SATISFACTION: ITS CORRELATES AND UNCORRELATES FOR COMPUTER OWNERS

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ABSTRACT

In three surveys, purchasers of home computers were asked about their experiences with the computers and their intentions for future purchases and activities vis-a-vis their computers. The home computer as a discontinuous (novel) innovation presents an unusual opportunity to study the development of satisfaction and its relationship to other consumer behaviors.

INTRODUCTION

In this paper we present and discuss findings about the satisfaction of adopters/consumers with their computers, the relationship of satisfaction with other behaviors and attitudes, and evidence that satisfaction alone cannot account for many interesting behaviors, intentions, and attitudes of consumers. The data are drawn from three papers that have been written about adoption of computers that have each had a different purpose. The papers are based on three surveys, one of which was a follow-up.

One study treated satisfaction as a value outcome or impact stemming from the adoption of a product (Danziger, 1985). The second study treated satisfaction as an experiential outcome measure and compared it to a values based attitude measure (Rokeach values). The third study treated satisfaction as an attitudinal measure and questioned its sufficiency to predict a range of intentions and choices (Fishbein and Ajzen, 1980). The three studies are tied together by the use of three common surveys focusing on adoption/purchase of computers and consumer's reactions and intentions about their use.

Computer adoption was chosen as the "event" or product to study because it is both the beginning of a process (post-adoption) and the end of a process (diffusion). In addition, the computer is a discontinuous innovation (of which there are not many in a single individual's lifetime) and as such involves major behavioral changes on the part of the consumer in order to effectively use the product.

Furthermore, the outcome of experiences with a computer (in the diffusion process) can be positive or negative and this impact (in the post-adoption process) can be thrust onto a specific product (a particular brand of computer) or experiences with the product category (computers as computers). These complexities make the "adoption" of a computer a considerably different consumer behavior process than that of soap and (to some) a more interesting and exciting event to study.

The purpose, therefore, of this paper is to explore the variable of satisfaction as it operated within the adoption/purchase of this discontinuous innovation.

In this paper we will first discuss the general survey design for the three studies; we will then discuss each of the studies focusing on their findings and finally we will discuss what can be learned collectively from these studies.

GENERAL STUDIES

Survey Design

We had access to a large mailing list of 562,062 names which were obtained from responses to a 40 million household coupon offer. This was used as our sample frame. The sample represents people who had completed a short questionnaire on the usage of various products, and who had answered affirmatively to a question on whether they owned a computer at home. The list contained only the name, address and model of computer owned. The three surveys discussed in this paper were based on this list.

First, two systematic samples of 350 people each were drawn from the Apple and Radio Shack sub-lists for use in pilot work. Ten months later, four systematic samples, 700 each, were drawn from the Apple, Radio Shack, Commodore and Texas Instruments sub-lists, for use in the main study. Finally, everyone who replied in the main study was surveyed again after an interval of fifteen months.

This sampling procedure has both limitations and strengths. First, it does not yield a probability sample of computer owners. Second, because we lacked any means of weighting the brands to reflect their proportions in the marketplace, and because these do not exhaust the list of available brands, generalization is further impeded. Third, due to the limited information contained in the list, it was not possible to compare the characteristics of respondents and non-respondents. Fourth, individuals of considerable interest within the present context--those who had discontinued their involvement or who had had negative experiences--are likely to be under-represented among the respondents.

The strengths of the study emerge from the standpoint of what is feasible in survey research among computer owners at this date. Given the lack of any comprehensive national list, a probability sample may not have been possible. Certainly the low incidence of ownership would have made the attempt prohibitively expensive. The brands selected do span the gamut of cost and capability. They include the prestige leader in the home market (Apple), and the most conspicuous of the failures (Texas Instruments). The sample frame is also attractive for the biases it avoids: it is not based on user groups, magazine subscriptions, or warranty registrations. The use of a mail questionnaire, while it resulted in a higher rate of non-response, did enable multiple operationalizations of key constructs, and the collection of more detailed information than a phone interview might have permitted. Furthermore, the commercial list house in question continues to compile these mailing lists on a regular basis. Therefore, a comparable sample could be drawn at some later date--an advantage seldom possessed by non-probability samples. Finally, the inclusion of follow-up data serves to indicate the stability of the findings, and to mitigate somewhat the essentially cross-sectional nature of the reported analyses.

