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Consumer Attitudes: Their Influence and Forecasting Value

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That measurements of consumer attitudes can help to explain and predict changes in discretionary consumer spending which cannot be accounted for by income changes is a belief basic to the work of the Economic Behavior Program of the Survey Research Center.¹ Psychological factors are frequently mentioned by writers on the business cycle, but usually as influencing primarily investment decisions. In regard to consumer spending the state of optimism and confidence has at best been treated as a secondary factor which may reinforce prevailing trends. The proposition that consumer attitudes may at times exert an autonomous influence on consumer spending clearly assigns to them a greater importance than they have traditionally enjoyed.

Since the war we have experienced short-run variations in consumer spending which cannot be explained by changes in income. For example, in 1951 discretionary consumer spending declined while personal incomes were rising. In the winter of 1954-55 consumer spending increased more sharply than did personal incomes. In late 1957, many analysts again referred to the consumer as the big question mark in the economic outlook. The possibility that variations in consumer confidence may help to account for fluctuations in consumer spending therefore has important implications for economic forecasting.

Empirical tests of the role of attitudes can be made at two levels: the aggregative and the individual. "Aggregative" tests start with the construction of time series based on the expressed attitudes of representative samples of American consumers at successive time points. These can then be checked against time series for total consumer purchases or purchases of specific goods. For example, if people were more optimistic at one date

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¹ "Discretionary" consumer spending denotes spending on such items as consumer durable goods, vacations, and luxuries. Expenditures may be discretionary because they are for nonessentials or because they are postponable (i.e. replacement of durable goods). Relevant to the analysis of fluctuations in discretionary spending are attitudes and opinions responsive to short-run changes in the economic environment rather than personality traits or attitudes evolved over a long time.

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than at another, were consumer purchases higher relative to disposable income after the first than after the second? "Individual" or "re-interview" tests require interviewing the same people at least twice. They tell us whether individuals who were optimistic were more likely to make major expenditures in the subsequent period than those who were pessimistic.

Evidence derived from the aggregative test of the relation between consumer attitudes and fluctuations in consumer spending was presented in several previous publications.² The analysis there, though not quantitative in a rigorous statistical sense, indicated that consumers' attitudes and their rate of discretionary spending exhibited similar movements over time, with changes in attitudes sometimes leading changes in spending. Here I shall first attempt to carry the aggregative test one step further by means of time-series correlations between consumer attitudes and spending on durable goods. Most of the data come from the periodic surveys which have been conducted by the Survey Research Center several times a year since 1951. Data for early 1953 and early 1954 come from the annual Survey of Consumer Finances.

The second and third sections present data on the relation between consumer attitudes and spending based on re-interviews. An extensive panel study was begun by the Survey Research Center in June 1954, when a representative cross section of 1,150 urban families in all parts of the country was interviewed. Additional interviews were scheduled in December 1954, June 1955, December 1955, and February 1957. Four complete interviews were obtained from 800 families during the first year and a half, and the fifth from about 700 families.³

In the last section the results of both tests are compared and evaluated.

Two attitude measures are related to consumer purchases in this paper. The primary measure is an index of consumer attitudes constructed experimentally from people's answers to questions on their:

1. Economic status relative to the preceding year
2. Personal financial expectations for the coming year
3. One-year expectations regarding business conditions
4. Long-range economic outlook
5. Appraisal of buying conditions for household goods and clothing
6. Price expectations.

Tentatively, the six components of the index have been given equal weight.⁴

² See George Katona and Eva Mueller, *Consumer Attitudes and Demand, 1950-52* (1953) and *Consumer Expectations, 1953-56* (1956), both published by the Survey Research Center, University of Michigan. The most recent data are contained in periodic reports by the Foundation for Research on Human Behavior, Ann Arbor, Michigan.

³ See Marion Gross Sobol, "Panel Mortality and Panel Bias," *Journal of the American Statistical Association*, March 1959, pp. 52-68.

⁴ An index including the six components has been computed and published by the Survey Research Center for the past four years (described in detail in Katona and Mueller, *Consumer Expectations, 1953-56*, pp. 91-105). Based on six questions, and scoring optimistic replies as 2, medium (same, pro-con) replies as 1, and pessimistic replies as 0,

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The second measure is a newly constructed index of buying intentions. In the panel study, data were collected on expressed intentions to buy houses, cars, durable household goods, to make home improvements or repairs, and to make major nonhousehold expenditures. Only plans which families thought had at least a fair chance of fulfillment were considered. Each family was scored 0=no such expenditure plan, 1=any one type of plan, or 2=two or more categories of plans. The index of buying intentions indicates willingness to spend rather than predicts specific purchases. It was used for the re-interview test but not for the aggregative test, since only some of the necessary data were available for all dates. For the aggregative test, a buying plans index referring only to car and house purchases was used, an index used in recent years together with the index of consumer attitudes to obtain a general evaluation of consumer sentiment. In the combined index, consumer attitudes have a weight of three-quarters, buying intentions one-quarter, as of the base period, November 1952.

Although the two indexes are still in a developmental stage, current tests may provide useful guides for future research. However, it should be noted that both the theory that consumer attitudes affect spending and a particular measure of attitudes are being tested here. If the results are disappointing, the question will arise whether theory or measure is at fault.

The Aggregative Test

Chart 1 shows durable goods sales, disposable personal income (both deflated Department of Commerce series), and consumer attitudes including and excluding buying intentions for November 1952–December 1957. Fluctuations in the index of consumer attitudes resemble fluctuations in durable goods spending. Changes in disposable income are somewhat less consistent in this respect. Movements of the buying-intentions component of the attitude index (see Appendix Table A-2) correspond only in part to movements in durable goods sales, possibly because buying intentions, which here cover only cars and houses, are subject to some seasonal variations. For the time being there are too few observations to make a seasonal correction.

With time-series correlation I shall first compare the effectiveness of attitude data and disposable income as advance indicators of spending on consumer durables. The following simple model must suffice because of the few observations:⁵

$$(1) \quad D = a(A) + b(Y_{-1}) + c$$

a score was computed for each respondent from his six answers. The scores can range from 0 for extreme pessimism to 12 for extreme optimism. People who repeatedly gave "I don't know" or similar answers were excluded from the present analysis. The remaining expressions of uncertainty were scored 1.

⁵ The computation of such regressions at this early stage was prompted by Arthur M. Okun's paper in this volume.

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where D = durable goods spending in the two quarters following the quarter in which the attitude survey was made (in current dollars)

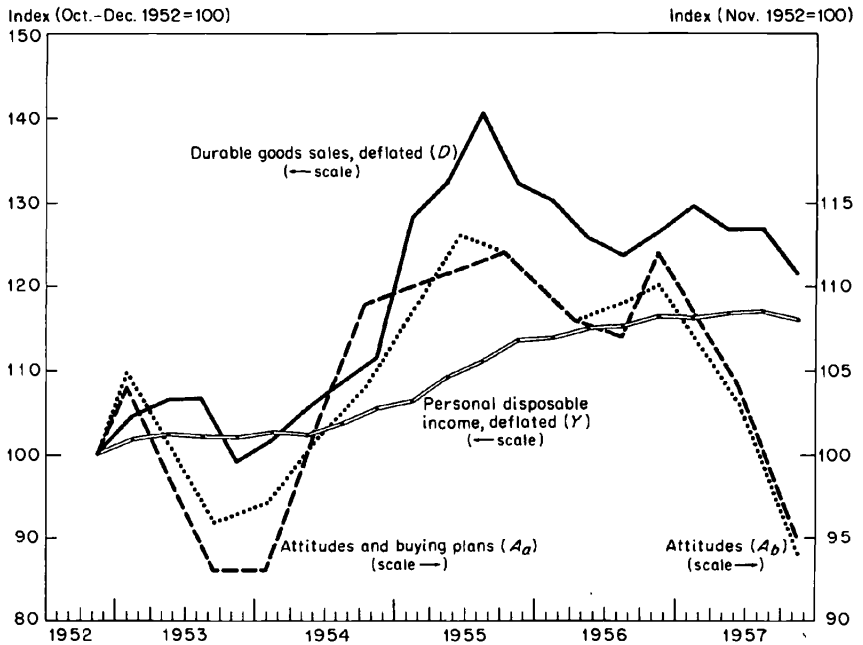
A = a measure of consumer attitudes

Y_{-1} = disposable personal income in the two quarters preceding the quarter in which the attitude survey was made (in current dollars).

Past income is used since only data available at the time of the forecast

CHART I

Durable Goods Sales, Personal Income, and Consumer Attitudes, 1952-1957



can legitimately be employed. Conceivably this treatment gives the attitudes an advantage, since they are closer in time than past income to the dependent variable. Therefore an alternative equation can be formulated:

$$(2) \quad D = a(A) + b(Y) + c$$

where Y = disposable personal income in the two quarters following the quarter in which the attitude survey was made (in current dollars), that is, in the same period for which durable goods spending is being predicted.

