

## PITFALLS IN PREDICTING BEHAVIOR FROM SURVEY RESPONSES\*

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Probably the most ubiquitous tool of the social scientist today is the sample survey, especially the attitude survey. Surveys are becoming increasingly common in the Philippines, and this trend may be accelerated by the recent successes of some of the pre-election surveys conducted during the 1969 presidential campaign. Such success is heartening to action-oriented social scientists who usually cast about in vain, seeking practical applications for their still immature disciplines. However beneficial the resulting euphoria may be for morale, it is necessary to keep an eye on the shortcomings that plague survey research. One such shortcoming is the fact that responses obtained in attitude surveys are not usually very useful for accurate prediction of behavior.

The objectives of this paper are to acquaint the reader with the magnitude of correlation ordinarily obtained between theoretically corresponding attitude and behavior measures and to suggest possible causes for discrepancy (Laing 1969). The discussion will be accompanied by illustrative empirical data from a family plan-

ning survey and action program conducted in Dumaguete City in 1967-68. The paper consists of three parts: (1) a brief review of the literature on the relationship between attitude measures and behavior measures; (2) a framework of potential causes of discrepancy between the two types of measures; and (3) application of this framework to the analysis of the relationship between family planning attitude and behavior measures in Dumaguete City.

### MAGNITUDE OF RELATIONSHIP

Surprisingly little effort has been exerted in the history of social psychology to evaluate the relationship between attitude measures and behavior. In 40 years of attitude research there have been only a few studies, most of them quite crudely designed, that bear on this relationship. As a rule these studies were designed simply to assess the magnitude of relationship obtaining between attitude and behavior measures which were thought *a priori* to be related. Though the investigators involved did not generally state their initial bias, it appears that they expected to observe moderate to high degrees of correlation between the pairs of measures employed. Nevertheless, their results indicate low orders of correlation and in some cases none at all.

For instance, in one of the earliest studies, Hartshorne and May (see Brown 1965:407-10) found that students' responses to questions about attitude toward cheating were only slightly correlated with subsequent performance on a test especially devised to invite cheating of a sort which could be observed without the sub-

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jects' knowledge. The average Pearsonian correlation coefficient obtained from various combinations of attitude and behavior measures was only .34. A similar study by Corey (1937) a few years later yielded an even lower correlation: .13. An obvious criticism of these studies is that, given a strong overt norm against cheating, even those who approved of cheating might be no more likely to admit a favorable attitude than those who disapproved. Consequently, a still later study (Freeman and Atar 1960) attempted to correct for such response bias by employing projective techniques. The resulting correlations with behavior were still worse, ranging from .19 to .10.

Similar findings have been obtained from studies of other types of attitude and behavior measures: for example, attitudes toward child-rearing methods and actual child-rearing behavior (Brim 1954:478); attitudes toward participation in student elections and actual degree and frequency of participation (Tittle and Hill 1967); religious attitudes and such religious behavior as frequency of church attendance and participation in church activities (Poppleton and Pilkington 1964) and interracial attitudes and behavior (DeFleur and Westie 1958; Fendrich 1967; Warner and DeFleur 1969).

With only one clear exception, all research efforts indicate that there is no necessary relationship between an individual's statements concerning his psychological disposition and his actual behavior. The one exception is the case of pre-election surveys. Since the development of valid sampling procedures, these surveys have proved to be quite accurate on the whole, the distribution of survey "votes" closely approximating the distribution observed during the election. This macroscopic consistency has of course masked some inconsistencies at the individual level, but even at this level the correlation between vote intentions and actual vote appears to be high (see, for example, Lazarsfeld et al. 1948 and Berelson et al. 1954).

