

RESPONDENT CHARACTERISTICS AND RECALL BIAS IN THE CONSUMER EXPENDITURE INTERVIEW SURVEY

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INTRODUCTION

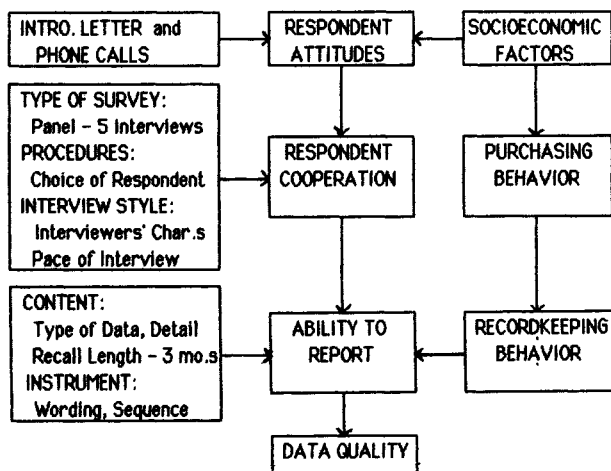
Recall bias results from the selective recollection of past events and is common in retrospective interviews. It is related to memory and tends to increase with longer recall periods and for less salient events. Unlike other types of omissions, such as the ones due to the use of proxy respondents, recall bias is easily identified in survey data as events close to the interview show higher reporting levels than events further in time. The incorrect reporting of events' time of occurrence, or "telescoping", interferes with the analysis of recall bias since it often affects reporting in a forward direction, thus combined "recall effects" result. "Bounding" techniques reduce telescoping external to the reporting period, but not telescoping within the reporting period.

This paper examines survey-related aspects of recall effects and their relationship to respondent and household characteristics. Reporting patterns from the 1984 Consumer Expenditure Interview Survey are analyzed using monthly expense data for two expense classes, Apparel and Housefurnishings (Hsefrngs), two classes exhibiting substantial differences by recall month and low estimates compared to outside sources. The study is a follow-up to a recent aggregate-level analysis of time-in-sample and recall effects (Silberstein and Jacobs, 1984); that study concluded recall bias, more than panel conditioning, contributes to the underreporting of expenditures.

RESPONSE PROCESS

The Interview Survey is a national panel survey collecting expenditures from a sample of households interviewed five times at three-month intervals, separately from the Diary Survey. The first interview has one month recall and is used only for "bounding". The second through fifth interviews have three-month recall and are used in the estimates; each interview tends to "bound" the next. The unit of analysis is a consumer unit (CU) which includes those members of a household who are either related and/or pool their income to make joint expenditure decisions.

Fig. 1 - Response Process in the Consumer Expenditure Interview Survey



The respondent(s) to the interview answer a single questionnaire covering all members of the CU. Figure 1 illustrates various elements of the survey process and their interaction with the socioeconomic background and the purchasing behavior of the consumer unit. The ability of the respondent(s) to report accurately is the necessary bridge between the factors involved and the quality of data collected. Major factors in response quality are the respondents' knowledge of expenses made by other CU members, the expense records available during the interview, and the length of the recall period. Errors are most typically in the form of underreports.

Far less CU's do not report an expenditure on the first recall month (i.e., the most recent month) when compared to the other two recall months. About 16 percent of the reporters of Apparel expenses do not report these expenses on the first month, whereas about 40 percent do not report these expenses on the third month. For reporters of Hsefrngs expenses, about 28 percent do not report an expense on the first recall month, but 47 percent do not report one on the third month. (Table 1)

Table 1. Month With No Expense in Category: Pct. of Respondents With Expenses in Category (CU's with previous qtr)

Qtr:	APPAREL		HSEFRNGS	
	842	843	842	843
Recall Month	%	%	%	%
FIRST	16	17	28	29
SECOND	33	31	45	40
THIRD	41	39	46	45
Number of CU's:	3461	3408	2745	2762

The percent ratio of the first recall month expenditures to the three-month average (a measure of first month, or recency, bias) was 128 for Apparel and 118 for Hsefrngs in the third calendar quarter of 1984 (Qtr 843). As Table 2 shows, the ratio was highest for CU's that reported the expenditure in only one month (186 for Apparel and 137 for Hsefrngs), but it was still over 100, although much lower, for CU's that reported expenditures on all three months (112 for Apparel and 116 for Hsefrngs). For 1984 as a whole (including all reporters) the percent ratio was 123 for Apparel and 115 for Hsefrngs.

