

SOME EXPERIMENTATION WITH RECALL PROCEDURES AND DIARIES FOR CONSUMER EXPENDITURES

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The importance of consumer expenditure information for government planning and econometric analysis is unquestioned. Since procedures for collecting this information vary from country to country, additional methodological research is needed to determine the procedures that yield the most valid results. We report here on three studies conducted by the Survey Research Laboratory of the University of Illinois.

The first study explored the effectiveness of various recordkeeping forms and panel recruiting procedures for obtaining information on frequent nondurable expenditures, such as food, groceries, drugs and meals eaten away from home. This was a precursor to a larger methodological study by the U. S. Bureau of Labor Statistics and to a large national study of consumer expenditures scheduled to start soon.

The aims of this study were:

1. To develop recordkeeping formats and related materials after reviewing the literature and the experience of panel operators in the United States and Canada.
2. To test format effects on sample cooperation, completeness of reporting and accuracy of purchase details.
3. To test the effect of different time periods for recordkeeping and gifts on sample cooperation and reporting, as well as other methods of stimulating response.

Methodology

Diary Forms

Three diary forms were tested. On all three forms information was obtained on the date of purchase, the item or service, the number of items, the size or weight per item, the price per item per pound, the total price and whether sales tax was included. The forms differed in how they were structured:

1. Journal Diary. In this form purchases were entered in the order in which they were made. No product categories were given in the diaries. A Checklist of the products or services to be included was given at the front of the diary.

2. Outlet Diary. This form was arranged by type of stores or services. Four pages were allowed for purchases made in food and grocery stores, and single pages or parts of pages for auto supply outlets, gas stations, drug stores, restaurants, bars, clothing or shoe stores, variety stores, etc.

3. Product Diary. This form was arranged by product group, such as milk, dairy products, eggs, cheese; meat, fish, poultry; fresh fruit, vegetables; bread, bakery products; beer, wine, liquor, soft drinks, etc. No outlet information was obtained.

Variations of these three diaries have been used previously. The open journal diary is used in most Common Market and Latin American countries. It has the advantage that the respondent need not search for the page of the diary on which to make an entry. The disadvantage is that the generalized headings and instructions may not cover all situations and may cause the respondent to worry about recording her purchases correctly.

The outlet and product diaries reverse the advantages and disadvantages of the journal diary. The product diary has been used in Canada and Great Britain. It requires the recordkeeper to decide whether, for example, frozen fish sticks should be included under meat, fish and poultry or under canned, frozen and packaged goods. Though there is little or no harm in processing the diary if a product is misclassified, the respondent may again be concerned.

The outlet form, though never used before to our knowledge, is based on research by MRCA and the Life Survey of Consumer Expenditures that suggests when respondents recall expenditures, they should first recall where they shopped and then what they purchased there. Like the product diary, the outlet form is subject to classifying errors, particularly for stores that sell groceries, drugs and clothing under a single roof. In addition, there may be classifying problems with the gas station that sells milk or the grocery store that sells toys, newspapers and fertilizer.

Time Period

The sample was divided into four equal subsamples for testing time periods of one, two, three and four weeks. The advantages of the longer time periods are in the more reliable picture of expenditures during the first period (Kemsley and Nicholson, 1960). Unfortunately, sample cooperation declines and sample biases increase as the recordkeeping period increases. The optimum period is one that minimizes the total error composed of recordkeeping errors and sample biases.

Compensation

Operators of continuing commercial panels are convinced that some continuing compensation in the form of gifts is required to maintain cooperation. The United States Government, however, has never paid respondents for participating in surveys. Given this constraint, we attempted to test the effect of three different rewards on cooperation and the accuracy of recordkeeping. In Springfield, half the cooperating households received a padded stationery holder with a retail value of about \$5.00 as an immediate gift when they agreed to keep the diary. The stationery holder was used to hold the diary and purchase records during the recordkeeping period but was then kept by the family. The other half of the cooperating households in Springfield were offered a report at the end of the study that would compare their purchase patterns with those of other panel households with similar incomes.

In Rock Island half the households were offered

their choice of an American flag, a series of historical posters or two books from a list of about 40 popular books on the Government Printing Office list. The other half, who acted as controls, were not offered a gift but were given a black plastic folder valued at about \$1.00 in which to keep the diary and purchase records. They were allowed to keep this folder at the end of the recordkeeping period.

