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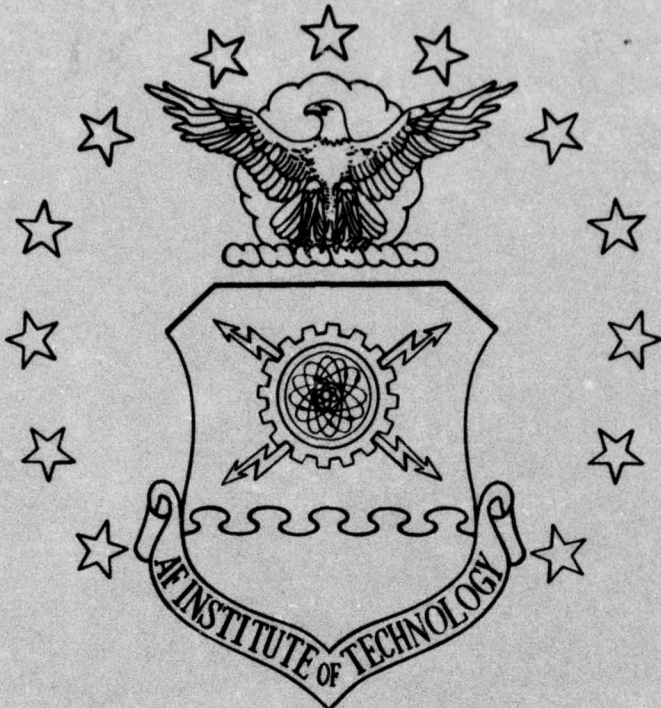
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**SURVEY RESPONSE BIAS: EFFECTS OF  
INTRODUCTORY APPROACHES AND FEEDBACK  
ON HONESTY OF RESPONSE**

**Gary R. Goetzman, Major, USAF  
Wendell B. Wood, Captain, USAF**

**SLSR 19-76B**

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The purpose of this thesis was to test the hypotheses that approaching respondents humanistically and promising feedback in the form of results of the survey would significantly reduce response bias. To test the hypotheses, four sets of instructions to a standard military survey were developed. The sets consisted of two sets of authoritarian instructions (one with and one without the promise of feedback) and two sets of humanistic instructions (one with and one without the promise of feedback). The research design was a 2x2 factorial design using two-way analysis of variance to test the research hypothesis. Responses to a postsurvey interview were used as the dependent variables for the analysis of variance. Interview responses indicated the degree of honesty (indicator of response bias) of response to the survey. Results of the statistical analysis were unclear. There was no significance for the hypothesis that a humanistic approach would decrease response bias and only one of the three interview questions showed significance for the reduction of response bias through offering feedback.

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SURVEY RESPONSE BIAS: EFFECTS OF INTRODUCTORY  
APPROACHES AND FEEDBACK ON HONESTY OF RESPONSE

A Thesis

Presented to the Faculty of the School of Systems and Logistics  
of the Air Force Institute of Technology

Air University

In Partial Fulfillment of the Requirements for the  
Degree of Master of Science in Logistics Management

By

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September 1976

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This thesis, written by

Major Gary R. Goetzman

and

Captain Wendell B. Wood

has been accepted by the undersigned on behalf of the  
faculty of the School of Systems and Logistics in partial  
fulfillment of the requirements for the degree of

MASTER OF SCIENCE IN LOGISTICS MANAGEMENT

DATE: 7 September 1976

  
COMMITTEE CHAIRMAN

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## CHAPTER I

### THE PROBLEM AND ITS SETTING

#### Background

The survey, in one form or another, has long been the primary means for gathering information from public opinion. The French used surveys in the 17th Century to study social and political phenomena. The American educator, Horace Mann, made extensive use of the survey to analyze and change the public school system (Diamond, 1959). The use of surveys was limited and based largely upon common sense until the beginning of the 20th Century when sampling techniques and probability theory were found to blend well with the nature of survey data. Application of statistical methods for evaluating survey data greatly increased the acceptance of surveys in social science endeavors requiring subjective opinion (Stephen, 1948).

Concurrent with the growing acceptance of survey usage was research pointing out faults in survey data (Salisbury, 1938). Design weaknesses plagued surveys. Poorly worded questions, too many questions, sampling from unrelated populations and asking inane, entrapping questions such as, "Do you still beat your wife?" (Payne, 1951, p. 114) undermined the validity of survey data.

Conscientious research and knowledge gained through experience combined to counteract many weaknesses in survey usage (Azrin, Holtz, & Goldiamond, 1961; Gullahorn & Gullahorn, 1973; Pace, 1939). But some faults have persisted. Possibly the most difficult problem to overcome, or even to recognize, is response bias.

Response bias, the focus for this thesis, is the reason a respondent may answer a survey question in a way which does not reflect true thoughts or feelings. As a consequence, survey data may reflect various degrees of response bias which render survey findings suspect or even useless. → (cont on p 1473)

#### Statement of the Problem

The problem is a lack of adequate techniques for reducing response bias. If response bias could be reduced or eliminated from survey data, responses would be better reflections of what respondents honestly thought and felt. Though research has uncovered many classifications of response bias, little effort seems to have been placed upon reducing that bias. An examination of techniques currently in use reveals complicated measures which may obscure the problem rather than solve it.

In reviewing current methods for reducing response bias, a common trait of manipulating or tricking the respondents seems to emerge. The respondent seems

dehumanized by the researcher's emphasis upon the individual as merely a tool for making a conclusion. From the respondent's viewpoint, some methods seem to be based upon the assumption that the respondent must be cajoled or coerced into responding honestly.

An alternate method for reducing response bias could be to approach the respondent as a competent, responsible individual with internal motivation for responding in one manner or another. Such an approach might have some effect upon how truthfully a respondent would answer survey questions.

#### Importance of the Research

Two aspects of survey usage justify research into ways to reduce response bias. First, there is a heavy reliance upon survey data by high-level decision makers. National elections, defense needs and military personnel policies are frequently interpreted or determined through the use of surveys (Bridge, Note 1; Prince, Note 5; Wilson & Rosen, Note 7). Second, countless research efforts depend upon survey data--90 percent of the research done in the social sciences has been dependent upon the use of surveys (Isaac & Michael, 1974, p. 64).

