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writing and constructing surveys[1]

It is common to open a newspaper or turn on the television and see results of public opinion surveys asking people about such things as who they would vote for in the next election, how important they consider the environment, or whether they approve of current political decisions. Private companies, governments, universities, and other organizations depend on surveys to gather information about the public and other interest groups. Simply defined, survey research involves administrating questionnaires to a sample of respondents selected from a particular population. The term *survey* implies that data have been gathered using some form of questionnaire administered to a sample of individuals (Mitra & Lankford, 1999). A sample should be selected in such a way that it represents the entire population of interest and that observations from the sample can be generalized to the population. This chapter discusses: (a) advantages, disadvantages, and guidelines for conducting different types of surveys; and (b) guidelines for writing survey questions and constructing questionnaires. Chapter 8 provides details regarding sampling procedures and implementing surveys.

Advantages of Survey Research

A fundamental principle of survey research is to use surveys in a scientific way at a reasonable cost to realize benefits of interviewing a representative sample instead of the entire population. There are advantages of this methodology. First, survey research is ***useful for describing characteristics of a larger population***. If selected appropriately, a sample of approximately 400 individuals can provide relatively accurate information about a population one billion people (Salant & Dillman, 1994). Procedures for selecting a sample of people and making accurate population estimates based on sample data are discussed in chapter 8.

Second, surveys ***use consistent or standardized questions, so comparisons among groups can be facilitated***. Recent research at Colorado State University, for example, has compared public value orientations toward wildlife in 19 western states (Teel, Dayer, Manfredo, & Bright, 2005), and hunters' responses to chronic wasting disease (CWD) in eight states

[1] This chapter was coauthored with Dr. Mark D. Needham, Oregon State University.

(Needham, Vaske, & Manfredo, 2006). These large-scale survey research projects allow for statistical comparisons among residents of different states and other geographical areas.

Third, survey research allows for ***large sample sizes that can be obtained in a relatively short period of time***. The sample for the wildlife value orientations study, for example, included over 12,000 mail survey respondents and had a telephone nonresponse survey of 7,600 people to test for differences between mail survey respondents and nonrespondents (Teel et al., 2005). The regional mail survey of hunters' responses to CWD generated almost 10,000 completed questionnaires in just over one month (Needham et al., 2006).

Fourth, ***numerous questions can be asked in a single survey***. Given the complexities of many human dimensions topics, multiple questions are often necessary to understand concepts under investigation and can improve the reliability and validity of the measuring instrument. Reliability and validity are discussed in chapters 4 and 18.

Disadvantages of Survey Research

There are, however, some disadvantages of survey research. Survey research, for example, requires that ***all questions in a questionnaire must be understandable to all potential respondents***. Researchers should never assume that all respondents will have a high level of reading capability and comprehension or a full understanding of topics being investigated. To illustrate, it would be imprudent to ask the general public a specific question such as "Do you support the Division of Aquatic Resources' policy regarding angling for pelagic fish?" First, not all people will know who the Division of Aquatic Resources is or what their mandate involves. Second, few people other than perhaps some anglers and interested nonanglers will understand specific details and guidelines stipulated in the policy to allow for an informed response. Third, people without a scientific background may not know what "pelagic" means. It is important to ensure that all questions are easy to understand and targeted to the appropriate audience.

Another disadvantage of survey methodology is that ***questionnaires are often not flexible***. Mail surveys, for example, cannot be changed once they have been written, printed, and administered. This disadvantage forces researchers to consider several important questions before proceeding with survey implementation, including:

- Do the questions address project objectives and/or hypotheses?
- Are there enough questions to test validity and reliability of concepts examined?
- Has the appropriate literature been examined to inform questions and response scales?
- Are the questions easy to understand for all potential respondents so that people in the sample are able to respond willingly and accurately?
- Is the questionnaire too long?
- Is the layout of the questionnaire attractive, professional, and easy to follow?
- Are the questions grouped into logical sections?

A third disadvantage of survey research is that it can ***sometimes seem artificial to respondents***. Some surveys focusing on public willingness to pay or behavior in response to hypothetical conditions may fit into this category. Such hypothetical scenarios may seem artificial to some respondents who have little or no past experience with the topic.