Table 2. Number of Months With Expense Category (Qtr 843)

No. of Months With Expense	CU's	Total Mean	Mean by Recall Month			1st Mo. Bias
			1st	2nd	3rd	
APPAREL						
Total	3944	\$ 89	\$ 114	\$ 84	\$ 68	128
no expn	536					
1 month	940	38	70	28	15	186
2 months	1114	82	119	78	47	146
3 months	1354	161	181	158	145	112
HSEFRNGS						
Total	3944	\$ 98	\$ 116	\$ 88	\$ 91	118
no expn	1182					
1 month	1126	74	102	66	55	137
2 months	922	145	154	136	145	106
3 months	714	236	279	206	224	116

MODEL DEVELOPMENT

The Dependent Variable

Log-linear models of recall effects were developed using data collected in two reporting periods from interviews conducted in the second and third calendar quarters of 1984; these months tend to exclude the fall and winter buying peaks which would affect comparisons between recall months. Only reporters with a previous interview (about 90% of all reporters) and who reported at least one expenditure in the categories studied were included; CU's that did not participate in a previous interview experienced an "unbounded" interview and were unsuitable for an analysis of recall effects. After these exclusions, sample cases in Qtr 843 were 3408 for Apparel and 2762 for Hsefrngs.

The percentage of expenses (the dollar value) reported in the first recall month compared to the expenditures reported for the three recall months was chosen as the statistic for the dependent variable in the multivariate analysis. A categorical variable with three levels was defined according to whether the expenses reported for the first month for a given CU were: (1) between zero and 35%, (2) between 35% and 75%, or (3) 75% to 100% of the expenses reported for the three-month period.^{1/} Table 3 shows the distribution and the monthly mean expenditure for Qtr 843. The levels, referred as "no recall effects", "moderate recall effects", and "great recall effects", were selected to highlight wide differences in reporting patterns. An additional level separating CU's that reported only for the first recall month, about half of the CU's in level 3, was used in some models and referred as "extreme effects".

Table 3. Dependent Variable: Recall Effects
(Qtr 843)

Recall Effects	% CU's	Mean Expn	Recall Effects	% CU's	Mean Expn
APPAREL n=3408			HSEFRNGS n=2762		
Total	100	\$ 102	Total	100	\$ 141
None	45	106	None	53	146
Moderate	29	125	Moderate	18	163
Great	27	71	Great	29	119

It is difficult to interpret the recall variable in terms of reporting quality. Reporting most of the expenses in one of the three months, for instance, would seldom result in the CU being classified in level 2, but this type of report might be due solely to the CU's shopping style. Some reporters exhibiting no bias in terms of the expenses could have had, or reported on, fewer but more salient expenditures (i.e., with a larger dollar value) for purchases made less recently. Similarly, a large expenditure might have occurred or telescoped into the most recent month and this could have produced greater recall effects. A comparison between reporters that remained in panel for all five interviews and the rest of the reporters indicates greater recall effects are associated with less cooperative reporters; the percentage of reports with "great" recall effects was 33% higher for respondents that did not report for the whole length of the panel.

Control Variables

There is a relationship between the number of purchases, the expenses reported, and the degree of recall effects, but this relationship is not easily characterized. It seems logical to assume the number of expenses incurred by the CU is related to the potential recall; the less items purchased the easier it is to remember them and when they were purchased. Reports with few records listed the most recent month more often than other months, however. It is possible that some purchases are made in anticipation of the next interview, but this kind of conditioning cannot be ascertained from the survey data.

The number of expenses recalled may influence how they are mentally allocated to each month: a larger number of expenses would likely result in a more even distribution. (Interview questions are first presented in terms of expenditures made and then in terms of expenditure month.) As Table 4 shows, the 1st-month bias ratio tends to decrease as more diverse expenditures are reported; note one "record" may include multiple purchases of the same item in the same month. The number of expenses for a given category is also indicative of different types of households, their needs and taste, and it was selected as a "control" variable.