These dual aspects of reliance and dependence upon survey data seem to rest upon an underlying assumption that survey responses are true, accurate, and honest

opinions, thoughts or feelings of the respondent. It would necessarily follow that research toward reducing response bias through the use of a different approach could have a beneficial impact. Possible improvement in both decision making and social science research seems adequate justification for the proposed research.

Additionally, acceptance of the principle of approaching military personnel on a peer level for survey purposes could be a step away from a traditional, impersonal manner and toward a more humanistic approach which might blend well with the concept of all-volunteer military forces. In any case, the relatively successful application of the humanistic approach in management and human relations endeavors seems to warrant an attempt to apply that approach to the military survey.

#### Definition of Terms

The term "survey" includes questionnaires, opinion polls, interviews, or any other means for gathering subjective responses. "Response bias" means any psychological motivation for answering survey questions in a manner which does not reflect the respondent's true thoughts and feelings. "Honesty of response" is an indicator of the degree of response bias--more honest response stems from less response bias and vice versa. The term "authoritarian" refers to a demanding, superior, directive approach to

respondents. "Humanistic" means a peer level, personal, involved approach to survey respondents.

#### Scope

The study concerns military surveys only. One aspect of response bias, honesty of response, will be investigated. Other dimensions of response bias, such as nonresponse bias, will not be investigated.

#### Overview of the Thesis

Subsequent chapters deal with the literature review, the methodology employed, results of the research, and conclusions. The literature review, Chapter II, summarizes methods for reducing response bias and discusses related research and ideas bearing upon the study. The methodology, Chapter III, explains the analytical bases underlying the research. Results, Chapter IV, reports the significance of the statistical tests used and the results of validity tests upon the instruments and variable values. Chapter V, Conclusions, interprets findings, discusses validity problems and outlines implications of the study.

## CHAPTER II

### REVIEW OF RELATED LITERATURE

This chapter discusses common methods for dealing with response bias and ties similar research and concepts to the study. Three methods for reducing response bias, anonymous response, randomized response, and construction of the survey, are explained and literature supporting the research hypotheses is presented.

#### Methods for Reducing Response Bias

Perhaps the most frequently used technique for reducing response bias has been "anonymous response." This method has involved the use of unidentified surveys so that the respondent need not feel jeopardized by sensitive questions (Fuller, Note 3). Though some research tends to support the rather intuitive theory that anonymity decreases response bias (Gee, 1950), Fuller (Note 3) found no significant difference in response bias between anonymous and identified groups. Further, the lack of trend comparison data such as age, sex, education, position and demographic information inherent in anonymous surveys caused Fuller to recommend that:

Since response bias does not appear to result directly from identification it is recommended that identifiable questionnaires be used when the

investigator can adequately provide for the maintenance of confidentiality and can protect his respondents against invasion of privacy (p.iv).

Since the anonymous response technique has not demonstrated any substantial reduction in response bias and causes the loss of potentially useful information, it would seem likely that other techniques might better deal with the response bias problem.

The increasing importance of emotional, social, and drug problems in the military seems to have stirred interest in a relatively new technique for avoiding response bias labeled "randomized response" (Wilson & Rosen, Note 7). This method involves allowing the respondent to randomly choose to respond to one of a set of two questions and then applying probability theory to the survey results to determine the approximate number of respondents answering affirmatively to the sensitive question in the set. The following are illustrative questions:

1. I have experimented with marijuana.
2. Apple pie is my favorite dessert.

The respondent uses a random choice device such as flipping a coin, cutting a deck of cards or spinning a pointer to determine which of the above questions he will answer. He then marks the question with a yes or no. Though no one could know which question he actually answered, variations of Bayes' probability theorem allow the researcher to estimate how often this question refers

to the use of marijuana and how often it is answered affirmatively (Leysieffer, Note 4).

Though research tends to support the claimed reduction of response bias realized through the application of random response procedures, several weaknesses have been reported. The first difficulty encountered is the explanation to the potential respondent of how to take the survey. Wilson and Rosen (Note 7) reported that, "Officers had a somewhat better understanding of randomized inquiry after explanation and demonstration than did NCOs and enlisted men (p.vi)." This finding seems to indicate that more education is required to comprehend random response procedures. Perhaps the major weakness of the random response technique is the underlying assumption that the respondent is always answering truthfully: "It is essential for the validity of the estimation . . . since the estimate is obtained under the assumption that a truthful answer is given (Leysieffer, Note 4, p.2).

An interesting aspect of random response surveys was noted by Reasor, Hartsock, and Hoehn (Note 6) in a study comparing responses among a conventional survey and two random response surveys (one with a 50 percent chance of having to respond to a sensitive question and another with an 83.3 percent chance of having to respond to the sensitive question). All surveys asked the same questions

with changes in only the technique used to determine which question would be answered. Though Reasor et al. (Note 6) had hypothesized that, "the less frequently the subject was required to respond honestly, the safer he would feel and the more honest he would be in responding (p.2)," the random response survey with a relatively high percentage demand for honest responses (83.3 percent) indicated "a higher incidence of drug use, racism, and Army discontent" than either of the other surveys. This finding could be interpreted as a tendency for respondents to take responsibility for their answers since there was much less protection of anonymity in the survey showing more radical responses.

The difficulties in understanding the concepts and instructions for random response surveys, admitted errors in the statistical estimate of percentage of responses to sensitive questions, and the possibility that a respondent may have responded dishonestly combine to undermine the usefulness of this technique. Though further research and respondent education may improve random response techniques, the difficulties and complexities noted seem to point toward research into other possible ways to reduce response bias.

Another method for dealing with response bias is the construction of survey questions to determine whether a respondent has answered related topics consistently.

Complicated systems for preparing, analyzing, and comparing survey questions is urged by Cattell (1974) as a means for determining when a respondent is answering dishonestly. Though many seem to agree that survey design can detect response bias to a certain extent, Braun and LaFaro (1968) examined the possibilities of faking responses to one of Cattell's surveys (the sixteen personality factor test) and determined that, in most cases, a truly sophisticated survey respondent could fake his answers so that internal checks would not detect the false responses.