Survey research also ***may not always provide data that is within the context of social life***. A few belief statements measured on seven-point scales, for example, may not be adequate to capture the complexity of specific emotions felt after a spouse or child passes away. In these situations, other methodologies may be more useful for addressing project objectives. Alternative data collection techniques include:

- *Document analysis* includes historical or archival analysis, literature reviews, diary methods, and analysis of existing or secondary data such as content or meta-analyses.
- *In-depth interviewing* includes unstructured and semi-structured interviews often followed by qualitative techniques such as ethnographic or content analyses.
- *Participant observation* includes systematic observations and recordings of phenomena such as when a researcher becomes a participant-observer.
- *Experiments* include true or quasi design experiments where participants are assigned to treatment or control groups and assessed via observation or standardized scales.
- *Group techniques* include focus groups, Delphi methodologies, Q-methodologies, and nominal group techniques.

Some of these methodologies are briefly discussed in chapter 1. Given that the focus here is on survey methodology and analysis, however, detailed discussion of these other quantitative and qualitative methodologies are beyond the focus of this book. There are many excellent texts and journal articles examining these alternative methodological techniques.

Things to Consider Before Administering a Survey

Some people believe that designing and implementing a survey is a simple task of quickly writing a few questions and then immediately asking a few people to respond. These people are mistaken. There are several broad steps that should be followed to ensure that a survey is conducted in a scientifically rigorous manner and results are representative of and generalizable to the population of interest. At a minimum, the following steps should be followed in order when designing and implementing a survey:

1. Identify the problem, objectives, and/or hypotheses that the project is trying to solve and information needs for addressing these issues.
2. Review the relevant literature and identify knowledge gaps (see chapters 2 and 3).
3. Decide what should be included in the questionnaire.
4. Select the most appropriate type of survey method for the project.
5. Develop a first draft of the questionnaire.

6. Ask experts to review the questionnaire and revise accordingly based on input.
7. Pretest the questionnaire and revise accordingly based on pretest results.
8. Establish procedures for coding responses, entering data, and analyzing data.
9. Administer the final questionnaire.
10. Conduct a nonresponse bias check if the response rate is lower than desired.
11. Enter and analyze responses; report findings.

This chapter provides an overview of the first five steps. The remaining steps are discussed in chapter 8 and in subsequent chapters of this book.

What Information Should Be Included?

Before deciding on the type of survey to administer and the mechanics of constructing and implementing a survey, it is important to ask a couple of seemingly simple questions: (a) ***What problem is this project trying to solve*** and (b) ***What new information is needed to solve this problem*** (Salant & Dillman, 1994)***?*** If questions are irrelevant for most respondents, do not provide useful information, and / or fail to address project objectives or hypotheses, the survey is likely to be a waste of financial resources, time, and personnel.

Human dimensions research projects typically try to address specific questions or hypotheses to improve understanding about a particular natural resource concept, theory, or problem. It is important to be specific about what the concept, theory, or problem is, why it is important, and what research has already attempted to address the same or a similar issue. Deciding what information the survey should cover seems like a trivial task, but many researchers struggle with this early stage because the focus of a project may be vague, biased, and/or not critical (Salant & Dillman, 1994). A research question such as "How do recreationists' feel about Carter Lake?" for example, is ***vague***. More specific questions such as "To what extent are boaters satisfied with boat access at Carter Lake?" "How crowded do hikers feel on the trail around Carter Lake?" and "Do anglers support or oppose the new catch-and-release policy at Carter Lake?" are more specific and provide clearer direction for developing questions and response scales in a questionnaire.

Bias can be introduced even before a single questionnaire has been administered. Writing leading or loaded questions (discussed later in this chapter) and selecting nonrandom samples of participants because their responses align with current policy decisions (see chapter 8) are examples of bias in survey research. Researchers must continually strive to design, implement, and report survey findings objectively if results are to be meaningful and scientifically valid.

Many surveys contain ***questions that are peripheral or irrelevant*** to project objectives or hypotheses. Although there are many interesting questions about a topic that could be asked, it is important to ensure that every question has a purpose and addresses a specific research objective or hypothesis. It is critical to separate "nice to know" from "need to know" when designing questionnaires (Salant & Dillman, 1994). Long questionnaires containing interesting but nonessential items increase respondent burden, reduce overall response rates, increase question nonresponse, and yield data that are unrelated to project goals.

