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potatoes and sweetpotatoes reduced the farm value of all agricultural products having food use by a quarter of a billion dollars during the 30 years.

In conclusion, we say again that our preliminary study of these commodity shifts, as well as the other questions we posed, has merely skimmed the surface of the problems.

There are other important questions, too, which we haven't tackled yet. One of the most intriguing is to evaluate the relationships between changes in utilization and farm prices, farm income, and the marketing bill for farm products. Furthermore, we have still to put those farm products which have no food uses, such as cotton, shorn wool, and tobacco, into our data, as well as our analyses. As soon as the

index covers all agricultural commodities, we shall be able to construct an index of per capita utilization of farm food and nonfood products for use in matching the production potential of American agriculture with future "requirements" for farm products. Also, we shall be able to tailor special indexes for use in particular problems, such as utilization of only those products grown in this country or utilization excluding exports.

We must end this article with the favorite conclusion of economists and statisticians, "more work needs to be done on the subject." But we continue work on a bulletin which we hope will cover more adequately these areas opened up in this article, as well as other aspects of the supply and use of farm products.

Condensed vs. Detailed Schedule in Expenditure Surveys

By Barbara B. Reagan

High costs of surveys have brought pressure for less expensive ways of getting data on family expenditures, and have raised interest in opportunities to get such data through limited supplementary schedules attached to other surveys. An experiment to test this approach was undertaken by the (former) Bureau of Agricultural Economics and the (former) Bureau of Human Nutrition and Home Economics in simultaneous surveys of farm-operator families in contiguous areas. One included a few summary questions on family spending, the other a more detailed breakdown of the major expenditure categories. This paper summarizes the comparison of data obtained from the two surveys, and discusses the implications regarding the feasibility of this approach for gathering data on family expenditures.¹

A CONDENSED-SCHEDULE APPROACH to family expenditures, obviously, is suited only for studies that seek total family living expenditures alone, or at most the relative importance of broad categories of family spending. It

would not yield data adequate for deriving expenditure weights for consumer price indexes or for analyzing market demand for specific consumer goods.

The type of condensed schedule considered in the study reported here is one in which esti-

¹ The separate surveys have been reported in THE GENERAL ENUMERATIVE SURVEYS, by EMERSON M. BROOKS and CATHERINE SENF, this Journal 1 (2):37-48; 1 (4): 105-128. April and October 1949; and FARM FAMILY SPENDING AND SAVING IN ILLINOIS, by JEAN L. PENNOCK, MARGARET L. BREW, and ROSE C. TILLINGHAST, U. S. Dept. Agr., Agr. Inform. Bull. 101 (in press). The ex-

periment described here is also summarized in USE OF CONDENSED SCHEDULE TO CUT COSTS IN FAMILY EXPENDITURE SURVEYS, Journal of Home Economics, vol. 46, No. 3 (March 1954), by the present author. A complete report, including reproductions of the schedules used, is available on request from the author.

mates of major categories of family living expenditures such as food, clothing, and housefurnishings, are obtained, as well as total family living. If the total alone were desired, an alternative method would be to obtain data on family income and net changes in family assets and liabilities during the year, and derive family expenditures by subtraction. This may be suitable for families who are dependent chiefly on wage or salary income for whom such items are easily determined. But complexities of gross income and business expense make this method difficult with farm or other self-employed families.

Furthermore, the condensed schedule was expected to result in a relatively short interview on family expenditures. A condensed schedule means reduced costs only if quick answers to summary questions are acceptable, and if the respondent is willing to give such answers. Past experience has shown that if carefully built-up answers are wanted, it is both quicker and more accurate to provide space for the components on the survey forms rather than leave enumerator and respondent to attempt to itemize and add components in the margin of a schedule or on scratch paper.

The opportunity to study a shortcut method of obtaining family living expenditures and major categories of spending arose when, to meet different objectives, the (former) Bureau of Agricultural Economics and the (former) Bureau of Human Nutrition and Home Economics simultaneously surveyed two statewide samples of Illinois farm-operator families early in 1947.² To provide material for this study, both Bureaus included questions on annual family expenditures, and each used different schedule designs for these questions.

The two surveys here compared were conducted with different field staffs and with somewhat different field procedures. The Illinois survey that used the condensed schedule, hereafter referred to as survey A, was part of the nationwide January 1947 Survey of Agriculture, conducted by BAE. Its field procedures were determined by requirements of the na-

tional study. It was a multi-purpose survey of farm income, farm expenses, other family income, family expenditures, accidents, wages and employment of hired farm workers, and characteristics of all persons in the household. No data, however, were obtained on net change in asset position in the condensed expenditure schedule. The schedule consisted of 29 pages, 1½ of which were on family expenses. The average interview time in this survey was 1½ hours.

The survey that used detailed questions on family living expenditures, survey B, was conducted by BHNHE in Illinois only. Its focus was on family expenditures, but it also obtained information on family income, changes in assets and liabilities during the year, composition of the family, and food production for home use. The schedule consisted of 33 pages, 20 of which were on family expenses, and the average interview time was about 3 hours.