Table 4. Number of Apparel Records Reported
(Qtr 843)

Number of Records	CU's	Pct. Distr. by Recall Effects			1st Mo. Bias	
		%	None	Mod		Great
3408	3408	1517	965	926	128	
		100	45	29		27
1	333	100	53	-	47	130
2 to 4	994	100	44	21	35	141
5 to 9	876	100	46	30	24	134
10 to 19	806	100	41	39	21	125
20+	399	100	41	49	10	124

Another issue in model development is the role played by the reporting of the second and third recall months. Comparisons of first to second recall months show invariably a drop in reporting when recall effects are observed. The third recall month was expected to have the lowest reporting level of the three months, judging from aggregate-level analysis, but data on individual reporters show this relationship is influenced by the interview timing in the month.

The interview reference period runs from "the 1st of the month three months ago" up to the interview day.^{2/} Expenses reported for the month of interview are entered into the next wave's database and added to expenses actually collected for the third recall month in the next interview. Interviews taking place late in the month capture many of the current month's expenditures, and lower levels of recall bias result. (See Table 5)

Table 5. Week of Previous Wave Interview
APPAREL - Qtr 843

Interview Week	CU's	TOTAL		3rd RECALL MONTH	
		Mean Expn	1st Mo. Bias	Mean Expn	Pct Clctd in Prev. Wave
Total	3408	\$ 102	128	\$ 78	39%
First	1418	90	132	60	17%
Second	1154	108	135	82	36%
Other	836	114	115	104	64%

In Qtr 843, the first month bias ratio for Apparel was 115 for CU's interviewed in the third or fourth week of the month in the previous wave. For these CU's 64 percent of the third recall month expenditures were collected in the previous interview. By contrast, CU's interviewed in the second week in the previous wave had a ratio of 135 and 36% of the third month expenditures had been collected in the previous wave. The lowest bias and the highest mean expenditure are observed when the previous interview is in the third or fourth week of the month and the current interview is in the second week of the month.

About three fourths of the interviews take place in the first two weeks of the month to allow the interviewers to work on other surveys during the latter part of the month. Aside from this constraint, the interview scheduling by week may be the result of complex factors, such as the criteria the interviewer may have developed to increase response, or the availability and cooperation of the respondent; some CU's may require callbacks more than others. The week of interview of the previous wave was chosen as a second "control" variable for several models, and, in two models, both current and previous interview week were included.

Independent Variables

Table 6 shows weighted percent distributions and 1st-month bias ratios for some of the variables used. The variation in the level of recall bias among different groups of respondents is apparent. See, for instance, the increase in bias by CU size, from 97 in one person CU's to 141 for CU's of five or more persons.

Table 6. Respondent and Consumer Unit (CU) Characteristics
APPAREL - Qtr 843

Pct 1stMoBias		Pct 1stMoBias	
AGE:	100 128	CU STRUCTURE:	100 128
Under 30	19 120	Husb-Wife w/others	41 136
30-39	25 138	Single & H-W alone	42 116
40-64	41 126	Other	17 126
65 and over	16 124	NO.OF RESPONDENTS:	100 134
CU SIZE:	100 128	(CU's w/2+ persons)	
One person	22 97	Only one	67 136
Two persons	29 126	More than one	33 132
3 or 4	35 135	RESPONDENT TYPE	100 136
5 or more	14 141	(H-W CU's only)	
CU INCOME:	100 128	Both wife and husb.	36 131
LT 15k	33 141	Wife	48 139
15k - 30k	28 125	Husband	16 138
30k and over	32 123	RECORD USAGE:	100 128
Incomplete	7 143	Some records	77 127
		No records used	23 135

The analysis deals with respondents that report certain expenses and participate in two consecutive waves. Age of respondent (in this case, age of main respondent) is a variable particularly sensitive to universe exclusions. About 40% of respondents less than 25 years old did not participate in the previous wave (new CU's, in most cases) and, as a result, this age group was reduced from 10% to 7% of the total. Respondents who were 65 years old and over presented a different situation: only 6% did not have a previous interview, but about 26% did not report any Apparel (compared to 13% for the total) and were excluded.