As discussed in chapter 1, there are approaches that allow researchers to obtain a feel for the type and range of issues that are related to project objectives and important to the population of interest. ***Elicitation surveys***, for example, include a series of open-ended questions that are administered to a small sample of people (Manfredo, 1992). ***Focus groups*** involve a moderator bringing together 6 to 12 individuals from a population of interest for direct questioning (Knap & Propst, 2001; Krueger, 1988; Merton, 1987). Both of these approaches stimulate thinking and elicit ideas on a particular subject. Small sample sizes and the open-ended nature of questioning often limit the representativeness and generalizability of findings from elicitation surveys and focus groups. Information gained from these techniques, however, can be used to develop questions that will be included in a questionnaire to be administered later to a larger sample of individuals. Table 7.1 compares and contrasts focus groups and survey research.

Table 7.1 Focus Groups Cannot Substitute for Surveys

	Focus groups	Surveys
Purpose	Stimulate thinking and elicit ideas on a subject	Determine what proportion of a predefined population has a particular attribute or opinion
Structure	Discussion of a small group led by a moderator	Mail, telephone, in-person, or electronic questionnaire completed by individuals
Capacity to generalize to larger population	No	Yes
Capacity to generate ideas or hypotheses for later testing	Yes	To some extent
Capacity to test ideas or hypotheses	To some extent	Yes
Must questions and answers be formulated ahead of time?	No, but moderator must be ready to guide discussion	Yes, except for open-ended questions

Source: Salant and Dillman (1994)

Once researchers are clear on the problem to be addressed and understand specific information needs, they need to select a particular type of survey for collecting data. When choosing between types of surveys (e.g., telephone, on-site, mail, electronic), researchers should carefully consider issues such as budget, ethics, availability of contact information for potential respondents, design and layout, completion time, and response rates. Each of these issues influences decisions about the type of survey that is most appropriate and feasible for addressing project objectives or hypotheses.

Types of Surveys and Criteria for Choosing Survey Type

There are multiple types of survey methods including mail, telephone, on-site (i.e., in-person, face-to-face), electronic (i.e., Internet, email), drop-off, and mixed mode surveys. None of these methods is inherently superior to the others; each has strengths and weaknesses that should be evaluated in the context of the specific project. Selecting a survey method requires consideration of issues such as survey length, completion time, accuracy of answers, complexity,

necessary facilities (e.g., telephone lines), personnel qualifications, and availability of sample contact information (e.g., addresses, telephone numbers). Table 7.2 compares mail, telephone, on-site, and Internet surveys in terms of criteria for human dimensions research.

Table 7.2 Some Broad Criteria for Choosing a Survey Type for Parks, Recreation, and Human Dimensions of Natural Resources Research

	On-site	Mail	Telephone	Internet
Questionnaire construction and design				
Allowable length of survey (minutes to complete)	5–15	30–45	10–20	15–30
Type of questions				
Allowable complexity	Medium	High	Low	High
Success with open-ended (fill-in-the-blank) questions	Low	Medium	High	Medium
Success with screening questions	Medium	Low	High	High
Success with controlling sequence of question completion	Medium	Low	High	High
Success with avoiding item nonresponse	Medium	Low	High	High
Sensitivity to design layout	High	High	Low	Medium
Accuracy of answers				
Likelihood of interviewer distortion/bias	Medium	Low	Medium	Low
Likelihood of social desirability bias	Medium	Low	Medium	Low
Administration considerations				
Cost per completed survey [1]	High	Low	Medium	Low
Anticipated response rates				
General population	Medium	Medium	Low	Medium
Specific user group or stakeholder/interest group	High	Medium	Medium	Medium
Data collection completion time after survey is developed [2]	Medium	Slow	Fast	Fast
Control of survey once developed and administered	High	Low	High	Medium
Need for sample contact list from population	Low	High	High	Medium

[1] Cost is variable depending on circumstances. On-site surveys, for example, can be expensive if they require substantial out-of-state or international travel (e.g., air, vehicle) and accommodation, but can be conducted for a lower cost if these costs are not incurred. Costs for mail surveys can be variable depending on type of postage selected (e.g., bulk, business reply, first class, international).

[2] Completion time is variable depending on number of personnel working on survey administration.

Mail surveys require an address list of a sample from a population. Addresses may be obtained from government agencies, private firms, or another source such as an earlier on-site survey (discussed in mixed-mode surveys). If a project requires information from hunters or anglers, for example, names and addresses of potential respondents might be obtained from a wildlife

agency's license sales records. Samples can also be purchased from private firms such as Survey Sampling International (SSI). Mail surveys typically involve multiple ordered mailings such as: (a) initial letter providing advance notification, (b) questionnaire packet (e.g., cover letter, questionnaire, return envelope), (c) postcard reminder to nonrespondents, and (d) additional mailings of the questionnaire packet to remaining nonrespondents (see chapter 8).