Comparison of Schedule Designs

In this experiment, only one form of condensed questions was tested against one form of a more detailed set of questions. Conclusions as to relative quality of data might well differ according to the degree of summation involved. In general, the condensed questionnaire used represents as extreme a degree of summation as would be considered reasonable. The detailed schedule represents as much detail as was considered feasible for an interview that covered all family living expenditures. Schedules with more detail have been used to cover total family spending. More detailed schedules have often been used when food and clothing were studied separately.

On the condensed schedule, one question (called a global question) was asked for each of 15 categories of family living expenditures: Food, clothing, housefurnishings and the like. In the more detailed set, an expenditure category was broken down to major items or groups of smaller items that might be thought of together. The contrast between the schedules in the degree of summation varies widely among the categories, depending on the content.

TOTAL FAMILY LIVING EXPENDITURE.—The two schedules build up estimates of total family

² Throughout this study the term "family" covers single-farm-operator units as well as farm-operator families of 2 or more.

living expenditures from widely different amounts of detail. In one it is the sum of 15 category estimates; in the other it is the sum of about 200 possible items of family expense grouped into categories, plus 14 to 37 clothing items for each individual.

EXPENDITURE CATEGORIES.—Differences between the two schedule forms among categories were greatest for clothing. The detailed questionnaire included separate lists of readymade clothing items that might have been bought for men and boys, women and girls, and infants, to be used for each member of the family. In addition, there was a section on expenditures for clothing made at home and a section on general clothing expenditures not mentioned elsewhere, such as shoe repairs and cleaning. In contrast, the global question asked about: "Clothing, including jewelry, dressmaking costs, and shoe repair."

The schedule forms differed almost as much for another category, housefurnishings. The detailed schedule listed 57 groups of items under 7 general headings. The global question asked about expenditures for "furniture and furnishings for the house; that is, all kinds of furniture and equipment like stoves, refrigerators, and washing machines; glass and chinaware and cooking utensils, household linens, bedding, curtains and things like that."

Medical expenditures were handled on the detailed schedule in 17 questions and personal care in 8, compared with 1 question each in the condensed approach. The contrast is less on the categories, reading and contributions, where the content is likely to be less complex. The detailed schedule had 5 and 4 questions each on these. The difference is least for income taxes and life, burial, and accident insurance; the more detailed schedule asked 3 questions each on income taxes and insurance.

The condensed questionnaire had questions on each of eight other categories of spending, but there is no way to recombine the data from the more detailed schedule to provide estimates that would match them individually. An "other" category, comprising primarily food and household operation, can be built up and used in the comparison, although the condensed approach is far from that of a single global question for the category.

FAMILY.—The two schedules defined the reporting unit differently. This affects reporting of expenditures. In part, this is a difference in the degree of precision possible with the condensed and the more detailed approaches, and in part a difference in the design of the schedules.

A clear understanding of family composition to be covered is particularly important to insure complete reporting on the more personal types of expenditures, such as clothing, medical care, or personal care, in a household containing (1) persons living as family members only part of the year and (2) older sons and daughters or adults related to the family head but not completely dependent on the family income pool. Expenditures and income of secondary units (often older sons and daughters) were specifically included in the family estimates along with those of the primary unit in the estimates from the more detailed questionnaire, but those of other persons living in the household such as farm laborers or household help were excluded. Thus, expenditure data from the detailed schedule cover spending of all persons related to the farm operator who lived in the household for part or all of the year.

Early in the interview with the detailed schedule, survey B, the composition of the family was ascertained, including the number of weeks each person was a member of the family.

In survey A, on the other hand, no attempt was made to establish whether expenditures of persons who were in the family only part of the year, or of secondary families, were to be included. The schedule merely requested information on "family" expenses. In another section of the schedule, questions were asked on population characteristics of all persons in the household. One such question asked the relationship to the head of household. It can only be assumed that the family expenditures referred to in the condensed questions are those of all related persons living in the household. Comparison of data is made on this basis. But in individual cases there is some doubt as to whether expenditures of part-year persons and relatives who lived with the primary family, but had some degree of financial dependence, are covered in the condensed schedule.

Uncertainty as to the composition of the

family group whose expenditures are to be reported is not a necessary result of use of a condensed schedule. It might have been avoided in survey A by a moderately detailed section on family composition to be related specifically to the expenditure questions in the schedule design, or perhaps by a statement on coverage in the enumerator's introductory remarks for the family expenditure section.

INCOME.—Differences between the two schedules are small in the sections on gross farm income, farm expenses, income from wages, salaries, or nonfarm business, and other family income.

BALANCE.—A "balanced schedule" was an intrinsic part of the schedule design for survey B. As the schedule covered income, expenditures, and net changes in assets and liabilities during the year, reported disbursements could be balanced against receipts. The field supervisor used this as a check on the reasonableness of entries. In cases out of balance more than 10 percent he asked the interviewer to revisit the family and request additional information. After this further inquiry, however, schedules were accepted for tabulation even if they remained out of balance. This procedure was adopted to provide a reasonableness check without encouraging interviewers to force entries into balance, and it undoubtedly added to the accuracy of the expenditure data obtained in survey B.