Only data from the survey itself were available and could not be altered to be more specific to the study's needs. The variable dealing with record usage, for instance, pertains to use of records at "some time during the interview" and not to a specific section such as Apparel. This variable is more indicative of the general cooperation level obtained by the interviewer rather than whether the Apparel recall process was done with the use of records, therefore. It can be assumed, however, that if "no records were used" then the Apparel recall process was done without records as well; about 23% of the respondents were in this category.

Testing Methodology

Using the CPLX computer program (Fay 1986), the relationship of each of the variables to recall effects was tested, i.e., a test of independence, and several multivariate models were fitted. CPLX fits log-linear models to the cross-classified, categorical, data and tests the contribution made to the models by individual variables through Jackknifed Chi-Square tests developed by Fay (1985). The log-linear models developed included the interaction between the independent variables and the two-way interactions of each independent variable and the dependent variable; higher-order interactions were not required for good fits. For three independent variables:

$$\log(F_{ijk}) = \lambda + \lambda_i^j + \lambda_j^k + \lambda_h^k + \lambda_k^h + \lambda_{ij}^{hk} + \lambda_{ih}^{jk} + \lambda_{ik}^{jh} + \lambda_{ijk}^{hjk}$$

where: i is the dependent variable, j, h, and k are either independent or control variables.

CPLX computes maximum likelihood estimates of the models' parameters as well as standard errors designed for complex surveys; standardized values are then computed. The Interview Survey is particularly suited for this program since it already has a "replicate" structure, one of the options in CPLX; the 1984 survey had 20 replicates.

Results were derived, for the most part, from models fitted to Apparel data; they are displayed in an abbreviated form for selected interactions in Tables 7 to 14. Standardized values for only one of the levels are shown for variables collapsed in two levels, the level not shown has opposite signs. Standardized values $|z| = 1.96$ or larger can be considered significant at the .05 level. Critical values for the Jackknifed Chi-Square Test are as follows:

Critical Values for the Jackknifed Chi-Square Tests							
DF	.10	.05	.01	DF	.10	.05	.01
2	1.0	1.5	2.3	10	1.2	1.6	2.3
3	1.1	1.5	2.3	20	1.2	1.6	2.4

The month of interview was found to be significantly related to recall effects in Qtr 842: CU's interviewed in May displayed great recall effects when compared to the other two interview months. This would imply April (the first recall month for May interviews) to be seasonally high for Apparel purchases. Data from Qtr 843 did not show any significant relationship with the month of interview and, for this reason, was chosen for the discussion of results.

TEST RESULTS

Previous and Current Waves

Recall effects for the same respondents in two consecutive waves were compared (Table 7). The model excluded data for the second wave, since recall effects for the first wave are not comparable. Recall effects were found to be consistent from one wave to the next, especially for respondents with moderate recall effects, (see standardized value $z=4.00$ for the Interaction of Recall Effects in 2 Waves). CU's that do not report any Apparel expenses in the previous wave are likely to exhibit great recall effects in the current wave.

Table 7

MODEL OF APPAREL RECALL EFFECTS IN 2 WAVES			
Variables: Recall Effects in Qtr 843 (Dependent), Recall Effects in Qtr 842, Week of Previous and Current Waves			
Interaction of Apparel Recall Effects in 2 Waves:			
(Standardized Values)	Apparel Recall Effects in Qtr 843		
APPAREL EFFECTS QTR 842	None	Moderate	Great
No Apparel Reported	1.49	-3.41	3.28
No Recall Effects	0.00	1.68	-1.90
Moderate	0.03	4.00	-4.33
Great	-2.33	0.37	1.89
Interaction of Recall Effects and Week of Previous Wave:			
3rd or 4th Week of Month	2.33	-0.41	-2.13
Interaction of Recall Effects and Week of Current Wave:			
3rd or 4th Week of Month	-2.89	0.80	1.87
Jackknifed Chi-Square Test		DF	
Previous Interview Week	1.8	2	
Current Interview Week	2.3	2	
Recall Effects in Qtr 842	4.8	6	

The relationship of week of current and previous interviews to recall effects is significant, (see test values of 1.8 and 2.3, respectively). The interview weeks were grouped in two levels, first and second week of the month, and third and fourth week of the month (values shown for the latter). CU's interviewed in the third or fourth week of the month in the previous wave tend to exhibit no recall effects in the current wave ($z=2.33$). By contrast, CU's interviewed in the first two weeks of the month in the previous wave tend to exhibit great recall effects in the current wave. Opposite results are exhibited by current interview week.

