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AUTHOR Orlich, Donald C.; And Others
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ABSTRACT

The manual provides vocational educators with information and guidelines regarding the design and use of questionnaires and interviews for gathering data and the construction, tabulation, and analysis of both open ended and forced response survey instruments. The first of nine chapters deals with surveys as a data collection technique, discusses the use of printed instruments, other information collecting techniques, and additional guidelines to determine the selection of survey type. Chapter 2, writing questions, covers plans for question building and response modes. Chapter 3, forced response questions, deals with establishing appropriate scales and includes self-practice items. Chapter 4, coding survey items, discusses forced response and open response codes. Chapter 5, preventing biased results, deals with wording the questions, sampling considerations, and selecting the appropriate response type. Chapter 6, conducting the survey, discusses knowing the target population, protecting the participants, using inclusionary language, and communicating with the target population. Chapter 7, tabulation of data, discusses methods of tabulation, especially electronic tabulation. Chapter 8, statistical analysis of data, discusses descriptive techniques and the use of statistical tests. The last chapter, the research report, covers planning and constructing the report. An appendix includes three model questionnaire formats. The document is indexed. (JR)

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GUIDE TO SENSIBLE SURVEYS

U S DEPARTMENT OF HEALTH, EDUCATION & WELFARE
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by

Donald C. Orlich
Patricia A. Clark
Nancy M. Fagan
Gary A. Rust

Washington State University
Pullman

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PROLOGUE

You have just completed a very, very busy Friday at school (hang in there . . . vacation starts next week). As you plow through the stack of mail on your desk, you spot a large, suspicious-looking envelope. You open it, and find there, in all its glory, a dittoed (very faint blue print, of course), 12-page, single spaced, questionnaire. The writer humbly requests that you complete and return it within three days. There is a poorly written cover letter and no self-addressed return envelope.

With your schedule being as jammed as it is, and a feeling of professional duty surging through your heart, you vow that the questionnaire shall be returned, posthaste. Being a prudent manager of time, you ask a student helper to complete the questionnaire for you. Rationale: the student helper can answer as clearly as you, since the questionnaire is confused, disorganized, and ambiguous.

Let's hear it for the Big Q!

If the above example approaches any reality, you'll appreciate an effort to help stamp out poorly designed questionnaires. That is where this book begins!

PURPOSE OF MANUAL

The purpose of this manual is to provide vocational educators with information which can assist them in designing questionnaires, or as they are often called--data gathering instruments. Data obtained through a survey can enhance a vocational educator's ability to plan new occupational programs, revise or improve current programs, or delete obsolete programs.

The manual contains a discussion of various uses and abuses regarding the use of questionnaires and interviews for gathering data. In addition, models are included that illustrate how to construct, tabulate, and analyze both open ended and forced response instruments.

In Washington, during 1974, approximately twenty "Skills Centers Feasibility Studies" were completed which used questionnaires of varying quality and design. Articles published in professional journals (e.g., School Shop, The Journal of Home Economics) and other funded projects revea1 that the questionnaire is a most commonly used tool to determine the needs of vocational education programs. It is important that data are collected in a scientifically respectable manner. The conclusions drawn from the data then will be useful and stand the test of critical review.

Guidelines are presented in this manual to design questionnaires by those individuals who may not have access to specialists. The writers assume that this manual will be valuable on an independent study basis and provide:

1. A checklist for the experienced educator or novice to evaluate the design of the questionnaire as to bias, objectivity, and workability.
2. Information on designing questions.
3. Suggestions about tabulating and analyzing the data which are gathered.
4. Suggestions about methods for communicating and illustrating data.

Methods for selecting sample populations, follow-up techniques, budget, and time limitations are included in the manual.

To further assist the occupational and career educator in conducting a successful investigation, a suggested sequence of events is provided. Each event is discussed and expanded in specific chapters. The sequence of events is shown here to provide a quick reference check to determine "Where am I?" in the data gathering process.

Sequence of Events

1. Determine the purpose of the study.
2. Determine the target population.
3. Determine the method of investigation.
4. Determine question format.
5. Write and code answers.
6. Plan method of tabulation.

7. Plan method of analysis.
8. Determine the sample population.
9. Write cover letter.
10. Pretest the instrument.
11. Conduct the survey.
12. Account for returns.
13. Follow up for non-respondents.
14. Process returned data.
15. Analyze returned data.
16. Compile research findings.
17. Display findings.
18. Write final report.

The manual is designed to address each of the above events in a direct and explanatory manner. The experienced educator and novice alike will benefit from its step-by-step approach. The express purpose of the manual is to improve the quality of data collected in the schools.

ACKNOWLEDGMENTS

This manual is the combined efforts of many individuals. The writers would like to thank Les Adams and William Bakamis for their critiques. David Murphy provided valuable editorial assistance. Allison Mondragon provided the cover design. Linda Miller, Miriam Tuck, and Jan Reinking all aided in typing the many, many drafts. Marlene Brong is to be complimented for completing the final draft. The assistance of Gene Bigger is most sincerely acknowledged. Others who aided in manuscript preparation are Karen Weis, Tammy Siebenberg, and Linda Goodan. Finally we express our gratitude to those who will utilize this guide and find it a useful reference.

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CHAPTER 1

SURVEYS AS A DATA COLLECTION TECHNIQUE

A decision to conduct a survey should be made only after serious consideration to the alternatives. In far too many cases, researchers conduct a survey via a questionnaire and obtain data that could have been abstracted from primary source reports or state forms. The mailing of questionnaires is most widespread. A district superintendent of schools told two of the writers of this manual that he completes an average of one questionnaire per day! If these data gathering techniques are used that widely, is it any wonder why so few returns approach 100 percent?

Thus, the first decision to make when designing a survey is to determine if the data are available in already collected sources. If the response is in the negative, the next decision should address the questions of, "Is this survey really needed?" "Will the information affect some policy?" Finally, one must ask, "What is the problem or needs area on which the survey will focus?" When these decisions have been made you are ready to plan for the conduct of a survey.

The focus. All surveys focus on a selected problem, need, or condition. The first task in conducting a survey should be to determine what has already been written or published about the problem. This step is often called a "Review of the Literature." By conducting a thorough review of published or unpublished reports, comparisons can be made between respondent groups. Surveys are often accomplished to determine the state of affairs of some trait. Usually questionnaires are data collection systems for so called "status" studies. One conducts a survey to determine, for example, the status of vocational tailoring, shop equipment, or career counseling.

The important point that must be stressed is that surveys always focus on some specific condition, state, need, or problem. A survey is not prepared from a template as one prepares cutting boards for mass sale. A survey is always unique to the situation. With this major point being emphasized, let us discuss the use of a printed questionnaire in data collection.

Using Printed Instruments

The Questionnaire: Advantages and Disadvantages

Each questionnaire must be constructed to address well established criteria or specific objectives. When designed and used in this manner, questionnaires can be an efficient

means by which to gather data. Many educational researchers have commented on the advantages and disadvantages of the survey questionnaire. By examining Sax (1968), Tuckman (1972), Glock (1967), and Oppenheim (1966), we have generated a list of common advantages and disadvantages of using questionnaires.

General advantages. The following list summarizes the overall general advantages of using a questionnaire to conduct a survey.

1. Many individuals may be contacted at the same time, usually through the mail.
2. A questionnaire is less expensive than the interview technique.
3. Each selected respondent receives identical questions.
4. A written questionnaire provides a vehicle for expression without fear of embarrassment to the respondent.
5. Responses are easily tabulated (depending on design of instrument).
6. People may answer at their own convenience.
7. There is no need to select and train interviewers.
8. People in remote or distant areas are reached.

The above eight advantages must be carefully analyzed for each specific survey. Further, the timing of a survey is critical. Some school districts have policies which specify that no one is obliged to complete any questionnaire which has not been approved by the district. Additionally, the months of September, December, January, May, and June of

the school year are very poor times in which to mail a questionnaire. The summer months of July and August are out. Thus, a researcher should attempt to contact the intended respondents in October, November, February, March, and April. These months tend to be less busy in completing reports by school personnel.

Timing is also important to the researcher. Often deadlines are being met and reports or recommendations based on the survey are promised to decision makers. Therefore, plans must be made far in advance of any actual submission of a questionnaire.

As one example, two of the writers of this guide conducted a rather short survey of vocational agricultural teachers in Washington. The instrument had only sixteen items. Yet, it took over six different drafts of the instrument and at least two months before all items were precisely stated and all focusing on the general problem area. What took so long? Each draft was critiqued by persons not familiar with the survey. As criticisms arrived, the items were modified, deleted, or replaced. This process took time, but it had been planned with the time lag in advance.

All persons who conduct reputable surveys must take great care in item selection to eliminate any possible chance for unintended bias. This topic is discussed in Chapter 3 at great length. The general advantage of a questionnaire survey must be applicable to the survey if it is to be successfully

completed. Now let us focus on the opposing end of the spectrum.

Disadvantages of a questionnaire. For every advantage to conducting a questionnaire survey there is an accompanying disadvantage. A summary of disadvantages yields the following list:

1. The investigator is prevented from learning the respondent's motivation for answering questions.
2. Respondents may be limited from providing free expression of opinions.
3. The collection of data from individuals who cannot read, write, or see is prevented.
4. The return of all questionnaires is difficult to achieve.
5. Complex designs cause poor responses or none.
6. The investigator is prevented from learning what causes a problem.
7. The name and current addresses of the target population are often not available.
8. A question may have different meanings to different people.
9. There is no assurance that the respondent actually completes the instrument.
10. Selections of the sample, per se, may cause biased results.
11. The questionnaire asks for long outdated information.
12. Respondents may not complete the entire instrument.

The above list may be far from complete but an investigator must realize the basic limitations of a written questionnaire. If the limitations do not render the survey

void, then a questionnaire may be used. There are other concerns. For example, two of the writers conducted a state-wide survey, unknowingly, at the same time that a similar survey was being circulated to the same target group. Undoubtedly, these two simultaneous surveys adversely affected the respective returns. We were a bit amused and chagrined to find that someone else's questionnaire had even been returned in our self-addressed, stamped envelope! (By the way, we did get a 97% return.)

But, if a written questionnaire is not used what are the alternatives? There are two: personal interviews and telephone interviews. Let us focus our attention on these techniques.

Other Information Collecting Techniques

The Interview: Advantages and Disadvantages

Several researchers, including those previously cited, have discovered some common characteristics about personal interviews. One of the most favorable aspects is the interviewer's personal contact with the respondents. In this setting, one can clarify any question immediately. A generalized set of advantages of the interview includes the following items:

1. Feelings of the respondents are revealed.
2. Discussion about the causes of problems or solutions to problems is allowed.

3. The respondent is allowed maximum opportunity for free expression.

4. The interviewer can observe non-verbal behaviors.

5. Respondents may provide personal information, attitudes, beliefs, and perceptions that might not be gained on a written instrument.

6. A high rate of participation is provided.

7. The interviewer has an opportunity to follow-up or probe leads.

8. Individuals who cannot read, write, or see can participate.

9. Fewer individuals may be needed than for mailed surveys.

A survey conducted by interview would take much longer to complete than a questionnaire survey, but the informants (respondents) tend to comply. One major consideration is the recording of information obtained during an interview. An interviewer may use a tape recorder, or write notes as the interview takes place. Some informants will not allow an interviewer to tape record while others get nervous about written notes taken during the conversation. This is one aspect of an interview that cannot be predicted in advance. The interviewer should ask the informant if the interview may be tape recorded or if taking notes would be bothersome. The interviewer might even tell the informant that the responses which are recorded will be reviewed by the informant for editing or other comments.

If the size of the sample group is small, perhaps under twenty-five, the interview technique would be

appropriate. This may not be so for telephone interviews which will be discussed later in the chapter. But, if the twenty-five are scattered throughout a region or state the cost to conduct a personal interview would be exorbitant.

Interviews should be used mainly to determine attitudes or opinions. Yet discretion must be exercised lest sensitive questions be introduced which could alienate the informant.

Interview types. As with questionnaires there are two general types of interviews: directed and focused. The directed interview is highly structured. An interview schedule or guide is prepared in advance. A focused or unstructured interview is not as completely structured with a well prepared schedule as is the directed type. The interviewer has some basic topic identified and then probes into areas which seem fruitful to explore. A structured interview does permit a similar set of questions to be answered by all; while the unstructured interview type may lead to problems of arriving at a consensus or set of generalizations.

Conducting an interview. Regardless of the type of interview used, some plan is required. Generally, an interviewer begins with a series of structured and perhaps fact questions. These are usually non-threatening questions and allow the informant to "loosen up." After the initial items, more pressing or feeling-types of questions can be asked.

If more than one person conducts an interview, then detailed training sessions must be conducted. All interviewers must be trained to avoid interjecting bias in the questions through the verbal aspects of the interview or non-verbal reactions. Even if one person does the interviewing it is essential to practice several trial interviews. If possible, video tape the trials to determine if the interviewer sessions were non-biased.

It is essential that all interviews be scheduled via an appointment with the informant. In most cases, the informant's schedule will take precedence over the interviewer's. When appointments are made, explain the objective of the interview and then set an appointment. Be prepared to spend a greater amount of time with each informant than you might have planned. As with questionnaires, cover letters explain why you are there and that all responses will be treated confidentially. These same points must be verbalized in an interview.

Disadvantages. The interview is usually more expensive than a mailed survey for three reasons: training, transportation, and wages. Major disadvantages of the interview technique include the following points:

1. The method is time consuming.
2. Only a limited number of persons may be interviewed due to time and cost.
3. Quantification of results may be difficult.
4. Scheduling of interviews may be difficult.

5. Cost may be prohibitive.

6. Respondents might feel that they are being "put on the spot."

7. The interviewer may make subjective judgments about the responses.

8. The overall reliability of responses can be limited since respondents tend to answer truthfully those questions which are not embarrassing to them.

9. Interview responses are sometimes biased depending upon the age, sex, education, race, interview experience, socio-economic level, and religious background of the interviewer.

The criteria for any survey will in part play a deciding role in the determination of conducting an interview. If the advantages of an interview are greater than those of a mailed questionnaire, the interview technique will be very revealing.

Telephone interviews. The telephone interview is also a method available to investigators. The same general constraints and rules apply to telephone interviews as with the personal interview. However, in telephone interviews the structured type of schedule may be preferable to the unstructured since people tend to consider telephone conversations as somewhat privileged.

Telephone interviews may be conducted via long distance which reduces travel costs. Interviews conducted over the telephone will be highly reliable if the interview schedule is non-biased. Persons respond freely to telephone surveys once initial rapport and trust have been established.

Telephone interviewing is a very effective method, especially, when seeking opinions on issues relating to public policy. Of course, a structured interview is easier to conduct and less expensive than is an unstructured one. The schedule which follows provides some ideas on how to proceed in the conduct of any interview.

The interview schedule. The plan or outline to be used when conducting the interview is the "schedule." As stated before, the schedule assists the interviewer to remain on track and helps to ensure that all informants have an opportunity to respond to the identical phrasing of a particular question.

A main point to remember when designing the interview schedule is to avoid questions that can be answered with a "Yes" or "No" response. One purpose of an interview is to gather details that are unique in the perception of the informant. Also, avoid language that might be considered offensive by the respondent.

One type of question that the interview schedule might contain is one that will provide some fact data such as:

"How long have you lived in this city?"

After a few of these, lead into more open ended questions that provide subjective data from the informant such as:

"To what extent do you think that the present vocational education program at the high school is meeting the needs of our youth?"

The interviewer must decide whether to record responses during the interview or immediately after the interview. It is recommended that the interviewer concentrate on what the respondent is actually saying. This takes a great deal of practice if accuracy is to be maintained. If delay in writing responses is used, they must be written immediately after the interview. The format which follows could be used when constructing an unstructured interview schedule.

A Model of an Interview Schedule

PARENT INTERVIEW

Name _____ Date _____

Address _____ Time _____

_____

1. How long have you lived in this city?
2. Did you attend high school here?
3. How many children attend high school in this city?
4. What type of vocational education courses should be provided for high school students?
5. What type of vocational education courses should not be provided for high school students?
6. What changes would you like to see in the present high school vocational education program?
7. Describe the type of vocational skills you feel should be taught in a high school vocational education program.

Observe in the above schedule that items 4-7 could be interchanged by the interviewer. In a structured interview, the interviewer would proceed through a definite list of items, just as one completes a questionnaire. When using an unstructured technique the interviewer may probe for additional comments or may alter the sequences of the planned set of questions. Both techniques require training and should be used only with such training for the most effective conduct of the interview.

Additional Guidelines to Determine Surveys

Another important planning consideration for the type of survey, either questionnaire or interview, is the budget limitation. It is crucial to project realistic cost analyses for the following tasks or elements:

1. Printing cost of the questionnaire, cover letter, or special forms.
2. Postage for initial mailing and follow-ups.
3. Typing of original and revised questionnaires after field testing.
4. Editing, marking, and tabulating returned questionnaires.
5. Electronic data processing needs, if required (including key punch and machine time).
6. Office supplies to be used.
7. Additional or part-time staff wages.
8. Typing of the final report.

Costs of mailed surveys are similar to those of the personal interview, except the postage cost will be replaced by interviewer cost, including the training of the interviewer, and the actual cost for the field test of the interview instrument. To aid in planning the costs of a survey, a somewhat realistic example is presented below.

Sample Survey Budget

The following budget figures are for illustration purposes only. Actual cost figures may vary a great deal from those figures shown below due to fluctuating economic conditions.

Wages. Plan to spend no less than $3.00 per hour for clerical help. It may be prudent to retain part-time staff persons (four hours a day) for at least four work weeks, at a total cost of $240.00. This item may be excluded from your budget by investigating the use of educational aides already employed by your school. In addition, you might request assistance from business occupation students through a course instructor. Consultant fees vary from $35.00 a day to over $200.00 a day. If consultants are required, be certain to plan for their costs.