A balanced schedule design was not part of the condensed approach. Balancing reported receipts against disbursements as a reasonableness check implies revisiting, which works against the speed and low cost that are objectives of the shortcut method. Balancing might be used, however, with a more summary schedule than the one used in survey B.

Comparison of Sample and Field Procedures

SAMPLE DESIGN.—The sampling procedures provided for two parallel probability-area samples. The sample for the schedule with the more detailed questions on family expenditures was designed to be 10 percent smaller than the other sample, and segments chosen were usually adjacent to the ones selected for the other sample.

FIELD PROCEDURES.—Interviewing for both

surveys started in January 1947. Training for both included practice in taking a schedule from a family not in the sample. In survey B, the ratio of supervisory time to interviewer time was probably higher; and since only one State was involved rather than 48 as in survey A, direction from the central office was more evident.

In each survey interviewers found about the expected number of farms in the sample segments in Illinois, but there were marked differences in the proportion interviewed (table 1). In survey A only 69 percent of the farmers identified as having headquarters in sample segments were interviewed, whereas 86 percent were interviewed in the other survey. However, as indicated later, the lower percentage for survey A was partly by design.

Supervisory attitudes regarding the necessity for contacting all sample farmers and for obtaining complete answers to all parts of the schedule probably differed between the surveys. This was undoubtedly related to differences in funds budgeted for the field work. Both survey designs originally called for some revisits to families not at home the first time.

TABLE 1.—*Number of farms identified and farm-operator families interviewed, 2 samples, Illinois, January 1947*¹

Item	Survey A	Survey B
	Number	Number
Farms identified ²	576	529
Farm-operator families interviewed	400	454
Farm-operator families not interviewed	176	75
Omitted because of subsampling	³ 11	0
Refused ⁴	31	49
Omitted for other reasons ⁵	134	26

¹ Survey A had condensed family expenditure questions; survey B, more detailed questions.

² Excludes institutional farms and idle or vacant farms.

³ Subsampling was used in a few segments having large numbers of farms. Weighting was introduced into tabulation procedures to allow for these and 23 other cases not interviewed; thus, tabulations show 434 cases instead of 400.

⁴ Refused outright or gave such meager information that no part of the schedule was usable.

⁵ Interviewer did not contact adult family member; the principal reason was no adult at home.

In survey B, the rule was that at least three attempts at varying times of day were to be made to get in contact with the family. In survey A interviewers were instructed to make at least one try to obtain a schedule in the first phase of enumeration, or more trials if necessary to get 75 percent interviewed. (This, however, was not accomplished in all segments.) Then in the second phase further followups were to be made in a third of the segments as specified by the State supervisor. (The interviewer did not know which segments were to be "cleaned up" until the first phase was completed.)

The sample design called for weighting the cleanup interviews in survey A to represent the non-respondents, including those not followed up. However, checks made at the regional level showed remarkably close agreement between cleanup and other interviews on selected items, so it was not believed necessary to give additional weight to the cleanup interviews. The low proportion of eligible farm families interviewed in survey A may have introduced a non-respondent bias, which accounts in part for differences found between the two surveys.

The family member who was asked about expenditures often was different in the two surveys, and this may also affect the comparability of the data obtained. As the survey with the condensed questions on family expenditures was primarily a study of farm-operation information, the enumerator was instructed to interview the farm operator and he or she may not have taken the additional time to interview the farm wife about family expenses. This procedure may well have affected the quality of the estimate obtained in survey A. In the other study, the farm wife was usually the respondent for the family expenditure questions, and the farmer for income data. This difference in field procedures might be considered to be a procedural discrepancy that interferes with a precise comparison of answers to global and detailed questions. Or the difference may be viewed as part of the schedule differences to be tested if approximate answers obtained from any adult family member are considered to be a characteristic of the condensed questionnaire.

EXTENT TO WHICH TWO SAMPLES ARE PARALLEL.—Although the sample design was plan-

ned to give two parallel samples, the two sets of schedules obtained are not parallel.

Even though the samples were stratified by type-of-farming area, comparable numbers of schedules were not obtained in the Specialized Dairy Area because an urban segment with a large number of farms happened to be drawn for survey A. As a result, survey A had somewhat more crop farms and fewer dairy and livestock farms than survey B. Differences between the two survey groups as to acres in farm and tenure are small and within the range of possible sampling error. They probably do not affect markedly the family expenditure comparison made in this study, and they do not account for differences in income distribution.

Income differences are marked (table 2). Differences this great in the distribution could be expected to occur by chance in two parallel samples less than 1 in 100 times. Examination of the schedules county by county shows lower incomes in survey A than in survey B in most of the counties surveyed.

Average family income in survey A is \$2,790, or about \$270 lower than in survey B (table 3). The difference in net farm income amounts to about \$225 owing to higher farm expenses reported in survey A. Gross cash farm income was also reported higher in that survey.