This is obviously not a forecasting equation, but it may throw light on the relative influence of attitudes and income on spending.

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TABLE 1

Correlations between Levels of Spending on Durable Goods, Three Measures of Consumer Attitudes, and Income, November 1952–November 1956

REGRESSION COEFFICIENTS						PROPORTION OF VARIANCE EXPLAINED ^a	
<i>Measures of Attitudes</i>			<i>Income</i>		<i>Constant</i>	<i>Unadjusted Data</i>	<i>Deflated Data^b</i>
<i>Attitudes and Plans to Buy (A_a)</i>	<i>Attitudes (A_b)</i>	<i>Plans to Buy (A_c)</i>	<i>Past (Y-1)</i>	<i>Current (Y)</i>		(\bar{R}^2 or \bar{r}^2)	
EQUATION 1							
<i>D</i> =	+0.30 (0.07)		+0.05 (0.03)		-12.54	0.84	0.82
<i>D</i> =		+0.41 (0.06)	+0.03 (0.02)		-18.86	.91	
<i>D</i> =			+0.10 (0.04)		-1.50	.57	
<i>D</i> =		+0.08 (0.05)	+0.13 (0.04)		-0.85	.50	.35
EQUATION 2							
<i>D</i> =	+0.25 (0.06)			+0.07 (0.02)	-11.55	.88	.86
<i>D</i> =		+0.36 (0.07)		+0.04 (0.02)	-17.24	.93	
<i>D</i> =			+0.06 (0.04)	+0.11 (0.03)	-3.90	.75	
<i>D</i> =				+0.13 (0.03)	-3.20	.70	.71

In this and the following tables, the figures in parentheses are the estimated standard errors of the coefficients (needless to say, they do not provide a valid significance test).

^a Corrected for degrees of freedom in each case.

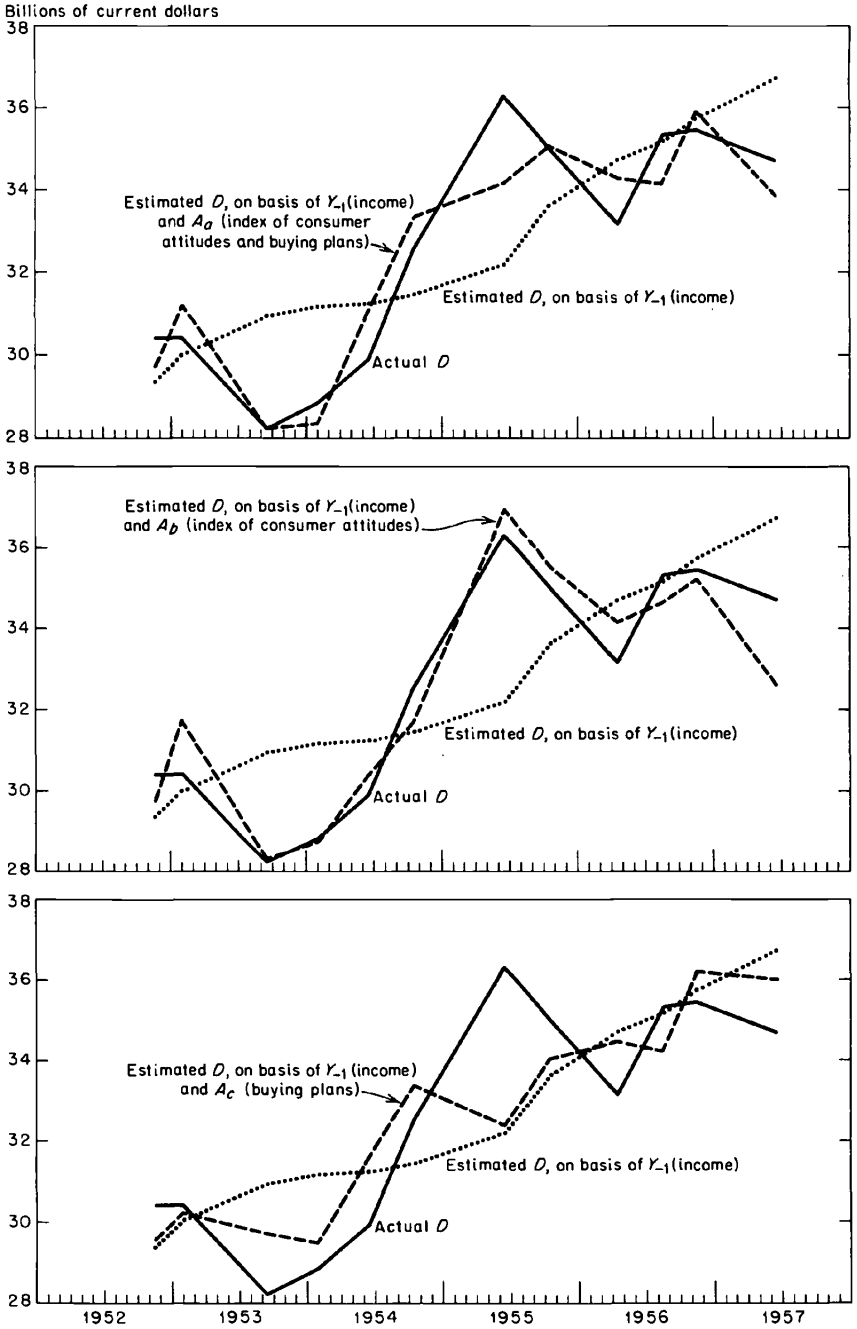
^b Based on deflated data adjusted for changes in the number of families. Source: Appendix Table A-2.

Table 1 summarizes the results of the test, using eleven observations from November 1952 to November 1956. (Observations for June and December 1957 had to be omitted, since durable goods expenditures in the following half-year were not yet available.) For each equation three alternative attitude measures are tested: the combined index of consumer attitudes and buying intentions and its two components. Ideally, we should test attitudes and buying intentions in the same question as separate independent variables, but with only eleven observations, testing the three measures alternatively is preferable. The data are presented merely for descriptive purposes. They cannot be subjected to a valid significance test, since the statistical requirement that all observations must be independent from one another is clearly not met. Moreover, the period of observation is short; the consistency of the relation between attitudes and

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CHART 2

Actual and Estimated Durable Goods Sales, 1952-1957



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spending at the aggregative level can be evaluated only as additional observations become available in the future.

Table 1 presents the regression coefficients for each of the six equations and compares the percentage of the variance explained by income alone and by income jointly with each of the three attitudinal measures. Chart 2 shows actual expenditures on consumer durables in the half-years following the survey dates, compared with the expenditures that would have been predicted (1) solely on the basis of income in the past half-year, and (2) on the basis of past income and each alternative measure of consumer attitudes.

For the period under study, income together with attitudes and plans to buy or with attitudes alone explained a substantial part of the variance in durable goods spending. Forecasts based on the latest available figure for disposable income together with consumer attitudes would have done substantially better than forecasts based on income alone. When future income (Y) is substituted for past income (Y_{-1}) the attitudes variables still contribute to the explanation of D . However, one cannot determine the net contribution of A relative to that of Y_{-1} or Y , since both are highly correlated with A . The results are substantially the same, whether deflated or current dollar figures are used.

Because of the small number of observations, we cannot be sure which measure of A is most closely related to D . In particular, we cannot decide whether the index of consumer attitudes has a greater explanatory value with or without buying plans, since both explain a very high proportion of the total variance, although the buying-plans component taken alone clearly contributed less to the explanation of durable goods spending than the attitudes component.

Another equation can be formulated expressing the notion that *changes* in attitudes should predict *changes* in spending, other factors being equal:

$$(3) \quad \Delta D = a(\Delta A) + b(\Delta Y_{-1}) + c$$

where ΔD = the change in durable goods spending in the two quarters following the quarter in which the attitude survey was made

ΔA = the change in attitudes since the previous survey

ΔY_{-1} = the change in income between the quarter in which the survey was made and the previous two quarters (in current dollars).