Services. There are many variables associated with electronic data processing. This budget item can be determined by asking computer specialists for cost estimates. If you have about 400 respondents, and a rather uncomplicated survey,

a $125.00 budget would probably be adequate. But, the more complex the analyses, the greater the cost.

Materials. Cost of materials varies, depending on the source of supplies. Paper and office supplies can run about $50. Postage approaches $200 for approximately 400 respondents. Although the estimated budget will vary with each survey, typically it costs about 50 cents to $1.00 per respondent for the mailing of a questionnaire which includes a self-addressed envelope and two follow-ups. Remaining postage can be used for the first follow-up, usually a postcard. A second follow-up, if required (and it often is), would include a letter and possibly another questionnaire.

The budget for a survey can easily approach $1,000 when one must pay for part-time help to complete the job.

This chapter has presented some general aspects that are important to decisions for conducting surveys. Once a decision is made to conduct a questionnaire survey, then, the writing of the questions is essential. That topic will be addressed in Chapter 2.

CHAPTER 2

WRITING QUESTIONS

Plans for Question Building

Question Content

Writing appropriate and carefully formulated questions for the instrument may be the single most time consuming and important job of conducting a survey. The content of each question determines whether or not the survey will help elicit the desired information. When writing questions, many criteria must be considered; Marie Jahoda, et al. (1951), compiled a comprehensive list of such criteria. Accompanied with examples and explanations, the list, with modifications, follows.

Is the question necessary? Ask only for information that is needed for the present study. Questions that would be nice to know or can be used for another study clutter up a questionnaire and often threaten the credibility of the study. Selecting appropriate questions is dependent on having precisely formulated objectives for the survey. Plan how the information from each question will be used.

Surveys taken in schools, for example, frequently ask a number of objective questions such as respondent's age,

sex, parents' occupation, major in school, address, "for possible use at some later date." If the information is not needed for the intended study, do not request it. Sensitive questions, such as respondent's income, should definitely be avoided.

It may be possible to ask a related question to obtain the desired information. For example, if it is essential to know the respondent's income, ask for the occupation and then approximate the income by checking local occupational salary averages available from the U.S. Bureau of the Census or local Employment Security Offices.

When seemingly unnecessary or sensitive questions are included in a survey, a typical participant reaction is to "throw the whole thing away." Only one or two inappropriate questions can destroy credibility and therefore hinder response rate.

Are several related questions needed? Questions should not be too general or too detailed. If more than one aspect of a topic is addressed in a single question, the question will be ambiguous. The following exemplify survey questions which need improvement. The discussions which follow illustrate how the questions can be improved.

1. Do you like shop and physical education?

   ( ) Yes
   ( ) No
   ( ) Neutral

Two distinct subjects are addressed in this question. If only one activity is enjoyed, the respondent's opinion

will not be reflected by any of the response categories. To obtain valid data, each of these subjects must be considered in a separate question.

2. Are you in favor of vocational education?

( ) Yes
( ) No
( ) Do not know

This question is too vague. The word "favor" will be subjectively defined by each respondent. A more specific question would produce usable data, e.g., "What percentage of the students in your high school should be provided with vocational training? (1) 0-25, (2) 26-50, (3) 51-75, (4) 76-100."

3. Should the school offer a class on "How to find a job?"

( ) Yes
( ) No
( ) Do not know

Respondent may answer "yes" and have no intention of enrolling in such a course. If the purpose of the question is to assess the need for the course, ask if the respondent would enroll in the class.

4. What is your favorite subject? _____

The results from this question may indicate little or no interest in vocational education, however, the results may not be conclusive. A more reasonable approach would be to have the respondent rank a series of various clusters of subjects. Yet, favorite subjects may not be the subject that

a student values most. Words must be carefully selected according to the purpose of the study, to avoid biasing the results.

5. What vocational courses would you like added to our list of offerings? _____

In this case, more additional information should be provided, such as the current listing of vocational courses. In that manner the question can be more precisely asked, with attitudes associated with the question being assessed. Question 5 should be accompanied with another question that would ask if the student plans to attend college, since college bound students may respond with a "none." Further, students entering science or engineering related courses in universities might find industrial arts or vocational offerings relevant. Thus, a series of questions might be developed which would focus specifically on their opinions.

6. How many hours do you usually work each week? _____

A seasonal worker, such as some construction workers, may respond to this question "60 hours per week." To get an accurate calculation of actual working time, a question must also be asked that will reveal the length of the usual layoff periods. If this question were asked of high school students the results would be chaotic since the question is too vague.

7. Do you think there is a need to build an addition to the business-education wing?

( ) Yes
( ) No
( ) No opinion

In addition to seeking opinions, it may be asked if the respondent is willing to establish an alternative for such a facility. Try not to fall into the "either-or" trap. Such questions do not provide adequate data for reasonable decisions, especially when alternatives are being sought. Lastly, the question may be very poor if the respondents were unaware of current building and classroom utilization.

In the preceding examples, a response continuum may be substituted for each ( ) Yes, ( ) No, ( ) No opinion question. For example, "There is a need to build an addition to the business-education wing."

_____ strongly agree
_____ agree
_____ no opinion
_____ disagree
_____ strongly disagree

The above illustrates how a continuum with degrees of approach or avoidance may be constructed.

Criteria for selecting the most appropriate response categories are discussed in Chapter 6.

Do respondents have the information necessary to answer the question? Occasionally questions are asked to which individuals cannot respond. Allow for this situation by providing non-content choices such as "Do not know" or "No opinion." However, if the non-content responses are marked frequently, the wrong group has probably been surveyed or the wrong questions have been asked. For example, it

would be of little value to poll public opinion concerning the adequacy of a school's insurance coverage for shop courses. Probably most people have no knowledge that such a policy even exists.

Consideration must also be given to the respondent's interest in the topic. If the general interest is minimal, completed returns will be practically nil. One means by which to increase interest in a questionnaire is to ask questions designed specifically for the subgroup. A section in a questionnaire may be directed toward a specific subgroup of respondents (e.g., male or female, vocational instructors or counselors, teachers or administrators). If the subgroups are thought to be very heterogeneous, separate questionnaires might be constructed for each selected group.

For example, to evaluate the success of certain vocational courses which might have been recently offered, instructors may be polled to assess student success in meeting class objectives. In this case, student opinions about the courses should also be polled. When planning a survey, plan to question all concerned groups so that the various studies will be complementary to each other.

Improving the items. Below are some specific examples of questions which could be asked in a survey. Immediately following each example are some suggestions for improving their construction.

8. Do you plan to enroll in a vocational school after high school graduation?

( ) Yes
( ) No
( ) Do not know

This type of question may be used to separate respondents into subgroups. Those respondents who answered positively may then be requested to answer a set of items designed particularly for them and vice versa.

9. Would you like to see a course on multilith (offset) printing returned to the school's curriculum?

( ) Yes
( ) No
( ) No opinion

The word "returned" indicates the course had been offered previously, but dropped for some reason. If two or three years have passed, it cannot be assumed that teachers, students, and parents will remember the course. A brief description of the course should be given and the word "returned" should then be clarified by stating when and perhaps why the course was dropped.

10. Have you ever had the opportunity to use your metal shop training after graduation?

( ) Yes
( ) No

The background of each respondent is important for obtaining valid information from this question. When polling the sample, persons with metal shop experience must be separated from those with none. In this manner, the response can be better interpreted by subgroup analysis. However, the

above question is a very poor one. What is meant by "ever used?" There are simply too many interpretations to the question. If the question is needed, reword an entire series of questions which identify clusters of skills associated with those taught in metal shop.

Does the question need to be more concrete, specific, and closely related to the respondent's personal experience? Questions must be structured to elicit characteristic responses. The entire questionnaire must be concise enough so that the respondent will not be required to use time "guessing" about question intent. To insure accuracy and ease in responding, questions must be written in a sequential manner. For example, if the question below were the only one asked the results could be very erroneous since it would require a series of statements relating to goals and objectives of student personnel services.

11. Do you think the career counselor position is important to the school?

    ( ) Yes
    ( ) No
    ( ) No opinion

For preciseness, in addition to asking students if they value the career counselor, questions could be added to determine the number of times students visited career counselors during a one-year period. A series of these types of questions allow assessment of respondents' behavior in addition to attitude.

12. List your last Saturday's activities. Start from the time of awaking, proceed through the day, and conclude with bed time. Be as precise as possible.

_____

_____

Items such as this are often used for assessing values and behavior. A student may report that reading is enjoyed, but if time is not spent actually reading, it probably is not valued. It may be noted that questions such as Number 12 above are currently under scrutiny for invasion of privacy. It is used here as an example of a method that ascertains what the students are actually doing. For even greater preciseness, students should be asked if the activities listed are typical of most of their Saturdays. The latter might be considered a dual set or couplet question methodology.

Is the question free from spurious specificity? Usually, questions that lack specificity cause problems. However, lengthy questionnaires with too many specific items may cause loss of interest, create confusion, or prevent the completion of the instrument. Do not overwhelm respondents with the content of the questionnaire. Questionnaires are almost always completed on a volunteer basis.

A list of 200 occupations which requires that the respondents mark the ones of interest to them is a confusing and boring task. A better method would be to group the occupations into a series of manageable categories and ask for preferences within job groupings.

When respondents are asked to rank a list of items, the list should not contain more than 10 items. Lists over 10 become rather difficult to judge. Most people are not generally willing to complete one set of extensive rankings. It is better to compile two or more lists. The respondents would be asked to rank order each list. In general, we consider five or six items as the maximum number to rank order.

Question Wording

Can the question be misunderstood? Be aware of educational jargon when conducting surveys. Terms such as closed campus, module, team teaching, accountability may mean nothing to some and too many things to others. Educators are frequently insensitive to the jargon and concepts which they use. Most educational terms are totally unknown or misunderstood by school patrons. Language and vocabulary limitations of the clientele are important considerations that must be realized when developing a survey instrument. Words that have multiple or vague definitions can invalidate a questionnaire.

13. What do you enjoy most about teaching? _____

_____

This open ended question may elicit a majority of "the summer vacation" responses. The responses would be honest, but hardly appropriate to the intent of the question. If there are doubts about the wording of a question, write it in

different ways and field test the questions on a small group to determine which version elicits the data in the desired form. Better yet, provide a series of forced response or rank order items.

Is the question likely to be objectionable? Topics such as age, income, religion, personal habits, and personal likes and dislikes are usually classified as "sensitive." Offensive terms such as "school dropout" and "poor grades" should not be used. Respondents tend to avoid questions that show them in an adverse situation. Topics such as these should be omitted if possible, but if the information is necessary wording should be changed to make the topic less offensive. Examine the next two examples.

14. How old are you? ____

Students may not object to this question, but the general public may. This sensitive information can be obtained by using a response continuum with five-year or ten-year intervals. It is less offensive for the respondent to put a check mark in the 35-39 category than it is to write 39 years of age.

15. Do you have a discipline problem in vocational classes?

( ) Yes
( ) No
( ) Neutral

The results from this question will invariably be less than accurate because the respondent may not be aware or may not want to admit that a discipline problem exists.

This information can be obtained more accurately by asking questions such as, "Over the last five school days, have you had a child disrupt your class to the point where punitive action was necessary: e.g., sent to office or being sent out of the room?" "If yes, how many children?" A teacher that sends four or five students out of the room in a week's time may be defined by the researcher as having a discipline problem. By asking situational questions, the term "discipline problem" is more operationally defined. Comparisons can then be made with other respondents.

Wording the question to produce results. There have been a number of studies on personal and impersonal wording of questionnaires. These show that results do differ with just a slight personal change in the wording. Versions of personal and impersonal questions follow.

16. To what extent are career resources in the library satisfactory?

    ( ) Very satisfactory
    ( ) Satisfactory
    ( ) No opinion
    ( ) Unsatisfactory
    ( ) Very unsatisfactory

17. To what extent do you think career resources in the library are satisfactory?

    ( ) Very satisfactory
    ( ) Satisfactory
    ( ) No opinion
    ( ) Unsatisfactory
    ( ) Very unsatisfactory

When answering question number 16, the respondent may consider other teachers' and persons' opinions along with his

or her own. Question 17 specifically asks for a personal response. Use personal and impersonal wording to elicit the response most appropriate to the purpose of the study.

There are no definitive rules for deciding whether to use a more direct or more indirect approach. The specific situation must be interpreted by the researcher. Consider each question individually in making decisions, keeping in mind such things as sensitive topics, personal attitudes versus public attitudes, and respondent background. The following sets will exemplify the approaches.

18. When was the last time a woman in your organization was promoted? _____

19. Do you believe there is sexual discrimination in promotions in your organization?

    ( ) Yes
    ( ) No
    ( ) No opinion

The first, indirect, approach will provide an objective answer by which the researcher can systematically and objectively define the existence of sexual discrimination. The second, direct, question ascertains subjective perceptions and would be more appropriate for determining opinions about discrimination in promotional practices. Further, opinions may be in error, especially if there is a very high rate of personnel turnover.

The series of questions which follow illustrate the difference between using a direct or indirect approach to seeking information.

20. Why were you fired? _____

21. How would you rate your relationships with your managers?

( ) Very good
( ) Good
( ) Average
( ) Poor
( ) Very poor

22. What percentage of your fellow employees did not get along well with you?

( ) 100%
( ) More than 50%
( ) 50%
( ) Less than 50%
( ) None

23. How was your work rated by your manager?

( ) Very good
( ) Good
( ) Average
( ) Poor
( ) Very poor

Question 20 and the three subsequent questions were designed for the purpose of ascertaining the reasons for which people are dismissed from their jobs. The responses obtained by using a direct approach in question 20 will probably not be returned or will be vaguely or perhaps dishonestly answered. By asking a number of indirect questions (21, 22, and 23), accurate and more precise information can be obtained.

A well constructed set of indirect questions will provide data from which a set of logical inferences may be drawn.

Question Placement

Logical leads. Where a question is placed in the questionnaire is very important since the respondent must recall information, make opinions or perhaps respond to some items which may be personal, e.g., age, schooling, income. The questionnaire should reflect a well organized outline with each set of items addressing a distinct topic. In this manner a respondent will tend to respond in an easy fashion.

When seeking chronological information, arrange the items so that the respondent begins with the present. For example, if one were seeking an employment profile the question might ask: "List the jobs which you have held chronologically, beginning with your present one." If such an item were to be a chief source of information, then the investigator might prepare a form which listed the job, year begun, year quit, and other relevant descriptions.

When sensitive areas are assessed, it is important that a conducive psychological order be established. If school "dropouts" are initially asked, "Why did you quit high school?" the few responses that might be returned will probably be vague or inaccurate. In contrast, by asking questions that lead the respondent through non-threatening items which lend themselves to easy responses, the respondent becomes less threatened by the more sensitive questions. Following the latter design will increase truthfulness in responding and the number of questionnaires returned.

Question placement. Place the easy, non-threatening questions at the beginning of the questionnaire. These would include sex, job, age, marital status, number of children, whether the spouse works or not, and other non-threatening demographic data. Note that these items are not very sensitive, although they are personal. As a category, these are called the "informational" questions. The informational questions are short, unoffensive, and allow the respondent to become accustomed to completing items. Once a rapport has been established, the respondent is more committed to the tasks and more sensitive questions are tolerated.

If a researcher desires to build some reliability checking items, they may be included in each section or topic. This usually requires that a major opinion-seeking item be reworded in two or three different forms. In this manner the researcher can determine if the respondent is consistent when responding. (If there is little consistency, that questionnaire may have dubious worth.)

Response Modes

Forced or Open Response Categories

Forced response questions include response categories which are predetermined by the researcher. The categories of forced response items which require the respondent to mark one category only must be exhaustive (include all possible

responses) and mutually exclusive (each response excludes all other possible responses, i.e., if a respondent is male--he cannot be female). In contrast, the categories of forced response items which require the respondent to mark all appropriate (more than one) categories must be exhaustive but not mutually exclusive. These items should provide alternatives for multiple responses, but yet, differentiated from each other. When it is not feasible to list all possible responses, an "other-please specify" category can be used. Use of this category, however, should be limited due to difficulty in tabulating and interpreting results. Examples of these two types of forced response items follow.

Exhaustive and mutual exclusive categories. One illustration of a mutually exclusive category is listed below:

24. Every high school student should be taught a marketable skill.

____ Strongly Agree
____ Agree
____ Undecided
____ Disagree
____ Strongly Disagree

The respondent can logically mark only one category, because the categories are mutually exclusive. Note also that an equal number of positive and negative responses are presented.

Categories which allow more than one response. In some cases the investigator may want a check-list construction

to determine broad categories for perhaps, future follow-up. One example follows.

25. High school students should be taught which of the following marketable skills? Mark any number of choices.

( ) Bookkeeping
( ) Carpentry
( ) Plumbing
( ) Cashier Operator
( ) Truck Driving
( ) Computer Programming
( ) Other-please specify _____

It would be impossible to list all of the skills that people may think should be taught in high schools, therefore the "Other" category is provided. Respondents have a choice to mark any number of responses. The teaching of one marketable skill does not exclude the teaching of other marketable skills.

Open ended questions. An open ended question does not include response categories. The respondent is free to select the response form. There are at least three reasons for using an open ended question: (1) to probe an idea further, (2) to accommodate categories which are incomplete or inadequate in a forced response list, and (3) to provide projective types of situations. Open ended questions are inappropriate when forced response categories can be formulated. Questions that can be answered yes or no should always be in a forced response format. Tabulating results and reaching meaningful generalizations are much easier with forced response questions.

Open ended questions require a more complex coding system than forced response questions. Coding is explained in detail under its own heading in Chapter 4. Be aware, however, at this point that tabulating results requires examination of each respondents' answers individually. Categories that are characteristic of the responses must be developed into which each of the responses must be classified. In contrast the categories of forced response questions are already developed for each respondent. Obviously, analyzing open ended questions is more time consuming than analyzing forced response questions. In some cases, the investigator may combine both types of questions. An example of a mixed open ended question follows.