In both surveys farm receipts were probably underreported, a common situation in income surveys. It is likely that farm expenses were underreported less in survey A than in survey B; net farm and family income estimates in survey A are lower. The ratio of farm expenses to gross farm income in survey A is higher than in survey B for each of 4 acres-in-farm groups. The ratios for survey A seem the more reasonable of the two sets when compared with ratios obtained from Illinois farm account books for 1946 (table 4).³

Two factors probably are important in explaining the differences between family income

³ REX F. DALY in *INCOME SIZE DISTRIBUTION FOR ILLINOIS FARM-OPERATOR FAMILIES*, a processed publication issued by the University of Illinois with the Bureau of Agricultural Economics cooperating, 1949, pp. 18, 22, and 56, adjusted for underreporting of income in the higher income classes, and still concluded that Illinois aggregate gross farm receipts as estimated from survey A were only 83 percent of those estimated from other sources by BAE, and farm expenses were 88 percent.

TABLE 2.—*Income distribution, 2 samples of farm-operator families, Illinois, 1946*¹

Net cash family income	Survey A	Survey B	Percentage distribution		Probability ²
			Survey A	Survey B	
	<i>Number</i>	<i>Number</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>
Negative	22	17	5.7	3.9	23
\$0-\$999	88	73	23.0	16.8	3
1,000-1,999	74	82	19.3	18.8	86
2,000-2,999	68	81	17.8	18.6	76
3,000-3,999	36	79	9.4	18.2	1
4,000-4,999	36	39	9.4	9.0	84
5,000-7,499	32	41	8.4	9.4	62
7,500-9,999	20	11	5.2	2.5	4
10,000 and over	7	12	1.8	2.8	34
Total reporting	383	435	100.0	100.0	-----

¹ Survey A, condensed family expenditure questions; survey B, more detailed questions.

² Probability of difference as large as observed occurring because of sampling variation, based on t-test for each income class.

estimates from the two surveys. First, within the framework of the total interview, there was more emphasis on the farm business in survey A even though the questions on farm operating expenses were the same in the two surveys. This may have elicited fuller answers on farm expenses by a family reporting, and thus contributed to a lower estimate of total family income. In this respect survey A is probably more accurate. Second, the large pro-

portion of sample cases not interviewed in survey A probably contributed to income being reported too low. Both factors operated to push apart the two survey estimates of income.

Method of Comparison⁴

To separate differences in State averages that could be attributed to schedule design from those that resulted from differences in the interview rate, it was necessary to weight the data to the same income distribution. Comparisons were made of schedules from units with incomes under \$7,500. (The higher income families surveyed were small in number and had different family types and sizes on the average in the two surveys.) Each income class up to \$7,500 was compared as reported in the two surveys. Overall State averages presented are averages by income classes in each survey, weighted together by the pooled income distribution from the two surveys. This procedure does not allow for differences in income level that occurred because of greater emphasis on the farm business in survey A. However, the distortion of the income distribution for such reasons would

TABLE 3.—*Average income by source of income, 2 samples of farm-operator families, Illinois, 1946*¹

Item	Survey A	Survey B
	<i>Dollars</i>	<i>Dollars</i>
Farm income:		
Gross cash	5,188	5,052
Farm expenses	2,969	2,606
Net farm income	2,219	2,446
Wages, salaries, and nonfarm business	449	485
Other income ²	122	127
Net cash family income	2,790	3,058

¹ Survey A had condensed family expenditure questions; survey B, more detailed questions.

² Net income from roomers and boarders, interest, dividends, royalties, net rents, dependency allotments, veterans payments, annuities, retirement benefits, unemployment compensation, sale of personal property, and contributions for support from persons outside the immediate family.

⁴ Data presented in this analysis will not necessarily agree with those published elsewhere from either of the two surveys as definitions and methods of tabulation used by the two Bureaus independently were adjusted in the retabulation to provide comparability and better meet purposes of this analysis.

TABLE 4.—*Ratio of average farm expenses to average cash receipts by size of farm, Illinois, 1946*¹

Size of farm	Survey A ²	Survey B	Farm account data ³
	Percent	Percent	Percent
Under 50 acres	92.5	72.5	-----
50-139	59.6	56.0	⁴ 51.0
140-259	53.6	49.6	52.7
260 and over	61.7	50.7	59.8
All farms 50 acres and over	57.4	51.1	56.4
All farms	58.4	51.8	-----

¹ Survey A had condensed family expenditure questions; survey B, more detailed questions.

² Estimates differ from those shown in REX F. DALY, *INCOME SIZE DISTRIBUTION FOR ILLINOIS FARM-OPERATOR FAMILIES*, a processed publication issued by the University of Illinois with the Bureau of Agricultural Economics cooperating, 1949, p. 18, because of retabulation to ensure comparability of surveys A and B and because acreage weights were not used for this analysis.

³ DALY, (see footnote 2), p. 18. Interest payments are not included in expenditures; the ratios shown are expected to be somewhat lower than the survey data because the accounts included relatively more large farms.

⁴ Number of cases is smaller than in the other acreage groups.

suggest that the differences observed are understated rather than overstated.