Research Method

Pilot. A questionnaire and one follow-up were

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mailed in January of 1984 to 350 people; a total of 290 were returned. After elimination of undeliverables (17) and non-owners (128), this gave a response rate of 52.2%. The pilot study served three purposes: it established the feasibility of using a mail questionnaire, indicated the fallibility of the list, and led to revisions in the measures used. Descriptive findings for usage and satisfaction in the pilot sample, using the 247 complete questionnaires, did not vary from the main study. The pilot will not be considered further; see McQuarrie (1985) for a discussion.

Main Study

A pre-mailer with postage paid card attached was sent to 2800 people. The pre-mailer described the study and asked for return of the card if a computer was not owned at that time. A questionnaire and one follow-up were mailed in October-November 1984 to those who had not been removed from the list and these mailings returned 992 questionnaires. Undeliverables (145) and non-owners (425) were eliminated giving a response rate of 44.5%. The analyses reported used the 936 complete responses.

Follow-up

In February of 1986, a brief questionnaire and one follow-up were mailed to the 936 people in the main study sample. Of these, 51 could not be reached, and 276 did not respond, for an attrition rate of 29%. A comparison of those who did and did not reply to the follow-up revealed no significant differences in usage, satisfaction or commitment. Of the 612 replies, 31 were from people who had discontinued use of the computer. Of the 581 completed questionnaires, 462 could be matched on sex and age with the corresponding main study questionnaire. Only these latter are used in the regression analyses, while all 576 replies are used for the descriptive findings (which thus have to be interpreted as household rather than individual level data).

INDIVIDUAL STUDIES

Study One -- Satisfaction As A Value Distribution

Danziger's scheme was adapted to reflect the specific focus on microcomputers. Three categories, interactions, value distributions and orientations, all identified as impacts of the adoption of a computer by Danziger, were measured by the amount of time allocated to computer use. A one question average weekly use was broken into a five range distribution. This measure represents the degree of time allocated to computer use compared to the number of hours available in a week.

Satisfaction was chosen as a measure of value distribution defined by Danziger as outcomes, positive or negative, stemming from adoption. Global satisfaction was measured with two items. Respondents were asked, "Taking everything into account -- all your experiences with your whole computer set up -- how do you now feel about it?" A seven interval Delighted to Terrible scale was the response and was added to a second item asking for an overall judgment of satisfaction on four gradations. The two measures represent affective and judgmental components of satisfaction and the composite measure was used in the regression analysis.

Commitment was selected to measure orientations which represents the individual's disposition toward the technology. Commitment was measured as the perceived instrumentality of microcomputer technology with respect to fifteen value terms taken from the Rokeach Value Survey (Rokeach, 1973).

Usage and satisfaction were measured in identical fashion in the follow up. Commitment was not measured because of the length of the questionnaire needed to do so. We chose to maximize response to the follow up through minimizing the amount of information collected.

Additional information on adopter characteristics (time of adoption and programming skill), product characteristics (adequacy and software), usage situation (play/work), and social situation (user's group membership/or not).

Two questions guided the analyses: what impacts are reported by people who purchased microcomputers for home use during the 80's and what are the determinants of the three categories of impact?

Frequency distributions for usage and satisfaction in the pilot, main study and follow up indicate that in all cases positive impacts predominate and therefore high satisfaction is reported as are high readoption and low discontinuance. Low use is reported along with low satisfaction and is more common with inadequate machines, low skill and low social integration.

The regression analysis results indicate that usage is predicted from system capability, software resources, and social integration and time of adoption, user group membership and re-invention are weak predictions.

Satisfaction is predicted by system capability and social integration while commitment is predicted from social integration.