Sampling and Field Work

The study was conducted primarily in the Springfield and Rock Island, Illinois Standard Metropolitan Statistical Areas. A probability sale of households was selected using city and phone directories, and the principal food shopper in the household was interviewed.

The time period for the main field work was May through July 1969. A total of 29 interviewer twelve each in Springfield and Rock Island and five in Decatur were trained, and 25 interviewers carried out their assignments. Interviewers were trained at group meetings, studied at home and completed a practice interview. At the debriefing sessions after the study the interviewers reported that most respondents had been highly interested in the topic of how they spent their money. There was little reluctance to report expenditure information. Almost all refusals were because the respondent was too busy or because she did not understand how to keep the form.

Results

As one would expect, level of cooperation drops sharply during the four week period. About 85 percent of interviewed households kept a diary for at least one week, while less than 50 percent kept it for four weeks. (Table 1)

The diary formats had an unexpectedly large effect on cooperation, particularly as the length of the recordkeeping period increased. Cooperation was highest on the product diary, lowest on the journal diary. The outlet was slightly but consistently lower than the product diary. (Table 2)

The offer of a gift had a slightly positive effect for respondents returning at least one diary and a much larger effect on those returning four diaries. The immediate gift of the stationery holder obtained the highest initial cooperation, but the delayed gifts obtained the highest cooperation for four weeks. This suggests that if a four week period is used, an effective strategy would be to give the recordkeeper both an initial and a delayed gift. (Table 3)

Completeness of reporting showed exactly the same relationships as did cooperation. The reported levels of expenditures were highest on the product diary, lowest on the journal diary. (Table 4) The time period effect was most noticeable in the fourth week when there was a very sharp decline in level of reported expenditures. The differences between the first week and the second and third weeks was not as large as had been expected, but there was some evidence that households purchased more heavily in the first week and bought less in the second week as they used up their first week stocks. (Table 5)

There was not much difference in the level of reported expenditures among the three gifts, but households that received no gift reported at a significantly lower level. (Table 6)

To summarize our conclusions:

1. The collection of data about frequently purchased items by use of a diary is not only feasible but is also more likely to result in lower cost information than would the use of long recall surveys.
2. Weekly diary records produce estimates of purchase expenditures for groceries, drugs and clothing that are in close agreement with sales tax estimates. Purchases of furniture appear to be overestimated while food eaten away from home is substantially underestimated.
3. The optimum time period based on cooperation and level of reported expenditures is two or three weeks.
4. The product diary is preferred over the journal and outlet diaries because it achieves a higher level of cooperation, better reporting and is also more easily processed.
5. A gift can increase panel cooperation and significantly improve the level of reporting.

The second study tested the accuracy of recall of durable and other goods for periods of 3, 6 and 12 months. In addition, differences in recall of clothing purchases by the household informant and individual household members were also measured. The study was conducted during the period January through March 1970 in the Decatur, Rock Island, and Springfield, Illinois Standard Metropolitan Statistical Areas. The sample was not a random sample of the population, but was selected so that verification from outside sources would be possible.

The results of the validation procedure agree with the internal analysis of responses and with the general literature on forgetting. The chief findings are as follows:

1. There is a sharp decline in reported recall of durable purchases as the recall period increases. The average number of purchases reported in the twelfth month is 78 percent less than the number reported in the first month.
2. Larger items such as furniture, rugs, draperies and appliances are better remembered than less costly durable goods, but recall also drops sharply for them as the recall period increases. Based on validation data these large ticket items are underreported by 11 percent for 3 month recall, by 41 percent for 4-6 month recall, and by 47 percent for 7-12 month recall. (Table 7)
3. Clothing purchases show a strange reversal of this trend. Based on validation data recall of clothing purchases appears to be better for

longer than for shorter periods. It is possible that telescoping effects are larger for clothing than for other durable goods and cancel out the forgotten items. (Table 7)