There are several strengths of mail surveys (see Dillman, 2007; Salant & Dillman, 1994). Mail surveys generally require fewer resources because personnel are not needed for talking with respondents as they are with on-site (i.e., face-to-face) and telephone surveys. Personnel also do not need as much expertise or training in communicating with people; skills mostly involve clerical tasks such as typing, sorting, stuffing envelopes, and processing incoming and outgoing mail. Compared to other survey methods, mail surveys give personnel and respondents the flexibility of making fewer immediate and high-pressure decisions. Given the lower personnel requirements, additional costs of administering and processing more mail questionnaires are lower than in-person or telephone contacts. Mail surveys are also more likely to ensure respondent anonymity and confidentiality. Respondents have more time to think about questions, which is useful particularly if the instrument contains complex questions. Finally, mail surveys are less sensitive to interviewer bias or distortion, and there is greater probability of avoiding ***social desirability bias***, which occurs when respondents provide answers that are consistent with societal norms or perceived viewpoints of the interviewer (e.g., a person did not vote in the last election, but said that they did because it is the politically correct thing to do; DeMaio, 1984).

There are, however, weaknesses of mail surveys. Mail surveys are susceptible to lower response rates than on-site surveys. Fewer individuals may respond to mail surveys because people may have less incentive and a chance to examine questionnaires before deciding whether or not to answer questions. Obtaining high response rates with mail surveys requires an attractive and properly formatted questionnaire that is easy to read and free of complications (Mitra & Lankford, 1999).

Another weakness of mail surveys is that individuals without a high level of reading capability and comprehension may choose to disregard the questionnaire because they struggle reading questions, following instructions, and providing written responses. In mail surveys, researchers also have little control over what happens to the questionnaire after it is mailed, including: (a) who actually completes the questionnaire; (b) if the respondent received advice from others, which could bias answers; (c) if questions were answered in the order in which they appeared, which is important if questions build on each other; and (d) if questionnaires were completed in full or respondents overlooked sections or avoided answering boring or challenging questions (Salant & Dillman, 1994). Finally, mail surveys often require more than one mailing to achieve an appropriate response rate. Multiple mailings necessitate more money and time.

Despite these shortcomings, mail surveys continue to be popular among researchers seeking to gather information from numerous interest groups about their perceptions of various natural resource issues. Mail surveys are particularly useful for large projects in which financial and personnel resources are limited and rapid project completion is not necessary. It is important to remember, however, that mail surveys require a reasonably accurate address list of a sample from a particular population.

Telephone surveys involve selecting a sample from the telephone directory, another list, or using random number techniques. Survey questions are asked by an interviewer who records responses into a computer or onto a form. Telephone surveys can also be automated where questions are asked by a recording and responses are recorded when interviewees press numbers corresponding to their answer (i.e., Interactive Voice Response [IVR], Touch-Tone Data Entry [TDE]; see Dillman, 2007 for a discussion).

Telephone surveys are advantageous because they can rapidly generate data and results. Polling companies (e.g., Gallup, Ipsos-Reid), for example, have enough personnel to conduct public opinion polls in one or two days and report results quickly thereafter. Telephone surveys are one of the quickest methods because time is not spent waiting for the postal service to deliver questionnaires to respondents and then back to researchers, and telephone surveys do not have travel time required for completing on-site / in-person surveys (Frey, 1989; Gad, 2000).

Telephone surveys allow researchers a high degree of control over the sequence in which questions are asked, avoiding influence of others in the household, and ensuring that all questions are answered (i.e., avoid item nonresponse). These surveys also give respondents the flexibility of asking researchers for clarification if questions are confusing. Finally, telephone surveys are not as sensitive to design layout because respondents seldom see the instrument.

There are, however, weaknesses of telephone surveys. Refusals occur because people can simply hang up the telephone. Other people may use answering machines and call display technologies to screen calls; government and private "do not call" telephone lists have also been established (e.g., Crabb, 1999; Tuckel & Feinberg, 1991). If the topic being investigated is of particular interest to the sample group, however, nonresponse may be less of a problem (Dillman, 2007).

Not all people have telephones and among those who do, telephone directories used for drawing samples are often incomplete because they are out of date, do not include unlisted numbers, and often do not include cellular telephone numbers. These issues are problematic for selecting a sample where all members of a population should have an equal or known chance of selection (Salant & Dillman, 1994). Selecting random telephone numbers (i.e., ***random digit dialing***) or adding a randomly chosen number to the last digit of each number in the sample (i.e., ***add-a-digit dialing***) can be used to partially overcome some of these issues (see chapter 8).