Comparison of Estimates

TOTAL FAMILY EXPENDITURES.—The estimate of total spending that was the sum of answers to a single question on each of 15 categories was 10 percent lower than the average built up from more detailed questions; the average was a little more than \$1,500 in survey A and nearly \$1,700 in survey B (table 5). This difference is greater than would be expected because of sampling variation ($P < 0.01$).

In the lower income classes, differences between total family expenditures reported in the two surveys are not statistically significant at the 5-percent level, but at higher income levels, where expenditures are greater, differences are marked (table 6). The condensed questions resulted in averages 15 to 25 percent lower than the more detailed questions in the three income classes from \$2,000 to \$7,500. This finding is consistent with earlier conclusions.

Previous work on this problem indicated that more detailed questions result in a larger total than a summary question. In the crop-estimating work of the Bureau of Agricultural Economics using mailed inquiries, it has been reported that a larger total results when a quantity is obtained by asking for several subgroups separately than when only a lump sum is requested.⁵ Dorothy Brady and Faith Williams reported in 1945 on a study of the "short" versus "long" schedule forms based on a small number of cases.⁶ They found that a schedule itemizing goods and services gave higher estimates than the condensed form.

Actually, in the present case it is probable that even with the more detailed schedule the total expenditure is underestimated. Both the condensed and the more detailed schedules involve the respondent's recalling expenditures for the previous year. Thus, both sets of data are subject to memory bias. Although it is possible to have overreporting, as for example through reporting major expenditures that actually occurred outside the schedule year or exaggeration of prestige items, such errors are probably outweighed by underreporting. Brady and Williams reported that rural and urban expenditures in 1941, which were based on enumerative surveys using detailed schedules, were 93 percent of the Department of Commerce aggregate expenditures for the country as a whole.⁷

SAVINGS.—The savings estimate from survey B was obtained from questions on net changes in assets and liabilities, but in survey A, as part of the condensed approach, no questions were asked on this subject. Thus the net-change-in-savings figure from survey A was obtained by subtraction of family expenditures and taxes from income. With such a method the savings estimate is affected by underreporting of family expenditures and errors in reporting income or taxes; that is, the balancing difference is

⁵ THE GENERAL ENUMERATIVE SURVEYS—II. op. cit., p. 125.

⁶ BRADY, DOROTHY S., and WILLIAMS, FAITH M. ADVANCES IN THE TECHNIQUES OF MEASURING AND ESTIMATING CONSUMER EXPENDITURES. *Jour. Farm Econ.* 27(2): 315-344. May 1945. p. 342.

⁷ Ibid.

TABLE 5.—Selected expenditures, 2 samples of farm-operator families with income under \$7,500, Illinois, 1946¹

Item and survey	Unit	Family living expenditures				
		Total	Clothing	Furnishings, including equipment	Personal care	Medical care
Average per family in group:						
Survey A	Dollars	1,515	205	137	34	133
Survey B	do	1,387	286	167	40	122
Difference ²	Percent	-10	-28	-18	-15	9
Probability ³	do	<1	<1	6	1	42
Coefficient of variation: ⁴						
Survey A	do	23.7	38.6	66.9	42.6	62.0
Survey B	do	19.6	28.2	58.8	31.2	64.9
Probability ³	do	<1	<1	4	<1	47
Percentage of families making expenditures:	do	100	96	67	97	90
Survey A						
Survey B	do	100	100	96	99	97
Probability ³	do		<1	<1	28	<1
Average per family making expenditures:	Dollars	1,515	213	204	35	146
Survey A						
Survey B	do	1,687	286	173	41	126
Difference ²	Percent	-10	-26	18	-15	16
Family living expenditures—Con.						
	Unit	Contributions	Reading	Insurance	Other ⁵	Income taxes
Average per family in group:						
Survey A	Dollars	67	17	76	846	152
Survey B	do	89	16	68	899	114
Difference ²	Percent	-25	6	12	-6	33
Probability ³	do	1	22	22		2
Coefficient of variation: ⁴					15	
Survey A	do	60.0	43.2	53.3	27.9	59.1
Survey B	do	51.6	40.5	54.4	20.4	63.7
Probability ³	do	1	24	73		24
Percentage of families making expenditures:					<1	
Survey A	do	97	97	68	100	64
Survey B	do	96	94	69	100	61
Probability ³	do	47	19	70		37
Average per family making expenditures:						
Survey A	Dollars	69	18	109	846	210
Survey B	do	91	17	91	899	161
Difference ²	Percent	-24	6	20	-6	30

¹ Standardized by pooled income distribution. Survey A had condensed family expenditure questions; Survey B, more detailed questions.

² Survey A estimate minus survey B estimate as percentage of survey B estimate.

³ Probability of difference as large as observed occurring because of sampling variation with samples the size of these, based on t-test using weighted standard error of difference.

⁴ Standard deviation as percentage of mean.