26. Do you feel every high school student should be taught at least one marketable skill?

    ( ) Yes, please elaborate _____

    ( ) No, please elaborate _____

Another version of the same question as an open ended question could be framed.

27. Recently it has been written that every high school student should be taught at least one marketable skill. What are your reactions to that statement?

    _____

Is the form of response easy, definite, uniform, and adequate for the purpose? Be certain that the respondent is able to reply in a manner that reflects precisely what is wanted. The entire questionnaire must be structured so that

there will be little chance for confusion. Not only will respondents cooperate with instructions but a well structured questionnaire lends itself to easy tabulation. Compare the first set of questions with the second set in the following examples.

Circle your sex: Female Male Check your ethnic background, Black or Afro-American ____ Oriental or Asian ____ American Indian or other native American ____ Spanish Surname ____ Caucasian (Other than Spanish surname) ____ Other (please specify) ____ Please write your year of birth _____

. . . . . .

1. Sex: (1) ___ Female (2) ___ Male
2. Ethnic Background:
   - (1) ____ Black or Afro-American
   - (2) ____ Oriental or Asian
   - (3) ____ American Indian or other Native American
   - (4) ____ Spanish Surname
   - (5) ____ Caucasian (other than Spanish surname)
   - (6) ____ Other (please specify) _____
3. Your Age
   - (1) ____ Under 20
   - (2) ____ 20-24
   - (3) ____ 25-29
   - (4) ____ 30-34
   - (5) ____ 35-39
   - (6) ____ 40 or over

The first set of examples is too difficult to follow and causes confusion. Further, the appearance gives the impression that not much effort or organization has gone into the instrument's preparation (the term instrument is used interchangeably with questionnaire). The second set of examples displays each question and response in a neat, organized fashion. Tabulation of the responses in the second example would also be accomplished much easier than for the first.

In Appendix A there are displayed a series of question formats. Appendix A also illustrates how questions may be arranged for a wide variety of instrument styles.

We have attempted to stress throughout this chapter that good questionnaires are well planned and that each question or response item be very carefully examined. The preplanning needed to construct a survey instrument pays off with valid data and high response rate. In the next chapter we address the topic of preparing forced response questions.

CHAPTER 3

FORCED RESPONSE QUESTIONS

Establishing Appropriate Scales

Forced response questions typically represent one of three measurement scales (systems of numerical notation). It is important to distinguish among these scales when coding responses or conducting statistical analysis. A working knowledge of these scales will also aid in designing appropriate questions.

Nominal Scales

One type of forced response question represents the nominal or "naming" scale. The response categories of a nominal item are basically non-numerical in their relationship. This scale identifies rather than measures. Questions representing a nominal scale are usually designed to gather factual (objective) information about the respondent. For example:

1. I am

____ (1) Male

____ (2) Female

Note that the response categories must be both exhaustive and mutually exclusive when the respondent is

required to mark only one category. The categories of the preceding example are exhaustive because the respondent must be either male or female, and the categories are mutually exclusive because the respondent is not a member of both.

In addition to factual information about the respondent, one may gather factual information, for example, about existing programs or school policies. All questions which require the respondent to answer "yes," "no," or "maybe" represent a nominal scale. For example:

2. Are vocational agriculture courses now being taught in your school?

____ (1) Yes

____ (2) No

____ (3) Do not know

Ordinal Scales

The ordinal scale, which represents another type of forced response question, is usually used to gather both factual information and respondent opinion. The ordinal scale indicates a rank order relationship among the response categories of a question; however, it does not reveal how much difference there is between the categories. For example:

3. Which of the following best compares your teaching load this year to your assigned teaching load for next year?

___ (1) I will teach fewer classes next year.

___ (2) I will teach the same number of classes next year.

___ (3) I will teach more classes next year.

The response categories of this question have a definite mathematical relationship; "fewer" is less than "same" and both of these categories are less than "more." However, the researcher cannot assume that there are equal differences between categories "few" and "same," and categories "same" and "more." One respondent may be assigned to two fewer classes for next year, whereas another respondent may be assigned to one more class for next year. Because the categories do not request the information how many "fewer" or how many "more" classes; equal distances cannot be assumed.

Another method of gathering opinions on a systematic basis requires that respondents rank the categories of a question according to their preference. Rank order questions also represent an ordinal scale. For example, a respondent's first preference may reflect weak opinions that are rather difficult to differentiate. Consequently, there can be a greater difference in preference between the first and second ranked items, than there is between the second and third. Because the researcher cannot determine the amount of difference between categories, unequal differences are assumed. The following example illustrates a rank order question which seeks to obtain factual information:

4. If no vocational agriculture courses are planned for the immediate future, please rank the first and second reasons which best describe why the courses will not be added. Place a "1" in front of the primary reason. Place a "2" in front of the second most important reason. Please do not rank any other categories.

____ (1) Not enough student interest
____ (2) No certified Vo-Ag teacher
____ (3) No need for agriculture training in our school
____ (4) Lack of facilities
____ (5) Lack of money
____ (6) Levy failures
____ (7) Other subjects are more important
____ (8) Other, please list _____

The categories of a ranked item do not inherently possess a mathematical relationship. However, when the respondent ranks the categories a mathematical relationship is established.

Likert scales. The most widely used ordinal scale among survey researchers is called the Likert scale, after the founder, Rensis Likert. Questions which require rating usually represent Likert scales. Such scales, used primarily for assessing opinions, are usually composed of five or more response categories: e.g., Strongly Agree, Agree, Undecided, Disagree, Strongly Disagree; or some such continuum. The following examples represent Likert-type scale items.

5. More vocational courses are needed in high school.

( ) Strongly Agree
( ) Agree
( ) Undecided
( ) Disagree
( ) Strongly Disagree

6. I would encourage the school board to promote programs aimed at providing job skills to the physically and mentally handicapped.

( ) Encourage very much
( ) Encourage
( ) No opinion
( ) Discourage
( ) Discourage very much

7. Rate yourself as a consumer education teacher:

( ) Excellent
( ) Good
( ) Average
( ) Poor
( ) Unsatisfactory

8. How well do you like attending workshops as compared to other instructional procedures?

( ) I like workshops much better
( ) I like workshops a little better
( ) I like all instructional procedures about equally well
( ) I like other instructional procedures a little better
( ) I like other instructional procedures much better

9. Students call vocational education teachers by their first names.

( ) Almost always occurs
( ) Frequently occurs
( ) Approximately equal in occurrence and nonoccurrence
( ) Infrequently occurs
( ) Almost never occurs

10. Would you tend to favor a new income tax as a way of reducing school taxes?

( ) Strongly favor
( ) Tend to favor
( ) Not sure
( ) Tend to oppose
( ) Strongly oppose

11. Do you feel that as a vocational counselor you could now effectively use the tests which were covered in the workshop?

( ) Definitely yes
( ) Probably yes
( ) Uncertain
( ) Probably not
( ) Definitely not

12. Extracurricular activities, such as DECA, VICA, and FFA, in high school were:

( ) Very important
( ) Important
( ) Undecided
( ) Unimportant
( ) Useless

The respondent is requested to select only one category of a Likert scale item. The categories must be exhaustive and mutually exclusive. The above models and all others in this manual are for your use. Please feel free to adapt them as scales as prepared for various surveys.

Interval Scales

The most sophisticated scale used by survey researchers is the interval scale. The term "interval" connotes a rank order relationship and equal differences between categories. The latter characteristic distinguishes the interval from the ordinal scale. The following question uses the interval scale.

13. How many secondary school students attend your high school (grades 9-12 or 10-12) for 1974-1975?

____ (1) 1,000 or more
____ (2) 750-999
____ (3) 500-749
____ (4) 250-499
____ (5) 249 or less

The above categories have a 250 point interval, making the categories equi-distant. Interval items are frequently used to obtain quantitative information.

Transforming Items

Nominal, ordinal, and interval data may require different coding techniques and forms of statistical analysis. Therefore, it is important to know precisely which scale a forced response question represents. It is an acceptable procedure to regroup data by converting from a higher to a lower order of measurement (from interval to ranked to nominal). But, conversion from a lower to a higher order is not ordinarily done. For example, consider age data and how they can be described using nominal, ordinal, and interval scales.

Interval scale. 14. Your age group is:

____ (1) 15-19
____ (2) 20-24
____ (3) 25-29
____ (4) 30-34
____ (5) 35-39
____ (6) 40-44
____ (7) 45-49
____ (8) 50-54
____ (9) 55-59
____ (10) 60 or over

Ordinal scale. 15. Your age group is:

____ (1) Adolescent
____ (2) Adult
____ (3) Middle age
____ (4) Retirement age

Nominal scale. 16. Were you born during the baby boom, i.e., between 1946 and 1950?

____ (1) Yes
____ (2) No

In these illustrations, the interval scale includes the information sought in both the ordinal and nominal forms. By using the interval form, more precise information can be obtained, plus the option of regrouping the data into more general categories. To change the item from interval to ordinal data, and assign the "under 19" category to the adolescent group, categories, "20-24," "25-29," "30-34," "35-39" to the adult group, categories "40-44," "45-49," "50-54" to the middle age group, and the "60 and over" to the retirement age group. Similarly, to change the item from an interval to a nominal item; assign category "25-29" to the yes group, and all other categories to the no group. The reverse procedure, changing nominal to interval data, cannot be accomplished because the nominal response categories are less specific and thus less informative than the interval categories.

Self-Practice Items

The models below are of different scales and have been formulated for your practice. Determine the scale which each item represents. The appropriate responses follow after item H.

A. I plan on going to a community college after I graduate from high school.

( ) Yes
( ) No
( ) Maybe

B. Vocational Education is valuable for girls.

( ) Strongly agree
( ) Agree
( ) Undecided
( ) Disagree
( ) Strongly disagree

C. Do you have any males under 18 years of age residing at your home now?

( ) Yes
( ) No

D. My ability to explain "how" to do things is:

( ) Very good
( ) Good
( ) Average
( ) Poor
( ) Very poor

E. How many vocational teachers taught at your high school during 1974-75?

( ) 1
( ) 2
( ) 3
( ) 4
( ) 5 or more

F. Which of the following best compares this year's (1974-75) vocational agriculture curriculum to next year's (1975-76) planned vocational agriculture curriculum?

( ) More classes will be offered next year
( ) Same for both years
( ) Fewer classes will be offered next year

G. Next year's vocational agricultural curriculum will cause which of the following to happen to your staffing pattern?

( ) No change
( ) More certified Vocational Agriculture teachers will be needed
( ) Certified Vocational Agriculture teachers will teach other subjects
( ) Certified Vocational Agriculture teachers will be transferred to another school
( ) Other

H. Why are you attending State University? Please rank the first and second choices which best describe why you are attending. Place a "1" in front of the most important reason. Place a "2" in front of the second most important reason. Please do not rank other categories.

( ) Parents suggested attendance
( ) Relative attending SU suggested attendance
( ) High school counselor or teacher suggested attendance
( ) Friend attending SU suggested attendance
( ) Cost of attending SU was most reasonable
( ) SU was conveniently located for attendance
( ) I considered SU an outstanding university
( ) I would prefer attending another university, but I had no other choice
( ) University Day sold me on SU

KEY A. Nominal

B. Ordinal

C. Nominal

D. Ordinal

E. Interval

F. Ordinal

G. Nominal

H. Ordinal

CHAPTER 4

CODING SURVEY ITEMS

Forced Response Codes

Data which are obtained from interviews and questionnaires are not necessarily usable in the exact form in which they are collected. Data must usually be converted to some quantitative form for analysis and display. The converting process is called scoring or coding. Most forced response questions can be precoded prior to questionnaire distribution with ease. The researcher simply assigns, in advance, a score to each response category of the questions. Then each response can be immediately and directly converted into a score (quantified) in an objective, consistent, and systematic manner.

Coding nominal data. The response categories of a nominal question do not have any quantitative relationship to one another. Therefore, numerical symbols for coding are assigned arbitrarily. Consider the following example:

1. I plan on getting a full time job in my community after high school graduation.

   ____ (1) Yes

   ____ (2) No

   ____ (3) Undecided

We have assigned a code of (1) to the response "yes," a code of (2) to the response "no," and a code of (3) to the response "undecided." This coding system does not imply that the response "yes" (code 1) is less than the response "no" (code 2). The numerical codes for nominal data simply identify mutually exclusive categories. Nominal data items can then be analyzed by a simple count of the number of respondents who marked each category, e.g., the number of respondents who marked category 1, the number who marked category 2, and the number who marked category 3. The above coding system would be used for all questions of similar construction in the questionnaire. In that manner a uniform coding system is maintained.

Coding ordinal and interval items. The response categories of ordinal and interval items do have a quantitative relationship, therefore, numerical symbols should be assigned consistently. Consider the following example:

2. Which of the following best compares this year's (1974-75) vocational curriculum to next year's (1975-76) vocational curriculum?

____ (1) Fewer classes will be offered next year

____ (2) Same for both years

____ (3) More classes will be offered next year

For this example, "fewer classes" (code 1) is less than "same" (code 2), and code 1 and code 2 are both less than "more classes" (code 3). Ordinal data of these types and interval

data can be analyzed by counting the number of respondents who marked each category. Note in the example that the date is included in the question to aid in precise and explicit interpretation.

Ranked items are scored individually by each respondent who is requested to number a set of categories according to some criterion. Consider the following example:

3. Did you attend University Day because: (Please rank the following five items according to your reasons for attending. Place a "1" in front of the primary reason, a "2" in front of the second most important reason, and so forth until you have ranked all five items. You may use a number only once.

    1. ____ Parents suggested attendance
    2. ____ High school counselor suggested attendance
    3. ____ Saw advertisement on local TV which influenced you
    4. ____ Friends suggested attendance
    5. ____ Saw advertisement in high school

Each ranked category requires one response, and can be viewed as a separate question. In the above example, each respondent scores every category. Ranked items can be analyzed by determining the mean rank for each response category.

Coding Likert scale items. The Likert scale is most frequently used to obtain ordinal data. The instrument is designed so that a respondent selects one of five categories that best describes an opinion toward the question. The response categories of a Likert scale item do have a quantitative

relationship and consecutive scores must be assigned to consecutive categories. For example:

4. My children are receiving adequate vocational counseling in high school.

( ) Strongly Agree ( ) Agree ( ) No Opinion ( ) Disagree ( ) Strongly Disagree

If you assign a code of "one" to Strongly Agree, then you must assign a code of "two" to Agree, a code of "three" to No Opinion, a code of "four" to Disagree, and a code of "five" to Strongly Disagree. If you assign a code of "five" to Strongly Agree, then you must assign a code of "four" to Agree, a code of "three" to No Opinion, a code of "two" to Disagree, and a code of "one" to Strongly Disagree. The order must be followed consistently throughout your instrument.

Coding subscales of Likert scale items. Often a questionnaire will contain a number of subscales, each of which measures a different aspect of the total scale. For example, if the purpose of the survey is to measure the community need for a specific aspect of a vocational education program, part of the questionnaire may ask four or five questions pertaining to the respondent's attitude toward vocational education in the comprehensive high school. These four or five questions comprise a subscale, and are viewed as a group because each question attempts to discover the same attitude from different perspectives. When you rely on more than one question to assess an attitude, the response reliability is greater.

Questions composing a subscale should be distributed throughout the questionnaire so that a respondent must consider each question individually rather than simply falling into a "response pattern syndrome" or "mind set."

A few of the questions composing a subscale should be worded such that if the respondent agrees with a statement, e.g., the present vocational courses, there will be a positive response. Other questions in the same subscale, however, should be so worded such that the respondent who is pleased with the present vocational courses will respond negatively. Reverse wording alleviates biasing a subscale and provides a means by which to ascertain respondent consistency. For example, the following pair of questions are reversely worded.

5. Students enrolled in a vocational course in the comprehensive high school are well prepared to seek a job in the area.

( ) Strongly Agree ( ) Agree ( ) Undecided ( ) Disagree ( ) Strongly Disagree

. . . . . .

6. Students who receive their vocational training in the comprehensive high school tend to be inadequately trained.

( ) Strongly Agree ( ) Agree ( ) Undecided ( ) Disagree ( ) Strongly Disagree

A respondent who strongly favors the vocational program will mark "strongly agree" to the first question and "strongly disagree" to the second question. These questions are called reversed items.

The purpose of using and analyzing a subscale is to assess the overall opinion toward an issue. Affirmative responses toward the issue must be coded in one direction while all negative responses toward the issue must be coded in the opposite direction. In Table 1 is an illustration of the coding procedure for reverse items.

Table 1. Scoring of Reversed Questions

	Scale Scores				
Affirmative Response (Question 5)	1	2	3	4	5
	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
Negative Response (Question 6)	5	4	3	2	1

In this example, code 1 in questions 5 and 6 refers to a positive response toward the issue, while code 5 in questions 5 and 6 refers to a negative response to the issue. The respondent who highly favors the vocational education program will receive a score of two, while the respondent who highly disfavors the program will receive a score of 10. If the coding were not reversed for these two questions, the respondent who highly favors the program would receive the same score as the respondent who highly disfavors the program. To evaluate the group of questions as a subscale, you must code according to

the response toward the issue that the subscale as a whole is attempting to assess. Practice coding the following items: The responses are listed on the following page.

7. I enjoy myself most of the time in school.

( ) Strongly Agree ( ) Agree ( ) Undecided ( ) Disagree ( ) Strongly Disagree

. . . . . .