Recall Effects of Apparel and Housefurnishings

The relationship of Apparel and Hsefrngs recall effects was tested in a model using data for the same CU's and in the same reporting quarter (Qtr 843). Recall effects were found consistent, but, not surprisingly, indicate lower recall effects are experienced in the reporting of Hsefrngs compared to Apparel -- CU's that had no recall effects for Hsefrngs are likely to exhibit moderate recall effects in reporting Apparel expenses. (Table 8)

The Apparel sections follow the Hsefrngs sections in the questionnaire, and they are similarly collected. These expenses are different in many respects, however, and the average expenditure size is much smaller for Apparel. Neter and Waksberg (1965) found the degree of telescoping would increase with size of expenditure, while the degree of recall loss would be higher for smaller items.

Table 8

MODEL OF APPAREL AND HSEFRNGS RECALL EFFECTS			
Variables: Apparel Effects (Dependent), Hsefrngs Effects, Week of Previous and Current Interview			
Interaction of Apparel and Hsefrngs Recall Effects:			
(Standardized Values)	Apparel Recall Effects		
HSEFRNGS EFFECTS	None	Moderate	Great
No Hsefrngs Reported	1.30	-5.02	5.96
No Recall Effects	1.59	2.09	-3.34
Moderate	-0.31	1.85	-2.07
Great	-1.97	-0.04	1.87
Jackknifed Chi-Square Test		DF	
Previous Interview Week	2.2	2	
Current Interview Week	2.8	2	
Hsefrngs Recall Effects	5.8	6	

Respondent Characteristics

Significant relationships with the recall variable were found for age and education of respondent, but not for sex or race of respondent. Respondents between the ages of 25 and 44 tend to have moderate recall effects, whereas older respondents (65 and over) tend to have either no effects or extreme effects. The frequency of reports in only one of the three recall months may produce significant relationships at the extremes.

Respondents with less than high-school education exhibit great recall effects, and respondents with a college education are the least likely to exhibit great recall effects. Simultaneous testing of age and education reveals that age is a more important variable than education. The interaction of age and education shows respondents with less than high school education are highly correlated with older respondents and this may be one of the reasons for the relationship found for education.

Characteristics of the Consumer Unit

The bivariate relationship of home tenure and recall shows that renters are more likely to exhibit great recall effects, whereas owners are more likely to exhibit moderate effects. Family income exhibits high significance levels. As Table 9 shows, lower income CU's display great recall effects more often than CU's in other income groups, with the exception of respondents with incomplete reporting of income who exhibit great recall effects. These respondents refuse to disclose major sources of income and this is often considered an indication of less than full cooperation.

Table 9

TEST OF INDEPENDENCE MODEL: RELATIONSHIP OF APPAREL RECALL EFFECTS AND FAMILY INCOME BEFORE TAXES			
(Standardized Values)	Apparel Recall Effects		
FAMILY INCOME	None	Moderate	Great
LT 15K	1.43	-4.97	2.81
15K - 30K	0.34	0.99	-1.65
30K OR MORE	-0.88	5.10	-4.18
Incompletely Reported	-0.46	-1.71	1.97
Jackknifed Chi-Square Test		DF	
Family Income	6.1	6	

CU structure appears to be an important variable in relationship to recall effects. The variable isolated single reporters and husband-wife CU's without children or other family members from other husband-wife families

and other types of CU's. A model that controlled for the week of the previous interview and the purchasing level for Apparel, i.e., 5 or more records and less than five records, shows, not surprisingly, husband-wife CU's with children tend to purchase more types of clothing. After eliminating the effect of this interaction, these CU's exhibit moderate recall effects, whereas other CU's do not. (See Table 10) The same relationship was found when age of main respondent was included in the model.