One possible explanation for such a high correlation between word and deed in this case is that vote intentions are attitudes only in the

most general sense of being psychological dispositions. A more restrictive definition of attitudes as evaluations would exclude intentions. Might it not be that stated intentions are highly predictive of behavior even though evaluations are only slightly correlated with behavior? Evidence from the area of race relations indicates a negative answer (DeFleur and Westie 1958; Fendrich 1967; Warner and DeFleur 1969). Relationships between stated intentions and actual behavior appear to be moderate at best. The correlations between stated willingness of white American subjects to interact with Negroes under various conditions and their actual behavior when confronted with a situation requiring a real decision to interact or not interact under these conditions are only moderate at best.

Similar findings have been obtained with regard to the relationship between stated family planning attitudes and behavior. Data from Koyang, Korea (Berelson 1959), and Taichung, Taiwan (Freedman and Takeshita 1969) show only a moderate degree of correlation between statements about intentions to use family planning and subsequent acceptance during an action program. Comparable findings have also been obtained more recently from a study in Dumaguete City. Here, a sample of married women in the childbearing ages were interviewed about their attitudes concerning family planning immediately prior to the inauguration of an intensive action program in which clinic services and supplies were made available free of charge or at nominal cost and each eligible woman in the city was visited by a fieldworker. At the end of a year, a follow-up survey was conducted, primarily to identify those women who had accepted a method at the clinic during the year. The responses to this survey were verified by examination of clinic records.

An "index of predisposition" was constructed with the help of multiple regression analysis from the nine attitude items on the survey which proved to be most highly predictive of subsequent acceptance or non-acceptance. The respondents were divided into four categories on

the basis of these scores. The cross-classification between predisposition category and acceptance is shown in Table 1. The degree of association may be summarized by gamma (Goodman and Kruskal 1954), which in this case is .531.

designed to indicate why it should be so low. This is surprising in light of the extent to which the concept of attitude is employed in social science with the ultimate objective of understanding human behavior. The few which have

Table 1

Sample of married women 15-44 years old, classified by predisposition to practice family planning, crossclassified by subsequent behavior (Dumaguete City, 1967-68).

Category of predisposition	No. of cases	Subsequent behavior		
		<i>Did not accept</i>	<i>Accepted</i>	
			No.	%
Most favorable (+ +)	169	118	51	30.2%
Favorable (+)	154	117	37	24.0
Less favorable (-)	205	178	27	13.2
Least favorable (- -)	195	186	6	3.1
Total	720	599	121	16.8
Gamma		.531		

To those more familiar with correlation coefficients than with gamma, this figure may seem greater than it actually is. Values of gamma tend to be greater than corresponding correlation coefficients, especially when, as in the present case, one of the variables in question is highly skewed. Regardless of the interpretation of gamma, however, examination of Table 1 reveals the existence of a large number of apparently discrepant cases: favorable respondents who did not accept and unfavorable respondents who did. Such a large proportion of discrepant cases calls for explanation.

#### SOURCES OF DISCREPANCY

Very little research has been reported which attempts to explore the causes of attitude-behavior discrepancies. Of the few studies in the literature concerned with the relationship, most have merely demonstrated that the degree of relationship is usually low but failed to follow up that observation with an empirical inquiry

attempted to formulate and test hypotheses to explain observed discrepancy have focused on one or two contingent variables or conditions of measurement which are expected to account for most of the discrepancy (Tittle and Hill 1967; DeFleur and Westie 1958; DeFrieze and Ford 1968). Invariably these studies have shown that the proposed explanations seem to account for some of the discrepancy but that much remains to be explained even after they are taken into account. These findings suggest that the discrepancy between attitude and behavior can best be explained in terms of multiple causes.

A review of the literature supports this conclusion. Despite the lack of relevant empirical data, there have been numerous speculative articles on possible causes, most of which have not been subjected to empirical examination. There is no reason to suppose that the many possible causes which have been hypothesized are mutually exclusive. The influence of one does not preclude the influence of the others. Con-

sequently, a complete framework for understanding the discrepancies usually observed between statements of attitude and actual behavior should include all of them. They may be summarized under two headings: measurement error and situational differences.