8. When I am in school I usually feel unhappy.

( ) Strongly Agree ( ) Agree ( ) Undecided ( ) Disagree ( ) Strongly Disagree

Correct Responses--Two Alternatives

	Scale Scores				
(Question 7)	1	2	3	4	5
	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
(Question 8)	5	4	3	2	1

	Scale Scores				
(Question 7)	5	4	3	2	1
	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
(Question 8)	1	2	3	4	5

Open Response Codes

Coding open ended items. Open ended items must also be quantified to analyze and summarize questionnaire or interview data. Coding an open ended question involves the superimposing of a structured format to a free or unstructured response. For efficiency, researchers often establish precoded response categories to account for responses of open ended questions. The extent to which precoding is possible is an indication of the extent to which the question is likely to yield relevant information. To avoid coding unreliably, open ended responses should be coded by at least two judges. It is the responsibility of the judges to categorize the unstructured responses according to the predetermined coding system. The coders must be trained in advance by the researcher.

The following question is an open ended item:

9. At what grade levels do you think children should be taught about careers and the world of work as a part of the school program?

The respondent is free to express an opinion in any manner. One respondent may write a paragraph describing the background information that led to the decision, another may write one summary word describing the opinion.

To establish precoded categories for an item, a researcher must know why the question is being asked and anticipate types of responses. The following are at least two possible coding systems for the above item:

____ Grades 1-3		____ Elementary school
____ Grades 4-6		____ Junior high school
____ Grades 7-8	(or)	____ Senior high school
____ Grades 9-10		
____ Grades 11-12		

Coding checklist items. Checklist items are a reasonable alternative to open ended items because they give the respondent more latitude, and also provide preidentified categories which are usable for coding. A checklist question is a special form of a forced response item which allows for multiple responding. For example:

10. Children should be taught about careers and the world of work as a part of the school program at which grade level(s). (Check as many as you desire.)

10.1 ____ Grades 1-3
10.2 ____ Grades 4-6
10.3 ____ Grades 7-8
10.4 ____ Grades 9-10
10.5 ____ Grades 10-12

To code multiple response items, each category must be viewed as a separate question to which the respondent may answer "yes" or "no." The respondent has the option to mark as many or as few categories as desired. The categories are not mutually exclusive and therefore the respondent considers each category in isolation. Within each category, a negative response may be coded "1" and a positive response may be coded "2." Whatever the coding system that is used must then be maintained for the entire study to assure uniform reporting.

Occasionally, checklist items will include a category titled "Other, please specify." If the researcher is

interested in analyzing these responses, the category must be approached like an open ended item. Responses must be assigned to subcategories and each subcategory must be analyzed individually.

Coding is a necessary procedure for analyzing and displaying survey data. A working knowledge of the types of forced response questions aids in developing a consistent and accurate coding system. Preplanning will not only make the coding procedure more efficient, but will improve the accuracy of the instrument. Included in that preplanning is care in construction of items to avoid any possibility of misinterpretation or bias. Chapter 5 will present a discussion of those concepts.

CHAPTER 5

PREVENTING BIASED RESULTS

Wording the Questions

Researchers often hold preconceived conclusions or assumptions pertaining to the research topic, respondents, or hypothesized results. These assumptions can cause a "bias" to be automatically built into a survey instrument. Built-in biases and inappropriate sampling almost always yield biased results. Researchers with a vested interest must be cautioned not to "load" a questionnaire by favoring one side of an issue or by devising questions which force respondent bias. Loading a questionnaire in any manner does not allow respondents the opportunity to disclose their true feelings about an issue. Any deliberate loading or biasing is totally unethical and unprofessional. It is also professionally dangerous: you'll probably be caught and discredited!

Many career or vocational courses include units which teach skills on how to find a job. An instructor in such a course may wish to assess job hunting techniques used by unemployed high school graduates. A questionnaire might be used, with one item on the questionnaire asking:

1. Which of the following sources do you use for finding job openings? (You may check more than one source.)

[ ] 1.1 State Employment referrals

[ ] 1.2 Friends and relatives

[ ] 1.3 Newspaper ads

[ ] 1.4 Various personnel office employees

[ ] 1.5 Private employment agencies

[ ] 1.6 Schools

[ ] 1.7 Other (please specify) _____

The built-in bias or probable assumption is that all unemployed persons are actively seeking work. If a number of respondents check only "Friends and relatives," the item may imply the distorted conclusion that respondents are unaware of useful sources of employment leads. However, some unemployed do not actively seek work and, therefore, sources of employment leads may be known but are not being utilized.

In this case, to assess the knowledge about job hunting rather than actual behavior, the item can be rewritten as is illustrated below.

2. If you wanted a job, which of the following sources would you use to find work? (Check any number that you would use.)

[ ] 2.1 State Employment referrals

[ ] 2.2 Friends and relatives

[ ] 2.3 Newspaper ads

[ ] 2.4 Various personnel office employees

[ ] 2.5 Private employment agencies

[ ] 2.6 Schools

[ ] 2.7 Other (please specify) _____

The item above places all respondents into a neutral frame of reference which seeks respondent knowledge. Unwarranted assumptions about the respondents are in this manner avoided. The important lesson to be learned here is that the simple framing of the question may reflect assumptions about respondents.

One ought to be aware of another rather subtle bias that can be built into an instrument; the "yes tendency," or the "response pattern syndrome." While responding to a list of questions, respondents may inadvertently have "mind set" by continuously answering to the positive. This tendency can be partially offset by including inverse or reverse questions. This question constructing technique requires the use of pairs scattered throughout the questionnaire. The technique helps to avoid the "yes tendency" and also acts as a means of checking respondent consistency on some issue or point.

Questions that are direct opposites to others tend to be redundant, but related ideas can be used to construct reverse questions. The following pair of questions might be used in determining attitudes toward a longer school year.

3. Do you favor a longer school year?

[ ] 3.1 Yes

[ ] 3.2 No

[ ] 3.3 Undecided

. . . . . .

4. If the school board approved a shorter school year, would you endorse such a decision?

[ ] 4.1 Yes

[ ] 4.2 No

[ ] 4.3 Undecided

In the above set, if "yes" is marked for both questions, one can conclude that the respondent has fallen into a "yes tendency" or that the respondent is inconsistent in opinion. A field test of a questionnaire may identify items that cause a "yes tendency." The researcher may then make adjustments for its reduction. Obviously the questions would be separated and would not follow each other.

Sampling Considerations

Surveys that are conducted by vocational educators often involve a known group of people (finite population). For example, all the public high school principals in a county or all seniors of one school might be the target population. In such cases the persons to be surveyed (sample of respondents) might include the entire target population. If the sample does not include the entire target population, then conclusions may be drawn related to the sample only. Unless appropriate statistical tests are used, predictions cannot be made with great certainty about the entire target population. For example, if a survey of 100 seniors is conducted, the investigator cannot automatically predict

that all seniors in a school district follow the patterns of those sampled.

Surveying the entire population of a comparatively small group eliminates the chance of sampling bias and is the preferred procedure. Improper sampling techniques almost always lead to biased surveys. However, sampling techniques are not difficult to use if precautions are taken. Volunteer samples often result in a biased study. When samples are drawn from any population, all members of the population must have an equal chance of being selected. Simple random sampling or stratified random sampling are two basic recommended techniques. The characteristics that may cause a bias in these sampling techniques will be discussed.

Random Technique

Simple random sampling is effective if a listing of the total population has been prepared. A telephone book is not a listing of the total population because such a list usually discriminates against the poor and is inaccurate since a large number of persons change residences, leave town, or have new numbers. City directories are also frequently neither current nor accurate. For example, two of the authors of this manual drew a 1,000 person sample from a telephone book. Immediately after the questionnaires were mailed, over 150 were returned with the U.S. Postal Service Stamp "Moved--No Forwarding Address!" Typically, however,

populations in school related surveys will be a more confined group, such as parents of high school students or home economics teachers in a specific district. Regardless of the size, the target population must be represented as the sample is drawn.

Drawing. Once the target population is defined, one simple method of selecting a random sample may be conducted by assigning a number to each member of the population. Corresponding numbers are then written on slips of paper with one slip representing each member of the population. The slips of paper are then placed in a container and thoroughly mixed up. Slips of paper can then be drawn one-by-one to identify the members of the population who will be surveyed.

Using random numbers. A table of random numbers or a computerized method may be more desirable and systematic for selecting random samples for larger surveys. These methods are also most appropriate for smaller surveys. Remember, when using simple random sampling, the entire population must be clearly defined and it must be equally possible for each member to be chosen for the sample.

Stratified Samples

Stratified sampling is a method used to obtain a greater degree of representation. Rather than selecting a sample from the total target population, appropriate numbers

are drawn from homogeneous subsets of that population. In a study of high school students, for example, the researcher may first organize the population by class and draw appropriate numbers of freshmen, sophomores, juniors, and seniors. The drawing must be representative of the percentage of the total for each class.

The researcher might wish to utilize an even more complex stratification method. In addition to stratifying by class, the researcher might also stratify by sex, by grade point average (GPA), and so forth. In this fashion, the sample would contain equivalent numbers of freshmen boys with a 4.0 GPA, of freshmen girls with a 4.0 GPA, and so forth.

The choice of stratification variables typically depends on what variables are available and the goal of the survey. Sex can often be determined from a list of names. Lists of teachers are commonly prepared according to school district, school, and perhaps subjects taught. In selecting stratification variables from among those available, the researcher should be concerned primarily that those selected can be represented accurately. Sex, education, and geographic location are frequently stratified.

The method of stratification usually requires grouping the population into discrete groups based on whatever stratification variables are used. On the basis of the relative proportion of the population represented by a given

group, a number of elements from that group are selected--either randomly or systematically. For example, if freshmen boys with a 4.0 GPA comprise one percent of the population, and a sample of 1,000 students is desired, then 10 freshman male students with GPA's of 4.0 must be selected. The effect of stratification is to insure the proper representation of the entire population in the sample which will be surveyed.

Systematic Techniques

Systematic sampling may be less laborious than simple random sampling, but does have some pitfalls. From the entire population, each "nth" member is chosen for the sample. For example, if there are 1,000 members in the target population and 100 are to be surveyed, every 10th member is chosen, beginning with any number beween one and ten. The starting number is randomly picked from a listing of "n" numbers or from a table of random numbers. In the first example, a number would be randomly selected from numbers ranging from one to ten. If three were selected, then numbers in the sample would be 3, 13, 23, 33, . . . until 100 subjects were chosen.

To avoid biasing a sample when using the systematic sampling technique, the listing of the population must not be cyclical. That is, it should not have any repeating pattern. For example, 12 teachers from 12 elementary schools are to be surveyed. Each school has listed their teachers by grade

level and each school has two classes for all grades, 1-6. If every 12th teacher is to be surveyed, and one began by selecting the second name and chose each 12th name thereafter, only sixth grade teachers could conceivably be surveyed. For this reason, great attention must be given to the manner in which lists of the population are prepared to insure that cyclical patterns are not present.

Sample Size

There are no absolute standards regarding the percentage of persons in a population who should be surveyed. However, it is imperative that those chosen be sufficiently representative of the entire population in the variables for which the sample will be analyzed. No matter what the sample size, data must be analyzed statistically to determine the confidence with which generalizations can be made concerning the entire population.

Table 2 provides a rough estimate of the sample size needed for various populations. Please remember that the sizes are only rough estimates and that each survey must be considered individually for its unique characteristics. No statistical inferences may be determined from the figures provided.

Table 2. Estimated Sample Size

Population Size	Sample Size	Population Size	Sample Size
100	79	5,000	357
200	132	6,000	361
300	168	8,000	367
400	196	10,000	370
500	217	15,000	375
600	234	20,000	377
800	260	30,000	379
1,000	278	50,000	381
2,000	322	75,000	382
3,000	341	100,000	383

SOURCE: The National Education Association. Table 2 is reproduced with the written permission of the NEA.

Is the Nonrespondent a Factor?

A number of studies have analyzed the significance of nonresponses. Larry L. Leslie (1972) conducted a thorough study of nonresponse bias and concluded that: (1) when surveying populations with a common group identity (e.g., parents from one school, teachers in a school district), response differences between respondents, nonrespondents, and late respondents are unlikely; and (2) the most likely exception to the above is the case when the topic overrides importance to group membership, e.g., highly personal or sensitive areas.

In 1960, Marjorie N. Donald found no significant demographic differences between respondents and nonrespondents in a study involving members of the Womens' League of Voters. Differences were found between respondents and nonrespondents

in the amount of involvement or interest that individuals had toward the research topic. Yet the obtained responses did not differ between the two groups.

Table 3 illustrates the percentage of returns Donald received after the initial mailing and subsequent follow-ups.

Table 3. Percentage of Returns and Follow-up Techniques

Mailing or Follow-up	Percentage Returned
First mailing	46.2%
First follow-up letter	12.3%
Second follow-up letter plus second copy of questionnaire	8.8%
Telephone call plus third copy of the questionnaire if desired	10.1%
Total	77.4%

M. N. Donald, "Implications of Non-response for the Interpretation of Mail Questionnaire Data," Public Opinion Quarterly 24 (1969): 99-114.

By observing Donald's data, it may be seen that initial questionnaire return rates can be greatly increased with additional follow-ups.

The impact of nonrespondents can be determined by comparing "waves of respondents" (early, average, and slow returners). According to Leslie, if the population is rather homogeneous and if responses between waves do not differ, then a very high response rate is probably not necessary. However, it is still the responsibility of a researcher to obtain the largest possible percentage of returns.

Lewis Mandell's (1974) example of a nonresponse bias involved perceived discrimination of women in employment. Upon review of the data, a researcher might find that the response rate for women is 90 percent, whereas, the rate for men is 50 percent. Also, a greater percentage of women (75%) than men (40%) felt that women are discriminated against in employment. With the available data, the study results would not reflect the feelings of the total population, thus a nonresponse bias is produced.

Selecting the Appropriate Response Type

Predetermining Categories

How does an investigator determine the exact type of question construction to be used when designing a survey? If respondents are forced to choose from categories which do not relate to their feelings, a bias is produced. When questions which require dichotomous answers (yes-no, agree-disagree, never-always) are used, all possible responses must be considered. For example, if a person were asked "Do you favor increased vocational training?"--Yes or No. A person might choose to omit the item since such an opinion would undoubtedly require qualification--e.g., increased for whom, when, where? However, if a question is worded precisely and there is any chance a respondent could not choose between dichotomous answers, then a continuum must be used. The five-point Likert

scale is the most widely used scale and the most highly recommended.

A question like, "Do you have an overhead projector in your room at all times?" does not require a scaled choice of responses. Yes or No are logically the only two possible responses. However, a question assessing job satisfaction would require the use of a continuum.

5. Check the answer that best describes your present job satisfaction.

   5.1 ____ Very satisfied

   5.2 ____ Satisfied

   5.3 ____ Don't know

   5.4 ____ Dissatisfied

   5.5 ____ Very dissatisfied

Forced response items with exhaustive categories can gather useful data. Again, it is important to use "other" as one response category if exhaustive choices cannot be categorized. A study might be conducted to examine vocational guidance resources for students. One question could be:

6. Which of the following persons would you visit first for vocational guidance? (Mark only one.)

   6.1 ____ Relative

   6.2 ____ Parent

   6.3 ____ Friend

   6.4 ____ Counselor

   6.5 ____ Principal

6.6 ____ Teacher

6.7 ____ Other (please specify) _____

A rank order format may be used to gather this information.

7. Rank the following persons in the order you would seek vocational guidance from them. (Place a "1" in front of the first person you would consult, a "2" for the second, etc., until you have ranked all six or seven possibilities.)

7.1 ____ Relative

7.2 ____ Parent

7.3 ____ Friend

7.4 ____ Counselor

7.5 ____ Principal

7.6 ____ Teacher

7.7 ____ Other _____

The rank order format, in this instance, provides the researcher with more information. If the researcher is interested only in the first preference, then the first form is most appropriate. However, if the average preference for each category contributes to the goals of the study, the ranking form is most appropriate.

Using Forced Response Items

If a forced response item is used, an investigator must adequately anticipate all the significant alternatives without overlap. Further, all items must be logically or consistently ordered and the wording of items must be

impartial and unbiased. Designing forced response categories that obtain accurate results requires careful consideration for every alternative. Often questionnaires contain alternatives which are too similar, thus unnecessarily dividing responses.

The following continuum, or one very similar to it, is often used to determine the use of some teaching method or the availability of an educational product. The question might be:

8. How many times do you use the overhead projector in your Home and Family Living classes?

8.1 ____ always

8.2 ____ usually

8.3 ____ sometimes

8.4 ____ infrequently

8.5 ____ seldom

8.6 ____ never

Other than always and never, the spectrum of responses is so very close that it is nearly impossible to draw worthwhile or reliable conclusions.

One better method is to place some precise or quantitative elements in the continuum. In the case cited above, at least a more definitive set of conclusions could be inferred if the response set were:

9.1 ____ every day

9.2 ____ at least once a week

9.3 ____ at least once a month

9.4 ____ less than once a month

9.5 ____ never

Another very frequent error in question writing is to require a single response when the question has two parts. Assume that you received a questionnaire which, in part, asked:

10. To what extent do you approve of team teaching or flexible scheduling in your Vo-Ag classes?

[ ] 10.1 Greatly approve

[ ] 10.2 Approve

[ ] 10.3 No opinion

[ ] 10.4 Disapprove

[ ] 10.5 Greatly disapprove

Although the continuum is technically correct, the question is invalid. The respondent is asked to make a joint decision about two completely different concepts. There is no possible analysis that can identify which of the pair is being judged. This type of plural question is very often used. In this case there should be two distinct questions. Also, when a respondent is asked to make a value judgment of some kind the response choices should not be numbered. Numbers seem to indicate a rating scale, although you might explain the instrument design in a cover letter to alleviate this unwarranted conclusion.

Other biases may be constructed into a survey instrument if the investigator does not analyze each set of responses for equal weighting, or in controversial issues, a positive, neutral, or negative position.

For example, a survey of public opinion concerning the effectiveness of vocational training in high schools is planned. If a disproportionate number of questions are concerned with the positive aspects of the curriculum, possible negative public attitudes may not be elicited. The item which follows illustrates this fallacy.