4. Hosiery and underwear are reported most accurately, with an average bias of 3 percent for the total sample and period. These items were reported on a form filled in by the respondent in the middle of the interview. This result along with recent Australian experience suggest that the use of self-administered forms may help to improve recall of durables. (Table 7)
5. Validation results for expenditures for automobile supplies and services indicate that recall for these items declines as the time period increases, as is true with other durable goods. This is so even though these items were also obtained by the self-administered form rather than by direct interviewing. Estimates for weekly expenditures for gas and oil, on the other hand, appear to be overstated. (Table 8)
6. Unlike other product expenditures, insurance premium expenditures are better collected annually than quarterly. Households reporting for premium expenditures for 12 months recall averaged one-third higher for life insurance, twice as high for automobile insurance and three times as high for fire insurance as households reporting for 3 months. There are no differences, however, for health and medical insurance where premiums are usually paid on a monthly or quarterly basis. Validation comparisons indicate that net reporting biases are near zero and that insurance payments are more accurately reported than are purchases of durable goods. (Table 9)
7. The wife is the single best respondent for a household survey of durable goods. Total quarterly purchases reported by husbands are about two-thirds of those reported by wives. Joint interviews with husbands and wives, which were conducted only at the request of the household, do not result in recall either much better or much worse than that obtained from the wife alone.
8. As expected, individual self-reports of clothing purchases are about 15 percent higher than those by the household informant for 3 month recall. For 6 or 12 months the differences are about 5 percent, suggesting that either everyone's memory has gotten worse or through time the housewife becomes more aware of what household members have purchased.

9. Forgetting does not appear to be uniform over demographic characteristics. Generally households making more purchases have a sharper decline in recall as the time period lengthens. Thus, larger households with three or more members and households above the median income show sharp declines in the levels of recall in months 2 and 3 as compared to month 1, while other households do not decline as much. The differences between groups are smaller for longer time periods, although overall results are worse. Recall also becomes worse as the age of the household head increases, but education does not have any effect independent of income.

The general pattern of forgetting that emerges from this study of durable goods is much like that for more frequently purchased non-durables. This is disappointing, but additional measures may improve reporting. Bounded recall procedures can certainly limit the degree of telescoping. Forgetting a purchase entirely is more difficult to control, but the use of inventory methods may help. Diaries for durables or self-administered forms for recall should also be tested.

Keeping a written record is a chore for virtually everybody and becomes impossible in households where no one is literate. One would expect that both cooperation and accuracy of reporting would decline with decreasing education of the respondent. Thus, diaries for measuring consumer expenditures which are used in middle class areas might not be feasible in lower income areas in the inner city.

An alternative suggests itself--the use of tape recorders to obtain purchase information as the item is brought into the house without requiring any written records. We now summarize the results of two small experiments in Decatur and Chicago, Illinois with the use of tape recorders, and compare levels of cooperation and of reporting between tape recorders and diaries.

The findings of the experiments are mixed. In both cities, households were willing and able to report purchase expenditures on tape, but there were no significant differences in level of cooperation between diaries and tapes. In Decatur, in a predominantly middle class area the level of reporting was higher for tapes than for diaries. In the lower income area in Chicago, the reverse was the case. With some Chicago tape recorder respondents the results suggested that some kind of written record was kept and that the report was made on tape at the end of the week from the written record.

Since the tape recorders make coding more difficult as well as requiring additional funds for their purchase and maintenance, one would make extensive use of them only if they were clearly superior to diaries. On the evidence to date, this is not clear.