Table 10

MODEL OF APPAREL RECALL EFFECTS AND CU STRUCTURE			
Variables: Recall Effects in Qtr 843 (Dependent), CU Structure, Week of Previous Interview, Expenditure Group			
Interaction of Recall Effects and CU Structure:			
(Standardized Values)	Apparel Recall Effects		
CU STRUCTURE	None	Moderate	Great
H-W With Children or Others	-2.58	2.13	0.28
Single or H-W w/out others	2.45	-1.33	1.42
Other CU's	-0.18	-0.89	1.13
Interaction of Recall Effects and Expenditure Group:			
(Standardized Values)			
5 or more Apparel Records	-0.74	12.47	-11.19
Jackknifed Chi-Square Test		DF	
Previous Interview Week	1.8	2	
CU Structure	2.2	4	
Expenditure Group	20.6	2	

Recall effects tend to increase for larger families. A model testing CU size included the variable on record usage and was restricted to CU's that reported more than one Apparel record. Results indicate that CU's with 5 or more persons are the most likely to show great recall effects, CU's with 3 to 4 members tend to have moderate recall effects, and CU's with 1 or 2 persons tend to have no recall effects. (Table 11)

Table 11

MODEL OF APPAREL RECALL EFFECTS AND CU SIZE				
Variables: Recall Effects in Qtr 843 (Dependent), CU Size, and Record Usage During Interview				
Restricted to Reporters of 2 or more Apparel Records				
Interaction of Recall Effects and CU Size:				
(Standardized Values)	Apparel Recall Effects			
NUMBER OF PERSONS	None	Moderate	Great	Extreme
1 Person	3.50	-3.45	-2.14	1.63
2 Persons	2.29	-2.07	0.07	0.16
3 or 4 Persons	-1.27	3.02	0.77	-1.95
5 or more Persons	-3.52	2.40	2.46	-1.14
Interaction of Recall Effects and Record Usage:				
(Standardized Values)				
Some Records Used	1.37	6.47	-1.02	-4.99
Interaction of CU Size and Record Usage:				
(Standardized Values)	Number of Persons in CU			
	1	2	3 or 4	5+
Some Records Used	-2.50	3.73	0.91	-0.72
Jackknifed Chi-Square Test		DF		
CU Size	5.0	9		
Record Usage	7.2	3		

Procedural Aspects

The relationship of record usage and the various CU and respondent characteristics resulted in significant test values, in most cases. The interaction of recall effects and record usage shows a positive relationship for moderate recall effects. Respondents with great

recall effects, on the other hand, are the least likely to use records. (Table 12) Discounting CU's that report very few expenses (little reason to use records), the relationship of CU size and record usage points out that CU's with two persons are the ones most likely to use records. (Table 11)

Another variable dealing with procedural aspects is the presence of more than one respondent. This variable shows a significant relationship to recall effects, positively related to moderate recall effects. (Table 12) Only one third of the CU's with 2 or more members have more than one respondent. The variable resulted a weak variable in comparison to respondent and CU characteristics, but was significantly related to recall effects when tested together with the record usage variable. Records tend to be used more often for interviews with more than one respondent (z=7.6).

Table 12

MODEL OF RECORD USAGE AND NUMBER OF RESPONDENTS			
Variables: Recall Effects in Qtr 843 (Dependent), Record Usage and Number of Respondents			
Restricted to CU's With More Than One Member			
Interaction of Recall Effects and Record Usage:			
(Standardized Values)	Apparel Recall Effects		
	None	Moderate	Great
Some Records Used	0.27	4.49	-5.31
Interaction of Recall Effects and No. of Respondents:			
(Standardized Values)			
More Than One Repondent	-2.33	2.48	-0.25
Jackknifed Chi-Square Test		DF	
Record Usage	6.0	2	
Number of Respondents	2.1	2	

The relationship of recall effects and respondent type was tested for husband-wife (H-W) families by age of main respondent. Few CU's that did not have either spouse as the main respondent were excluded. The variable "CU structure" was in this case dichotomous: H-W with no other members, and H-W with children and/or others (standardized values refer to second level). Age of main respondent was collapsed in two groups: less than 40 years old, and 40 and over (again, values shown for second level).

The results, displayed in Table 13, are summarized as follows: (1) H-W CU's exhibit moderate recall effects when both husband and wife participate in the interview and no recall effects when only the husband does; (2) only the wife is likely to be the respondent for CU's with children or other members, and both spouses are likely to answer for CU's with only husband and wife; (3) great recall effects are exhibited when the main respondent is 40 or more years of age, and moderate recall effects are more likely when the main respondent is less than 40 years old; (4) no recall effects are apparent for CU's without children or other family members.