11. Concerning our high school vocational program, to what extent do you think it is doing a good job?

[ ] 11.1 Doing great

[ ] 11.2 Doing an adequate job

[ ] 11.3 Doing about as good as we can afford

[ ] 11.4 Could be improved

[ ] 11.5 Not doing a good job

Note above that four of the five responses are positively oriented, while only one is negative. There is no neutral response. On any random sample the bias ought to show 80 percent responding favorably to this item and 20 percent responding negatively. The above bias is a very frequently observed one in response construction.

To alleviate the positive or negative bias, as may be the case, a response set of five should contain the following elements:

[ ] 1. Very Positive Response

[ ] 2. Positive Response

[ ] 3. Neutral Response

[ ] 4. Negative Response

[ ] 5. Very Negative Response

The model above is mandatory for Likert-type response sets.

If the researcher desires to use but three items in a response set, then a positive, neutral, and negative spectrum should be used. Biases can be built into forced response items--either by purposeful design or ignorance. The following illustrates this point.

12. Put a check [/] in the box that preceeds your favorite make of car.

    [ ] Ford

    [ ] Dodge

    [ ] Chevrolet Impala

    [ ] Chevrolet Caprice

    [ ] Fiat

    [ ] Toyota

    [ ] Other (please specify) _____

Did you detect the two causes of bias? First, the response choice for Chevrolet is divided, potentially reducing its rating. Secondly, the omission of popular cars such as Volkswagon may preclude their being rated even though the category of "other" is offered. The above checklist would yield invalid results, at best, especially if several respondents checked more than one make of car.

Another source of bias is to request professional judgments of the general public, for example, if one were asked the following:

13. I favor a 12-month school year because students have much more to learn than in the past.

____ agree

____ disagree

____ do not know

Some respondents would be in a quandry, if they favored a 12-month school year, but with not all students attending at the same time. The two notions: (1) favoring a 12-month school year, and (2) students have more to learn now than in the past, should be presented in two different questions. In addition, if this question is addressed to the general public the situations should be defined.

To what extent is a question likely to be influenced by the context of the preceding one? There is a dangerous way of "prompting" a respondent. In a series of questions, a respondent may be led to a decision that would not have been made if a different line of questioning had been used. A researcher is ethically bound not to be dishonest or to willfully structure a questionnaire to "prove a point."

Consider this case. If, after a number of questions concerning which occupations have the most respect, highest pay, and most satisfaction, a student is asked what he or she plans as a future occupation, the response will surely be

biased. Such a design is referred to as "prestige bias." People enjoy prestige, even if only in questionnaires. This bias can be avoided by careful placement of items throughout the instrument.

Some considerations must be given to influences outside the survey. The timing of a survey alone, for example, can be a biasing factor. For example, officials wish to know the number of seniors who plan to apply for work at a large local lumber mill. A questionnaire is sent out immediately after a major labor dispute has occurred. Possibly, the survey results might be substantially different from a similar survey taken at a different time.

The number of types of biases is nearly equal to the number of types of studies conducted. Each study may have a unique type of bias which must be minimized or eliminated if one were to arrive at valid conclusions. The ultimate end of a survey is to determine perceptions at some point in time. If the perceptions are validly sampled then a high degree of credibility will be gained by the researcher. And, the reverse is also true!

Now, on to the conduct of the survey, which is the focus of Chapter 6.

CHAPTER 6

CONDUCTING THE SURVEY

Knowing the Target Population

Vocational and career educators are faced with the problem of planning, implementing, and evaluating current and projected programs each year. One way to obtain needed information to help make decisions or solve problems is to seek opinions from the concerned clientele. A first step is to identify the population group which can best provide the most meaningful information to help in the decision making processes. These important groups are called the "target population."

A target population may include more than just a single interest group. For example, a recent study wanted to assess attitudes about expanding vocational education sites outside of the existing school facility. Investigators determined that it would be important to obtain attitudes not only from the vocational and career instructional personnel of the school, but also from the involved parents and the students. By incorporating these segments of the educational community, the investigators received three different points of view on which to base a decision--a decision based on relevant and meaningful data.

To obtain the most complete and unbiased data, researchers should be sensitive to unique characteristics of target populations. For example, if these subgroups have already been "bombarded" with interviews and questionnaires, there may be reticence to respond to yet another survey.

Community Resource People

In recent years, ethnic minorities and the socio-economic disadvantaged populations have been priority targets for all sorts of researchers. After being frequently massaged for information, these respondents often do not perceive any positive result from the all too numerous studies. How then, can you obtain planning information from a unique audience?

A few techniques have proven successful. One method is to enlist assistance from resource persons already in the community. These individuals may possibly be able to provide all the needed information. If they cannot provide complete and accurate information and a survey is necessary, the resource persons, because they have established rapport with the target group, may actually be more successful than the researcher in collecting the needed data. For example, the county cooperative extension or home demonstration agent might have established communication channels with a particular target population. It may be beneficial to the researcher to engage these agents by having them write a cover letter or

conduct the interviews. Other resource persons might be members of the ministry, scout leaders, local business managers, and employment service administrators.

Cardozier (1971) suggests that alternative sources of information could be used in the event that a survey might not be possible. He suggests using public resources such as the records of public schools, census data, welfare offices, and chambers of commerce. In other words, collect data at primary record sources. These records will be accurate and allow a researcher to complete data collection in an unobtrusive manner.

Questionnaires are most frequently used to identify a problem or to show that a particular or emerging need exists. A questionnaire oriented to a group of people can be a powerful instrument, but so can a respected professional. A resource person knowledgeable of the field can be very helpful or persuasive to others.

Resource persons must be given specific, unbiased questions to ask their contacts. They must also understand that the collection of data requires accurate reporting. Most likely, when you enlist the aid of community resource persons, you will find that a considerable amount of training must also be undertaken--including a few simulated interviews to insure quality work.

Protection of Participants

After the target population has been defined, investigators must realize that recent federal legislation has placed limitations on methodologies that can be used when conducting research on human subjects, i.e., the participants.

Individuals who write proposals concerning behavioral research which will be submitted to the Department of Health, Education, and Welfare (D/HEW), should be aware of recent legislation on the protection of human rights (Public Law 93-348, 1974, short title): "The National Research Service Award Act of 1974," Title II, Protection of Human Subjects of Biomedical and Behavioral Research," establishes procedures that must be followed when any person is involved as a subject in a behavioral studies program funded by D/HEW or any other federal agency!

The law is lengthy and technical. For our purposes, it is necessary to know that a National Commission for the Protection of Human Subjects of Biomedical and Behavioral Research has been established. Its duties include establishing guidelines for biomedical and behavioral research to protect human rights. The Commission's responsibility entails developing methods for evaluating and monitoring the performance of institutional review boards. Also, it investigates biomedical and behavioral research conducted or supported under HEW programs involving children, prisoners, and institutionalized mentally infirm.

The Assistant Secretary for Planning and Evaluation (D/HEW) established rules for the protection of the privacy of persons who are the subjects of projects sponsored by D/HEW. The following excerpt from the Federal Register is very explicit and illustrates the kinds of constraints placed on human research, of which vocational education surveys would qualify.

> (c) Protection of privacy. (1) No project supported under this part may involve the use of a data collection instrument which constitute invasions of personal privacy through inquiries regarding such matters as religion, sex, race, or politics. (2) A grantee which proposes to use a data collection instrument shall set forth in the grant application an explanation of the safeguards which will be used to restrict the use and disclosure of information so obtained to purposes directly connected with the project, including provisions for the destruction of such instruments where no longer needed for the purposes of the project.
>
> (d) Clearance of instruments. (1) Grantees will not be required to submit data-collecting instruments to the Assistant Secretary or obtain the Assistant Secretary's approval for the use of these instruments, except where the notification of grant award specifically so provides. (2) If a grantee is required under paragraph (d)(1) of this section to submit data-collection instruments for the approval of the Assistant Secretary or if a grantee wishes the Assistant Secretary to review a data-collection instrument, the grantee shall submit seven copies of the document to the Assistant Secretary along with seven copies of the Office of Management and Budget's standard form No. 83 and seven copies of the Supporting Statement as required in the "Instructions for Requesting OMB Approval under the Federal Reports Act (Standard form No. 83A).

Of importance to all researchers is that the data gathering instrument does not seek sensitive information. In some cases, your instrument must be screened by a Human Subject Review Board.

Do not hesitate to get clarification on how you may use human subjects in federally funded projects. Guidelines may be obtained by contacting any of the regional D/HEW Field Offices. In the Northwest, for example, contact:

United States Government
Department of Health, Education, and Welfare
1321 Second Avenue
Seattle, WA 98101

Inclusionary Language

Another aspect to consider when writing requests for funds, data gathering instruments, cover letters, or final reports is to use inclusionary language. Inclusionary language helps to remove sex bias in dialogue and is important to both sexes when describing vocational or career roles. The following statements are offered as comparative samples.

Example 1. "After a student completes the welding course, he will be able to use three different styles of beading."

The implication of this statement is that females are excluded from taking welding courses. The statement could have been improved if it had been written with inclusionary language:

Example 2. "Upon completion of the welding courses, students will be able to use three different styles of beading."

Example 3. "Upon completion of the Family Living course, she will be able to plan a weekly budget."

Again, this implies that males have no desire to be involved with a course in Family Living. The more appropriate writing would be:

Example 4. "Upon completion of the Family Living course, the participant will be able to plan a weekly budget."

Other examples. When writing cover letters or follow-up letters use alternatives for the traditional "Dear Sir" when the sex of the addressee is unknown. Other salutations that could be used include: Dear "Supervisor," "Director," "Owner," "Faculty Member," or "To Whom it May Concern." There are also alternatives that may be used when describing various vocations such as "letter carrier" instead of "mail man," "human resources" instead of "manpower," and "newscaster" instead of "newsman."

By using inclusionary language, educators are broadening the awareness of the world of work for all concerned. Stereotypical vocational role expectations for the sexes have become a major concern of our society. The writer of survey instruments must also become sensitized to these societal concerns.

Communicating with the Target Population

Written Correspondence

Once the target population has been selected, the next task is to insure that the participants receive and respond to the survey instrument. An effective cover letter explaining the reason for the study helps in obtaining a good return of the survey instrument. The cover letter must tell why it is important for the respondent to give personal

attention to completing the instrument. A well-written letter is a persuasive and motivating device.

The following points should be addressed when designing a cover letter:

1. State the purpose of the study clearly.
2. Explain how the data will be used.
3. Explain the value of the study.
4. Identify the sponsoring agency or institution.
5. Include the investigator's name and the name of the study's sponsor.
6. Give explicit directions for completing the questionnaire.
7. Provide a reasonable deadline for returning the questionnaire.
8. Assure the respondent that the data will be handled confidentially.
9. Ask if a copy of the results of the study are desired by the respondent.
10. Provide a self-addressed, stamped envelope.
11. Date the letter.
12. Sign the letter personally.
13. Use an original or an extremely high quality copy.

A sample cover letter that contains all the points that have been mentioned above follows as one model.

Sample Cover Letter

Rainier Public Schools
Last Chance Gorge, Washington 98999

Date

Dear Vocational Educator:

The Office of Evaluation and Research of the Rainier Public Schools, in cooperation with the Office of the Superintendent of Public Instruction, is conducting a study to assess the supply and demand of vocational teachers in this state. This information will be used for future planning in vocational certification program offerings provided by state colleges and universities.

Enclosed is a questionnaire designed to complete the study. Your opinion would be greatly appreciated. Just mark the appropriate response for each item. If you would like to include comments of your own please write them in the Remarks section. All responses will be handled confidentially.

We hope to complete the study by (date) and your cooperation will help us a great deal. If you want a copy of the completed study please so indicate on the questionnaire.

Sincerely yours,

Dr. Robyn A. Bird
Project Director

Ms. Dianne L. Hunt
Project Assistant

RAB:ts

Enclosure: Questionnaire
Return envelope

Follow-ups. The investigator must usually conduct a follow-up after the initial mailing if the questionnaire return rate has not been adequate. There are several methods that can be used. One technique is to send a second letter which "gently" requests cooperation in returning the questionnaire. Another method is to send a second questionnaire and return envelope with the second letter.

Postcards may also be used in the follow-up. With tight budgets, postcards are less expensive. A suggested postcard note follows.

Dear Vocational Educator:

Two weeks ago you received a questionnaire concerning vocational programs in your school. This is just a reminder to ask your help in completing and returning that questionnaire. If you have already done so, thank you. If not, your reply is needed to help in assessing vocational teacher supply and demand in the state.

Thank you for your cooperation.

Dr. Robyn A. Bird
Project Director

If you have adequate budget, use a telephone contact with tardy respondents.

Consideration for the Respondents

As vocational and career educators the problem of finding time to complete questionnaires is sometimes difficult. Therefore, when you send out questionnaires, you can understand some of the problems of the recipient.

Consider the limitations of the questionnaire when deciding whether or not to use one. These limitations are also useful as guidelines in preparing a survey. Here are some suggestions that should be considered when attempting to get maximum response.

1. Is the entire questionnaire concise enough so that the respondent will not have to use time "guessing" what is required?

2. Will the subject be interesting to the respondent? If the subject of the investigation does not have any general interest, completed returns will be practically nil.

3. Is the questionnaire verbally designed (vocabulary, technical jargon) for a particular target population? You must know the language and vocabulary limitations of the clientele and create an instrument that can be understood by them.

4. Have the questions been printed with crisp, clean type? The physical appearance of the questionnaire can affect return rate. If the instrument has a messy appearance, it implies that the investigator will handle return data in an unprofessional manner.

5. Does the questionnaire look professional? Are the questions presented in an attractive, uncluttered way? An orderly presentation of items helps the respondent to reply more efficiently.

6. Is the questionnaire easy to handle? In other words, is the instrument void of loose inserts, fold-outs, and requirements to cross reference particular items?

7. Are the directions for completing the questionnaire stated clearly? If a recipient is not afforded appropriate instruction on "how and what" to do, a large return cannot be expected.

From the respondent's point of view, the ease with which an instrument may be completed is very important. Remember, you may have gone through the same experience, so

be considerate of your participants. Consequently the investigation will be beneficial.

The "tips" presented in this chapter should aid in the overall conduct of a survey. We desire to imply that conducting a survey is a rigorous and serious effort--not something that can be hastily constructed and distributed. Of course, once the data are collected, then what? That question is answered in Chapter 7.

CHAPTER 7

TABULATION OF DATA

Methods of Tabulation

Designing a survey requires that a plan be specified for tabulating the returned data. In most cases, a response count of each category is required. The purposes of survey research are to determine general characteristics and opinions of a sample population; all data must be summarized to achieve these objectives.

There are two general methods for tabulating data. The first method, hand tabulation, is less efficient, more time consuming, yet practical for a limited number of questionnaire items or a small sample size. The second method, a readily available alternative, is electronic data processing. This method is invariably used for larger sample sizes and for most statistical analyses.

Hand Tabulations

Tabulation of data by hand is a technique which is usually efficient for small sample sizes or where there are relatively few questionnaire items. No electronic data processing equipment or special material is necessary. The method consists of simply counting the number of responses

for each category of each questionnaire item. Efficient hand tabulation requires planning, consistent organization, and neatness. Below are two sample questions followed by a layout for tabulating their results.

1. I am

   1.1 ____ male

   1.2 ____ female

2. I am

   2.1 ____ Under 20 years of age

   2.2 ____ 20-29

   2.3 ____ 30-39

   2.4 ____ 40-49

   2.5 ____ 50 years or over

Table 4. Tabulation Form for Survey Items

Variables	Categories		Totals
Sex	Male	|||	10
	Female	𝍸 ||	
Age	Under 20	||	10
	20-29	|||	
	30-39	|	
	40-49	|||	
	50 and over	|	
No response			0

For illustration purposes in Table 4, assume that 10 respondents marked the above two questions. Three of the respondents were male and seven were female. Two were under 20, three were between 20-29, one was between ages 30-39, three were 40-49, and one was 50 and over. The column labeled "Totals" indicates the number of respondents who marked each questionnaire item. The "No Response" variable indicates how many respondents neglected to mark each questionnaire item. These counts are important as a check against tabulation error and for further analysis involving percentages and means. The tabulation procedure requires examining each questionnaire returned, noting which category represents that particular respondent, and tallying the response appropriately. It is a prudent practice to place a mark on each questionnaire which has been tabulated. In this manner, you will know which instruments have been counted and which have not.

Frequently, researchers are interested in determining relationships between the response categories of two or more questionnaire items, for example, the number of males and females in each age category. Data can be specifically arranged to indicate the frequency of response for each of these subcategories. Table 5 illustrates an efficient layout for tallying the relationship between two questionnaire items.

Table 5. Tabulation of Two Items

Age	Sex			
	No Response	Male	Female	Totals
No response				
Under 20		|	|	2
20-29			|||	3
30-39			|	1
40-49		||	|	3
50 and over			|	1
Totals		3	7	10

As you examine each questionnaire, note whether the respondent is male or female, and the appropriate age category. Mark the tabulation sheet in the appropriate combination sex and age cell. Note that there is only one cell appropriate to both of these categories. The cells labeled "Totals" in Table 5 provide a separate count of the response categories of each questionnaire item. In this example there is a separate count of males, females, and each age category. For example, in Table 5 there are two respondents under 20, three between the ages of 20-29, one between 30-39, three between 40-49, and one 50 and over. A total of 10 respondents marked the age item.

Compare Tables 4 and 5 and note that it would be redundant to tabulate the data in both forms. Table 5 yields the same information as Table 4, in addition Table 5 indicates

the relationship between the subcategories of two questionnaire items. If relationships between questionnaire items are important, these same items do not necessitate individual tabulation. By grouping data according to your interests, more efficient and detailed displays of data can be obtained. Before you begin tabulating, organize a tabulation form for the entire questionnaire to assure efficiency and lack of repetition.