Again, ΔY (change in income in the half-year following the survey as compared with the previous half-year) may be substituted for ΔY_{-1} :

$$(4) \quad \Delta D = a(\Delta A) + b(\Delta Y) + c$$

This formulation may have the advantage that the few observations are more independent of one another than in the first test. Its disadvantage

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TABLE 2

Correlations between Changes in Spending on Durable Goods, Three Measures of Consumer Attitudes, and Income, November 1952–November 1956

REGRESSION COEFFICIENTS						PROPORTION OF VARIANCE ^a EXPLAINED (\bar{R}^2 or \bar{r}^2)
Changes in:						
Measures of Attitudes						
Attitudes and Plans to Buy (ΔA_a)	Attitudes (ΔA_b)	Plans to Buy (ΔA_c)	Income		Constant	
			Past (ΔY_{-1})	Current (ΔY)		
EQUATION 3						
$\Delta D =$	+0.28 (0.10)		+0.12 (0.14)		-0.72	0.45
$\Delta D =$		+0.32 (0.14)	+0.05 (0.16)		-0.29	.35
$\Delta D =$			+0.06 (0.04)	+0.12 (0.19)	-0.50	.00
$\Delta D =$				+0.08 (0.20)	-0.09	.00
EQUATION 4						
$\Delta D =$	+0.26 (0.10)			+0.08 (0.14)	-0.46	.42
$\Delta D =$		+0.33 (0.16)		-0.01 (0.17)	-0.11	.30
$\Delta D =$			+0.06 (0.04)	+0.18 (0.18)	-0.79	.07
$\Delta D =$				0.15 (0.19)	-0.50	.00

^a Corrected for degrees of freedom in each case.
Source: Appendix Table A-3.

is that it relies essentially on paired comparisons.⁶ The results of the second test are presented in Table 2. Neither short-run changes in income nor changes in buying plans contribute to the explanation of changes in consumer spending. This is true whether past or current income changes are used in the equation. Changes in consumer attitudes explain 30 to 45 per cent of the variance in changes in consumer spending. Here the index of consumer attitudes including buying intentions does somewhat better than the index excluding buying intentions, although the differences are minor considering the small number of observations.

A third test has been applied by Arthur Okun and James Tobin, which may be formulated as follows:⁷

$$(5) \quad D/Y = a(A) + b$$

⁶ This point is discussed in the paper by Okun in this volume.

⁷ *Ibid.*, and James Tobin, "On the Predictive Value of Consumer Intentions and Attitudes," *The Review of Economics and Statistics*, February 1959, pp. 1-11.

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Although in the past, the Survey Research Center has compared graphically the trend of attitudes with the trend of the ratio of durable goods sales to income, I question the use of D/Y for testing the forecasting value of attitudes. The index of consumer attitudes is correlated not only with future durable goods spending but also with future income. Answers to several of the questions in the index may be influenced directly or indirectly by whether or not the breadwinner expects a raise in the next few months. Over short periods such expectations usually are quite accurate. Thus when the index rises, D and Y are likely to follow suit. If favorable attitudes have a positive effect of their own on spending, D/Y should also rise, but this fraction is difficult to predict in the short run since changes in D and Y will not be perfectly synchronized. This criticism is less relevant when A is represented by buying plans only. For the period under study the simple time-series correlation (adjusted for number of degrees of freedom) between income in the half-year following the survey and consumer attitudes alone is 0.76, between subsequent income and buying plans only 0.38. Equation 5 cannot do justice to these complicated interrelationships. Hence it is not surprising that both indexes of consumer attitudes explain only about 39 per cent of the variance in D/Y for the following half-year (i.e. $\bar{R}^2=0.39$); the buying-plans component alone explains about 22 per cent.⁸

The Re-interview Test

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Influence, unlike forecasting value, may be studied in retrospect. Thus we may take account of initial attitudes as well as of attitude change. We can also take account of *current* income. Buying plans can be disregarded, since they can hardly be thought of as having an independent influence on spending.⁹

The dependent variable here will be the *number* of major purchases of a family rather than the dollar amounts spent. This choice was made in part because number of purchases could be determined readily for half-year periods for a comprehensive list of items, while dollar figures were collected only on a calendar year basis and for fewer expenditures. However, it also has a conceptual basis. The state of consumer confidence may influence primarily the decision whether or not to go ahead with a desired expenditure rather than the amount spent.

⁸ These figures differ slightly from those presented by Okun in this volume (his equation 3); this discrepancy is discussed in my comment on Okun's paper.

⁹ Measures of buying plans represent an attempt to intercept the decision-making process for forecasting purposes. Presumably, they reflect the current influence of many variables relevant to spending decisions, including income and a wide range of attitudes. It has been suggested that it might be interesting to hold buying plans constant while examining the influence of income and attitudes on purchases. Such a test could only obscure the real influence of attitudes and income.

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Included in the number of purchases are expenditures for cars, large household goods, additions or repairs to the home, and major non-household expenditures (for power lawnmowers, musical instruments, speedboats, typewriters, etc.). Excluded are medical and educational expenditures—which are largely nondiscretionary—and vacations—which are strongly seasonal and do not necessarily involve a major expense.¹⁰ The major independent variables are income and the index of consumer attitudes (excluding buying intentions).

Our data cover three periods: June–December 1954, June–December 1955, and December 1955–February 1957. An analysis of some data for the first two has already been published.¹¹ Otherwise the material is presented here for the first time.

In the first period there was a pronounced divergence between income and attitude trends. The economy was recovering from a mild recession and disposable income in the second half of 1954 was only 2 per cent above the previous year. On the other hand, consumer attitudes as well as intentions to buy cars and houses already showed substantial improvement in June 1954, and attitudes reflected even greater optimism by December.¹²

By the second half of 1955 the divergence had narrowed. Income rose sharply in 1955, and in the second half of that year it was 8 per cent above 1954. Attitudes continued to improve during the first half of 1955, and in the second half showed stability at a very high level. Thus it would not be surprising if the relative influence of income and attitudes varied between the two periods.

During the third phase neither income nor attitudes changed precipitately, but some divergence was apparent. Between the last quarter of 1955 and the first quarter of 1957 personal disposable income rose by 7 per cent, but real income by only 4 per cent. Yet consumer attitudes grew decidedly less optimistic. However, independent nonpanel surveys conducted at three different times in 1956 and again in the spring of 1957 show that while some weakening occurred in 1956, the most pronounced deterioration took place in early 1957. Hence many purchases must have been made before the major downturn of attitudes, a factor which

¹⁰ Five categories of expenditures were counted: (1) buying one car, (2) buying a second or third car, (3) buying one or more major household goods, (4) making major repairs or improvements on one's house or apartment, (5) making major nonhousehold expenditures (as defined above). For each family the number of categories which applied in each half-year was computed. Thus the maximum number that could be obtained in any half-year was 5, in an entire year 10. Actually, no family scored more than 4 for a half-year, nor more than 6 for a whole year. The average number of purchases per family in our urban sample was 1.52 for the year June 1954–June 1955, and 1.02 for the half-year June–December 1955.

¹¹ Eva Mueller, "Effects of Consumer Attitudes on Purchases," *American Economic Review*, December 1957, pp. 946-965.

¹² See Appendix Table A-1.

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handicaps the test of the effect of attitude change on purchases for that period.

The re-interview test involved classifying families according to attitudes and attitude change and comparing purchases made by the various attitude groups. The index of consumer attitudes was used to distinguish among people who were initially optimists (scoring 10 to 12 on a 12-point attitude scale), medium (scoring 7 to 9), and pessimists (scoring 0 to 6); and also among those whose attitudes remained "the same" (i.e. changed by 1 point or less), "improved" (by 2 or more points), and "deteriorated" (by 2 points or more).

The analysis proceeded in two stages. First the income effect was "eliminated," because optimists tend to have higher incomes than pessimists. The average number of purchases was determined for each of nine income groups, which gave an "expected" number of purchases for each family based on its current income, and the re-interview gave its actual number of purchases. After adding up actual and expected purchases for all the families within any one attitude group, the ratio of its actual to expected purchases was computed.

The method is a rigorous test of the influence of attitudes on purchases, in that it gives priority to income. The method determines how much consumer attitudes contribute toward the explanation of purchase decision over and above the explanation provided through current income. To the extent that differences in purchases between income groups are due to differences in attitudes, the influence of attitudes is understated. The method also is flexible, facilitating examination of crucial subgroups of the sample.

Table 3 shows the average number of purchases made by families within each of seven attitude groups in the second half of 1954 and in the first half of 1955. Considerable differences appear—all in the expected direction. However, the data overstate the influence of attitudes because no account was taken of income differences between the attitude groups. Therefore in the second half of the table, ratios of actual to expected purchases are presented for the same seven groups classified according to initial attitudes in June 1954 and attitude change during the following twelve months.¹³ The total columns show the ratio of actual to expected purchases by initial attitude groups, irrespective of later attitude change. In the first half-year initial attitudes appear to have a pronounced effect on subsequent purchases. A variance analysis of these differences shows them to be significant at better than the $2\frac{1}{2}$ per cent level. In the second half-year the group whose attitudes in June 1954 were medium had a higher actual to expected purchases ratio than either the optimists or the pessimists, but the observed differences between the three groups were not

¹³ Examination of the partial correlation coefficient indicates that eliminating the income effect also eliminates most of the effect of age on purchases.