When the variables are grouped together as predictors of usage, satisfaction and commitment we can construct the following matrix:

	usage	satisfaction	commitment
adopter charac.	high	moderate	low
product charac.	high	high	low
usage situations	high	moderate	low
social situations	high	high	high

Usage, therefore, has truly multiple determinants. Each of the variable sets (adopter, product, usage and social) exerts a substantial influence on usage. Satisfaction, however, is more heavily influenced by product characteristics and social situations. Commitment, or disposition toward the technology, is heavily influenced by social situations and barely influenced by any of the other sets of variables.

It is also interesting to note that the social situation is the only determinant which is influential across all three impacts of adoption.

Study Two -- Specific Attitude Measures (Satisfaction) and General Attitude Measures (Values)

Rokeach (1980) describes values as broader and deeper in scope than attitudes and more enduring. A convenient way to summarize the relationship is to note that values can be numbered in the dozens while attitudes can be numbered in the hundreds and beliefs can be countless. In this study a sub-set of the 36 value terms included in the Rokeach Value Survey were selected, including both terminal and instrumental values, to create a single measure which would indicate the general attitude towards computers. Two items were added to create a specific attitude measure, in this case satisfaction. The general measure focuses on the perceived value of the use of the computer to the individual (using the computer I feel a sense of pleasure, etc.) the satisfaction measure focused on satisfaction with the computer setup itself.

Commitment was measured by eight items which indicated intentions to maintain or increase involvement with computers such as finding new uses for the computer, learning a new programming language, or taking action to learn more about computers. Loyalty was indicated by responses to "buying again from their manufacturer" and "recommending this company to someone who was planning to purchase a computer." These two items were summed.

The results of the correlational analysis can be found in the following table.

	commitment	loyalty
satisfaction	.20	.49
values	.43	.23

Satisfaction is related moderately to loyalty and barely to commitment whereas value of the computer to the individual is moderately related to commitment and barely to loyalty -- in one case a rather specific attitude toward the computer itself, in the other case a more general attitude twoard the role of the computer in satisfying or demonstrating one's values.

Study Three -- Satisfaction As a Sufficient Predictor of Other Consumption Behaviors and Attitudes

Several future behaviors for the purchaser of a computer were identified: loyalty to the product (recommending the product to others, re-purchasing from the same manufacturer); and spending plans for hardware and software. Loyalty was identified as a choice behavior whereas spending plans were viewed as a degree or amount. Satisfaction and "other variables" were measured and the degree to which satisfaction was a sufficient predictor of these future behaviors was assessed. Other behaviors are listed in Tables 1 and 2 and are grouped into attitudinal, social, situational, and action.

Four measures of attitude were used. Product satisfaction was measured by two items on a four step gradation together with Andrews and Withey's (1976) delighted-terrible scale. An eleven item measure of negative outcomes, modeled on the Likert scale described in Westbrook and Oliver (1981) also measured satisfaction. Attitude toward spending was measured by four Likert items. The time frame for all appropriate items was one year.

A hierarchical regression analysis for loyalty and spending was performed and the results can be found in Tables 1 and 2. The idea that satisfaction is sufficient to explain loyalty (a choice behavior) was supported in all cases. Satisfaction was not sufficient to explain spending plans (a plan or amount). These findings were also found to hold up within subgroups from the sample (Table 3).

The results lend support to two opposing theories for predicting consumer behavior; the theory espoused by Fishbein, Ajzen and Rokeach that behavior is predicted from knowing the "evaluative" beliefs of the consumer; and the prominence of past behaviors and prior spending for predicting future actions.

