOLLAR AND PERCENTAGE CHANGES IN SPENDING BY CATEGORY FROM THE PREUNEMPLOYMENT MONTH TO THE MONTH PRIOR TO THIRTEEN WEEKS OF UNEMPLOYMENT FOR HOUSEHOLDS IN WHICH BENEFIT ADEQUACY WAS 86 PERCENT OR MORE FOR THE BENEFICIARY

Expenditure Category	Mean Amount Spent During Preunemployment Month	Mean Amount Spent During Month Prior to 13 Weeks of Unemployment	Dollar Change in Mean Amount Spent From Preunemployment Month to Month Prior to 13 Weeks of Unemployment			Percentage Change in Mean Amount Spent From Preunemployment Month to Month Prior to 13 Weeks of Unemployment[a]		
			Dollar Change (a)	Limits of 95% Confidence Interval: Lower Limit (b)	Limits of 95% Confidence Interval: Upper Limit (c)	Percentage Change (d)	Limits of 95% Confidence Interval: Lower Limit (e)	Limits of 95% Confidence Interval: Upper Limit (f)
Components of Necessary/Obligated Expenses:								
Housing	$ 162.96	$169.71	$ 6.75	$- 1.26	$ 14.76	4.1	- 0.91	9.11
Loans	84.10	88.75	4.65	- 2.22	11.53	5.5	- 2.77	13.76
Food	113.68	115.90	2.22	- 3.09	7.53	2.0	- 2.70	6.70
Transportation	51.75	67.26	15.51*	8.87	22.14	30.0*	16.18	43.82
Clothing	14.99	14.38	- 0.62	- 3.65	2.42	- 4.1	-23.94	15.74
Support	5.23	6.70	1.47	- 1.82	4.76	28.1	-39.42	95.62
Medical	20.93	25.84	4.91	- 0.19	10.01	23.5	- 2.05	49.05
Insurance	32.08	45.11	13.03*	4.69	21.36	40.6*	12.10	69.10
Taxes	1.14	11.77	10.63*	3.43	17.83	932.5	-204.68	2,069.68
Services/Other	17.84	12.80	- 5.04*	- 9.39	- 0.69	-28.3*	-50.78	- 5.82
Total Necessary/Obligated Expenses	$ 504.70	$558.21	$ 53.51*	$ 33.37	$ 73.65	10.6*	6.58	14.62
Other Expense Categories:								
Education	11.18	4.71	- 6.46	5.01	- 17.93	-57.9*	-102.70	-13.10
Charity/Gifts	50.13	31.01	- 19.12*	- 32.85	- 5.39	-38.1*	-58.49	-17.71
Travel/Entertainment/Snacks & Meals Away From Home	71.49	46.63	- 24.86*	- 33.92	- 15.81	-34.8*	-45.20	-24.40
Total Other Expenses	$ 132.80	$ 82.35	$- 50.45*	- 70.50	- 30.39	-38.0*	-49.01	-26.99
Total All Expenses	$ 637.50	$640.57	$ 3.06	- 25.25	31.38	0.5	- 3.95	4.95
(Total Recurring Household Income)	($1,012.29)	($723.27)	($-289.02)*	($-323.92)	($-254.12)	(-28.6)*	(-31.63)	(-25.57)

[a]The percentage change for any category is defined as the change in the mean for that category from the preunemployment month to the month prior to 13 weeks of unemployment divided by the mean amount spent in that category during the preunemployment month. This percentage change is not a "simple" estimator but a ratio estimator. Thus, the usual formula for constructing confidence intervals is modified to be:

$$r \pm 1.96 \sqrt{\left(\frac{1}{n}\right)\left(\frac{1}{\bar{X}^2}\right)\left(\frac{\Sigma(Y_i - rX_i)^2}{n-1}\right)} \quad \text{where:}$$

n = the sample size;
$\bar{X}$ = the mean amount spent during the preunemployment month;
Y_i = the difference for the ith individual between the actual amount spent during the preunemployment month and during the month prior to 13 consecutive weeks of unemployment;
X_i = the actual amount spent during the preunemployment month by the ith individual; and
r = the sample ratio = $\Sigma Y_i / \Sigma X_i$.