*Measurement error.* It is well known that attitudes, intentions, and the like are very difficult to measure with accuracy. They must be inferred indirectly from verbal behavior, since they cannot be observed directly. Because the measurement is so indirect, it can never attain much accuracy. Verbal responses may be biased by the wording of the question, the intonation of the interviewer, or the influence of pressures external to the interview situation; they may be meaningless articulations recited by the respondent to mask a lack of any clearly defined attitude or even deliberate falsifications designed to hide an attitude which the respondent does not wish to reveal. The interviewer may fill in an answer arbitrarily in order to save time. The question or questions asked may not adequately measure all dimensions of the attitude of interest. Measurement errors need not be limited to attitude measures; often the measurement of the behavior of interest invites error, especially if, as is often the case, the behavior is measured in terms of self-report and therefore subject to serious biases resulting from memory problems, mental defense mechanisms, or deliberate falsification. Each of these sources of error and probably several others may be acting simultaneously to reduce the correlation between attitude and behavior.

*Situational differences.* The sources of discrepancy arising out of measurement difficulties are probably most obvious and in many cases are undoubtedly of great importance, but we should not allow this to obscure the importance of situational differences, which could sharply affect the relationship between attitude and behavior even if measurement errors were eliminated. By "situational differences" are meant those features of the interview situation in which the verbal attitude response is elicited that differ from the situational context in which the behavior is observed. For instance, the time of the

interview is often different from the time of the behavior; some discrepancy may be expected on the basis of attitude change between the two times.

Even if there is no attitude change, situation differences can nevertheless affect the relationship between attitude and behavior. The attitude questionnaire or interview situation places the respondent in a social and ecological vacuum. Questions of attitude usually fail to take explicit account of social and other pressures that might affect the likelihood that the individual will engage in the behavior of interest. They thus ignore the possibility that characteristics of the real-life situation in which the individual finds himself may present cross pressures of sufficient magnitude to overwhelm the influence of his attitudes.

#### *Illustrations from the Dumaguete Data*

The remainder of this paper will be concerned with evaluating the bearing of selected measurement problems and situational differences on the relationship between predisposition for family planning and subsequent response to the action program in Dumaguete City. Two possible types of measurement error are considered here. The first is the influence of interviewer differences. This source of bias is selected partly because it is relatively easy to isolate and partly because the interviewers employed in the survey were neophytes, with no experience other than a two-week training session. Because of their lack of experience, it was expected that some would prove more competent at obtaining reliable and valid responses than others. To test this hypothesis, the value of gamma, indicating the degree of association between predisposition and acceptance, was computed for each interviewer separately. The resulting values, shown in Table 2, vary from .202 to .790. This range appears to be greater than we might expect on the basis of chance, indicating that the degree of relationship between attitude and behavior was influenced by differences among interviewers.

Another measurement error which was considered likely to affect the association between:

Table 2

*Degree of association (Gamma) between respondents' predisposition to practice family planning and their subsequent acceptance, classified by interviewer (Dumaguete City, 1967-68).*

<i>Interviewer</i>	<i>No. of cases</i>	<i>Gamma</i>	<i>Interviewer</i>	<i>No. of cases</i>	<i>Gamma</i>
A	77	.790	G	66	.409
B	34	.409	H	54	.503
C	44	.517	I	61	.693
D	60	.578	J	61	.648
E	51	.202	K	62	.270
F	77	.698	L	65	.465

\*Total number of cases reported on in this table is 712, not 720 as in other tables. Six respondents were interviewed by interviewers who did not have enough cases to be included here. In the other two cases, the interviewer's identity was not established.

predisposition and acceptance was the acquiescence, or "yea-saying", response bias. This is the tendency to answer all questions in the affirmative. It is believed to be especially likely to occur when respondents are asked questions about which they have not thought much before the interview, and about which they are therefore unlikely to have firm opinions. The influence of yea-saying could be observed if those respondents more subject to this bias could be distinguished from the rest; the degree of association between predisposition and acceptance among this group could be compared with the comparable figure for the others to determine whether there were a significant difference.