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TABLE 3

Initial Attitudes, June 1954, and Attitude Change, June 1954-June 1955, Related to Actual Purchases and to Ratios of Actual to Expected Purchasers

INITIAL ATTITUDE	ATTITUDE CHANGE				TOTAL NO. OF FAMILIES ^a
	<i>Improved</i>	<i>Same</i>	<i>Deteriorated</i>	<i>Total</i>	
ACTUAL AVERAGE NUMBER OF PURCHASES PER FAMILY					
<i>In Second Half of 1954</i>					
Optimist		1.24	1.05	1.18	209
Medium	1.00	0.83	0.73 ^b	0.89	295
Pessimist	0.77	0.63 ^b		0.75	170
All	0.88	0.99	0.96		
<i>In First Half of 1955</i>					
Optimist		0.70	0.59	0.67	
Medium	0.80	0.65	0.50 ^b	0.70	
Pessimist	0.51	0.27 ^b		0.46	
All	0.65	0.64	0.56		
RATIO OF ACTUAL TO EXPECTED PURCHASES WITHIN ATTITUDE GROUPS ^c					
<i>In Second Half of 1954</i>					
Optimist		1.17	1.09	1.15	
Medium	1.04	0.90	0.82 ^b	0.95	
Pessimist	0.91	0.76 ^b		0.88	
All	0.97	1.00	1.01		
<i>In First Half of 1955</i>					
Optimist		1.00	0.89	0.97	
Medium	1.23	1.04	0.85 ^b	1.10	
Pessimist	0.89	0.48 ^b		0.82	
All	1.05	0.97	0.88		
Total No. of Families ^a	269	320	85		674

^a The numbers are the same for both half-years and both parts of the table. Given over 650 cases, the fact that the sample was clustered has practically no effect on the significance tests presented in this section.

^b Less than thirty-five cases.

^c Figures within cells represent ratios of actual to expected number of purchases in each of the two half-years. Expected number of purchases were calculated separately for each cell on the basis of its income distributions. Simple variance analysis showed that for the second half of 1954 differences in the seven-way classification were significant at the 5 per cent level, with an *F*-ratio of 2.13 (2.10 at the 5 per cent level); for the first half of 1955 only at 10 per cent level, with an *F*-ratio of 1.89 (1.77 at the 10 per cent level).

statistically significant. That is, there was little carryover of the effect of June 1954 attitudes to purchases beyond December 1954. A further check was made by relating June 1954 attitudes to purchases in the third half-year period (June-December 1955), but no significant differences emerged.

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Among the people whose attitudes improved there was a disproportionate number of initial pessimists, and among those whose attitudes deteriorated initial optimism was relatively frequent. The bottom row of Table 3 ("all") therefore understates the impact of attitude change. To isolate the net effect of attitude change on purchases, initial attitudes must be held constant. Accordingly, in the following tabulation the average number of purchases was computed for each income group within the three attitude groups. "Expected" purchases as used here thus take account of both income and initial attitudes.

Ratios of Actual to Expected Purchases

	ATTITUDE CHANGE, JUNE 1954-JUNE 1955		
	<i>Improved</i>	<i>Same</i>	<i>Deteriorated</i>
Second half of 1954	1.04	0.99	0.95
First half of 1955	1.11	0.95	0.87
Number of cases	269	320	85

Undoubtedly people whose final attitudes differed from their initial attitudes changed at different times during the year. Probably the number whose sentiment changed increased as the year progressed. Therefore a stronger relationship of attitude change to purchases in the second half-year is to be expected. For the first half-year the differences are not statistically significant, although they are in the expected direction. For the second half-year there are at least three chances in four that the three groups differ with regard to number of purchases.

We may conclude that between June 1954 and June 1955 consumer attitudes exerted a significant influence on spending decisions. However, after extensive attitude changes, as during the second half of 1954, the full impact of the state of consumer confidence becomes apparent only when account is taken of the attitude change as well as of the initial attitudes. And apparently the influence of a given set of attitudes extends primarily over the half-year preceding and the half-year following the measurement, rather than the full year after the expression of attitudes.

There was less divergence between income and attitudes in the second half of 1955, and the data show that attitudes made a smaller net contribution to the explanation of consumer purchases than in 1954. Table 4 relates purchases in the second half of 1955 to initial attitudes in June 1955. The data are less complete than for the previous year so the relationship with attitude change could not be analyzed. No difference appears in the ratio of actual to expected purchases between the optimist and the medium groups. The pessimists show a somewhat lower ratio, but they had shrunk to 10 per cent of the sample by June 1955. The differences are not statistically significant.

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TABLE 4

Initial Attitudes, June 1955, Related to Actual Major Purchases, June-December 1955, to Expected Purchases, and to Ratios of Actual to Expected Purchases

INITIAL ATTITUDE	PURCHASES			TOTAL NO. OF FAMILIES
	Actual ^a	Expected ^b	Ratio of Actual to Expected ^c	
Optimist	1.10	1.09	1.01	292
Medium	1.00	0.99	1.01	317
Pessimist	0.77	0.84	0.92	65

^a Observed average number of major purchases per family.

^b Expected on the basis of income distribution within each of the three attitude groups.

^c Differences are not statistically significant.

TABLE 5

Initial Attitudes, November-December 1955, and Attitude change, December 1955-February 1957, Related to Ratios of Actual to Expected Purchases

INITIAL ATTITUDE	ATTITUDE CHANGE				TOTAL NO. OF FAMILIES ^b
	Improved	Same ^a	Deteriorated	Total	
RATIO OF ACTUAL TO EXPECTED PURCHASES WITHIN ATTITUDE GROUPS ^c					
<i>In First Half of 1956</i>					
Optimist		1.20	1.10	1.14	285
Nonoptimist	1.13	0.93	0.68	0.91	324
All	1.13	1.06	0.96		
<i>In December 1955-February 1957</i>					
Optimist		1.17	1.04	1.10	
Nonoptimist	0.95	0.97	0.87	0.94	
All	0.95	1.07	0.98		
Total No. of Families ^b	88	277	244		609

^a By definition, most of those who were initially optimistic (scoring 10 to 12 on a scale ranging from zero to 12) could not improve (by 2 or more points). However, some of these people probably did in fact feel more optimistic at the time of the second interview.

^b The numbers are the same for both periods.

^c Figures within cells represent ratios of actual to expected number of purchases in each of the two periods. Expected number of purchases were calculated separately for each cell on the basis of its income distribution. Differences in the five-way classification were significant only at the 10 per cent level for the first half of 1956, with an *F*-ratio of 2.07 (1.94 at the 10 per cent level); at 5 per cent for December 1955-February 1957, with an *F*-ratio of 2.44 (2.37 at the 5 per cent level).

Table 5 relates initial attitudes in late 1955, and attitude change from late 1955 to early 1957, to number of purchases.¹⁴ Because attitudes have

¹⁴ The index for December 1955 was computed by substituting the corresponding June 1955 figure for the one component which was not available.

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their maximum effect during the first half-year following the measurement, we so far have analyzed purchases during half-years. In this third period the time which elapsed between the initial interview (December 1955) and the final interview (February 1957) was so long that many respondents had difficulty recalling the approximate date of their purchases.¹⁵ Since the data for the whole period are better and more complete than data for the two halves, Table 5 shows the relation between attitudes and purchases for the first half of 1956 as well as for the fourteen months from December 1955 to February 1957. Because the number of pessimists in December 1955 was very small (52 families), the medium and pessimist groups were combined.

For the first half of 1956 substantial differences appear in the ratios of actual to expected purchases among the five attitude and attitude change categories—all in the expected direction. For the whole period Table 5 shows somewhat smaller variations, and the ratios for the nonoptimists who improved and for those whose attitudes did not change are about the same. However, the differences for the first half fall short of being significant at the 5 per cent level, unlike the differences for the entire period.

Examining again the separate effects of initial attitudes and attitude change, we find that differences between the two initial groups are in the expected direction. But for the first half-year they again fall short of being significant at the 5 per cent level. For the whole period they are significant at the $2\frac{1}{2}$ per cent level. Differences in the ratio of actual to expected purchases for attitude change groups were computed holding constant initial attitudes. Although the differences were largely in the expected direction, no statistically significant results emerged for either half. Since much of the attitude change during this period occurred rather late this finding is not surprising.

THE PREDICTIVE VALUE OF DATA ON CONSUMER ATTITUDES

Although we shall now speak of predictive value, this is not forecasting in the aggregative sense. Rather, we wish to determine whether groups of consumers who differ with respect to certain initial variables differ also with respect to later purchases.

Since we are interested in forecasting, only data available at the beginning of the period under study can be used: the past year's income, not current income; and initial attitudes, but not attitude change during the year being forecast. In view of the findings reported in the previous section, the predictive value of data on consumer attitudes over half-year periods rather than for entire years was analyzed, by a multiple correlation technique, using re-interview data.

¹⁵ During the first year and a half of the study interviews were taken at half-year intervals. Therefore the dating of purchases by half-years presented no problem.