When ranking is required, each category of the question must be tallyed for each possible preference. Below, in Table 6, a first preference choice for Metal Shop was selected by six respondents. Woodworking received two first preference choices, while Airframe received three. The number of respondents who selected each of the classes for second and third choices is also tabulated.

Table 6. Tabulation of Ranked Items

Preferences	Classes		
	Metal Shop	Woodworking	Airframe
First	𝍸 I	II	III
Second	II	𝍸 I	III
Third	III	III	IIII
No response			

Electronic Data Processing

Data are most frequently tabulated and analyzed by electronic equipment. Three standard pieces of machinery are the key punch, the card sorter, and the computer or printer. These items of equipment are accessible in most towns. Vocational schools and community colleges typically have a key puncher and a card sorter. State colleges and universities invariably possess the equipment, and will process outside data, usually charging only for personnel. Private businesses charge slightly higher fees for the same services.

Tabulation and analysis needs for the questionnaire should be planned in accordance with the budget before the research begins. If the use of electronic data processing is planned, the instrument should be examined by a data processing specialist before the questionnaire is printed. It has been very sad for many researchers to determine, after data have been collected, that the items are not transferable to data cards. Thus, protect your study by seeking expert advice in the early planning stages.

Data are transferred from each questionnaire to electronic data processing (EDP) cards, which are a medium for systematic representation. The illustrated EDP card (Fig. 1), also called an "IBM card," is divided into 80 vertical columns, with 10 numbered spaces in each vertical column, zero through nine. Data are made machine readable

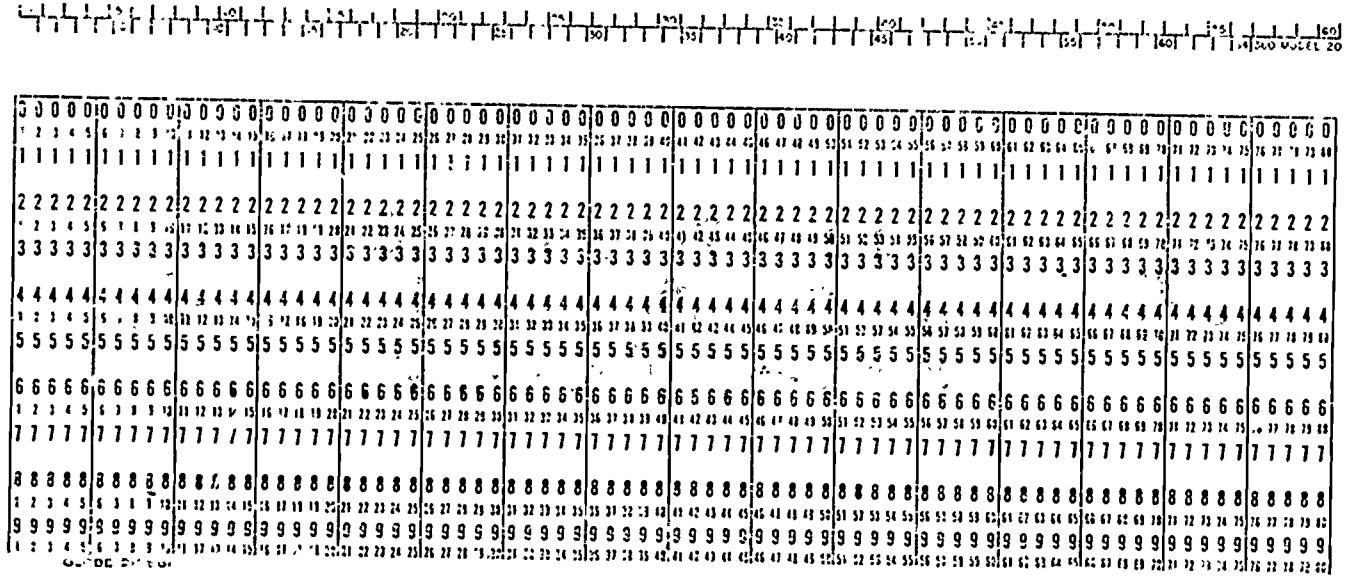

Fig. 1.--A Typical Electronic Data Processing Card

by assigning one or more specified vertical columns of the card to a particular questionnaire item and assigning spaces within that column to the various possible response categories. It is efficient when transferring the data to the card, if the questionnaire item number is coded to correspond directly to the vertical column number of the EDP card. For example, if the first item of a questionnaire requests the respondent's age and there are fewer than 10 response possibilities, this item can be represented in vertical column one. If the age data are divided into five categories, six of the 10 numbered spaces of the column will be needed to represent the respondent's age. Row zero is usually reserved to indicate "no response." The response category coded (1) should be represented in row one for easy transfer of data. By numbering the specific response categories to coincide with the row numbers, an easy coding device is automatically established with your questionnaire.

A single EDP card normally accommodates one respondent. If more than 80 vertical columns are needed to record the responses of one individual it is necessary to use two or more cards. The last few vertical columns should be used to mark the card for identification. As a check against transfer errors, each respondent should be assigned an identification number to be written on both the original questionnaire and the appropriate EDP card. If more than one card per respondent is necessary, the card number, 1, 2,

3, etc., should be indicated on the EDP card in a specified column. Figure 2 has identification numbers marked in the last columns. It is card number 2 (indicated in column 80) representing respondent number 25 (indicated in columns 78-79).

Precoding

Precoding a questionnaire allows one to key punch or hand tabulate directly from the questionnaire. Precoding forced response data involves assigning questionnaire items and response categories to EDP card columns and rows in advance of printing the questionnaire. Notations are then made on the questionnaire that indicate these assignments. There are two steps involved in precoding a questionnaire.

Step one. Card and column assignments should be indicated for each question. Typically, the column number is shown in parentheses in the left margin beside each item. This should be done inconspicuously so as not to distract the respondent. Otherwise, explain the use of these numbers to the respondent in the introduction or cover letter. The illustration below shows a precoded questionnaire item.

[3] 3. Which of the following best compares this year's (1974-75) vocational agriculture curriculum to next year's (1975-76) planned vocational agriculture curriculum?

____ (1) Fewer classes will be offered next year

____ (2) Same for both years

____ (3) More classes will be offered next year

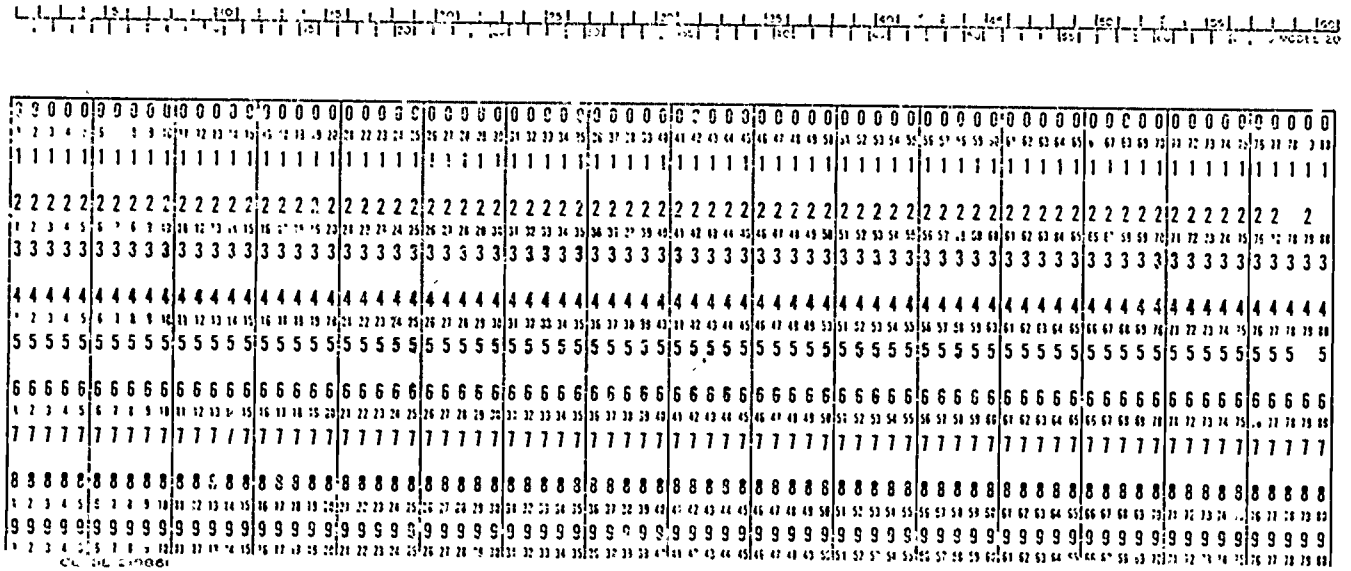

Fig. 2.--EDP Card with Identification Numbers Punched

In this example, column three of the EDP card will be used to represent question three. It is more expedient when the questionnaire item number and the column number are the same; but this is not always possible with ranked or checklist items.

Another format may be used for the same question: The questions and responses remain the same, but the response items have a numerical system that identifies both the column and the row. For example:

3. Which of the following best compares this year's (1974-75) vocational agriculture curriculum to next year's (1975-76) planned vocational agriculture curriculum?

3.1 ____ Fewer classes will be offered next year

3.2 ____ Same for both years

3.3 ____ More classes will be offered next year

Or the numbers could follow the blank:

____ 3.1 Fewer classes will be offered next year

____ 3.2 Same for both years

____ 3.3 More classes will be offered next year

The examples above quickly show that column three will use three rows, one, two, and three. Again, nonresponses would automatically be marked in row zero. Either system is efficient and saves valuable time in transferring data.

Step two. The second task in precoding involves row assignments within a given column. If there are nine or fewer response categories to an item, assign the categories

to rows 1-9. Reserve row "zero" to represent "no response." Only one space in each column should be punched. In the case of ranked and checklist items, where the respondent is required to respond to more than one category, each category must be represented by a separate column on the data card. The ranking assigned by the respondent for a particular response category should be punched in the row which corresponds to the ranked number, in the column which represents that response category. In summary, ranked or checklist items require more columns on the EDP card than do nominal, ordinal, or interval items whose categories are mutually exclusive.

Keep a code book or log which describes the locations of questionnaire items and response categories on EDP cards. In simple surveys, it is sufficient to list these assignments on a blank copy of the questionnaire.

If a precoded questionnaire contains proper indications of columns and punch assignments, direct keypunching from the questionnaire to the EDP card is possible. To accomplish this, all questionnaires should be first edited to clarify or assign "zeros" to any unclear responses. Those questions that are unanswered or are incorrectly completed should be automatically assigned a zero.

The layout of a questionnaire is extremely important in aiding direct punching. Question items and response

categories should be located in distinct patterns for ease of reading and transferring of responses to EDP cards.

There are some instances in which precoding of categories is not recommended. When the respondent is requested to give an opinion, such as is typical with Likert items, numerical codes assigned to response categories tend to "weight" the study. Consider the following illustration where item 4 might ask:

4. I would encourage my child/children to participate in a program that could provide skills to get a job.

____ (1) Strongly Agree

____ (2) Agree

____ (3) No opinion

____ (4) Disagree

____ (5) Strongly Disagree

The numbers in this case may tend to influence the respondent's choice. A respondent may associate a number one with the "best" or a number five with the "most." A factor which may preclude precoding interval items is the frequent use of reversed questions with the Likert scale. It may be confusing to the respondent if "Strongly Agree" were coded five on one question, and coded one on another question.

When the response categories of some items cannot be precoded, it is necessary to prepare data transfer sheets for keypunching. A set of data sheets is illustrated below.

Table 7. Representative Data Response Models

Blocked Column-Question Items	Open Numbered System	Closed Pre-coded System	Open Pre-coded System	Parentheses Pre-coded System
[1]	1.			
	___ (1)	1.1 ___	___ 1.1	( ) 1.1
	___ (2)	1.2 ___	___ 1.2	( ) 1.2
	___ (3)	1.3 ___	___ 1.3	( ) 1.3
[2]	2.			
	___ (1)	2.1 ___	___ 2.1	( ) 2.1
	___ (2)	2.2 ___	___ 2.2	( ) 2.2
	___ (3)	2.3 ___	___ 2.3	( ) 2.3

Each respondent is represented by a separate data sheet. The key puncher simply transfers the data from the code sheet to an EDP card. The data sheet must be consistent in organization. The keypuncher should never have to "guess" the appropriate response nor should the keypuncher be required to match codes with responses. That is the researcher's responsibility!

A punched deck of EDP cards is ready for virtually any type of analysis. The deck can be fed through a card sorter, which simply counts the number of respondents who marked each category. The card sorter can also be used to separate cards according to specified categories, and then to subdivide the categories according to another item. For example, the cards may be separated according to sex. In this case, there would be two decks; one representing males

and the other representing females. The researcher may then want to subdivide according to age. Each deck would be fed into the card sorter, one at a time, so that males would be divided according to age and females would be divided according to age. See Fig. 3.

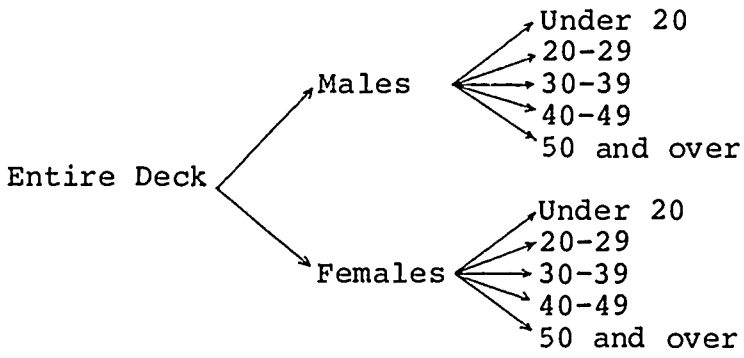

Fig. 3.--Subdivision of Two Questionnaire Items

The card sorter does the same type of analysis that can be done using hand tabulation. Yet with the card sorter, subsort or category sorts can be accomplished for an unlimited set of arrays and all within a relatively few minutes. Such output allows the researcher to spend more time interpreting the data, rather than simply tabulating it.

Punched EDP cards are ready to be fed into a computer when accompanied by a program which specifies a certain analysis. There are numerous preprinted programs (commonly called "canned programs") that usually require few additional computer instruction cards. Programs can be selected that range from simple means and percentages to complex statistical analyses.

The advantages of electronic data processing are numerous. The researcher's time is greatly economized by the speed with which electronic equipment analyzes data. Accuracy is improved because humans are involved in few steps. There is less opportunity for human error. Also, a deck of EDP cards can be used again and again for different analyses by selecting different programs. Although organizing the survey may take somewhat longer when using electronic data processing, the pay-off to the investigation can be very substantial because greater analyses of the data can be conducted. In some cases, percentages are very adequate. In other situations, you will want to use some inferential statistics. Chapter 8 provides detail about two commonly used treatments when using questionnaire data.

CHAPTER 8

STATISTICAL ANALYSIS OF DATA

Descriptive Techniques

Statistical analysis refers to those methods which may be used to organize and interpret collected data. A few of the common procedures used to summarize and describe sets of data are included in this section.

Respondent Counting

The preliminary step in analyzing data is usually respondent counting. Either of two methods are used: hand tabulations or electronic data processing tabulations. When working with nominal, interval, checklist, and some types of ordinal data, respondent counting is a very straightforward procedure. For review, consider the following questionnaire item.

1. Do you plan to attend a community college when you graduate from high school?

   ____ (1) Definitely yes

   ____ (2) Probably yes

   ____ (3) Undecided

   ____ (4) Probably not

   ____ (5) Definitely not

Respondent counting for item number one above would involve counting all who marked "Definitely yes," "Probably yes," "Undecided," "Probably not," and "Definitely not." Those who did not respond to the question should be counted under a category entitled "no response."

A word of caution about the latter group--nonrespondents. It has been observed that some people simply do not complete selected items or sections of an instrument. In some surveys this may be a substantial number. Therefore, in order for the total tabulation of each item to equal the number of returned instruments it is essential to show the number and percentage of those who did not respond. And, no inferences or speculations are allowed as to why! You can only report that "x" number and "x" percent of the surveyed group did not respond to item "2." Often nonresponses are the problem of a poorly worded or confusing question or item. If more sampling is planned, it behooves the investigator to analyze or seek external critiques of those "nonresponse" items, so that they may be rectified for future surveys.

In contrast, analyzing ranked data requires counting the number of respondents who selected each category as a first preference, a second preference, and so forth. For example, the following questionnaire item elicits ranked data.

2. Rank each class title according to your interest. Use number 1 for that which interests you most, to number 4, that which interests you least. Use each rank one time only.

____ Air frame

____ Engine repair

____ Metal shop

____ Woodworking

In each category of the above item, respondent counting involves tabulating the number who selected the category as first preference, second preference, third preference, and fourth preference. The technique will be amplified later in this chapter.

Percentages. Respondent counting provides a summary of the tabulated frequency for which each category is marked. Frequency data can be converted to percentages indicating the number of respondents who marked a particular category in relationship to the total number of respondents. Percentages are usually calculated for nominal, some ordinal, interval, and checklist items. Table 8, for example, shows a method of displaying data concerning the distribution and return of a questionnaire.

Caution should be noted here. The final column cannot be averaged to obtain 81.5 percent. The total percentage figure must be 155/190 x 100. If you average the percentages there will be great error. This point is illustrated since some researchers mistakenly "average percentages."

Table 8. Data Concerning Distribution and Return of the Questionnaire

Group Polled	Number Sent	Number Returned	Percentage Return
Private high schools	19	16	84
First class high schools	10	10	100
Second class high schools	74	58	78
Third class high schools	87	71	82
Totals	190	155	81.5

Table 9 is a simulated study which is used to illustrate another precaution. Examine the data and the various responses. When using percentages, precaution must be taken to describe survey respondents so as not to imply that 4.8 percent of all home economics teachers have one teaching preparation per day. Any percentage figure is derived for a sample of respondents who participated in the survey. In this example, the report would correctly read: "That 4.8 percent of the survey respondents reported having one preparation per day in Home Economics."