The interview length (almost 2 hours, on the average) is a variable of interest, even though it pertains to the total time of interview and not to a specific questionnaire section. Not surprisingly, very short interviews point in the direction of high recall effects and moderate effects are more likely in long interviews. A final aspect tested was the panel wave the CU was in. The findings point out recall effects can be

observed in the data irrespective of time-in-sample, as the relationship was not found significant.

Table 13

MODEL OF APPAREL RECALL EFFECTS AND REPENDENT TYPE			
Variables: Recall Effects in Qtr 843 (Dependent), CU Structure, Who is the Respondent, Age of Main Respondent			
Restricted to H-W CU's with main respondent either husband or wife			
Interaction of Apparel Recall Effects and Respondent Type:			
WHO IS THE RESPONDENT	Apparel Recall Effects		
	None	Moderate	Great
Both Husb. and Wife	-2.75	2.81	-1.11
Wife Only	0.59	-1.30	0.42
Husband Only	2.13	-1.61	0.52
Interaction of Recall Effects and Age of Main Respondent:			
(Standardized Values)			
40 Years Old and Over	0.82	-3.29	2.44
Interaction of Recall Effects and CU Structure:			
(Standardized Values)			
CU's W/ Children or Others	-2.13	3.62	-0.35
Interaction of CU Structure and Respondent Type:			
(Standardized Values)		Who is the Respondent	
H-W Families:		Both	Wife Only
CU's W/ Children or Others		-2.11	5.49
		Husb.Only	-1.52
Jackknifed Chi-Square Test		DF	
Who is the Respondent		2.0 4	
Age of Main Respondent		2.8 2	
CU Structure		2.8 2	

SUMMARY AND CONCLUSIONS

The characteristics tested in relationship to recall effects vary in importance. The most important variables are the ones dealing with the size, structure, and income level of the consumer unit. Age and education of the respondent are important respondent characteristics; race and sex of the respondent are not. Several procedural aspects of the survey display significant test values even after household and respondent characteristics are taken into account.

Great recall effects are associated with CU's with five or more members. By contrast, no recall effects are apparent for single and two-member CU's, for CU's with no children, and when the only respondent is the husband in husband-wife CU's. Moderate recall effects are found when both spouses participate as respondents in husband-wife CU's and when expense records are used. In general, reports with "moderate" recall effects display higher mean expenditures than other reports.

The respondents most likely to exhibit moderate recall effects are husband-wife families with children and CU's that own a home. Respondents between the ages of 25 and 44 years are highly correlated to these characteristics and show the same pattern. The tendency of recall losses to increase with age of respondent was evident in a model that restricted the comparison to the subset of respondents in husband-wife CU's; this model tended to reduce the confounding effect of CU's with very old respondents and/or very scant reports.

About half of the CU's with few expenses report them as having occurred in the most recent month. This seems to be the tendency for respondents with less than high school education, and for CU's with low income levels or with

incomplete income reports. Some older respondents also show this pattern of reporting, but other older respondents report few expenses with no recall effects.

The length of the recall period is the underlying variable in recall bias analysis; only experimental studies can approach this issue effectively. This study points out how sensitive reporting patterns are to changes in interview week, a variable influencing not only the length of the reporting period but also the respondent's perception of it. In terms of respondent characteristics with respect to the recall process, the study suggests the following hypothesis. Respondents exhibiting moderate recall effects may be the respondents more likely to "try harder" to report completely; telescoping errors may be made in the process. However, even cooperating reporters tend to exhibit greater recall losses when the family is large and the respondent less in control of purchasing. Additional research should focus on the components of what is reported, e.g., the types of purchases and how diversified they are by recall month. Finally, seasonality should be a variable included in more generalized versions of recall effect models.

1/ Expenditures not collected by month of expenditure, a small portion of the classes analyzed, were excluded. Monthly expenditure data were adjusted to a uniform length of expenditure month.

2/ These expenses are transcribed in the next wave questionnaire to minimize duplication. (The interviewer asks whether an expense mentioned by the respondent is the same as the one mentioned in the previous interview when it appears to be the same.)

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