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Certain variables may be held constant in analyzing the relation between attitudes A and purchases P :

1. Variables which affect A as well as P . Previous studies have indicated that income and age fall into this category. Optimism increases with income. The number of purchases also increases with income, and this relation is by no means due entirely to the greater optimism prevailing among the upper income groups. Young people are more optimistic than older people. They also make more purchases, partly because of their greater optimism, but also because usually they must equip a newly formed household.

2. Variables which affect P but show no significant relation to A (after account has been taken of income and age), for example, marital status, number and age of children, education, place of residence, home ownership status. If the sample is sufficiently large, groups homogeneous with respect to income and age but differing in attitudes should have similar distributions of this second type of characteristic. These variables may then be disregarded without biasing the relationship between A and P , although some random variations may arise from the presence of small subgroups in the sample.

By contrast, variables which determine attitudes should *not* be held constant. These include a wide variety of stimuli originating in the economic and political environment as well as more personal experiences. However, they also include age and income. So when we relate attitudes, income, and age to purchases in a single equation, we do not know how much of the effect of income and age is brought about indirectly through their impact on attitudes.¹⁶

Keeping this problem of interpretation in mind, we present two regression equations for each of our three periods (Table 6). The first relates income (Y_{-1}), age (X), and the index of consumer attitudes excluding buying intentions (A_b) to purchases in the subsequent half-year. In the second the index of buying intentions (A_c) is added to the independent variables.

The results bear out the previous findings. Equation 6 indicates that for the second half of 1954 the index of consumer attitudes made a significant contribution to the forecast of P . For the second half of 1955 (equation 8), on the other hand, the coefficient of A_b is smaller than its standard

¹⁶ Given the following equations, the "pure" relation between P and A is not identifiable:

$$A = f_1(Y, X, O)$$

$$P = f_2(A, Y, X)$$

where A =attitudes, Y =income, X =age, O =a short-cut expression for other determinants of attitudes, and P =purchases.

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TABLE 6

Predictive Equations Relating Consumer Purchases to Attitudes, Plans to Buy, Income, and Age, Selected Periods, June 1954-February 1957

EQUATION	REGRESSION COEFFICIENTS					COEFFICIENT OF MULTIPLE CORRELATION (R)
	Attitudes (A _b)	Plans to Buy (A _c)	Income (Y-1)	Age (X)	Constant	
SECOND HALF OF 1954						
6	P = +0.031 (0.015)		+0.060 (0.017)	-0.066 (0.024)	+0.708	0.23
7	P = +0.022 (0.015)	+0.131 (0.044)	+0.052 (0.016)	-0.053 (0.024)	+0.624	.25
SECOND HALF OF 1955						
8	P = +0.015 (0.018)		+0.085 (0.017)	-0.063 (0.025)	+0.758	.25
9	P = +0.011 (0.019)	+0.157 (0.048)	+0.073 (0.018)	-0.050 (0.026)	+0.655	.28
FIRST HALF OF 1956						
10	P = +0.013 (0.014)		+0.052 (0.012)	-0.050 (0.019)	+0.315	.24
11	P = +0.013 (0.014)	+0.108 (0.032)	+0.041 (0.013)	-0.040 (0.019)	+0.240	.28
DECEMBER 1955-FEBRUARY 1957						
12	P = +0.023 (0.021)		+0.143 (0.019)	-0.097 (0.029)	+0.777	.37
13	P = +0.023 (0.021)	+0.220 (0.049)	+0.121 (0.019)	-0.078 (0.030)	+0.625	.40

error.¹⁷ In 1956 (equations 10 and 12), the predictive value of data on consumer attitudes was less significant than in the second half of 1954, but greater than in the second half of 1955.

The addition of the index of buying intention (A_c) to the predictive equations raises the multiple correlation coefficients only slightly, although buying intentions show a highly significant relation to consumer purchases in each period. The reason is that since buying intentions are correlated with our other three independent variables, their introduction reduces the contribution of the latter. In particular, the contribution of consumer attitudes in the second half of 1954 now appears of less importance.

This result is not surprising, nor does it contradict the notion that attitudes influence purchases. The influence of consumer attitudes should express itself in part through their relation to buying intentions; in part it should be independent, affecting the likelihood of unplanned purchases. It appears reasonable that in the second half of 1954, when income was

¹⁷ The standard errors provide an unsatisfactory test of significance, partly because of the interdependence of the independent variables mentioned above, and also because we are dealing with a clustered sample.

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fairly stable, the high level of buying intentions should stem in part from the high level of consumer optimism. Yet if we are concerned with the practical problem of forecasting (as opposed to questions of influence or causation), we must conclude that, at the individual level, buying intentions have proved to be a better predictive device than data on consumer attitudes.¹⁸

This conclusion is reinforced by Table 7, which shows the intercorrelations between our variables as measured by the simple and partial correlation coefficients. In all three periods the simple correlations (zero order) of purchases with income and buying plans are somewhat higher than the correlations of purchases with age and attitudes. Several of the intercorrelations between the independent variables are stronger than the correlations of any one of them with purchases. Particularly strong are the correlations between income and attitudes, income and buying plans, and, in 1954, attitudes and buying plans.

The net correlation between attitudes and purchases (third order) is decidedly lower for the second half of 1955 than for 1954. The first half of

TABLE 7

Interrelationships among Purchases, Income, Age, Consumer Attitudes, and Buying Plans, Selected Periods, June 1954-February 1957

1 = Purchases(P) 2 = Income(Y_{-1}) 3 = Age(X) 4 = Attitudes(A_b)
5 = Buying plans(A_c)

PERIOD	ZERO ORDER CORRELATION COEFFICIENTS									
	R_{12}	R_{13}	R_{14}	R_{15}	R_{23}	R_{24}	R_{25}	R_{34}	R_{35}	R_{45}
Second half of 1954	0.18	-0.13	0.14	0.19	-0.08	0.31	0.25	-0.12	-0.22	0.28
Second half of 1955	.23	-.15	.12	.19	-.21	.30	.26	-.28	-.22	.18
First half of 1956	.21	-.16	.11	.20	-.25	.30	.31	-.18	-.22	.11
December 1955- February 1957	.34	-.21	.16	.28	-.26	.30	.31	-.18	-.21	.11
	THIRD ORDER CORRELATION COEFFICIENTS									
	$R_{12.345}$	$R_{13.245}$	$R_{14.235}$	$R_{15.234}$						
Second half of 1954	0.12	-0.08	0.06	0.11						
Second half of 1955	.16	-.08	.02	.13						
First half of 1956	.13	-.09	.04	.13						
December 1955- February 1957	.24	-.10	.06	.18						
	MULTIPLE CORRELATION COEFFICIENTS									
	$R_{1.23}$	$R_{1.45}$	$R_{1.2345}$							
Second half of 1954	0.21	0.21	0.25							
Second half of 1955	.25	.21	.28							
First half of 1956	.24	.22	.28							
December 1955- February 1957	.37	.30	.40							

¹⁸ How purchases shortly before the survey (when most people must have had the same attitudes) varied between optimists and pessimists is not considered here (see the comments by Katona on Okun's paper in this volume).

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1956 occupies an intermediate position. The higher the attitude coefficient, the lower the income coefficient. Income was a less important determinant of consumer spending in the second half of 1954 (when attitudes diverged from income trends) than in the second half of 1955 (when both income and attitudes had risen substantially).¹⁹ The correlation between buying plans and purchases is generally of about the same magnitude as the correlation between income and purchases.²⁰

The third part of Table 7 compares the joint explanatory value (multiple) of income and age with that of attitudes and buying plans. In 1954 about equally accurate forecasts could have been obtained from either of the pairs of variables (disregarding the other pair). For the first half of 1956, income and age would have done slightly better than attitudes and buying plans; and for the second half of 1955 the superiority is more marked. Consumer attitudes make only a small net contribution to the joint forecasting potential of attitudes and buying plans. These conclusions apply, however, only to cross-sectional forecasting. When we draw inferences about forecasting at the aggregative level, the cyclical behavior of our variables must be taken into account.