Inevitably, it would seem that building internal checks into a survey would depend greatly upon the skill and knowledge of the survey designer. It might even be an impossible task to construct a survey which could detect bias in a sample of individuals with a relatively high educational level.

In each of the techniques discussed there seems to be a heavy reliance upon manipulative, external measures. An implicit denial of the possibility that an individual will respond honestly if approached honestly seems to pervade current response bias reduction techniques.

#### Literature Bearing on the Study

Support for the idea that survey respondents are influenced by introductory remarks was found in the work

of Cantril (1944) who introduced the speculation that a "preamble effect" is created by cover letters, introductions, instructions or other introductory comments. Cantril felt that these early sentences made an impression upon the respondent which affected responses to the survey questions. Further, the psychological bias created was said to persist through the survey and continue after the questionnaire was completed.

Though Cantril's theory may have possessed potential for further research, there has been very little research into the effect of the introductory approach upon response bias. Darby, Gardner, and Brown (Note 2) studied the return rate of an Army questionnaire with two different sets of introductory remarks. In one set, a General Officer ordered respondents to complete the survey and return it by a specific date. In the other introduction, an altruistic appeal was made for the respondent to complete and return the survey. In comparing the percentage returned and elapsed time before return of the surveys for the two groups, no significant differences were found.

Darby et al. were concerned only with return rate of the surveys and did not look at response bias. It is speculated that the apparently equal appeal of the altruistic and direct command letters implies support for the theory that a humanistic approach would decrease

response bias. The reason support is inferred is that it would seem intuitively, that a direct military order would be perceived by respondents as stronger motivation for completing and returning the survey than an altruistic appeal. The dichotomy in motivation, external versus internal, seemed equally divided even though the sample was composed of military officers accustomed to being motivated externally through regulations, policies, operating procedures, and direct orders.

The only research found concerning the effects of promising feedback was a study by Wiseman (1973) of the effect of feedback upon return rates of surveys. Wiseman found no significant differences in return rates for surveys prefaced with the promise of feedback and those without such a promise. Still, despite the lack of evidence to support the use of feedback, many texts in research methods urge survey initiators to promise results of the survey to potential respondents (Isaac & Michael, 1974, p.94; Leedy, 1974, p.83).

#### Summary

The review of literature concerning techniques for reducing response bias revealed an extreme dependence upon researcher design and manipulated methods for controlling or detecting response. Each technique seems to have one or more major drawbacks which detract from

its effectiveness. Anonymous response causes a loss of demographic information and hampers longitudinal data collection. Randomized response methods are complex and rest upon the assumption that questions are answered with absolute honesty. Researcher-designed checks can be negated by the sophisticated survey respondent.

On the other hand, research into the effects of approach to the respondent and offering or withholding feedback has been sparse and inconclusive. The possibilities that a respondent can be influenced to respond more honestly by the right introductory approach or the promise of feedback have not been explored. A finding that either introductory approach or feedback, or both, affect response bias could have a significant impact upon survey techniques. The possibility of such a finding provides the stimulus for this study.

### CHAPTER III

#### METHODOLOGY

This chapter presents the analytical bases, hypotheses, and assumptions underlying the research. The instruments are explained in terms of content, development, and pretesting. The selection and testing of the sample is described. Finally, the specific statistical techniques for analyzing the data are explained and the criteria for testing the hypotheses are established.

The research design was a factorial experiment to determine the effects of varying two treatments in two ways (Figure 1). Orientation to the respondent was either authoritarian or humanistic and feedback (promise of receiving results of the research) was either offered or withheld.

		Feedback	
		No	Yes
Orientation toward Respondent	Authoritarian	n=20	n=20
	Humanistic	n=20	n=20

Fig 1. Research Design

The remainder of this chapter explains exactly how the research design was organized, operationalized, and tested.

### Research Hypotheses

The first research hypothesis is that there is significantly less response bias when humanistic instructions preface a survey than when authoritarian instructions are used.

The second hypothesis is that there is significantly less response bias when feedback, the promise to send results of the research to the respondent, is offered than when it is not.

In addition to the formal hypotheses, the interaction between the research hypotheses will be explored.

### Assumptions

The assumptions necessary to test the hypotheses are:

1. Responses to a face-to-face interview are valid for determining the honesty of response to a survey.

2. The degree of honesty of response to survey questions is a direct reflection of the degree of response bias. A high degree of honesty in answering questions indicates a low degree of response bias, and dishonesty shows a high degree of response bias.

3. Respondents to the survey read and comprehended the instructions.

4. The instructions to the survey appealed to the respondents as intended--either as authoritarian or humanistic.

#### Variables

The relevant dependent and independent variables considered in the study are shown in Table 1. Once operationalized, these elements comprise all the elements of the factorial design.

TABLE 1  
DEPENDENT AND INDEPENDENT VARIABLES

Variable	Dependent or Independent	How Operationalized
Orientation toward respondent	Independent	Instructions for taking the survey vary-- Humanistic vs. Authoritarian
Feedback (promised results of research)	Independent	Promising or not promising results of the research
Honesty of response (interval data scaled from 0 to 10)	Dependent	Administering a structured interview immediately after the respondent completes the survey

As can be seen from the list of variables in Table 1, the responses to the survey itself were not considered as variables. The reason survey responses were omitted was that the survey was used solely as a means

of operationalizing the experiment. The only responses examined were the answers to the interview questions.

#### The Instruments

The instruments used were:

1. A standard, previously used, military survey, the USAF Human/Race Relations Education Survey, USAF SCN 76-27, from which portions were selected (Appendix A).
2. Two sets of authoritarian instructions, one with and one without the promise of feedback (Appendix B).
3. Two sets of humanistic instructions, one with and one without the promise of feedback (Appendix C).
4. A structured interview designed to determine honesty of responses to the survey (Appendix D).

#### Development of the Instruments

The first instrument, the standard military survey, was extracted from an existing survey. This particular survey was selected because the topic was subjective and allowed for a wide range of response.