Unlike "simple" estimators, ratio estimators are often biased. For sample sizes greater than 30 and for cases where the ratio of the standard error of the mean to the mean is less than or equal to .10, the bias is negligible. In all cases, the maximum bias can be estimated and is less than or equal to the product of the standard error of the mean and the standard error of the sample ratio divided by the sample mean. For more information on ratio estimators and their associated confidence intervals, see: Scheaffer, Mendenhall and OTT, Elementary Survey Sampling; North Scituate, Mass: Wadsworth Publishing, 1979 (2nd ed.); and Kish, Survey Sampling; New York: John Wiley and Sons, 1965.

*95% confidence interval does not include zero.

APPENDIX TABLE D-2

DOLLAR AND PERCENTAGE CHANGES IN SPENDING BY CATEGORY FROM THE PREUNEMPLOYMENT MONTH TO THE MONTH PRIOR TO THIRTEEN WEEKS OF UNEMPLOYMENT FOR HOUSEHOLDS IN WHICH BENEFIT ADEQUACY WAS 51-85 PERCENT FOR THE BENEFICIARY

Expenditure Category	Mean Amount Spent During Preunemployment Month	Mean Amount Spent During Month Prior to 13 Weeks of Unemployment	Dollar Change in Mean Amount Spent From Preunemployment Month to Month Prior to 13 Weeks of Unemployment: Dollar Change (a)	Limits of 95% Confidence Interval: Lower Limit (b)	Limits of 95% Confidence Interval: Upper Limit (c)	Percentage Change in Mean Amount Spent From Preunemployment Month to Month Prior to 13 Weeks of Unemployment[a]: Percentage Change (d)	Limits of 95% Confidence Interval: Lower Limit (e)	Limits of 95% Confidence Interval: Upper Limit (f)
Components of Necessary/ Obligated Expenses:								
Housing	$ 201.33	$196.07	$- 5.25*	$- 11.63	$- 1.13	- 2.6	- 5.75	0.55
Loans	107.96	96.66	- 11.30*	- 18.89	- 3.71	-10.5*	-17.38	- 3.62
Food	150.43	128.88	- 21.55*	- 26.30	- 16.79	-14.3*	-17.30	-11.30
Transportation	71.13	68.43	- 2.71	- 8.88	3.47	- 3.8	-12.37	4.77
Clothing	22.03	12.93	- 9.11*	- 11.69	- 6.53	-41.3*	-50.33	-32.27
Support	8.88	7.99	- 0.89	- 3.89	2.12	-10.0	-43.19	23.19
Medical	34.32	33.10	- 1.21	- 7.00	4.58	- 3.6	-20.32	13.12
Insurance	40.65	38.26	- 2.39	- 6.98	2.19	- 5.9	-16.90	5.10
Taxes	4.02	21.44	17.43*	2.06	32.80	433.3	-10.97	877.57
Services/Other	23.71	13.47	- 10.24	- 13.48	7.00	-43.2*	-53.62	-32.78
Total Necessary/Obligated Expenses	$ 664.45	$617.23	$- 47.23*	$- 71.15	- 23.30	- 7.1*	-10.69	- 3.51
Other Expense Categories:								
Education	8.48	6.62	- 1.86	- 9.47	5.76	-21.9	-96.52	52.72
Charity/Gifts	46.51	57.09	10.58	- 19.62	40.79	22.8	-43.60	89.20
Travel/Entertainment/Snacks & Meals Away From Home	69.39	40.56	- 28.83*	- 34.76	- 22.90	-41.6*	-47.71	-35.49
Total Other Expenses	$ 124.37	$104.26	$- 20.10*	$- 51.63	$- 11.43	-16.2*	-23.97	- 8.43
Total All Expenses	788.82	721.49	- 67.33*	-109.02	- 25.64	- 8.3*	-13.55	- 3.05
(Total Recurring Household Income)	($1,042.51)	($621.89)	($-429.62)*	($-459.21)	($-400.02)	(-41.2)*	(-43.32)	(-39.08)