Also included in Table 7 are correlation coefficients for the period from December 1955 to February 1957. The correlations of all the variables with purchases are higher for these fourteen months than for the half-year periods. The multiple correlation coefficient is 0.40 as compared with 0.28 for the first half of 1956. The difference reflects the fact that purchases over a year are more easily explained than purchases over shorter periods, which are more strongly affected by accidents of timing. It is also noteworthy that while for the first half of 1956 the explanatory value of income

¹⁹ The difference between the second half of 1954 and the second half of 1955 appears even more clearly if we substitute current income (*Y*) for the past year's income (*Y*₋₁). This is done in (7A) and (9A), which otherwise correspond to (7) and (9):

	<i>A_b</i>	<i>A_c</i>	<i>Y</i>	<i>X</i>	<i>R</i>
SECOND HALF OF 1954					
(7A)	<i>P</i> = +0.021 (0.015)	+0.126 (0.044)	+0.056 (0.016)	-0.041 (0.024)	+0.564 0.26
SECOND HALF OF 1955					
(9A)	<i>P</i> = +0.002 (0.019)	+0.143 (0.048)	+0.092 (0.018)	-0.039 (0.026)	+0.557 .30

Current income here means income of the entire calendar year in progress. The "forecast" is being made in June for the second half of that year. It appears that for the second half of 1954 the regression coefficient of *A_b* is not affected appreciably by this substitution. *A_b* has only a slightly closer relation to *Y* than to *Y*₋₁: the correlation between *Y* and *A_b* is 0.315, between *Y*₋₁ and *A_b*, 0.308. For the second half of 1955, however, the regression coefficient of *A_b* is reduced considerably as a result of this substitution, while the importance of income is increased further. For this period the correlation between *Y* and *A_b* is 0.354, between *Y*₋₁ and *A_b* 0.315.

²⁰ For the second half of 1955 the buying plans coefficient is somewhat lower. But buying plans there were measured as of the previous December instead of June 1955.

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and age is only slightly greater than that of attitudes and buying plans, for the whole fourteen months income and age have a decided advantage—a result consistent with the finding that the influence of a given set of attitudes extends primarily over the half-year before and after the attitude measurement. It is also consistent with a similar finding on buying plans. The percentage of all car purchases which were planned is much higher for the half-year immediately following a survey than for the subsequent half-year.²¹

We have found that the relative influence of income and attitudes on consumer purchases varied between periods. Attitudes showed the strongest autonomous influence in the second half of 1954. In 1956 their influence was less significant, and in 1955 it was negligible. The importance of income varied in the opposite direction, being smallest in the second half of 1954 and largest in the second half of 1955. If we define "autonomous" variations in consumer spending as variations which are unrelated to changes in income, there is every reason to believe that at times no such variations will occur. We conclude from our data that autonomous variations in consumer spending, indicated in advance by attitude changes, did occur in the second half of 1954 and to a lesser extent in 1956, but not in the second half of 1955.

How can forecasters know when consumer attitudes will have an autonomous effect on spending? Measurements are needed because the answer depends upon how much changes in attitudes diverge from changes in income. Information on consumer attitudes is most valuable when there is a marked divergence such as occurred in the second half of 1954. The divergence may be due to people's reactions to economic news about price changes, tax changes, employment opportunities, sales trends, recession or recovery prospects. Or it may be due to political developments such as the outcome of an election or international disturbances. When there is less divergence, attitudes may also be influential. However, since financial and demographic factors play a greater role as determinants of attitudes at such times, attitudes data can add little to the explanation of consumer behavior provided by these factors. Additional studies conducted under varying economic conditions are needed to substantiate this hypothesis.

The Relationship between the Aggregative and the Re-interview Test

We have found that data on consumer attitudes showed a close relation to consumer spending at the aggregative level for 1952-56. At the individual level the net impact of attitudes appeared rather small and varied from period to period.

²¹ See Charles Lininger, Eva Mueller, and Hans Wyss, "Some Uses of Panel Studies in Forecasting the Automobile Market," *Proceedings of the Business and Economic Statistics Section* of the American Statistical Association, 1957, pp. 409-421.

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The apparently contradictory findings are to be expected and apply to other anticipations data as well.²² Group characteristics will almost always yield demonstrably higher correlations with group behavior than the corresponding cross-section variables relating to individuals because a much larger number of factors affect individual behavior than can be taken into account in the analysis.²³ In the present case personality traits, past experience, recent illness, and quantity and quality of durable goods owned are examples of relevant "omitted" characteristics. The larger the groups analyzed, the less likely it is that these factors will vary between groups. In the entire population these characteristics vary little, or not at all, in the short run. With this sort of "noise" eliminated, the relationship between anticipations and behavior emerges more strongly.

The investigation also revealed that at the aggregative level consumer attitudes were more highly correlated with spending than were buying plans, while the reverse was true at the individual level. Again these findings need not be in conflict.

The cross-section analysis presented here is essentially static, while the time-series analysis is dynamic. For example, differences in income over time are quite different from cross-section differences in income (which reflect primarily people's position on the income scale). Conceivably there are variables which affect spending behavior appreciably only when they change to a significant extent (in the population). Price expectations may be a case in point.

More important, some variables vary more over time than others. There are variables such as age or thrift which vary considerably between individuals, producing correlations with spending behavior in a cross section without varying appreciably over time; their value to business cycle analysts or forecasters is almost nil. Hence any conclusions about the significance and relative importance of attitudes and buying plans must be drawn in the light of their cross-section relation to behavior *and* their variation over time.

Appendix Table A-4 presents data on the variability of attitudes, buying plans, and income over the course of the panel study. It shows that attitudes varied more than income and buying plans, absolute changes in proportions of the population with a given characteristic being relevant here, rather than their percentage changes. In the panel study the proportion having no buying plans varied between 39 and 45 per cent and the proportion with pessimistic attitudes between 8 and 25 per cent. Thus the contribution of buying plans to aggregative prediction could equal the contribution of attitudes only if the buying plans had a considerably higher correlation with individual behavior. Clearly, if several variables

²² See for example the paper by Murray F. Foss and Vito Natrella in this volume.

²³ W. S. Robinson, "Ecological Correlations and Behavior of Individuals," *American Sociological Review*, June 1950, pp. 351-356.

are ranked according to the strength of their relation to spending first at the individual and then at the aggregative level, the two rank orderings need not correspond closely.

Consideration of the bias imparted by omitted variables leads to similar conclusions. Kuh has demonstrated that "the biases from excluded variables are likely to be of strikingly different nature in the two cases, time series and cross sections. Therefore, the propriety of applying estimated behavior relations for prediction purposes in one context that were estimated in another context is highly questionable."²⁴ The time-series error is likely to be caused by *dynamic* excluded variables, which vary to some extent with the business cycle; the cross-section error primarily to *static* excluded variables such as demographic characteristics, personality traits, stocks of durable goods owned. Conceivably consumer attitudes, having a clear business cycle reference, are correlated with the dynamic excluded variables and reflect some of their impact on spending, while buying plans may be more closely related to the static excluded variables. If this assumption is correct, time-series tests would have a tendency to overestimate the influence of attitudes and cross-section tests a tendency to overestimate the influence of buying plans.²⁵

Another relevant consideration relates to the concept of marginal or borderline decisions. Some variables, notably income and certain demographic characteristics, may have a pervasive influence on consumer spending patterns. Other variables, such as small price changes, presumably affect only the marginal decisions. Yet the latter variables may account for a considerable part of all fluctuations in spending. Conceivably the influence of attitudes on purchases is limited to marginal decisions. Since we have no way of distinguishing between marginal and nonmarginal decisions among the survey population, and must test the influence of attitudes across the board, it is not surprising that the relationship between attitudes and purchases at the individual level appears rather weak. Buying plans, on the other hand, may predict the nonmarginal purchases more accurately than the marginal purchases and therefore make a good showing in the cross-section test. For example, the man who always trades cars every second year, the man who has just advanced a major step in his career, or the man whose car needs a complete overhaul can probably state his buying plans very accurately; but these are not the marginal buyers whose purchases explain the ups and downs in car sales.

These theoretical considerations show that neither the aggregative nor

²⁴ Edwin Kuh, "The Validity of Cross-Sectionally Estimated Behavior Equations in Time Series Applications," paper delivered in December 1957 at the Philadelphia meeting of the Econometric Society.

²⁵ If the correlation between the error due to excluded dynamic variables and consumer attitudes is fairly stable, it may detract little from the observed forecasting value of consumer attitudes. The period of observation is too short, however, to provide information on the stability of that relation.

the re-interview test is sufficient by itself for testing the influence of consumer attitudes on spending. Both tests are needed. The results of the tests described here are not yet conclusive. On the positive side were (1) the strong relationship between attitudes and purchases obtained in the aggregative test over the short period for which data were available, and (2) the finding that at the individual level attitudes exhibited a pronounced influence on purchases in two of the three periods studied (as long as buying plans were disregarded). On the negative side is the finding that data on consumer attitudes consistently made only a small *net* contribution to forecasts of consumer spending at the individual level, when income, age, and buying plans were also taken into account. However, theoretical considerations suggest that a small net contribution by the attitudinal data at the individual level is not inconsistent with a considerably greater contribution to forecasting at the aggregative level. More definite conclusions must wait upon additional data.

One clear need for further research is in connection with the aggregative test. Data collection must continue over a longer time so that we can make aggregative tests on the index of consumer attitudes and the index of buying plans based on larger numbers of observations. With additional observations seasonal adjustment factors could be worked out for various types of buying plans.²⁶ More research also is needed at the individual level. We have seen that the influence of consumer attitudes on purchases, after account is taken of income differences, varies considerably from period to period. The next goal is to learn more about the conditions under which attitudes do, or do not, have influence.