The second and third instruments, authoritarian and humanistic instructions, were developed through testing three sets of each type instruction (Appendix E). Fifteen students at the Air Force Institute of Technology (AFIT) participating in a graduate degree program in Logistics Management rank ordered the six instructions on a scale of one to ten (most humanistic as one and most

authoritarian as ten). The two sets of instructions, one of which was ranked overall as most authoritarian and the other as most humanistic, were selected for use in the research. A promise of feedback was developed heuristically for each type instruction resulting in the development of the following instructions:

Authoritarian, No Feedback Instructions. *It is mandatory that you answer all questions in this survey honestly and completely. Make no extraneous marks on the survey form. Mark your answers as shown on the following page. Since the findings of the survey could ultimately affect you in your daily job, it is your responsibility to insure that each question is answered truthfully. You may now proceed.*

Humanistic, No Feedback Instructions. *Your help is needed in a research effort. Please answer all questions as honestly and openly as you can so that how you "really feel" is expressed. Your answers will not be identified with you specifically but only along with others as group statistics. Thank you for your help in this project.*

Authoritarian, With Feedback Instructions. *It is mandatory that you answer all questions in this survey honestly and completely. Make no extraneous marks on*

the survey form. Mark your answers as shown on the following page. Since the findings of this survey could ultimately affect you in your daily job, it is your responsibility to insure that each question is answered truthfully. You may now proceed.

Print your mailing address clearly on the answer sheet if you are interested in receiving the results of the research. The results will be forwarded to you as soon as possible.

Humanistic, With Feedback Instructions. Your help is needed in a research effort. Please answer all questions as honestly and openly as you can so how you "really feel" is expressed. Your answers will not be identified with you specifically but only along with others as group statistics. Thank you for your help in this project.

If you would like to receive a copy of the results of this research, please print your mailing address on the answer sheet. Simply omit the mailing address if you do not wish to receive the results.

The fourth instrument, interview questions, was initially developed by the authors and then refined by testing another group of twelve AFIT Logistics Management students. The resultant questions were intended to determine honesty of response by posing hypothetical

instances concerning the importance of the survey, the influence of socially accepted norms, and the extent of personal involvement. The following questions were used:

1. *If the life of someone close to you depended upon how honestly you answered the questions in the survey you just completed, what percentage of your answers would you like to change?*

2. *What percentage of the survey questions do you feel you answered by expressing what you felt was a socially acceptable position rather than your personal opinion?*

3. *Given that you personally were conducting this survey to make a decision requiring consistent, reliable data, what percentage of your answers would you feel were satisfactory for making the decision?*

Each question was answered in terms of percentages, from zero to one hundred. These responses were then converted to values from zero to ten. The responses to question three were reverse scored (one became nine, three became seven, etc.) because the question was the inverse of the other two.

#### Pretesting the Instruments

The final instruments were tested upon another group of twelve AFIT Logistics Management students (three for each of the four sets of instructions). The

purpose of this pretesting was to obtain an average time to complete both survey and interview, practice administering the survey and interview, and check for any weaknesses or ambiguities which might have been overlooked.

The average time to complete both the survey and interview was approximately nineteen minutes. The longest period was twenty-two minutes and the shortest was seventeen minutes.

It became obvious that many of the survey questions were difficult to answer from a student's viewpoint. Consequently, the stipulation that respondents answer questions as if they were in their previous operational job was added to the verbal request to complete the survey.

Some difficulty was noted in respondents' comprehending interview question number three. Paraphrasing or restating was sometimes necessary to permit a cogent answer.

### The Subjects

#### The Sample Population

The sample population consisted of all graduate students enrolled in the AFIT School of Engineering at the time of the study. Convenience, time, and budgetary constraints were the primary factors bearing upon the choice of a sample population.

### The Sampling Process

Volunteers were solicited from classes on an as-available basis. Only students with free time immediately following a class could be used. Of the 117 classes available, 23 were needed to complete the sampling process. Only active duty military members were selected.

The unwieldy process of conducting a personal interview immediately upon completion of the survey dictated the use of small subgroups (five per subgroup was desired) to avoid building up a queue of subjects awaiting the interview. Ultimately, subgroups ranged in size from two to eight.

An administrative oversight resulted in completing more than 20 interviews for the authoritarian, without feedback and the humanistic, without feedback groups. Of the twenty-two interviews completed for the authoritarian group and the twenty-one for the humanistic group, the appropriate number of each type were randomly picked and discarded. In that way, the number of observations for each group was equalized at twenty each.

### Analyzing the Data

#### Compiling and Testing Responses

The original plan for compiling responses was to sum the responses to the three questions for each respondent. However, prior to summing responses, Pearson Product

Moment correlations were computed for all interview questions. A high coefficient would indicate that the interview questions all measured the same thing and that each was interpreted consistently the same by all respondents. A correlation coefficient of at least .7 was desired. The actual values of the correlation coefficients for all possible pairs of interview questions ranged from .34 to .48, which indicated low correlation and that a difference in interpretation may have existed. Consequently, each interview question was analyzed separately resulting in three sets of data for the final statistical test, two-way analysis of variance (ANOVA).

#### Statistical Analysis

The values determined from the interview responses were evaluated through the use of a computerized two-way ANOVA program.

The criterion chosen was a confidence interval of 90 percent (an alpha level of .1). This confidence interval was selected to help detect small differences between the sample groups. It was decided to establish a reasonably large rejection region in order to test for significance of the interaction between all factors.

### Summary

This chapter has presented the underlying research design, research hypotheses, instruments, sample selected, and statistics used to complete the research. Some assumptions were necessary to allow the testing of highly subjective subjects. The overall intent was to follow established research procedures and attempt to objectively test the research hypotheses. Every effort was made to eliminate weaknesses which might affect the validity of the study.

The promise of feedback, which was discussed throughout this chapter, was fulfilled by sending the research results to the ten individuals who requested it.

## CHAPTER IV

### RESULTS

Chapter IV is a straightforward report of the findings of the statistical analyses. The first portion of the chapter deals with the specific statistical tests performed on the data to determine validity and suitability of the ANOVA test of the research hypotheses. The results of the ANOVA test are presented in graphic and tabular form. Each research hypothesis is then examined in terms of expected and actual results. A summary of the results of the statistical analyses concludes the chapter.