By reporting percentages alone, the conclusions are usually misleading. For example, three out of ten respondents yield a 30% return; as does 300 out of 1,000. However, because the total number of respondents is much larger, the latter 30% might be more representative of the community as a whole than would be a figure of 30% which represents three out

Table 9. Simulated Number of Different Daily Preparations of Home Economics Teachers

Number of Different Daily Preparations	Private High Schools		First Class High Schools		Second Class High Schools		Third Class High Schools		Totals	
	No.	%	No.	%	No.	%	No.	%	No.	%
1			5	50.0	1	1.7	1	1.4	7	4.8
2	2	12.5	4	40.0	20	35.1	10	14.0	36	23.5
3	7	44.0	1	10.0	23	40.3	29	41.4	60	39.2
4	5	31.0			10	17.6	25	36.0	40	26.0
5	2	12.5			3	5.3	5	7.2	10	6.5
Totals	16	100.0	10	100.0	57	100.0	70	100.0	153	100.0

of ten respondents. Obviously, stating sample size is important when using percentages to describe data. We recommend that the number always be given with the percentages.

Means. Likert scale and ranked data are frequently summarized by determining the average mean scores as a measure of the central tendency. The mean, or average, is computed by adding a list of scores and then dividing the sum by the number of scores. For example, the question below might be asked of 1,000 students and then tabulated.

3. The high school typing courses adequately prepared you for your current stenographic position.

____ Strongly agree

____ Agree

____ No opinion

____ Disagree

____ Strongly disagree

The tabulation would be reflected in Table 10.

Table 10. Tabulation of Question Three (Simulated)

Response Item	Number	Percentage of Total
Strongly agree	650	65
Agree	250	25
No opinion	30	3
Disagree	50	5
Strongly disagree	10	1
No response	10	1
Totals	1,000	100

To convert the number who responded to a mean or average, a numerical code would be provided for each category. The code is listed in Table 11.

Table 11. Codes to Convert Scaled Items to Means

Scale Item	Code Weight
Strongly agree	1
Agree	2
No opinion	3
Disagree	4
Strongly disagree	5
No response	0

In this example a code of "1" represents "Strongly agree" and "5" represents "Strongly disagree." The next step in determining the mean response is to multiply the code given to each category by the number of respondents who marked that category. Observe Table 12 for the model.

Table 12. Preliminary Calculation for Mean Score of Likert Items

Code	Multiply	Number of Respondents		Mean
1	x	650	=	650
2	x	250	=	500
3	x	30	=	90
4	x	50	=	200
5	x	10	=	50
0	x	10	=	0
Totals		1,000		1,490

In the above example, the computed mean score is 1.49, rounded to 1.5, and when reconverted falls between "Strongly agree" and "Agree"--a very positive response for the group.

The algebraic formula used to determine the mean is:

$$\bar{X} = \frac{\Sigma X}{N}$$

when $\bar{X}$ = the mean

ΣX = the sum of the scores

N = the total number of scores

We have determined that $\Sigma X = 1{,}490$, and that $N = 1{,}000$, therefore $\bar{X} = \frac{1{,}490}{1{,}000} = 1.49$.

The methods illustrated in Tables 10, 11, and 12 are very commonly used to determine the central tendency (arithmetic mean) for groups. The computation of this statistic is useful when interpretations are attached to data--by the researcher! However, a few extremely high or low scores can make the mean not as typical of the central tendency as the median.

Some ranked items are also commonly analyzed by means, as in the following illustration. Assume that 100 students were asked to respond to item four below.

4. Rank these class titles according to your interest, with number 1 being that which interests you most to number 4, that which interests you least. Use each ranking number only one time.

____ Air frame

____ Engine repair

____ Metal shop

____ Woodworking

(Note: To avoid possible placement bias, these subjects are arranged alphabetically.)

Table 13 presents the hypothetical results of the survey.

Table 13. Tabulation of Ranked Items (Simulated)

Ranked Preference	Number of Respective Responses			
	Air Frame	Engine Repair	Metal Shop	Woodworking
First	10	20	30	30
Second	30	40	30	10
Third	10	10	30	40
Fourth	50	30	10	20
Totals	100	100	100	100

To compute the average preference for each category a separate mean score must be calculated. For example, we assign a "weight" of 4 to each first place preference, 3 to each second, 2 to each third, and 1 to each fourth. Table 14 illustrates this method for Air Frame only.

Table 14. Calculation of Mean Preference for Air Frame Preference

Preference	Weight	Number of Responses	Mean Product
First	4	10	40
Second	3	30	90
Third	2	10	20
Fourth	1	50	50
Totals		100	200

The product of all weightings is 200. By dividing the product by the number of respondents (100), the mean (200/100) is 2.0 for Air Frame. This is the assigned weight for third place preferences.

Using the same formula above, we calculated the mean preferences for each as follows:

Air frame	2.0
Engine repair	2.5
Metal shop	2.8
Woodworking	2.5

We would conclude that on a mean preference, Metal shop is the average first preference choice. But, note that Engine repair and Woodworking each received an identical mean ranking of 2.5. Thus, other criteria could be used to determine the second and third preferences. Subjectivity often enters into the evaluation of even objectively derived data.

Statistical Tests

For the most part, percentages and means are adequate analytical methods. Yet, if an investigator were to determine whether differences between groups are due to chance, then either parametric or nonparametric tests must be employed. For example, if a certain question or variable were answered by male and female respondents in different proportions, a

statistical test should be computed to determine if a statistically significant difference exists between response patterns.

In survey research, nonparametric methods are usually used. This condition is emphasized because one assumption which must be met for parametric tests is that the sample is drawn from a normally distributed population. In most surveys this basic assumption cannot be made. The use of powerful parametric statistics such as t and F tests or analysis of variance, is usually inappropriate. The second assumption needed for parametric statistics is homogeneity of variance. If a number of means are computed for a number of differently drawn samples, the means will surely differ but the variance of the means should be similar. If the variance of means is different then the assumption of homogeneity cannot be met. Again, in selecting samples for surveys, there are frequently wide differences in the variance.

Continuity and equal intervals of measure comprise the third basic assumption to validate use of parametric methods. The measures to be analyzed are continuous, having equal intervals. The counting numbers, 1, 2, 3, . . . meet the third assumption. Most scales, questions, items, or rank ordered data used in questionnaires do not meet the third assumption.

The statistical methods that can be employed when any of the above assumptions cannot be met are called nonparametric tests. These include:

1. The Sign Test
2. Binomial Test
3. Chi Square
4. Rank Order Coefficient of Correlation
5. Nonparametric Analysis of Variance

The use of nonparametric tests is appropriate when:

1. The assumption of normality about the population is suspect.
2. The data are expressed in ranks.

A discussion of the above five popular nonparametric tests would require a lengthy and detailed treatment. We refer the reader to three excellent sources.

1. James L. Bruning and B. L. Kintz, Computational Handbook of Statistics (Glenview, Ill.: Scott, Foresman and Company, 1968).

Bruning and Kintz provide detailed explanations of numerous parametric and nonparametric methods. All examples are illustrated and clearly described. It makes statistics interesting, understandable, and enjoyable.

2. Fred N. Kerlinger, Foundations of Behavioral Research (New York: Holt, Rinehart and Winston, Inc., 1966).

Kerlinger provides a detailed discussion concerning many techniques related to research and statistical testing. He emphasizes the logic of scientific research.

3. Gilbert Sax, Empirical Foundations of Educational Research (Englewood Cliffs, N.J.: Prentice-Hall, Inc., 1968).

Sax presents detailed chapters about questionnaire and interview techniques. His book emphasizes the basic foundations of research and also describes experimental designs by which to conduct and analyze different types of research.

Use of Statistical Tests

Statistical treatments, such as the Chi Square and Spearman's "rho" (rank order), are used to compare observations and to determine the strength of relationship between response categories of two or more questionnaire items. In many cases vocational educators will not use any statistical tests. The data will probably be reported in numbers or percentages. Such reporting is often adequate. Yet, when groups are being compared, appropriate statistical tests can strengthen the conclusions.

Chi Square

Chi Square (χ^2) treatment in contingency tables is a commonly used nonparametric test for significance. Two basic assumptions must be met to use the test: (1) there must be a dichotomy or clear division of categories and (2) there must be a continuum of responses--at least two choices or a Likert-type scale.

In most cases an investigator will desire to test if the responses on selected questions are related. By computing the Chi Square contingency coefficient this determination can be made. Consider the following simulated item. Assume that a survey was conducted among school patrons to determine the feasibility of expanding vocational subjects into a summer session. The questionnaire would ask, among others:

5. To what extent do you favor offering high school vocational subjects during the summer months for high school aged youth in our school district?

____ I strongly favor

____ I favor

____ I have no opinion

____ I oppose

____ I strongly oppose

Perhaps the investigator is interested in determining how various aged patrons responded to this general policy question. Perhaps a division at age 50 is made. The data would be subdivided into all respondents 49 years old and younger as one category with the second category being all respondents 50 years old or over. Table 14 illustrates a model for these data.

Table 15 is organized in a contingency table format. The dichotomy is the two distinct age groups. The continuum is the five-item Likert-type scale. By referring to a statistics textbook the techniques by which to compute the

Table 15. Responses to Question Number 5*

Age Groups	Response Category					
	Strongly Favor	Favor	No Opinion	Oppose	Strongly Oppose	Total
49 and under	N_1	N_2	N_3	N_4	N_5	N_6
50 and over	N_7	N_8	N_9	N_{10}	N_{11}	N_{12}
Totals	N_{13}	N_{14}	N_{15}	N_{16}	N_{17}	N_{18}

*The "N" represents the absolute numbers or tabulated responses for each category.

χ^2 would be illustrated, e.g., Bruning and Kintz. Using the Chi Square test the investigator could report that:

> The response patterns on the general policy question of offering summer session high school vocational courses had a response pattern statistically different [or not] at the .01 level [or other selected level] between those respondents 49 years of age and under and those 50 years old and over.

Observe how the previous statement is very specific and operationally defined. A reader of that finding would know precisely what was reported. This specificity of reporting results is essential so that there can be no misinterpretation of data.

Rank Order Coefficient of Correlation

Rank order correlation or Spearman's "rho" is also commonly computed for survey data when different individuals

or groups rank order specific lists. For example, if groups were asked to rank order a set of items, the rankings could be analyzed to determine if they were similar or not. Table 16 presents a general model illustrating when "rho" could be used.

Table 16. Model of Rank Ordered Items

Group A		Group B	
Rankings	Variable	Rankings	Variable
1	A	2	A
2	B	3	B
3	C	1	C
4	D	5	D
5	E	6	E
6	F	4	F

By computing "rho" it can be determined if a statistical difference exists between the rankings of the variable by the two groups.

This technique is helpful when an investigator desires a ranking or preference for a set of items. Although statisticians allow for the ranking of up to 20 items in their formulae, in practice we have found that the ranking of more than eight or ten items is a source of confusion or frustration to a respondent. If several items, e.g., 16, are to be ranked; we suggest subdividing the items in several groups of four or eight so that multiple rankings could take

place. This technique eliminates the frustration of ranking large lists. One truly may not care about the eleventh, fourteenth, or fifteenth placed item.

Again, by using a statistics textbook the formula and methods for "rho" can be found.

The use of any statistical method is to determine the probability that chance played in creating the results. Statistics do not prove or verify conclusions. The appropriateness of the statistical treatment is more important than finding "a significant difference at the .01 level."

The next chapter provides ideas on organizing and reporting survey results.

CHAPTER 9

THE RESEARCH REPORT

Planning the Report

After conducting the survey, tabulating the data, and making appropriate conclusions, the next step is preparing a final written report. The preparation of such a report is essential since it is the means by which your results are disseminated. Further, most funding agencies require a final report.

As briefly outlined below, a report plan should include an introduction and separate sections which present methods, results, and discussion. The four main parts of a report are described below.

1. The Introduction states the goals of the study and describes previous related research.

2. A Methods section describes the respondent population, the survey instrument, and the procedures used to conduct the study.

3. The Results section reports the outcome of the analysis of data.

4. A Discussion section interprets and explains the results, and identifies the limitations and shortcomings of the study.

A research report includes all relevant aspects of the study. At the same time, it is concise. The writer

must be organized, in order to clearly and accurately present the study in a manner that would allow the reader to repeat the procedure.

Writing Style

The writer should strive for objectivity, giving facts, rather than personal judgments. Simple words are preferred in the writing of the report.

Word selection is an art. To convey the exact meanings and conclusions the writer must strive to select the words or concepts that carry the appropriate connotation and denotation. A few rules are listed below to help in writing a respectable survey report.

Do not use trite phrases. "It is a proven fact that . . . ." "Everybody knows that . . . ." If you state a fact, present data to support it. In survey research, absolutely nothing is ever "proved." All results are tentative. The survey, if correctly conducted, simply reflects a relative mood of the respondents. In most cases, terms such as "it seems that . . ." or "it was apparently . . ." are appropriate for survey reports. "Seems" and "apparently" connote a tentativeness about the findings. This is precisely what you desire to connote.

Minimize personal references. Instead of "I believe . . . , write, "the data indicate . . . ." The reason for this emphasis is to demonstrate to the reader that the

generalizations and conclusions are based on data collected from an appropriate group.

Be careful of Latinized singular and plural forms. Write these data, not this data. Data is the plural form; datum is singular. Criteria is plural; criterion is singular. You may think that this is being far too particular. No, it is simply knowing correct grammatical forms. Your report will be judged on how it is written, as well as what the findings are.

Select the precise term. Do not substitute the word "percent" for "probability." Again, careful word choice is essential toward conveying the correct interpretation to the reader. A written report is strictly a one-way communication device. The reader cannot ask you to reinterpret a statement.

Using "significant difference." Do not write "the data are (or are not) significant." Instead, write, "The statistical analysis indicates there is a significant difference between . . . ." This example demonstrates how the written statement describes something. In this case the writer must denote that it was through statistical analysis that a significant difference is determined. Further, it is totally inappropriate to state that there is a "significant difference" when using data unless you determine statistical significance through appropriate parametric or nonparametric measures. If you do not compute such tests, then you must use some other description; such as "The forty percent

difference between the two groups in question 18 would indicate a very apparent discrepancy in opinion." Or, it could be written as "There was a wide range of responses, with a 40-point range being computed between the two groups." Do not write there were no results, when you mean that there was no significant difference between variables. Here again is demonstrated an often committed error in choosing a set of terms which convey an incorrect summarizing statement.

Format. The format of a report should reflect careful organization in appropriate topics or themes. The sections of this chapter illustrate a sample format. As a matter of style, this entire guide has a very definite format. Have you observed the various headings? These act as an outline organizer and aid the reader. A few tips about format are listed below.

Abbreviations. When using abbreviations there are a few general rules to which nearly all researchers subscribe. Use standard abbreviations. Write the word and the abbreviation together the first time the term appears in the report. In the remainder of the report just use the abbreviation. Actually, a monogram is used. To illustrate this point consider the following: "After computing the grade point average (GPA) for the junior class the GPA was computed for all seniors." It is most important to always write out a word or set of words before abbreviating. This technique helps to keep the reader fully informed--not confused by

unknown monograms, acronyms, or abbreviations. Quotation marks should be used to abbreviate statistical tests, such as Spearman's "rho." Numbers less than 10 should be spelled out unless written in series, or as dates, scores, or units of measurement.

Tense. To provide a rather uniform style and for consistency, the report should be generally written in one tense. Most reports are written in the past tense since the writers are describing some activity which took place.

Write in the simple past tense, except when something is observed in the present. Use the future tense when speculating or addressing issues of the future. An important point to remember is that you are communicating to others. Use the general rules of writing.

Write in the third person. The third person is preferred since it eliminates overuse of "I" or "We." Throughout this guide the writers (Note: third person form) have used third person construction. Other terms are the researcher or investigator.

Source citation. All citations, quotes, or paraphrases must be identified for the reader. In this manner, the sources may be rechecked or examined by those who become more interested in the study. Avoid using footnotes; rather, cite the authors and the dates of relevant publications in the body of the paper and include in a bibliography. Observe how citations are accomplished in this guide.

All of the above mechanics of technical writing are the "nuts and bolts." Let us now focus attention on the components of the report.

Parts of the Research Report

Introduction

The introduction provides focus and establishes the context for the entire study. The introduction is analogous to a funnel shape: wide at the mouth and progressively narrowing to a smaller passageway. The opening statements provide a logical conceptual outline for the formulation of the remainder of the report. Begin the introduction by briefly summarizing the present state of knowledge. Next, present the process by which the current study evolved. Finally, pare the introduction down to the actual purpose and anticipated findings of the present study.

Method

The methods section provides detailed information about the manner in which the study was conducted. Provide enough information so that the survey could be replicated by a reader. At the same time, be concise, accurate, and precise.

Respondent population. Describe the relevant characteristics of the population from which your sample was selected, e.g., age, sex, education, socioeconomic status,

and race. Explain the exact method used to select a sample from the population.

Survey instrument. The questionnaire should be described in detail in this section. Discuss the subscales and identify the questions which compose each subscale. State the methods of tabulation and analysis of the data. A copy of the instrument should be included in an Appendix.

Procedure. The procedure is a step-by-step description of your communications with the respondents, including the cover letter, instructions and follow-up procedures. This section also includes how data were treated, how the sample was selected, and any other details appropriate to the study.

Results

The results section includes the quantitative values obtained from your data analyses. Graphs and tables are very helpful in summarizing data. For example, instead of listing the number of respondents who marked each category of an item, a frequency distribution table yields the same information in a simple, pictorial manner.

Table 16. Example of Frequency Distribution Table

	Yes	No	Maybe
Male	15	25	5
Female	10	20	10

Tables can be constructed in many forms, illustrated by the various contingency tables presented in this manual. Select a layout for its simplicity and readability.