Several further studies, based on the Ford Foundation Re-interview Project, are under way and may yield clarification of the relation between the attitudes and spending behavior of individuals. One of these will use an alternative approach—relating *changes* in expenditures to *changes* in attitudes. Instead of number of purchases, changes in dollar amounts spent will be used as a dependent variable. Another study will analyze in more detail than was possible here the relation of consumer buying plans to purchases.

Most important, however, is the challenging problem of seeing whether closer correlations with purchases can be established by constructing a more refined index of consumer attitudes. The index used here was constructed several years ago on an experimental basis. Since then additional measures of attitudes and buying plans have been developed, some of which should be incorporated into the index. Also the question of what attitudes are most influential under what circumstances and for what kinds of people should be analyzed with the aim of improving the weighting

²⁶ Since this paper was prepared in the fall of 1957 four additional time series observations have become available for the aggregative test. Equations (1) and (2), when recomputed including these four new observations, in every case yield values of \bar{R}^2 as high as those shown in Table 1, in some cases slightly higher.

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and composition of the index. For example, certain complexes of attitudes, or of attitudes and financial developments—such as the expectation of rising prices accompanied by an expectation of stable income—may have a particularly strong impact on behavior. Finally there is the difficult task of improving the underlying attitude measurements themselves.

TABLE A-1
Data Underlying Chart 1

Year and Quarter	DOLLAR AMOUNT (BILLIONS)				INDEX OF:	
	Durable Goods Sales ^a (current) (1)	Durable Goods Sales ^b (deflated) (2)	Personal Disposable Income ^a (current) (3)	Personal Disposable Income ^b (deflated) (4)	Consumer Attitudes Including Buying Intentions ^c (5)	Consumer Attitudes Excluding Buying Intentions ^c (6)
1952:						
IV	29.0	25.5	244.3	214.1	100	100
1953:						
I	30.2	26.6	247.9	218.2	104	105
II	30.6	27.1	251.0	219.2		
III	30.5	27.2	251.7	218.5	93	96
IV	28.0	25.3	251.0	218.5		
1954:						
I	28.5	25.9	252.3	219.8	93	97
II	29.2	26.9	252.3	219.2	102	101
III	29.4	27.7	254.6	222.0		
IV	30.4	28.4	258.4	226.1	109	104
1955:						
I	34.7	32.7	260.1	227.6		
II	35.3	33.7	267.8	234.1	111	113
III	37.2	35.9	273.2	237.8		
IV	35.4	33.7	278.6	242.9	112	112
1956:						
I	34.6	33.2	279.6	243.8		
II	33.3	32.1	285.8	246.0	108	108
III	33.0	31.5	288.8	246.6	107	109
IV	34.8	32.2	294.0	249.2	112	110
1957:						
I	35.9	33.1	296.1	249.0		
II	35.0	32.3	300.4	249.9	104	103
III	35.0	32.3	303.3	250.5		
IV	34.4	31.0	302.1	248.4	95	94

^a In this and the following tables, from *Survey of Current Business*, Dept. of Commerce, July 1957, May 1958. Figures are seasonally adjusted annual rates.

^b Obtained by deflating the figures in cols. (1) and (3) respectively, on the basis of the Department of Labor Consumer Price Index, reclassified, *Survey of Current Business*, October 1957, Table 4. For disposable income the deflator is the "all items" index; for durable goods sales the deflator is the "durables" index.

^c In this and the following tables, from Survey Research Center, University of Michigan. The series through October 1955 have been published in George Katona and Eva Mueller, *Consumer Expectations 1953-1956*, Survey Research Center, 1956.

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TABLE A-2
Data Underlying Table 1 and Chart 2

Survey Date	AMOUNT (BILLIONS OF CURRENT DOLLARS)			INDEX OF:		
	<i>Actual Durable Goods Sales</i> ^a	<i>Past Income</i> ^b	<i>Current Income</i> ^c	<i>Consumer Attitudes Including Buying Intentions</i>	<i>Consumer Attitudes Excluding Buying Intentions</i>	<i>Buying Intentions</i>
	(1)	(2)	(3)	(4)	(5)	(6)
Nov. 1952	30.40	237.3	249.5	100	100	100 ^d
Jan.-Feb. 1953	30.40	242.3	249.5	104 ^e	105 ^e	100
Sept. 1953	28.25	249.5	251.7	93	96	85
Jan.-Feb. 1954	28.85	251.4	252.3	93	97	80
June 1954	29.90	251.7	256.5	102	101	106
Oct. 1954	32.55	253.5	259.3	109	104	125
June 1955	36.30	259.3	275.9	111	113	106
Oct. 1955	35.00	270.5	279.1	112	112	113
April 1956	33.15	279.1	287.3	108	108	108
Aug. 1956	35.35	282.7	294.8	107	109	101
Nov. 1956	35.45	287.3	297.5	112	110	120
June 1957 ^f	34.70	295.1	302.7	104	103	108

^a Durable goods spending in the two quarters following the survey. Where the survey fell into the later part of a quarter, the two following quarters were used. Where the survey was taken at the beginning of a quarter, the current quarter and the following quarter were used. Figures are seasonally adjusted annual rates.

^b Personal disposable income in two quarters preceding the quarter in which the survey was conducted. Figures are seasonally adjusted rates.

^c Personal disposable income in two quarters following the survey (concurrent with the figures in col. (1)).

^d Estimated since data not available in November 1952 survey.

^e Several components estimated since they were not available in the January-February 1953 survey.

^f Data for June 1957 not included in computation of regression equations.

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TABLE A-3
Data Underlying Table 2

Survey Date	CHANGE IN:					
	AMOUNT (BILLIONS OF CURRENT DOLLARS)			INDEX OF:		
	<i>Actual Durable Goods Sales^a</i>	<i>Past Income^b</i>	<i>Current Income^c</i>	<i>Consumer Attitudes Including Buying Intentions^d</i>	<i>Consumer Attitudes Excluding Buying Intentions^d</i>	<i>Buying Intentions^e</i>
	(1)	(2)	(3)	(4)	(5)	(6)
Sept. 1953	-2.30	+3.8	+0.3	-7	-4	+15
Jan.-Feb. 1954	-0.40	+0.6	+1.0	0	+1	-5
June 1954	+1.05	+1.3	+4.2	+9	+4	+26
Oct. 1954	+3.25	+6.1	+5.8	+7	+3	+19
June 1955	+1.30	+9.4	+12.0	+2	+0	-19
Oct. 1955	-1.25	+10.8	+8.6	+1	-1	+7
April 1956	-1.85	+7.2	+8.2	-4	-4	-5
Aug. 1956	+2.20	+9.2	+7.5	-1	+1	-7
Nov. 1956	+1.55	+8.2	+6.1	+5	+1	+19

^a Change in durable goods spending between the two quarters following the survey and the two preceding quarters. Where the survey fell into the later part of a quarter, the two following quarters were used. Where the survey was taken at the beginning of a quarter, the current quarter and the following quarter were used. In either case change is measured from the two preceding quarters. Figures are based on seasonally adjusted annual rates.

^b Change in personal disposable income between quarter in which survey is made and two quarters earlier. Figures are based on seasonally adjusted rates.

^c Change in personal disposable income between the two quarters following the survey and the two preceding quarters (concurrent with the figures in col. (1)).

^d Change in September 1953 is from November 1952, since the attitude indexes for January-February 1953 are partly interpolated (only a few attitudes were available for January-February 1953).

^e Change in September 1953 is from January-February 1953, since buying plans were not included in the November 1952 survey.

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TABLE A-4

Variations in the Distribution of Attitudes, Buying Plans, and Income,
June 1954–February 1957 among Panel Members
(per cent)

	INDEX OF CONSUMER ATTITUDES ^a			
	June 1954	June 1955	Dec. 1955	Feb. 1957
Optimistic (10-12)	31	43	47	30
Medium (7-9)	44	47	45	47
Pessimistic (0-6)	25	10	8	23
All	100	100	100	100

	INDEX OF BUYING INTENTIONS ^a			
	June 1954	Dec. 1954	Dec. 1955	Feb. 1957
Two or more plans	26	19	27	
One plan	35	39	28	not available
No plan	39	42	45	
All	100	100	100	

	INCOME DISTRIBUTION		
	1954 Income	1955 Income	1956 Income
Under \$3,000	23	21	19
\$3,000-4,999	30	29	24
5,000-7,499	31	31	34
7,500 and over	16	19	23
All	100	100	100

^a The data here are derived from the panel study. They relate to the urban population only and are not strictly representative for the later interviews (because of panel losses). The data in Tables A-1 and A-3, on the other hand, are derived from successive independent cross sections and relate to the entire population—urban as well as rural. Also the index of buying intentions constructed for the panel differs from that shown in Tables A-2 and A-3 (see discussion at the end of the introductory section of the paper).