#### Statistical Analyses

As mentioned in the methodology chapter, the correlation coefficients between each pair of interview questions were calculated. The lack of correlation found (correlation coefficients ranging from .34 to .48) resulted in the decision to perform ANOVA on each individual question. The results of the ANOVA are shown below in Table 2.

The suitability of the data was also tested using Hartley's test for homogeneity of variance. Hartley's test showed variances to be homogeneous,  $p < .01$ .

Since manipulation of the responses to interview questions was checked during the development and pretesting

TABLE 2  
ANOVA TABLE DEPICTING EFFECTS OF ORIENTATION  
TOWARD RESPONDENT AND FEEDBACK

Source	d.f.	Interview Question #	Variance (MS)	F Ratio
Orientation	1	1	1.25	3.91*
toward	1	2	.80	1.96
Respondent		3	.80	.39
Offering or Withholding Feedback	1	1	0	0
		2	.01	.01
		3	8.45	4.10**
Interaction	1	1	0	0
		2	0	0
		3	1.25	.61
Residual	76	1	.32	
		2	.41	
		3	2.06	

NOTE: 0 indicates no significant value to seven decimal points.

\* $p < .1$

\*\* $p < .05$

of the instruments, no manipulations check was performed on the final data. It was assumed that the face-to-face interview atmosphere prevented manipulation of responses.

Mean responses for each group were computed for each interview question. The interaction graphs (Figure 2) were prepared by plotting the means for each group as the end points for the lines shown. Thus, interaction (crossing of the lines) and relative differences between groups are graphically illustrated by the positions of end points and connecting lines between them.

The final test of the data, two-way ANOVA, shows the significance of the effect of orientation toward respondent and feedback upon honesty of response (Table 2). As can be seen, some effects were so small that they were considered nonexistent. The critical  $F$  value, for the alpha level of .1, was 2.78.

#### Findings in Relation to Orientation Toward Respondent

Table 2 shows that orientation toward respondent was significant for interview question one but not for the other two questions. However, examination of the interaction graphs (Figure 2) shows that the mean responses were lower, and thus considered more honest, for the authoritarian sets of instructions. Therefore the first research hypothesis must be rejected because the resulting significance supports the opposite hypothesis, that

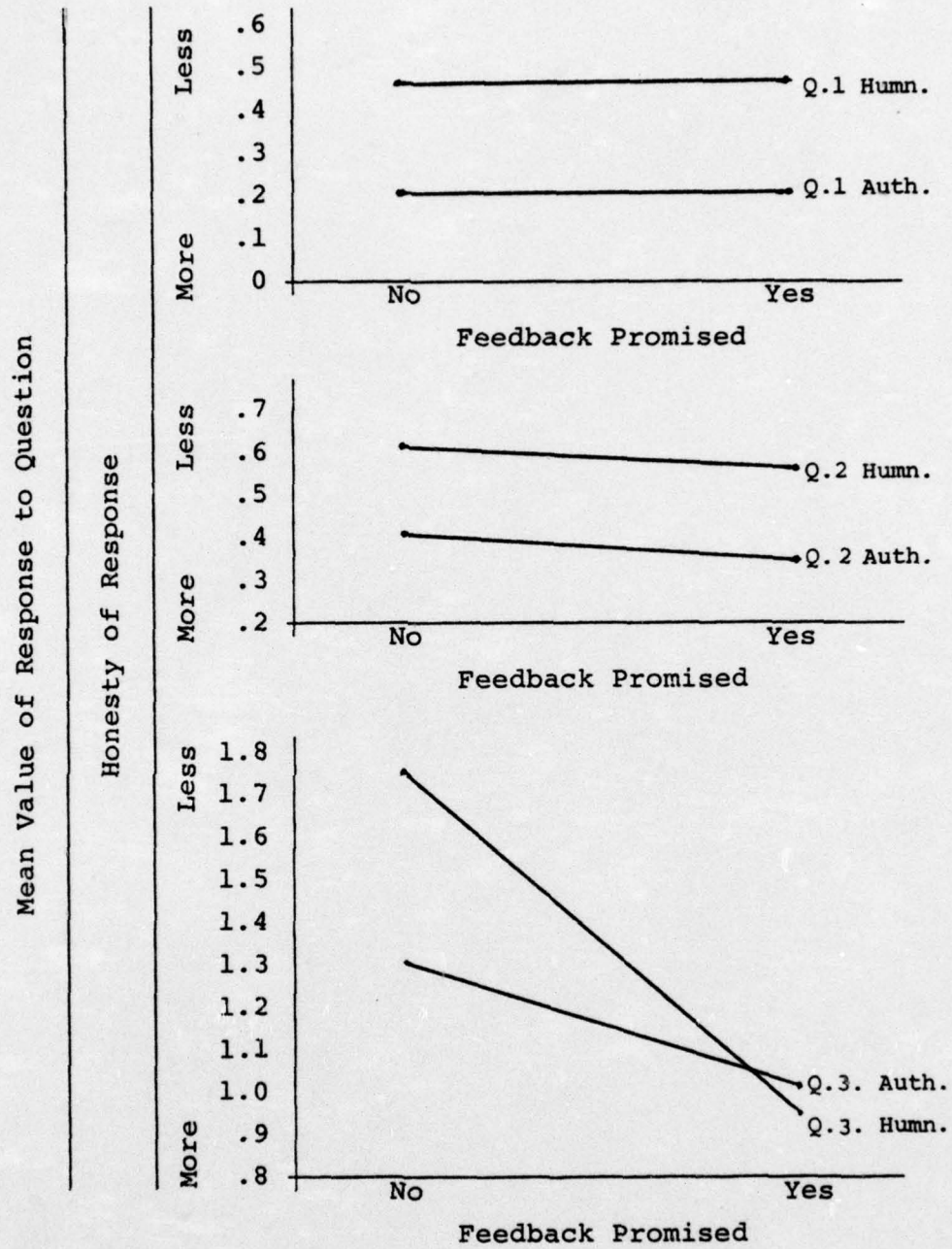


Fig. 2. Interaction Between Orientation Toward Respondent and Feedback

authoritarian instructions reduce response bias. Still, even this finding had weak support in that only one of the three interview questions indicates significance.