⁵ Primarily food and household operation.

added into the savings estimate. The understatement of family expenditures in survey A previously observed undoubtedly is a major factor in the difference between the savings estimates from the two surveys (table 7). Com-

parison is made difficult in this study by the definitions of income and family expenditures used, and the combination in the residual of other items with net change in assets and liabilities.

TABLE 6.—Selected expenditures by income groups, 2 samples of farm-operator families, Illinois, 1946 ¹

Net cash family income and survey	Unit	Net cash family income	Family living expenditures				
			Total	Clothing	Furnishings, including equipment	Personal care	
\$0-\$999:							
Survey A	Dollars	502	1,038	137	84	22	
Survey B	do	579	925	123	125	20	
Difference ²	Percent	- 13	12	11	- 33	10	
Probability ³	do		30	43	24	50	
\$1,000-\$1,999:						35	
Survey A	Dollars	1,536	1,571	191	148		
Survey B	do	1,507	1,386	226	136	30	
Difference ²	Percent	2	13	- 15	9	17	
Probability ³	do		14	16	76	26	
\$2,000-\$2,999:							
Survey A	Dollars	2,601	1,443	238	163	35	
Survey B	do	2,425	1,792	314	179	45	
Difference ²	Percent	7	- 19	- 24	- 9	- 22	
Probability ³	do		< 1	3	69	10	
\$3,000-\$4,999:							
Survey A	Dollars	4,047	1,807	242	148	43	
Survey B	do	3,748	2,121	397	192	56	
Difference ²	Percent	8	- 15	- 39	- 23	- 23	
Probability ³	do		1	< 1	12	2	
\$5,000-\$7,499:							
Survey A	Dollars	6,111	2,033	262	181	43	
Survey B	do	6,094	2,759	478	225	61	
Difference ²	Percent	(4)	- 26	- 45	- 20	- 30	
Probability ³	do		< 1	< 1	45	< 1	
		Family living expenditures—Con.					
	Unit	Medical care	Contri- butions	Reading	Insurance	Other ⁵	Income taxes
\$0-\$999:							
Survey A	Dollars	90	35	11	48	611	19
Survey B	do	82	35	8	24	508	12
Difference ²	Percent	10	0	38	100	20	58
Probability ³	do	78		3	4	12	50
\$1,000-\$1,999:							
Survey A	Dollars	167	55	15	78	882	58
Survey B	do	116	55	14	38	771	49
Difference ²	Percent	44	0	7	105	14	18
Probability ³	do	19		56	< 1	17	66
\$2,000-\$2,999:							
Survey A	Dollars	103	74	21	54	755	169
Survey B	do	125	81	14	63	971	85
Difference ²	Percent	- 18	- 9	50	- 14	- 22	99
Probability ³	do	31	72	8	48	< 1	4
\$3,000-\$4,999:							
Survey A	Dollars	172	75	20	89	1,018	213
Survey B	do	139	122	21	100	1,094	204
Difference ²	Percent	24	- 39	- 5	- 11	- 7	4
Probability ³	do	22	< 1	62	43	36	77
\$5,000-\$7,499:							
Survey A	Dollars	153	118	25	160	1,091	444
Survey B	do	186	229	32	171	1,377	322
Difference ²	Percent	- 18	- 48	- 22	- 6	- 21	38
Probability ³	do	45	6	28	79	4	17

¹ Average per family in group. Survey A had condensed family expenditure questions; survey B, more detailed questions.

² Survey A estimate minus survey B estimate as percentage of survey B estimate.

³ Probability of difference as large as observed occurring due to sampling variation with samples the size of these based on t-test.

⁴ 0.5 or less.

⁵ Primarily food and household operation.

TABLE 7.—*Farm family spending pattern, 2 samples of farm-operator families with income under \$7,500, Illinois, 1946*¹

Item	Survey A	Survey B
	<i>Percent</i>	<i>Percent</i>
Income.....	100	100
Disbursements:		
Family living expenditures ²	62	71
Income taxes.....	6	5
Net change in assets and liabilities ³		13
Purchase of farm equipment.....		12
Family share of automobile expense.....	32	24
Other receipts ⁴		-5
Balancing difference.....		-2
Total family living expenditures ²	100	100
Clothing.....	14	17
Furnishings, including equipment.....	9	10
Personal care.....	2	2
Medical care.....	9	7
Contributions.....	4	5
Reading.....	1	1
Insurance.....	5	4
Other (primarily food and household operation).....	56	54

¹ Standardized by pooled income distribution. Survey A had condensed family expenditure questions; survey B, more detailed questions.

² Includes contributions and life insurance premiums, but excludes family share of automobile expenses.

³ Excludes life insurance premiums. The proportion of income saved shown in this study is lower than it would have been if net change in inventory of crops and livestock had been included in income and in change in assets as is done in many studies.

⁴ Cash gifts other than regular support and inheritances, lump sum settlements on insurance or property, and sale of farm equipment. The schedule for survey A did not specifically cover these items and they were not listed in the overall "other" category on any schedule, but they were reported by 16 percent of the families in survey B.