This is the procedure followed to obtain the results shown in Table 3. The "yea-sayers" were isolated by analysis of response patterns to a question involving 10 evaluative statements about family planning with which the respondent was asked to agree or disagree. Five of these statements were positively worded and five were negatively worded. Yea-sayers were operationally defined as those who agreed with all five positive statements and also agreed with three or more of the negative statements. As can be seen in Table 3, this variable also had an important effect on the relationship between pre-

disposition and behavior. The difference between the values of gamma—.285 and .627—is statistically significant at the .01 level.

The two kinds of measurement error just discussed do not, of course, exhaust the possible sources of discrepancy in the Dumaguete study. They have been selected for this analysis because they are readily controlled with the data available from Dumaguete. Undoubtedly other measurement errors affected the attitude-behavior relationship as well. However, given the likelihood of interdependence among the various types of error, it seems doubtful that even all of them together could account for all the discrepancy between predisposition and acceptance. Hence, it is worthwhile to look for other sources of discrepancy among situational differences. The more comprehensive report from which the present paper is derived tests for many such differences. We shall limit the present discussion to three contrasting examples in the interests of brevity.

The first example is a test of the hypothesis that individuals are more likely to express valid attitudinal responses to the extent that they are familiar with the attitude object. For instance, it might be suspected that some of the discrepancy observed in the Dumaguete study might be attri-

Table 3

*Relationship between predisposition to practice family planning and subsequent acceptance, controlling for acquiescence response set (Dumaguete City, 1967-68).*

Item	Predisposition	Response set	
		Yea-sayers	Others
A. No. of cases	++	43	126
	+	59	95
	-	71	134
	--	52	140
	Total		225
B. Percentages accepting	++	20.9%	33.3%
	+	22.0	25.3
	-	18.3	10.4
	--	5.8	2.1
	Total		16.9
C. Gamma		.285	.627

butable to favorable attitude responses among those individuals who did not know about the existence of the family planning clinic and could not therefore put other favorable attitudes into practice. This would be manifested by a lower value of gamma for these respondents. Table 4 fails to support this hypothesis. The difference in the values of the gamma is not significant. (In fact, what difference there is is in the direction contrary to the hypothesis; however, this is probably a result of differences in the marginal percentage differences, which tend to affect gamma slightly).

However, it may be observed that prior knowledge of the clinic does nevertheless affect the relationship between predisposition and acceptance. This is because controlling for the effect of predisposition does not eliminate the relationship between knowledge of the clinic and subsequent acceptance (line C2 of Table 4). In other words, prior knowledge affects acceptance to some extent independently of predisposition

and thereby detracts slightly from the influence of predisposition.

The second example is a test of the hypothesis that the present fertility of a woman dictates her need for contraception, and therefore her response to the action program, independently of her attitudes concerning family planning. The test of this hypothesis is shown in Table 5, where age is employed as an indicator of fertility. Comparison of the percentages accepting for each age category with the acceptance rates to be expected if predisposition were controlled indicates that most of the variation in acceptance rates is independent of predisposition. (The values of gamma are not shown here, since they do not bear on the hypothesis being tested and the differences among them are not significant).

The third example tests the hypothesis that women with a more "traditional" orientation will be less likely to accept family planning regardless of their stated attitudes while more

“modern” women will be more likely to accept regardless of attitude. Orientation to traditional versus modern values is measured for present purposes by combining the responses to four story questions asking the respondent to choose between traditional and modern responses regarding acceptance of innovations, the importance of luck as opposed to hard work, sharing with neighbors at the expense of economic self-betterment, and celebrating fiesta versus saving. Table 6 shows the interrelationships among predisposition, acceptance, and traditionalism. As hypothesized, traditionalism is negatively associated with acceptance; 21.0% of the most modern versus 9.6% of the most traditional respondents accepted. However, contrary to the hypothesis, this relationship is washed away by

controlling for predisposition score (see line C). In other words, traditionalism exerts no independent influence on acceptance. Instead, all of its influence appears to be mediated through the individual's attitude.