Table 1

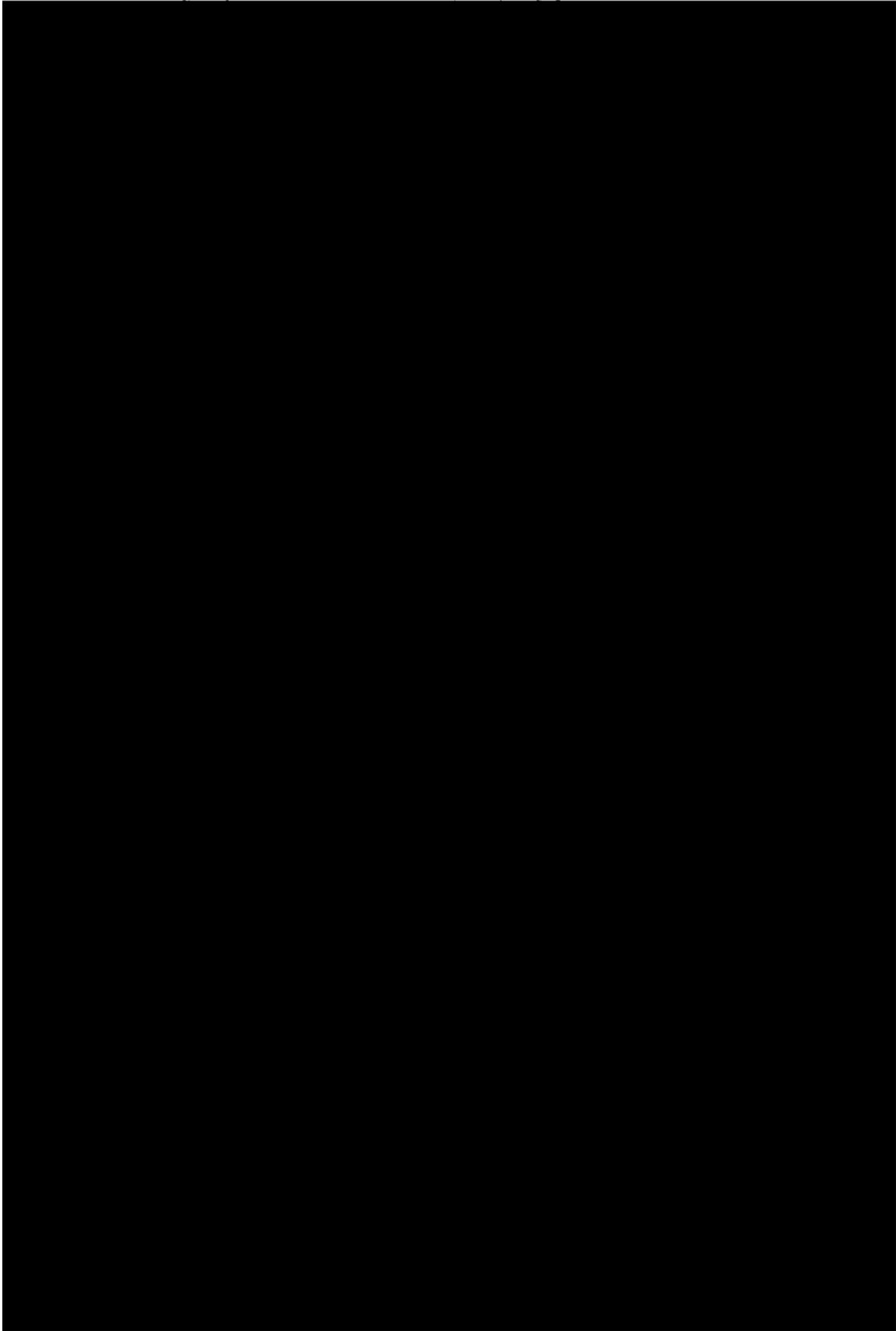


Table 5

REPORTED PURCHASE EXPENDITURES PER HOUSEHOLD BY OUTLET AND WEEK

Outlet	Week				Sales tax estimate
	1	2	3	4	
Grocery and food	\$22.75	\$20.58	\$22.78	\$18.50	\$25.71
Restaurants	7.92	5.89	6.79	6.66	12.50
Clothing	5.49	4.47	5.29	2.64	5.25
Furniture	2.86	9.10	9.29	8.18	4.54
Automotive	8.74	9.62	6.83	8.70	
Hardware	2.98	2.68	2.23	1.45	
Drug	2.61	2.44	2.42	1.59	
Department stores	7.12	9.82	8.61	6.23	
Books or toys	2.64	2.04	2.17	1.55	
Medical	4.87	2.99	7.38	3.50	
Services	5.58	5.40	4.19	3.27	
Housing payments	26.75	26.90	32.92	14.52	
All others	<u>28.12</u>	<u>25.46</u>	<u>21.75</u>	<u>9.41</u>	
Total	\$128.43	\$127.39	\$132.65	\$86.20	
Base	314	184	102	44	

Table 6

REPORTED TOTAL EXPENDITURES PER HOUSEHOLD BY TYPE OF GIFT AND WEEK

Week	No gift	Summary and comparison of purchases	Large stationery holder	Flag or book
1	\$124.34 (85)	\$140.77 (97)	\$136.43(105)	\$129.26(125)
2	106.93 (42)	121.82 (57)	112.88 (74)	142.28 (76)
3	89.15 (20)	144.03 (37)	139.90 (41)	141.07 (42)
4	<u>60.86 (7)</u>	<u>96.38 (13)</u>	<u>75.94 (16)</u>	<u>114.59 (17)</u>
Four week average	\$112.14(154)	\$133.24(204)	\$125.55(236)	\$133.36(260)