TABLE 1
Hierarchical Regressions for Loyalty

Variables	Only Att	Add Soc	Add Sit	Adding Past Behav	All Var
ATTITUDE					
Satisfaction	.37*	.38*	.36*	.35*	.35*
Negative outcomes	-.08	-.09	-.09	-.09	-.09
Poor mfr. support	-.16*	-.16*	-.16*	-.16*	-.16*
Toward spending	.11*	.12*	.11*	.11*	.11*
SOCIAL					
Interaction		-.05			-.05
User group member		.03			.03
SITUATION					
Product age			-.05		-.03
Work proportion			.01		.01
Earnings			-.02		.00
Date first bought			-.02		-.02
Others also use			.06		.05
ACTION					
Hours used				.06	.06
No. of applications				.07	.07
Hardware dollars				-.07	-.07
Software dollars				-.01	-.01
Systems purchased				.03	.03
Programming				-.06	-.03
Background				-.05	-.05
Reading				.00	.01
R^2	.3001	.3025	.3077	.3144	.3207
Increment	--	.0024	.0076	.0143	--
F		1.39	1.77	2.10	--

Note: N=818 for these analyses. The incremental contribution of each variable set is tested separately, and then a simultaneous analysis with all variables is displayed for comparison. Standardized beta coefficients.

*$p < .01$

DISCUSSION

The use of computer adoption as the framework for studying the role of satisfaction in the post adoption and diffusion processes shows promise, although we recognize that the time bound nature of the phenomena limits the generalizability of our findings.

If we consider the members of our sample part of the early adopters, then we cannot assume that the impact of the computer on subsequent adopters will be the same. However, these studies may be used as comparison points for future studies of the early majority and later groups.

In the first study, the impacts of usage, satisfaction and commitment (based on Danziger's more general categories) were found to be distinct from one another and to exhibit varied patterns of termination. This finding suggests that impacts of the adoption of microcomputers will prove diverse and multifaceted. It also implies that in general, attempts to study the consequences of an innovation should take a broad rather than a narrow focus.

Certain determinants of the impacts emerge as especially powerful explanations for variations. Most important is the social situation of the user and the extent to which he or she is integrated within a community of people involved with computer technology. When social support based on such integration is present, usage, satisfaction and commitment all tend to be greater. Evidently support for user's groups is a good policy for computer companies and attempts to

TABLE 2
Hierarchical Regressions for Spending

Variables	Only Att	Add Soc	Add Sit	Adding Past Behav	All Var
ATTITUDE					
Satisfaction	.09	.01	.00	-.06	-.09
Negative outcomes	.07	.08	.07	.08	.08
Poor mfr. support	.02	.01	.00	-.02	-.03
Toward spending	.30*	.29*	.31*	.30*	.29*
SOCIAL					
Interaction		.21*			.08
User group member		.07			.02
SITUATION					
Product age			-.08		-.02
Work proportion			.14*		.03
Earnings			.17*		.07
Date first bought			.13*		-.02
Others also use			.05		.04
ACTION					
Hours used				.02	-.01
No. of applications				.02	.00
Hardware dollars				.14*	.11*
Software dollars				.21*	.21*
Systems purchased				.12*	.12*
Programming				.02	.01
Background				.07	.05
Reading				.13*	.12*
R^2	.0996	.1484	.1796	.2873	.3009
Increment	--	.0488	.0800	.1877	--
F		23.24*	15.76*	26.50*	--

Note: N=818 for these analyses. The incremental contribution of each variable set is tested separately, and then a simultaneous analysis with all variables is displayed for comparison. Standardized beta coefficients.

*$p < .01$

TABLE 3
Regression Analyses for Sub-Groups

Groups	Only Att	Add Soc	Add Sit	Adding Past Behav	All Var
Loyalty--Breakout by Brands					
APPLE (N=225)					
R^2	.1534	.1535	.1640	.1749	.1835
Increment	--	.0001	.0105	.0215	--
F	--	.01	.55	.69	--
RADIO SHACK (N=275)					
R^2	.3329	.3522	.3379	.3763	.4002
Increment	--	.0193	.0050	.0434	--
F	--	3.99	.40	2.27	--
COMMODORE (N=219)					
R^2	.3666	.3779	.3784	.4010	.4194
Increment	--	.0113	.0118	.0344	--
F	--	1.92	.79	1.48	--
ALL OTHERS (N=99)					
R^2	.4048	.4245	.4902	.4855	.5673
Increment	--	.0197	.0854	.0807	--
F	--	1.54	2.91	1.65	--
Spending--Breakout by System Cost					
HIGH COST (N=403)					
R^2	.1852	.2150	.2297	.3444	.3580
Increment	--	.0298	.0445	.1592	--
F	--	7.52*	4.54*	11.83*	--
LOW COST (N=415)					
R^2	.0670	.1112	.1229	.2237	.2409
Increment	--	.0442	.0559	.1567	--
F	--	10.14*	5.16*	10.14*	--