These findings and others not reported here tend to support the “situational differences” hypothesis: the variables that affect behavior independently of attitude tend to be those that imply the presence of external pressures on the individual either to accept or not to accept. Being at the peak childbearing ages, for instance, places pressures on the woman to do something about limiting births even though she may be psychologically opposed to the idea of family planning. Lack of familiarity with the clinic makes it more unlikely that a woman will attend

Table 4

*Relationship between predisposition to practice family planning and subsequent acceptance, controlling for prior knowledge of the clinic (Dumaguete City, 1967-68).*

Item	Predisposition	Prior knowledge	
		Knew	Did not know
A. No. of cases	++	105	64
	+	92	62
	-	107	98
	--	67	125
	Total		371
B. Percentages accepting	++	33.3%	25.0%
	+	28.3	17.7
	-	14.0	12.2
	--	6.0	1.6
	Total		21.6
C. Related statistics:			
1. Gamma			
		.454	.584
2. Expected acceptance controlling predisposition			
		19.3%	14.3%

*Table 5*  
*Relationship between predisposition to practice family planning and subsequent acceptance, controlling for age (Dumaguete City, 1967-68).*

<i>Item</i>	<i>Predisposition</i>	<i>Age in years</i>					
		<i>15-19</i>	<i>20-24</i>	<i>25-29</i>	<i>30-34</i>	<i>35-39</i>	<i>40-44</i>
A. No. of cases	++	7	22	47	42	37	14
	+	4	24	40	34	30	22
	-	6	33	41	62	38	23
	--	7	17	33	41	48	45
	Total	24	96	161	179	153	104
B. Percentages accepting	++	(14.3)*	45.5	31.9	31.0	27.0	(14.3)
	+	( 0.0)	41.7	27.5	29.4	16.7	4.5
	-	(16.7)	21.2	19.5	12.9	5.3	4.3
	--	( 0.0)	( 5.9)	3.0	7.3	2.1	0.0
	Total	8.2	29.2	21.7	19.0	11.8	3.8
C. Expected acceptance, controlling for predisposition		9.0	27.4	19.8	18.8	13.1	7.5

\*Parentheses indicate percentages based on less than 20 cases and are therefore unreliable.



Table 6  
*Relationship between predisposition to practice family planning and subsequent acceptance, controlling for traditionalism (Dumaguete City, 1967-68).*

Item	Predisposition	Normative orientation			
		1 (Modern)	2	3	4 (Trad.)
A. No. of cases	++	71	54	38	6
	+	45	58	38	13
	-	41	64	77	23
	--	24	66	71	31
	Total		181	242	224
B. Percentage accepting	++	26.8	33.3	36.8	( 0.0)
	+	26.7	25.9	21.1	(15.4)
	-	17.1	14.1	9.1	17.4
	--	0.0	6.1	1.4	3.2
	Total		21.0	19.0	13.4
C. Expected acceptance rate, controlling for predisposition		16.6	19.4	15.1	14.6

the clinic even if she is favorably inclined toward family planning. On the other hand, a traditional or modern value orientation is, like the attitude toward family planning itself, a part of the respondent's psychological makeup and therefore relatively unlikely to exert an independent influence on her behavior.

The literature summarized and the empirical illustrations presented in this paper all point to the need for great care in the interpretation of survey data. Such data may be highly subject to error, and this error must be corrected if possible or at least taken into account.

But even if most of the measurement error can be eliminated, attitudinal data will still be useless, in most cases, for the accurate prediction of behavior unless a methodology can be developed for selecting, measuring, and accounting for situational variables relevant to the prediction.

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