#### Findings in Relation to Feedback

The promise of feedback is significant only for interview question three (Table 2). Further, all mean values are, as expected, lower (and therefore more honest) for the groups receiving the promise of feedback (Figure 2). As in the case of orientation toward respondent, the finding of significance for feedback is weakened by the fact that only one interview question indicated significance.

#### Findings in Relation to Interaction

As can be seen in both Table 2 and Figure 2, interaction is virtually nonexistent for interview questions one and two, and well below the required  $F$  value of 2.78 for question three.

#### Summary

The results of the statistical analysis are unclear. Though some support for the hypothesis that the promise of feedback reduces response bias is indicated, only one of the three interview questions showed significance. The hypothesis that a humanistic orientation

toward respondents reduces response bias cannot be supported--in fact, the opposite case is significant for one of the interview questions. Interaction between the factors of orientation toward respondent and feedback was insignificant for all three interview questions.

## CHAPTER V

### CONCLUSIONS

#### Summary of Preceding Chapters

During the more than 300 years that surveys have been used to collect subjective opinion many of the obvious weaknesses of survey usage have been eliminated or counteracted. Yet the problem of response bias, that unmeasurable factor of individual perception and mental attitude regarding survey questions, seems to remain virtually impervious to detection or elimination.

The basic problem, a lack of adequate techniques for reducing response bias, is heightened by the extreme dependence and reliance upon survey data for high-level decision making and social science research.

The most common methods for dealing with response bias, anonymous response, random response, and internal checks have been shown to possess serious weaknesses. Alternative methods for reducing response bias through approaching the respondent humanistically or offering feedback of survey findings have been proposed. No previous research was found concerning the effects of these factors.

Thus, the hypotheses that a humanistic orientation toward respondents and the promise of feedback would reduce response bias were proposed. The methodology chosen to test these hypotheses was the factorial design of comparing both approach and feedback as they influenced honesty of response, the designated indicator of the degree of response bias present.

Instruments for testing the hypotheses were developed through requesting opinions of groups of AFIT logistics management graduate students. Pretesting was accomplished upon another similar group to complete the development of suitable instruments.

Results of the ANOVA rejected the hypothesis that a humanistic orientation reduced response bias, but gave weak support for the hypothesis that the promise of feedback reduced response bias.

The purpose of this chapter is to attempt to interpret the results of the statistical analysis, examine the validity of findings, outline implications for managers, and recommend further research into the problem of reducing response bias.

#### Conclusions in Relation to Orientation Toward Respondent

Orientation toward respondent was shown to be significant for one of the three interview questions. But the significance was that the authoritarian approach

reduced response bias. Therefore, the hypothesis that a humanistic approach reduced response bias was rejected.

A possible explanation of this finding is that a respondent's professed degree of honesty (in a face-to-face interview) may not be a true indication of the degree of response bias to a survey. In fact, it is possible that respondents in the authoritarian group actually answered interview questions less honestly than those in the humanistic groups. It is conceivable that the "preamble effect" (Cantril, 1944) persisted through the survey into the interview. Evidence of this possibility comes from strong impressions of the interviewers that respondents in authoritarian groups seemed uncomfortable and anxious to terminate during the interview while those in humanistic groups seemed more relaxed and less threatened by the interview questions.

Hence, there seems to be a strong possibility that respondents who indicated less honest response to the survey were being more honest than those who claimed they answered survey questions honestly. Reasor et al. (Note 6) posed the assumption that respondents would respond dishonestly to threatening survey questions. Respondents who denied use of drugs, disobeying orders, or other threatening issues were considered to possess much higher response bias than respondents who admitted to occasional infractions. Thus, if the Reasor et al.

assumption can be accepted, the findings of higher degrees of admitted dishonesty for the humanistic groups would be expected, rather than contradictory. That is, individuals in the humanistic groups would confess that they had answered dishonestly more often than those in the authoritarian groups.

#### Conclusions in Relation to Feedback

The hypothesis that the promise of feedback reduces response bias was supported by one of the interview questions. But the fact that, of the two remaining interview questions, one supported another hypothesis and the other showed no significance for either hypothesis reflects weak overall support for the hypothesis.

Interpretation of the findings is difficult. The fact that the mean responses were lower for all groups which were promised feedback may simply reflect an increased interest in the survey which caused respondents to respond more honestly. On the other hand, the indication of greater honesty of response could have been an effort, on the part of respondents, to appear more honest to the interviewer.

#### Conclusions in Relation to Interaction

The findings of no interaction at all for two of the interview questions and very little interaction for the

third lead to the conclusion that there simply was no interaction.

#### Conclusions in Relation to the Problem

The primary conclusion regarding the problem of a lack of adequate techniques for reducing response bias is that the problem is truly difficult and complex. The difficulties in creating control variables, designing measurement instruments, and determining whether or not a particular treatment was effective combine to make the problem of reducing response bias extremely difficult to examine or solve. Still, the difficulties involved should not deter efforts to solve the problem. Obviously, problems which resist early attempts toward solution often yield a solution after repeated efforts.

#### Validity of Findings

##### Internal Validity

The basic question of internal validity, "Did the treatments make a difference?" is a difficult one to answer. Still, some aspects of the study can be identified which may have been detrimental to the validity of findings.

Volunteers were used in place of a random sample. Further, these volunteers were tested during their free time.

The testing was administered over a two-week period. The possibility of contamination due to discussions between those who had completed the testing and those who were later tested is impossible to estimate. As a result of the possibility of contamination, interviewers were unable to question respondents, after the interview, to determine whether or not the instructions had been perceived as either humanistic or authoritarian. It was felt that to ask questions concerning perceptions of the instructions would further increase the likelihood of contamination.

Finally, the validity of the study could be suspect if the instructions were not read and understood. Again, the question of whether the respondents had actually read and comprehended the instructions was not asked for fear of possible contamination of the remaining interviews.