COMMENT

IRWIN FRIEND, University of Pennsylvania

Eva Mueller has written an extremely interesting paper on the effects of consumer attitudes on purchases which concludes that “under certain

NOTE: Since these comments were written, two years ago, Miss Mueller has revised her paper rather drastically, but has made only one major substantive change—the addition of an aggregative test of the relative effectiveness of an index of attitudes, an index of buying intentions and deflated disposable personal income (Commerce) in predicting or explaining deflated durable goods sales (Commerce), based on eleven observations from November 1952 to November 1956. In this test, attitudes (but apparently not buying intentions) do add significantly to the prediction or explanation of durable goods spending. Some of the questions that might be raised are implied in my earlier comments relating to the form of the relationship tested, objective variables not introduced into the analysis and—perhaps most important—the comparative predictive ability of projections of the most recent rate of expenditure.

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conditions attitude variables do contribute significantly toward an explanation of fluctuations in consumer spending." Though Miss Mueller makes some remarks on the contribution of attitudes to the understanding and prediction of short-term trends in aggregate expenditures, the core of her paper is devoted to cross-section analyses of the relationship between the number of major (or large) expenditures per family and key objective and attitude variables characterizing the family.

The first type of analysis Miss Mueller presents is essentially devoted to tests of the significance of differences in the number of actual expenditures of families with different attitudes at the beginning and end of various periods after elimination of income effects. She finds that initial attitudes as distinct from intentions or plans to buy did have a statistically significant influence on purchases for at least a six-month period ahead in two of the three periods tested, those beginning in mid-1954 and the end of 1955 but not that beginning in mid-1955. Changes in attitudes had a significant influence on purchases only in the first of these periods. Since this is perhaps the most impressive evidence to date that data on consumer attitudes may under certain conditions help to explain variability in expenditures which cannot be explained by objective variables such as income, these results merit close examination. One question which arises is how to tell in advance when data on consumer attitudes will be a useful supplement to objective data and when they will not be. However, a more fundamental question is whether consumer attitudes are not correlated with objective variables other than income which have an important influence on expenditures. This latter question leads directly to the second and probably most interesting set of results in Miss Mueller's paper.

In this second type of analysis, Miss Mueller presents multiple linear regressions between the number of major family expenditures as the dependent variable, and family income, age of head, an index of initial consumer attitudes, and an index of buying intentions as the independent variables. Family income and age of head are selected as the key objective variables influencing both expenditures and attitudes (and presumably also buying intentions). Initial attitudes seem to have a clearly significant influence on the number of major expenditures only in the first of the periods tested (*viz.*, that beginning in mid-1954) and only when buying intentions are not included in the regression. Income, age, and buying intentions seem to be significant in all periods. When all four independent variables are included in the regression, the regression coefficient of attitudes is about one and a half times its standard error for the period beginning in mid-1954 but equal to or less than the standard error in the other periods. Consequently, Miss Mueller's conclusion as to the significant contribution of attitudes under certain conditions (as distinct from objective variables or intentions) seems to be based largely on the 1954 regression results, and perhaps to a lesser extent on the first, less com-

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prehensive analysis referred to earlier. In 1954 attitudes seem definitely significant when buying intentions are not held constant, much less so when buying intentions are held constant.

The question naturally arises whether these results contradict findings by other analysts—including Arthur Okun's paper in this volume and one by James Tobin¹—that whereas buying intentions (as Miss Mueller also finds) have predictive value, other attitudinal questions do not. Tobin presents new cross-section results for 1952 which reaffirm this negative conclusion as to the predictive value of attitudinal questions. The apparent discrepancy between Tobin's and Miss Mueller's findings might reflect the difference in time periods; initial attitudes might have been useful in explaining expenditures in 1954 and not in 1952. Moreover, Miss Mueller gets somewhat better results with a six-month period than with the year period Tobin uses. The discrepancy may also simply reflect the fact that Tobin is attempting to explain variation in the dollar amount of expenditures (on cars and major household goods), Miss Mueller variation in the number of expenditures. Clearly, we are more interested in amounts than in number, but Miss Mueller points out that her paper is simply the first step in a more comprehensive analysis.

I think however that a more important reason for the discrepancy in the two findings may be the difference in the independent variables and in the forms of the relationships tested. Tobin introduces three independent objective variables—liquid assets and personal debt (both as ratios of income) and marital status—in addition to income and age, and uses a rather different mathematical form, attempting to eliminate heteroscedasticity in the dependent variable and allowing for interaction between income change and other explanatory variables. Tobin's findings suggest, but do not of course prove, that Miss Mueller may be attributing to attitudes in 1954 an influence on expenditures which really reflects either objective variables—such as assets and debts—omitted from her analysis or departures from linearity in the assumed linear relationship between the number of expenditures and income and age.

One final comment is in order. Miss Mueller and both Okun and Tobin present evidence that consumer buying intentions have predictive value in the sense that they explain, in advance, variability in cross-section and aggregate expenditures which cannot be explained by objective variables. It seems to me that three qualifications should be noted. First, the expenditures involved are largely major durables, and an obvious objective variable which has not yet been introduced into these analyses is the initial stock of durables. Second, it is possible at least in some of these analyses that the test used introduces a timing bias in favor of intentions data. This would be true in Tobin's test, for example, if the intentions data

¹ James Tobin, "On the Predictive Value of Consumer Intentions and Attitudes," Cowles Foundation Discussion Paper No. 41, mimeographed, October 8, 1957.

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collected in early 1952 to help predict expenditures during 1952 reflected to any significant extent expenditures in the opening months of the year. Third, these papers do not show how at the aggregate level consumer-expenditures intentions—either alone or supplemented by objective information on income and related economic, social, and demographic characteristics—compare in predictive ability with simple projections of the most recent rate of expenditure (again if desirable supplemented by additional objective information). At the cross-section or individual family level, the family's expenditures in the preceding period may also serve as a highly useful "objective" variable in explaining or helping to predict expenditures in the next period, though obviously the correlation between the two periods might be direct or indirect depending on the nature of the item.

To summarize, I think the weight of evidence including the new data presented by Miss Mueller suggests that consumer-intentions data in the major household expenditures or durable goods area do have predictive value, whereas the evidence for consumer attitudes as distinct from intentions is mostly negative though not conclusive. However, unlike the situation for fixed capital expenditures planned by business, blow-ups of consumer intentions give extremely poor forecasts of expenditures and, even when supplemented by objective data, do not as yet give very reliable forecasts of expenditures.

ROBERT FERBER, University of Illinois

Evaluation of the use of intentions and attitude data in predicting consumer durable goods purchases should be improved by approaching the problem with a broader perspective. In the context of such surveys, durable goods purchases during a given period can be segregated into two broad groups, purchases for which (1) a plan had been previously reported, and (2) a plan had not been previously reported.¹

Plans for type 1 purchases were not only known in advance but were also fulfilled. In predicting such purchases, the value of intentions or plans-to-buy data clearly depends on our ability to discriminate between those that will be and those that will not be fulfilled during the given period. Preliminary indications are that, at least in the aggregate, such discrimination is possible.²

Type 2 purchases can be divided for analytical purposes into three major groups, (2a) those for which a plan had existed but was not reported to the interviewer, (2b) those unplanned at the time of the interview but

¹ For an earlier version of this model, see Robert Ferber, "Sales Forecasting by Sample Surveys," *Journal of Marketing*, July 1955, pp. 10-12.

² Robert Ferber, *Factors Influencing Durable Goods Purchases*, Bureau of Economic and Business Research, University of Illinois, 1955.

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made later because of necessity, and (2c) those unplanned and not needed but purchased largely on impulse.

Type 2a purchases are undoubtedly a function of the interviewing approach and the survey technique, and may well be constant from one interviewing wave to another. But a correction factor or equation for this understatement in the aggregate should not be difficult to obtain.

For predicting necessity purchases (type 2b) survey data are likely to be of little value, except perhaps the data on the age distribution of specific durables. These data would serve as a determining variable in predicting necessity purchases (given an operational definition of them) with the aid of multivariate techniques.

It is in the prediction of impulse purchases (type 2c) that attitude data may well be most useful. The extent of purchases made on the spur of the moment, at a given level of economic circumstances (income, prices, etc.), probably depends on consumer attitudes at the time. But an impulse to purchase can arise under many different kinds of circumstances. It seems desirable, therefore, to subclassify this category before attempting to assess the net effect of attitudes or even attempting to devise prediction techniques for such purchases.

This rather sketchy outline of the proposed model will, I hope, be sufficient to indicate its potential general usefulness as a means of integrating survey techniques with aggregate techniques and of predicting consumer purchases of either specific durable goods or all durable goods.