Table 7

ACCURACY OF PURCHASE REPORTS BY LENGTH OF RECALL PERIOD AND PRODUCT TYPE

A. Furniture, Rugs, Draperies, and Major Appliances

Category	Months recall			Total
	3	6	12	
Correct	11	5	11	27
Item omitted by respondent	9	19	36	64
Item not shown in store record	7	7	13	27
Price overstated	2	2	0	4
Price understated	1	2	0	3
Date understated	0	2	3	5
Date overstated	<u>1</u>	<u>0</u>	<u>0</u>	<u>1</u>
Total items verified	31	37	63	131
Estimated response bias	-11%	-41	-47	-35

Table 7 (continued)

B. Housewares and Small Appliances

<u>Category</u>	Months recall			
	<u>3</u>	<u>6</u>	<u>12</u>	<u>Total</u>
Correct	6	9	11	26
Item omitted by respondent	21	40	64	125
Item not shown in store record	13	14	20	47
Price overstated	1	3	4	8
Price understated	1	3	4	8
Date understated	0	2	1	3
Date overstated	<u>1</u>	<u>1</u>	<u>1</u>	<u>3</u>
Total items verified	43	72	105	220
Estimated response bias	-28%	-45	-52	-45

C. Automobile Supplies

<u>Category</u>	Months recall			
	<u>3</u>	<u>6</u>	<u>12</u>	<u>Total</u>
Correct	2	3	5	10
Item omitted by respondent	13	13	23	49
Item not shown in store record	8	4	3	15
Price overstated	0	0	1	1
Price understated	2	0	1	3
Date understated	0	1	1	2
Date overstated	<u>0</u>	<u>1</u>	<u>0</u>	<u>1</u>
Total items verified	25	22	34	81
Estimated response bias	-32%	-48	-70	-52

D. Clothing

<u>Category</u>	Months recall			
	<u>3</u>	<u>6</u>	<u>12</u>	<u>Total</u>
Correct	19	39	43	101
Item omitted by respondent	77	133	204	414
Item not shown in store record	23	112	137	272
Price overstated	7	18	11	36
Price understated	3	6	11	20
Date understated	5	3	5	13
Date overstated	<u>7</u>	<u>1</u>	<u>6</u>	<u>14</u>
Total items verified	141	312	417	870
Estimated response bias	-45%	-9	-24	-23

E. Hosiery and Underwear

<u>Category</u>	Months recall			
	<u>3</u>	<u>6</u>	<u>12</u>	<u>Total</u>
Correct	9	4	12	25
Item omitted by respondent	15	26	39	80
Item not shown in store record	16	30	36	82
Price overstated	3	3	1	7
Date understated	<u>1</u>	<u>1</u>	<u>2</u>	<u>4</u>
Total items verified	45	66	91	202
Estimated response bias	+6%	+13	-3	+2.7

Table 7 (continued)

F. Miscellaneous

<u>Category</u>	Months recall			<u>Total</u>
	<u>3</u>	<u>6</u>	<u>12</u>	
Correct	1	5	6	12
Item omitted by respondent	28	41	94	163
Item not shown in store record	9	5	8	22
Price overstated	1	1	0	2
Price understated	1	0	3	4
Date understated	0	0	1	1
Total items verified	40	52	112	204
Estimated response bias	-61%	-76	-84	-78

Table 8

AVERAGE QUARTERLY EXPENDITURES FOR AUTOMOBILE PRODUCTS AND SERVICES
BY 3, 6 AND 12 MONTHS RECALL

<u>Product</u>	Months recall		
	<u>3</u>	<u>6</u>	<u>12</u>
Gas or oil (weekly)	\$ 9.29	\$ 8.85	\$ 10.22
Grease or oil change	10.89	8.73	10.20
Service or repairs	28.46	15.80	15.13
Supplies	18.63	14.49	14.23
N	140	130	115

Table 9

AVERAGE QUARTERLY INSURANCE PREMIUMS PAID
BY 3, 6 AND 12 MONTHS RECALL

<u>Type of insurance</u>	Months recall		
	<u>3</u>	<u>6</u>	<u>12</u>
Life	\$ 62.85	\$ 67.05	\$ 83.77
Health/medical	32.35	26.07	25.54
Auto	22.39	37.03	49.30
Fire/homeowner	5.05	10.58	14.58
N	127	122	105
Don't know	17	13	14