SPENDING PATTERNS.—As has been observed in comparing other expenditure studies, even though considerable differences appear when dollar expenditures are compared, the pattern of spending appears to be much the same. In this study, despite different levels of spending, the pattern of distribution of expenditures among major categories differed only slightly in the two surveys. The condensed questions showed a lower proportion spent by all families for clothing and more for medical care and "other," which is primarily food and household operation, than the more detailed questions revealed.

The differences amounted to 2 and 3 percent of the total budget.

EXPENDITURE CATEGORIES.—The greatest difference in estimates of major spending categories from the two types of schedule is found in clothing—the category in which schedule differences between the global and detailed approach are most marked. The global question elicited an average clothing expenditure estimate per family of about \$205, nearly 30 percent lower than the average of about \$285 per family shown by the more detailed questions ($P < 0.01$). In addition, 4 percent of the families reported with the global question on clothing that they had no clothing expense during the year, whereas none so reported on the detailed schedules ($P < 0.01$). Except at the lowest income levels, the global estimate of clothing expenditures was lower than the detailed, with the difference increasing at successive income levels.

Expenditures for housefurnishings contrasted between the global and detailed responses almost as much as with clothing. But here the dollar amount per family that reported such expenditure was higher with the global question; yet only two-thirds of the reporting units interviewed with the global question reported spending any money for furnishings and equipment, compared with 96 percent of the units interviewed with the more detailed questions. It may have been that the respondent thought only of major purchases of furniture and equipment, even though reminded of dishes, pans, linens, curtains, and the like in the global question. The low proportion reporting this type of expenditure occurred in each income class. The net effect was an average expenditure for furnishings per family that was about 20 percent lower than the estimate based on the more detailed question ($P=0.06$).

For personal care and contributions the global questions resulted in average expenditures that were 15 and 25 percent lower than averages based on the more detailed questions ($P < 0.01$). In each of these categories, understatement by the global approach was observed at higher income levels.

The "other" category was 6 percent lower in survey A, a difference that was not statistically significant. "Other" is primarily food and

household operation but it covers eight questions on the global questionnaire that must be considered as a total here because individual items from the two surveys could not be matched. No analysis was made in this study of the food estimates because of inability to match definitions, but it seems likely that the respondent's estimate of annual food expenditures is improved when the same interview covers detailed food expenditures for a recent week as well as data for the past year. The differences shown might have been greater if an improved section on annual food expenditures had been used in the more detailed schedule; actually schedule differences between the two tested were not as great for food as for any of the other major spending categories.

The global questions produced higher estimates of medical care expenditures, which are among the most variable, and the difference found could well have come from sampling variation. Differences found in insurance also could have been due to sampling variation. They occurred in the lower income classes, but agreement was close at the higher levels. The overall averages for reading expenditures differed by only a dollar. These are the exceptions to the findings that the global questions elicited lower estimates of family expenditure categories than did the more detailed questions at the middle and higher income levels, with differences at those levels increasing with income.

Reporting Problems

INCOMPLETE SCHEDULES.—Failure to obtain an estimate for an item, here called a “no report,” was more extensive in survey A. In that survey 33 families that gave information on the other sections of the schedule gave no data at all on the family living section. In addition, “no reports” on the individual categories of family living ranged from 1 to 5 for most categories, and there were 19 for contributions. As a result, in 63 schedules, 15 percent of all respondents, the total amount spent for family living was not obtained.

In survey B, there were no incomplete schedules on any of the selected family living categories except clothing. Expenditures for family clothing and total family living were incom-

pletely reported on 27 schedules, 6 percent of the total.

“No reports” in the clothing section for survey B were usually omissions of clothing expenditures for one or two members of families otherwise reporting such expenditures; 27 families did not give information for 38 persons. Most frequently the person had been a family member for only part of the year. The second most common omission was clothing expenditures of an older son or daughter who was a member of the family but bought all his own clothes and was not available to give the information. Incomplete reporting from both of these sources is likely to occur regardless of the type of schedule used. It may well have occurred in survey A also but it is not evident there because reporting was for the family, not for individuals.

Possible differences in enumeration methods and emphasis between the two surveys make it difficult to relate differences in completeness of schedules to the type of schedule used. The differences in frequency of “no reports” certainly do not suggest that, within the limits set by these two schedules, the number of “no reports” increases with the schedule detail. They do suggest that global questions elicit more incomplete schedules than the detailed approach, but they cannot be used to prove it. Some of the differences may be due to differences in training and supervision of interviewers and in schedule emphasis on the family living questions. Some may be due to the person interviewed—whether it was the farmer or his wife. The emphasis on a balanced schedule in survey B with revisits to complete schedules that were extremely out of balance, undoubtedly contributed to complete reporting in that survey.

ROUNDED AND EXTREME ANSWERS.—It is to be expected that the answers to global questions will be rounded off as, for example, \$50, \$200, or \$1,000 for a particular category. This occurred in survey A. The global questions also elicited more extreme answers and thus more variability in answers than the more detailed questions (table 5). The balancing procedure that went along with the more detailed questions probably was a factor in the lower variability observed in survey B. The greater variability of answers to global questions occurred

in the same categories for which the resulting averages were considerably lower than those based on the more detailed questions.