#### External Validity

External validity could be described as weak. The populations, settings, treatment variables and measurement variables to which the findings can be generalized are narrow. The use of a sample composed of military, post-graduate engineering students cannot be said to represent military forces in general. Generalizations would be limited to an extremely small number of similar

groups. The responses of the specialized sample surveyed could be a compilation of extremes rather than responses near the mean or median.

Certain reactive effects may have been present. The solicitation of volunteers may have influenced responses to the interview. The face-to-face interview itself could have had a reactive effect. An extension of possible effects of the interview would be the likelihood of varying responses due to different phrasings, intonations, and conduct on the part of the interviewers.

Overall, the greatest effect upon validity of findings was the lack of even moderate correlation between the interview questions. Without the desired degree of correlation, only fragmentary information could be gained. Reconciliation of the differences in response to each of the three interview questions became difficult, if not impossible.

#### Implications for Managers

The lack of solid support for the research hypotheses makes it difficult to extract possible implications from the study. Consequently, the implications below should be weighed carefully before action is taken based upon the findings.

Since some support was found for the hypothesis that promising feedback reduces response bias, feedback

should be offered whenever that offer is practical and feasible.

Possible benefits of a humanistic orientation toward respondents, though not supported by this research, should not be ignored. The humanistic approach has been supported in many social science research efforts and must not be ruled out on the basis of a single study which finds no support for the humanistic approach.

#### Recommendations for Further Research

The primary recommendation for further research is that an attempt be made to learn the bases for response bias. Such a study could concentrate on the reasons for response bias. One method could be for the researcher to list all possible reasons for response bias, such as fear of reprisal, lack of interest in the topic, personal bias, and others and request a large number of individuals to rank order the reasons most frequently underlying dishonest survey responses. Though study along the lines described might still encounter difficulties in measurement, an attempt to learn the reasons underlying response bias might allow further research to begin at a higher level.

The other recommendation is that research be undertaken into the relationship between individual motivation, internal or external, and response bias. Basic differences

in motivation could be the cause of much of the difficulty in dealing with response bias. The individual who feels that destiny controls his every move may respond differently than the individual who believes that he controls his own destiny. Again, the purpose of such a study would be to attempt to narrow the underlying bases for response bias.

#### Conclusions

In conclusion, support was found only for the hypothesis that the promise of feedback reduced response bias. But even that finding was supported by only one of the interview questions. Thus, it is possible that there is no decrease in response bias for either a humanistic approach to respondents or the promise of feedback. In order to alleviate the problem of a lack of adequate techniques for reducing response bias, it appears that further research is necessary.

APPENDIXES

APPENDIX A  
STANDARD MILITARY SURVEY ADMINISTERED TO  
ALL GROUPS

APPENDIX A  
PRIVACY STATEMENT

In accordance with paragraph 30, AFR 12-35, the following information is provided as required by the Privacy Act of 1974:

a. Authority:

(1) 10 U.S.C., 80-12, *Secretary of the Air Force, Powers, Duties, Delegation by Compensation*; and/or

(2) EO 93-97, 22 Nov 43, *Numbering System for Federal Accounts of Defense Personnel*; and/or

(3) DoD Instruction 1100.13, 17 Apr 68, *Surveys of Department of Defense Personnel*; and/or

(4) AFR 178-9, 9 Oct 73, *Air Force Military Survey Program*.

b. Principal purposes. The survey is being conducted to collect information to be used in research aimed at illuminating and providing inputs to the solution of problems of interest to the Air Force and/or DoD.

c. Routine Uses. The survey data will be converted to information for use in research of management related problems. Results of the research, based on the data provided, will be included in written master's theses and may also be included in published articles, reports, or tests. Distribution of the results of the research, based on the survey data, whether in written form or presented orally, will be unlimited.

d. Participation in this survey is entirely voluntary.

e. No adverse action of any kind may be taken against any individual who elects not to participate in any or all of this survey.

SURVEY

	Strongly Disagree		C	Strongly Agree	
	A	B		D	E
1. When decisions are being made in my organization, the persons who will be affected most are asked for their ideas	A	B	C	D	E
2. I have confidence and trust in the persons in my work group	A	B	C	D	E
3. My supervisor is willing to listen to my problems	A	B	C	D	E
4. My supervisor maintains high standards of personal performance	A	B	C	D	E
5. My supervisor is friendly and easy to approach	A	B	C	D	E
6. Different departments or divisions in my organization plan and coordinate their efforts	A	B	C	D	E
7. My work group really wants to meet its objectives successfully	A	B	C	D	E
8. My supervisor encourages persons in my work group to give their best efforts	A	B	C	D	E
9. Persons in my work group know what their jobs are and know how to do them well	A	B	C	D	E

	Strongly Disagree		C	Strongly Agree	
	A	B		D	E
10. I have confidence and trust in my supervisor.	A	B	C	D	E
11. Persons in my work group encourage each other to work as a team.	A	B	C	D	E
12. My supervisor sets an example by working hard.	A	B	C	D	E
13. When I talk to people in my working group, they pay attention to what I am saying.	A	B	C	D	E
14. Persons in my work group offer each other new ideas for solving job-related problems.	A	B	C	D	E
15. I would say that the lowest level supervisors in my organization usually have enough say or influence on what goes on.	A	B	C	D	E
16. My supervisor pays attention to what I have to say.	A	B	C	D	E
17. Persons in my work group generally exchange opinions and ideas about job-related matters.	A	B	C	D	E
18. Information is usually widely shared in my organization so that those who make the decisions will base their decisions on the best available know-how.	A	B	C	D	E

	Strongly Disagree		C	Strongly Agree	
	A	B		D	E
19. Employees who do not supervise others in my organization have an adequate amount of say or influence on what goes on.	A	B	C	D	E
20. In the long run, the women's movement will only make things worse for everyone.	A	B	C	D	E
21. Racial prejudice and discrimination are sometimes justified.	A	B	C	D	E
22. It seems that minority group members are given special privileges and treatment by the Air Force today.	A	B	C	D	E
23. All career fields should be open to qualified women in the Air Force	A	B	C	D	E
24. There is no practical way that most people who discriminate can be changed.	A	B	C	D	E
25. If I lived in a barracks, I would prefer to live in one that was racially mixed.	A	B	C	D	E
26. For the most part, discrimination against minorities is on the decline and is really not much of a problem anymore.	A	B	C	D	E
27. Racial discrimination and prejudice is still a problem in the Air Force today.	A	B	C	D	E