Note: Although only Apple, Radio Shack and Commodore brands were sampled, errors in the lists and repurchases resulted in the inclusion of other brands. The high cost group contains owners of systems whose total cost was greater than the median (approximately $1500).

*$p < .01$

promote and reinforce all kinds of social interaction among users of the technology are likely to be rewarded with increases in satisfaction, usage and commitment.

In the second study, values were used to scale the relationship between a person and an object, computers. The basic assumption of this procedure, which was not tested, is that people orient themselves with respect to unfamiliar objects through relating them to fundamental values. This suggests that under conditions of high involvement, values serve as anchors for newly formed attitudes. If so, then the use of values to measure attitudes provides some assurance that basic tendencies toward approach or avoidance will be grasped. While it is a rare consumer product which demands this treatment, we urge consideration of Rosenberg's formulation, updated by Rokeach's value terms, whenever the object of study is momentous, highly involving and of uncertain potential; it is particularly appropriate when a measure of affect toward the product category is desired, distinct from affect toward the owned product.

In the third study a distinction was made between consumer behaviors that involve a choice (purchase or not, recommend or not) versus behaviors that involve a degree or amount (amount of spending). An argument was made that the Theory of Reasoned Action (Ajzen and Fishbein) which emphasizes evaluative beliefs and attitudes works best when a choice is involved. The results supported such an argument. Reasoned action emphasizes the sufficiency of attitudes such as satisfaction for predicting consumers' behaviors. Other variables, including prior action, social involvement with other users, characteristics of the product itself and usage, were implicated and more important when predicting spending plans. The greatest contribution to predicting spending comes from knowing the computer owner's past record of spending. Once a level of spending has been established, it tends to maintain itself, independent of the person's feelings about whether spending is good or bad.

The studies are of some interest for two reasons: the computer is a product of some uniqueness and the results suggest some divergences of consumers' reactions to the computer and their subsequent evaluation and behaviors. Consumer psychologists do not often have the opportunity to study the diffusion of a discontinuous product, a product that is unlike anything that came before it; how consumer's acquire their evaluations of the product, their satisfactions and intentions, their patterns of usage and repurchase. Satisfaction with the initial purchase is correlated with many other reactions and intentions but satisfaction is not sufficient to understand the computer purchaser's reactions. The three studies provide ample evidence for the inclusion of other variables.

REFERENCES

Andrews, F. and Withey, S., Social Indicators of Well-Being (New York: Plenum Press, 1976).

Danziger, J. N., "Social Science and the Social Impact of Computer Technology," Social Science Quarterly, 66(March, 1985), 3-21.

Fishbein, M. and Ajzen, I., Understanding Attitudes and Predicting Social Behavior (Englewood Cliffs, NJ: Prentice-Hall, 1980).

McQuarrie, E. F., Commitment to Home Computing: A Joint Result of Action and Evaluation (unpublished doctoral dissertation, University of Cincinnati, Cincinnati, Ohio, 1985).

Rokeach, M., The Nature of Human Values (New York: The Free Press, 1973).

Rokeach, M., "Some Unresolved Issues in Theories of Beliefs, Attitudes, and Values," in M. Page (Ed.), Nebraska Symposium on Motivation 1979: Beliefs, Attitudes, and Values (Lincoln: University of Nebraska Press, 1980).

Westbrook, R. A. and Oliver, R., "Developing Better Measures of Satisfaction: Some Preliminary Results," in K. B. Monroe, Advances in Consumer Research, Vol. 8 (Ann Arbor: Association for Consumer Research, 1981).