Reasonableness of Estimates

Average expenditures do not increase as smoothly with income in the estimates derived from the global questions as those based on the more detailed schedule (table 6). This is due partly to the smaller sample that resulted from the lower interview rate in survey A. But it also shows the greater variation in the responses obtained. In contrast, the averages based on the more detailed questions appear more reasonable in terms of relatively smooth progress with increase in income.

Income elasticities estimated with data from the global questions are unreasonably lower than those based on data from the more detailed schedule for clothing, personal care, contributions, reading, and "other" (table 8). Elasticities of the major categories of family living expenditures from survey A range only from 0.2 to 0.5 compared with a range from 0.3 to 0.8 for survey B estimates. Despite these differences, the rank of the categories with respect to income elasticity is approximately the same in the two surveys.

Global questions did not provide a lower estimate of income elasticity than the more detailed questions for housefurnishings and medical care. The small difference in income elasticity for medical care is not statistically significant, and the variability of medical care expenditures in survey A is so great that little reliance can be put on the elasticity estimate. The elasticity of furnishings in both surveys is abnormally low. The supply situation for furnishings in 1946 was still affected by the war situation, and spending for these items was influenced markedly by a backlog of demand and savings from World War II years.

The two Illinois surveys had similar income elasticities for income taxes. This category was among those with the smallest differences in the amount of detail asked for in the two surveys. Another such category was insurance. Its elasticity was lower for data from the global questions, but the relative changes in the income-expenditure relationship for insurance in

TABLE 8.—*Income elasticity of farm-operator family living expenditures*¹

Item	Farm units			
	Illinois, 1946		White, Tennessee, 1944	2 counties, Mississippi, 1945 ²
	Survey A	Survey B		
Family expenditure categories:				
Medical care ³	0.2	0.3	0.6	0.1
Furnishings.....	.3	.3	.6	.7
Other ⁴2	.4	.6	.4
Personal care.....	.3	.5	.5	.6
Reading.....	.3	.6	.5	.4
Clothing.....	.3	.6	.6	.6
Insurance.....	.3	.8	.8	1.1
Contributions.....	.5	.8	.6	.7
Total family expenditures.....	.2	.5	.6	.5
Income taxes.....	1.3	1.4	1.7	1.9

¹ For Mississippi and Tennessee, based on incomes from \$0 to \$5,000; for Illinois, both surveys based on income from \$0 to \$7,500. Calculated from average expenditures classified by net cash family income, using a least square regression and assuming constant income elasticity throughout range. Income was adjusted for inventory change in Mississippi study, but not in other studies. Illinois survey A had condensed family expenditure questions; survey B, more detailed questions.

² Farm units with at least \$200 farm sales.

³ Income expenditure relationships erratic so that less reliance can be put on the elasticity estimate.

⁴ Primarily food and household operation.

survey A were so erratic that little reliance can be put on the estimate of income elasticity, and differences were not statistically significant ($P=0.07$).

The survey B estimates of income elasticities are in line with those obtained in two other farm family living expenditure studies made in about the same period with the more detailed type of questionnaire. They thus appear to be more reasonable than those from survey A.

Conclusions and Possibilities for Future Use

In schedule design, as in sampling, the degree of accuracy that can be afforded must be decided in the light of each study purpose and of money available.

If the global questions are to provide estimates of major categories of spending as well as the total spending estimate built up from the categories, a schedule as condensed as that

used in survey A gives so little and such inaccurate information as to be almost worse than nothing. Steps that might be taken to improve the estimates are probably incompatible with the basic idea of adding a few overall questions at little additional cost to a survey obtaining other data.

If global questions on categories are used only to build up a total of family living expenditures, but not to provide estimates for the categories, a condensed schedule might yield valuable results if a few improvements were made in the schedule design and field procedures. In this study, the total family spending estimate built up from the summary questions was 10 percent less than the total built up from the detailed questions, which is in addition to an unknown understatement by the detailed questions used.

Uses for estimates of total family living expenditures with no breakdown by major categories, however, are limited. One use might be as an intermediate figure in deriving savings by subtracting the expenditures from net family income. In such a procedure, errors in the expenditure and income estimates are passed on to the savings estimate. This study suggests

that even though the total family expenditure estimate obtained from a condensed schedule might be sufficiently reliable for some uses, its error would be too great to permit its use in deriving savings by subtraction from income.

Something between surveys A and B in amount of detail of schedule could serve some limited purposes—estimating total expenditures plus internal relationships of main categories. Such a schedule would have to be used with the expectation that some understatement would be involved, but enough detail would have to be used that internal relations would not be seriously distorted. Global questions might be used for smaller categories such as personal care and contributions, knowing that underestimates larger than likely sampling error would probably result. Somewhat more detail might be needed in the food section than was used here in the more detailed schedule. Moreover, the experience reported here shows the difficulties of administering a short schedule on family expenditures as a subordinate part of a larger study.

For some purposes, of course, an even more detailed schedule than used in survey A would be justified.