	Strongly Disagree			Strongly Agree	
	A	B	C	D	E
28. Minority group members resent it when whites try to participate in activities with them.	A	B	C	D	E
29. Problems of racial prejudice and discrimination will eventually go away if they are only left alone.	A	B	C	D	E
30. A person's first loyalty should be to his own racial or ethnic group.	A	B	C	D	E
31. If there had never been any base race relations courses, things would be just about the same as they are in the Air Force today.	A	B	C	D	E
32. The Air Force needs race relations and human relations type programs.	A	B	C	D	E
33. I just don't think I will ever be able to get to know persons from certain ethnic groups very well.	A	B	C	D	E
34. I would prefer that most of the students at my child's school be from my own ethnic group.	A	B	C	D	E
35. Trying to bring about racial integration is more trouble than it is worth.	A	B	C	D	E
36. It bothers me when members of my family associate with members of certain races or ethnic groups.	A	B	C	D	E

	Strongly Disagree		C	Strongly Agree	
	A	B		D	E
37. There are certain Air Force jobs that most women are just not able to perform as well as men.	A	B	C	D	E
38. Most women in the Air Force don't want to be equal to men when it's time for the "bad" jobs to be handed out.	A	B	C	D	E
39. Calling attention to racial problems only makes things worse.	A	B	C	D	E
40. Because minorities have been discriminated against in the past, they should receive special consideration today.	A	B	C	D	E
41. People must be patient and in time racial differences will work themselves out.	A	B	C	D	E
42. For the most part, discrimination against minorities is not really as bad as you hear.	A	B	C	D	E
43. I would rather not associate with persons from certain ethnic groups.	A	B	C	D	E
44. Persons from minorities must band together in their own groups and work as a unit to make any progress in our society.	A	B	C	D	E
45. People from some ethnic groups tend to have more undesirable qualities than do people from other ethnic groups.	A	B	C	D	E

APPENDIX B  
AUTHORITARIAN INSTRUCTIONS  
WITH AND WITHOUT THE  
PROMISE OF FEEDBACK

## APPENDIX B

### AUTHORITARIAN INSTRUCTIONS WITH AND WITHOUT THE PROMISE OF FEEDBACK

#### Instructions With Promise of Feedback

It is mandatory that you answer all questions in this survey honestly and completely. Make no extraneous marks on the survey form. Mark your answers as shown on the following page. Since the findings of this survey could ultimately affect you in your daily job, it is your responsibility to insure that each question is answered truthfully. You may now proceed.

Print your mailing address clearly on the answer sheet if you are interested in receiving the results of the research. The results will be forwarded to you as soon as possible.

#### Instructions Without Promise of Feedback

It is mandatory that you answer all questions in this survey honestly and completely. Make no extraneous marks on the survey form. Mark your answers as shown on the following page. Since the findings of this survey could ultimately affect you in your daily job, it is your responsibility to insure that each question is answered truthfully. You may now proceed.

APPENDIX C

HUMANISTIC INSTRUCTIONS  
WITH AND WITHOUT THE  
PROMISE OF FEEDBACK

## APPENDIX C

### HUMANISTIC INSTRUCTIONS WITH AND WITHOUT THE PROMISE OF FEEDBACK

#### Instructions With Promise of Feedback

Your help is needed in a research effort. Please answer all questions as honestly and openly as you can so that how you "really feel" is expressed. Your answers will not be identified with you specifically but only along with others as group statistics. Thank you for your help in this project.

If you would like to receive a copy of the results of this research, please print your mailing address on the answer sheet. Simply omit the mailing address if you do not wish to receive the results.

#### Instructions Without Promise of Feedback

Your help is needed in a research effort. Please answer all questions as honestly and openly as you can so that how you "really feel" is expressed. Your answers will not be identified with you specifically but only along with others as group statistics. Thank you for your help in this project.

**APPENDIX D**  
**INTERVIEW QUESTIONS**

APPENDIX D

INTERVIEW QUESTIONS

*Answer each of the following questions by choosing a percentage, from 0 to 100, which reflects your true feelings. Please use intervals of 10, i.e., 0, 10, 20, etc.*

1. If the life of someone close to you depended upon how honestly you answered the questions in the survey you just completed, what percentage of your answers would you like to change?

Response \_\_\_\_\_

2. What percentage of the survey questions do you feel you answered by expressing what you felt was a socially acceptable position rather than your personal opinion?

Response \_\_\_\_\_

3. Given that you personally were conducting this survey to make a decision requiring consistent, reliable data, what percentage of your answers would you feel were satisfactory for making the decision?

Response \_\_\_\_\_

*NOTE: Though the above terminology will be used in every case, verbal restatements of the questions will be allowed to better explain the questions to interviewees.*

**APPENDIX E**  
**PRETESTING OF SURVEY INSTRUCTIONS**

## APPENDIX E

### PRETESTING OF SURVEY INSTRUCTIONS

We are attempting research into the effects of various instructions upon survey response bias for our thesis. A large part of our research is dependent upon how our instructions are interpreted. In order to refine the final sets of test instructions, we need your help in giving us your perceptions of six test instructions we have developed.

A continuum of how you perceive each of these sets of instructions follows the sample instructions. This continuum is intended to represent various appeals ranging from strict authoritarian approach to a humanistic, peer-level approach. As you read each set of instructions, place the number corresponding to that set above the continuum in a weight (1 to 10) which you feel describes how that set of instructions strikes you. For example, if you feel that instruction set number 2 is very appealing from a humanistic point of view, but not as humanistic as an ideal might be, you might place the number two above the continuum line at a point between two and three. The same applies to a choice which seems authoritarian.

We fully realize the difficulty involved in rank ordering these sets of instructions (we've been looking at them for over seven months) and beg your indulgence in trying to subjectively weigh each set and rank them the way you see them. Please add any comments you may have regarding the sets of instructions in the space provided beneath the continuum. Thank you for your help in a difficult task.

Major Gary Goetzman and Captain Bruce Wood  
Class 76B



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