[a]The percentage change for any category is defined as the change in the mean for that category from the preunemployment month to the month prior to 13 weeks of unemployment divided by the mean amount spent in that category during the preunemployment month. This percentage change is not a "simple" estimator but a ratio estimator. Thus, the usual formula for constructing confidence intervals is modified to be:

$$r \pm 1.96 \sqrt{\left(\frac{1}{n}\right)\left(\frac{1}{\bar{X}^2}\right)\left(\frac{\Sigma(Y_i - rX_i)^2}{n-1}\right)}$$ where:

n = the sample size;
$\bar{X}$ = the mean amount spent during the preunemployment month;
Y_i = the difference for the ith individual between the actual amount spent during the preunemployment month and during the month prior to 13 consecutive weeks of unemployment;
X_i = the actual amount spent during the preunemployment month by the ith individual; and
r = the sample ratio = $\Sigma Y_i / \Sigma X_i$.

Unlike "simple" estimators, ratio estimators are often biased. For sample sizes greater than 30 and for cases where the ratio of the standard error of the mean to the mean is less than or equal to .10, the bias is negligible. In all cases, the maximum bias can be estimated and is less than or equal to the product of the standard error of the mean and the standard error of the sample ratio divided by the sample mean. For more information on ratio estimators and their associated confidence intervals, see: Scheaffer, Mendenhall and OTT, Elementary Survey Sampling; North Scituate, Mass: Wadsworth Publishing, 1979 (2nd ed.); and Kish, Survey Sampling; New York: John Wiley and Sons, 1965.

*95% Confidence interval does not include zero.

APPENDIX TABLE E-1

MAXIMUM BIASES FOR THE PERCENTAGE CHANGES REPORTED IN TABLE 1 [a]

Expenditure Category	$\bar{X}$ [b]	$\sigma_{\bar{X}}$ [c]	σ_r [d]	$\frac{\sigma_{\bar{X}}}{\bar{X}}$	$\frac{\sigma_{\bar{X}}\,\sigma_r}{\bar{X}}$
Components of Necessary/ Obligated Expenses:					
Housing	$ 209.56	3.108	.01137	.0148	.00016
Loans	120.48	3.174	.02153	.0263	.00056
Food	156.46	2.324	.01061	.0149	.00015
Transportation	78.91	1.932	.02801	.0245	.00068
Clothing	23.47	.950	.03479	.0405	.00140
Support Outside Persons	9.68	1.104	.09928	.1140	.01132
Medical	42.70	2.041	.04918	.0478	.00235
Insurance	49.47	1.721	.04076	.0348	.00141
Taxes	6.93	1.484	.42928	.2141	.09192
Services/Other	25.93	1.215	.03653	.0469	.00171
Total Necessary/Obligated Expenses	$ 723.59	9.261	.01122	.0128	.00014
Other Expense Categories:					
Education	8.54	2.294	.21852	.2686	.05869
Charity/Gifts	54.82	3.849	.16658	.0702	.01169
Travel/Entertainment/Snacks & Meals Away From Home	77.87	2.387	.02316	.0307	.00070
Total Other Expenses	$ 141.23	5.270	.06591	.0373	.00245
Total All Expenses	$ 864.81	11.812	.01530	.0137	.00020
(Mean Monthly Gross Recurring Household Income)	($1,111.36)	(14.702)	(.00816)	(.0132)	(.00010)

[a] The maximum bias of r, $E\,|\,\hat{r} - r\,|$, is less than or equal to $\frac{\sigma_{\bar{X}}\,\sigma_r}{\bar{X}}$

[b] $\bar{X}$ = mean amount spent

[c] $\sigma_{\bar{X}}$ = standard error of the mean amount spent.

[d] σ_r = standard error of the percentage change in the mean amount spent.

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