Graphs and histograms are also recommended for data display. The bar diagram in Fig. 4 is frequently used to illustrate data. Note how the responses in Table 16 would appear in a histogram.

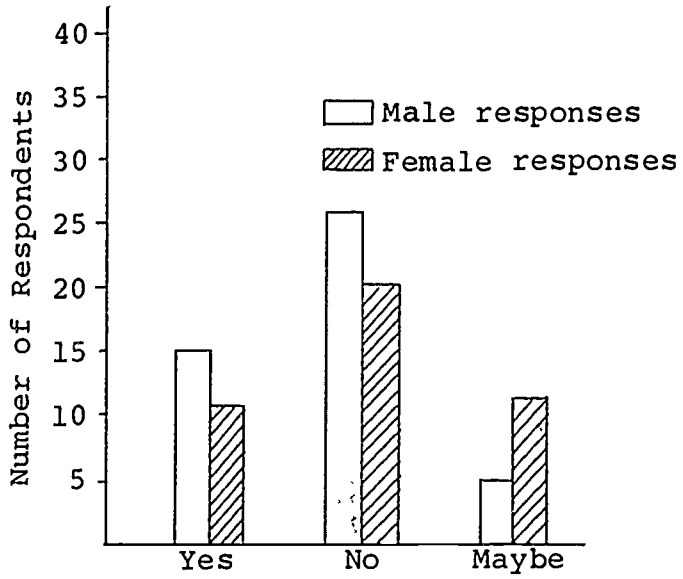

Fig. 4.--Example of Bar Diagram

The bar diagram provides a visual picture of the frequency with which each category was marked, or the total response pattern of some question.

The object of graphing is to present data accurately in an easy to understand form. Certain basic considerations are necessary. The axes of the graph are to be precisely labeled. The graph should be numbered as a "figure" and be

titled. It must be large enough to show clearly summary analysis. The area in which the graph is drawn should either be a square or a nearly rectangular square. Disproportionately tall or wide graphs should be avoided since they convey distorted images of the real situation, hence a visual bias. Finally, the axes of the graph should not be abridged, expanded, contracted, or distorted in such a way that they give a false impression of what the data indicate.

Discussion

The discussion section, in contrast to the introduction, is developed like an inverted funnel. It begins with the specific conclusions of the study and expands to discuss the general area of knowledge and the applicability of the results. In this section, first interpret and explain the results; then discuss any limitations of the study and conclusions. If appropriate, include a generalized statement of the population. Finally, summarize the present state of knowledge on which the study focuses.

Be extremely careful to identify the (1) assumptions, (2) summaries, (3) generalizations, and (4) conclusions. Each of these four is very different. Assumptions and conclusions are usually subjective in characteristic. They are subject to the personal evaluation of the individual researcher. Summaries simply give a short recapitulation of the survey results. Generalizations are those statements made from the summaries.

For example, if a study were conducted by a teacher who found that 80 percent of the senior boys intended to go to college after graduation while 38 percent of the senior girls intended to do so. The investigator might write the following, but very brief, discussion.

> Since the survey was administered without threat, the data from the seniors should be accurate and valid [the assumption]. The finding here is consistent with other studies reviewed by the investigator [a summary]. Therefore it appears that male seniors show a greater interest in going on to higher education after high school than do the female seniors at George High School. It might also be stated that male seniors have identified their post secondary school plans earlier than do female seniors [generalizations].
>
> From these findings it seems that more vocational counseling is needed for the females so that post secondary school plans are formulated earlier in their careers [conclusion].

It has been one of the writers of this guide's experience to observe reports where a writer was confused on all four concepts--and needless to say, the discussion was a disaster.

Appendix

You may wish to include an appendix at the end of your report to show all collected raw data, any detailed statistical treatments, or the survey instrument itself. The appendix should include only information that is unnecessary to be integrated in the body of the report.

General

The report should be typed or duplicated in a neat fashion. Use high quality photo reproductions or ink

duplicated copy. Ditto is usually unacceptable since it is so often dull and cannot be easily photocopied for further reproduction.

Finally, consider writing a short article for your professional association journal. In this manner you communicate your results to your colleagues who share similar interests. Or, if the results are of local interest, then write a report for the school district newsletter. The final report is written to communicate. As the investigator, this is all your responsibility.

In Conclusion

This manual has been prepared to aid teachers in conducting better surveys. Our intent has been to provide not just a manual, but a total format. Throughout this book are examples that can be revised with little adaptation to fit almost any possible survey. We desire to impart the affective consequence that good surveys reflect a lot of hard thoughtful work. Good luck!

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APPENDIX

MODELS OF QUESTIONNAIRE FORMAT

Within the Appendix are four different questionnaire formats, all of which are adapted from one survey instrument. The first model is the actual instrument which was mailed to obtain opinions and information from the vocational agricultural director in the State of Washington, public high schools, and high school principals. Of 311 instruments mailed, 301 or 97% were returned. Following Model No. 1, other models will be illustrated to show how modifications may be made from a basic format.

Model 1 was designed to accommodate ease of response. Note, double spacing, one variable per question, uncrowded appearance.

Each question is key-coded to an electronic data processing card. Thus, question number one is punched in card column one. To aid the key punch operator, each row number is precoded. If a respondent checked that the major responsibility was a "Vocational Agriculture Teacher," the key punch operator would punch in column one, the row one punch. All items are coded for column and row designations.

Observe questions 3, 7, 8, 9, and 10. Here we followed the formula of balance. The items reflect all possible responses for the variables.

Questions 12 and 16 required numerical information from the respondent. We predicted that the number would be 0 through 9, and alloted one column for the quantification of those responses.

Response categories were precoded by parentheses instruction, ( ) 1.1, where the respondent checked the space within the parentheses.

Questions 1 and 2 will be altered in Models 2, 3, and 4 to illustrate other features which may be incorporated into an instrument.

Model 1

SURVEY OF VOCATIONAL AGRICULTURE
TEACHER SUPPLY AND DEMAND

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College of Education
Washington State University
Pullman, WA 99163

DIRECTIONS

Most items can be answered by placing a check (✓) mark in the blank box ( ). Please respond appropriately where information is requested for other questions.

1. Please indicate your major responsibility by checking only one of the categories below.

   ( ) 1.1 Vocational Agriculture Teacher

   ( ) 1.2 High School Teacher

   ( ) 1.3 Administrator

   ( ) 1.4 Other (please specify) _____

2. How many secondary school students attend your high school (grades 9-12 or 10-12) for 1974-75?

   ( ) 2.1 1,000 or more

   ( ) 2.2 750-999

   ( ) 2.3 500-749

   ( ) 2.4 250-499

   ( ) 2.5 249 or less

IF NO VOCATIONAL AGRICULTURE (Vo-Ag) COURSES ARE BEING TAUGHT IN YOUR HIGH SCHOOL, PLEASE CONTINUE BELOW WITH QUESTION 3.

IF THERE ARE VOCATIONAL AGRICULTURE (Vo-Ag) COURSES NOW BEING TAUGHT IN YOUR HIGH SCHOOL, PLEASE GO DIRECTLY TO QUESTION 7.

3. If there are no Vo-Ag courses or programs in your high school, are there plans for your high school to offer a Vo-Ag course or program?

( ) 3.1 Yes

( ) 3.2 No

( ) 3.3 Do not know

4. If a Vo-Ag course or program is planned for your high school, in which year will it start?

( ) 4.1 1975-76 school year

( ) 4.2 1976-77 school year

( ) 4.3 After 1977 school year

( ) 4.4 Do not know

5. & 6. If no Vo-Ag course or program is planned for the immediate future, please rank in order the first and second reasons which best describe why a course or program will not be added. Place a "1" in front of the primary reason. Place a "2" in front of the second most important reason. Please do not rank any other items. Just rank the first and second reasons, only.

_____ 1 Not enough student interest

_____ 2 No certified Vo-Ag teachers

_____ 3 No need for agriculture training in our school

_____ 4 Lack of facilities

(5) (6)
(1) (2)_____ 5 Lack of money

_____ 6 Levy failures

_____ 7 Other subjects considered more important

_____ 8 Other (please specify) _____

_____

If you are not offering any Vo-Ag courses, you have completed your portion of this questionnaire. Please return this questionnaire in the enclosed envelope. Thank you for your cooperation.

Please check only one response for each question, 7 & 8. Please indicate how you perceive the teaching load of Vo-Ag teachers in relation to all other teachers for each of the following scales.

7. ( ) 7.1 The teaching load in Vo-Ag is heavier than for most teachers in the high school.

   ( ) 7.2 The teaching load in Vo-Ag is about equal to that of most teachers in the high school

   ( ) 7.3 The teaching load in Vo-Ag is lighter than for most teachers in the high school.

8. ( ) 8.1 The "conference or preparation" periods for Vo-Ag teachers are greater than for most teachers in the high school.

   ( ) 8.2 The "conference or preparation" periods for Vo-Ag teachers are about equal to that of most teachers in the high school.

   ( ) 8.3 The "conference or preparation" periods for Vo-Ag teachers are fewer than for most teachers in the high school.

Questions 9 & 10 draw a distinction between classes and courses. Agriculture Science is an example of a course. The number of sections of Agriculture Science which are being taught equals the number of classes.

9. Which of the following best compares this year's (1974-75) Vo-Ag <u>classes</u> to next year's (1975-76) planned Vo-Ag <u>classes</u>?

   ( ) 9.1 Fewer <u>classes</u> will be offered in 1975-76.

   ( ) 9.2 Same for both years.

   ( ) 9.3 More <u>classes</u> will be offered in 1975-76.

10. Which of the following best compares this year's (1974-75) Vo-Ag <u>courses</u> to next year's (1975-76) planned Vo-Ag <u>courses</u>?

   ( ) 10.1 Fewer <u>courses</u> will be offered in 1975-76.

   ( ) 10.2 Same for both years.

   ( ) 10.3 More <u>courses</u> will be offered in 1975-76.

11. Next year's (1975-76) Vo-Ag curriculum will cause which of the following to happen to your staffing pattern?

( ) 11.1 No changes in staffing are anticipated.

( ) 11.2 More certified Vo-Ag teacher(s) will be needed (expansion assumed).

( ) 11.3 Certified Vo-Ag teacher(s) will teach other subjects (reduction assumed).

( ) 11.4 Certified Vo-Ag teacher(s) will be transferred to another school (reduction assumed).

( ) 11.5 Other (please specify) _____

_____

12. If you checked 11.2, 11.3, 11.4, or 11.5 in question 11, approximately how many teachers will be involved? Place the number on the appropriate line.

_____ 12.1 (11.2) More certified Vo-Ag teachers will be needed (expansion assumed).

_____ 12.2 (11.3) Certified Vo-Ag teacher(s) will teacher other subjects (reduction assumed).

_____ 12.3 (11.4) Certified Vo-Ag teacher(s) will be transferred to another school (reduction assumed).

_____ 12.4 (11.5) Other (please specify) _____

_____

Questions 13, 14, and 15 concern some anticipated changes for 1975-76. You will only have to respond to one of the sets. Below is a quick summary.

13. Respond to number 13 if no change in Vo-Ag classes is anticipated.

14. Respond to number 14 if you anticipate increasing the number of Vo-Ag classes.

15. Respond to number 15 if you anticipate decreasing the number of Vo-Ag classes.

13. If no change in the number of Vo-Ag classes, check only one statement that best describes your reason for the Vo-Ag curriculum plans for next year.

( ) 13.1 We have the proper balance of classes offered at our school.

( ) 13.2 There is not enough student interest to warrant more classes.

( ) 13.3 Not enough certified Vo-Ag teachers to enable a class increase.

( ) 13.4 Vo-Ag Advisory Committee decision.

( ) 13.5 Other (please specify) _____

_____

14. If increasing the number of Vo-Ag classes, check only one statement that best describes your situation.

( ) 14.1 Curriculum officials felt it advisable.

( ) 14.2 Student interest was high.

( ) 14.3 School patrons felt it advisable.

( ) 14.4 Vo-Ag Advisory Committee decision.

( ) 14.5 Other (please specify) _____

_____

15. If decreasing the number of Vo-Ag classes, check only one statement that best describes your situation.

( ) 15.1 Curriculum officials felt it advisable.

( ) 15.2 Student interest was low.

( ) 15.3 School patrons felt it advisable.

( ) 15.4 Vo-Ag teacher leaving the school.

( ) 15.5 Vo-Ag Advisory Committee decision.

( ) 15.6 Other (please specify) _____

_____

16. If Vo-Ag teachers are leaving your school during 1975 for any of the following reasons, please place the number of those leaving on the appropriate line(s).

Number Leaving		Reason for Leaving
_____	16	Do not know
_____	17	Retiring
_____	18	Moving to administration
_____	19	Moving to Community College
_____	20	Teaching in another state
_____	21	Switching to farming
_____	22	Switching to agri-business
_____	23	Switching to non-agriculture business
_____	24	Switching to non-agriculture teaching
_____	25	Serving in military
_____	26	Deceased
_____	27	Attending graduate studies
_____	28	Other (please specify) _____

_____

Thank you for your cooperation. Please return this instrument in the stamped, self-addressed envelope which is enclosed. If you have any questions concerning this study, kindly contact:

Dr. Donald C. Orlich
Professor of Education
Cleveland Hall
Washington State University
Pullman, WA 99163

NOTE: A report of this survey is to be presented at the annual Washington Vocational Agriculture Teachers Association (WVATA) in Spokane, July 21-25, 1975.

For survey use only ID ___ ___ ___
29 30 31

Model 2 is an adaptation of the original in that the responses use a short blank space and only one number, i.e., the row number preceding each response is preprinted. Parentheses or square brackets could be substituted for the blank space without changing the basic format.

Model 2

SURVEY OF VOCATIONAL AGRICULTURE
TEACHER SUPPLY AND DEMAND

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Pullman, WA 99163

DIRECTIONS

Most items can be answered by placing a check (✓) in the blank box ( ). Please respond appropriately where information is requested for other questions.

1. Please indicate your major responsibility by checking only one of the categories below.

   ____ 1 Vocational Agriculture Teacher

   ____ 2 High School Teacher

   ____ 3 Administrator

   ____ 4 Other (please specify) _____

2. How many secondary school students attend your high school (grades 9-12 or 10-12) for 1974-75?

   ____ 1 1,000 or more

   ____ 2 750-999

   ____ 3 500-749

   ____ 4 250-499

   ____ 5 249 or less

IF NO VOCATIONAL AGRICULTURE (Vo-Ag) COURSES ARE BEING TAUGHT IN YOUR HIGH SCHOOL, PLEASE CONTINUE BELOW WITH QUESTION 3.

IF THERE ARE VOCATIONAL AGRICULTURE (Vo-Ag) COURSES NOW BEING TAUGHT IN YOUR HIGH SCHOOL, PLEASE GO DIRECTLY TO QUESTION 7.

Model 3 illustrates a feature of having each respondent code the questionnaire for tabulating or key punching. The respondent places the forced response code item in a designated area. The placement of the code item helps reduce some work for the researcher. Using this technique, the respondent places the key punch row number in the blank numbered space. The numbered space indicates the question number as well as the EDP card column number. The technique illustrated in Model 3 thus reduces the chances of transposition errors by the researcher or key punch operator.

Model 3

SURVEY OF VOCATIONAL AGRICULTURE
TEACHER SUPPLY AND DEMAND

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DIRECTIONS

MOST ITEMS CAN BE ANSWERED BY INDICATING IN THE COLUMN AT THE RIGHT YOUR APPROPRIATE CODE RESPONSE. PLEASE RESPOND APPROPRIATELY WHERE INFORMATION IS REQUESTED FOR OTHER QUESTIONS.

1. Your major responsibility is:

   1 Vocational Agriculture Teacher _____(1)

   2 High School Teacher

   3 Administrator

   4 Other (please specify) _____

2. How many secondary school students attend your high school (grades 9-12 or 10-12) for 1974-75?

   1 1,000 or more _____(2)

   2 750-999

   3 500-749

   4 250-499

   5 249 or less

IF NO VOCATIONAL AGRICULTURE (Vo-Ag) COURSES ARE BEING TAUGHT IN YOUR HIGH SCHOOL, PLEASE CONTINUE BELOW WITH QUESTION 3.

IF THERE ARE VOCATIONAL AGRICULTURE (Vo-Ag) COURSES NOW BEING TAUGHT IN YOUR HIGH SCHOOL, PLEASE GO DIRECTLY TO QUESTION 7.

Model 4 is an adaptation of Model 3. The respondent simply places a check in the appropriate parentheses. The investigator then by hand, places the coding information in the right-hand two columns. This allows the investigator to make all decisions on the responses. The key punch operator would simply follow the information recorded in the right hand coding area.

Model 4

SURVEY OF VOCATIONAL AGRICULTURE
TEACHER SUPPLY AND DEMAND

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DIRECTIONS

Most items can be answered by placing a check (✓) mark in the blank box ( ). Please respond appropriately where information is requested for other questions.

1. Please indicate your major responsibility by checking only one of the categories below.

   ( ) Vocational Agriculture Teacher

   ( ) High School Teacher

   ( ) Administrator

   ( ) Other (please specify) _____

2. How many secondary school students attend your high school (grades 9-12 or 10-12) for 1974-75?

   ( ) 1,000 or more

   ( ) 750-999

   ( ) 500-749

   ( ) 250-499

   ( ) 249 or less

PLEASE DO NOT MARK IN THIS AREA

Column	Row
1	
2	

IF NO VOCATIONAL AGRICULTURE (Vo-Ag) COURSES ARE BEING TAUGHT IN YOUR HIGH SCHOOL, PLEASE CONTINUE BELOW WITH QUESTION 3.

IF THERE ARE VOCATIONAL AGRICULTURE (Vo-Ag) COURSES NOW BEING TAUGHT IN YOUR HIGH SCHOOL, PLEASE GO DIRECTLY TO QUESTION 7.

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