Complex questions such as those involving hypothetical scenarios, visuals (e.g., maps, photographs), or ranking a long series of items are difficult to complete using telephone surveys. As a result, telephone surveys must be relatively short and simplistic for interviewers to communicate questions and for respondents to comprehend and answer in a timely manner. Telephone surveys are also susceptible to interviewer distortion and social desirability bias through leading questions, the interviewer's tone, and by what the respondent thinks the interviewer wants to hear (e.g., Gad, 2000; Mitra & Lankford, 1999; Salant & Dillman, 1994). Training of all interviewers is required before survey administration.

In the last decade, telephone surveys have received less attention in parks, recreation, and human dimensions research. This is partially attributable to the increasing complexity of methodologies used by researchers. Stated choice modeling and conjoint analysis, for example, are becoming

popular for examining tradeoffs among social, environmental, and managerial attributes preferred by recreationists (e.g., Kneeshaw, Vaske, Bright, & Absher, 2004; Lawson, Roggenbuck, Hall, & Moldovanyi, 2006). Although data collected from these approaches assists managers with prioritization when faced with challenging decisions, the number and complexity of scenarios and questions required for these methodologies are arguably too complex to convey using telephone surveys.

Researchers often conduct research in diverse geographical areas (e.g., other states, countries), which necessitates long-distance costs when administering telephone surveys. If a large sample size is desired, these rates can be prohibitively costly compared to approaches such as mail and electronic surveys. Telephone surveys also require reasonably accurate lists of telephone numbers for specific samples. These lists are becoming more difficult to obtain due to cellular telephone numbers and unlisted numbers. Regardless, telephone surveys are advantageous especially when rapid turnaround is important, experienced help is available, and questions are relatively straightforward (e.g., Frey, 1989; Khurshid & Sahai, 1995).

On-site (i.e., in-person, face-to-face) surveys are useful when address or telephone lists required for mail or telephone surveys are unavailable, and for surveying people who may be unwilling or unable to respond by mail, telephone, or electronic methods. Interviewers intercept individuals in person and either: (a) read survey questions to respondents and record answers on the questionnaire form (i.e., interviewer-completed), or (b) ask respondents to immediately read and respond to questions themselves (i.e., respondent-completed). On-site surveys are common in tourism and recreation settings where lists of visitor contact information are often unavailable. Trailhead surveys, for example, are common for intercepting backcountry recreationists and obtaining completed questionnaires about issues in remote areas.

On-site surveys typically yield exceptionally high response rates because researchers can explain the rationale and importance of the survey, and ensure that responses remain anonymous and confidential. Researchers retain a high degree of control over who completes the survey and can encourage people to complete all questions (i.e., avoid item nonresponse). On-site surveys also give respondents the ability of asking researchers for clarification if questions are confusing (Groves & McGonagle, 2001).

Like telephone surveys, a major weakness of site intercept survey instruments, especially in human dimensions and recreation research, is that they cannot be too long because few people want to be disrupted for an extended period of time. By comparison, mail and some electronic surveys can be longer and more complex because respondents have the choice of completing questionnaires on their own time at one or more sittings. Most on-site surveys ask people to stop what they are doing to answer questions.

On-site surveys can be costly in terms of time and money. Although these surveys can be completed relatively quickly, they can be more expensive and less efficient than telephone and mail surveys. Time and cost to travel to the study site as well as accommodation costs at the site can increase quickly with on-site studies. This is especially true when the study site is large and potential respondents are widely scattered across the site. It makes little sense conducting an on-site survey when the target sample population is the general public in a large area (e.g., state).

Another weakness of on-site surveys is that interviewers must be trained in interpersonal communication, why the research project is being conducted, format of the questionnaire, and how to respond professionally to anticipated and unanticipated questions (Salant & Dillman, 1994). Supervisors should be present to monitor interviewers and ensure that questionnaires are being filled out completely during survey administration. Extensive training and supervisor presence can increase costs of on-site surveys. Despite these shortcomings, on-site surveys are popular because of their high response rates and ability to reach populations for which no contact list (e.g., addresses, telephone numbers) currently exists.

Electronic surveys are conducted using electronic mail (i.e., email) or websites operated by researchers or private companies (e.g., www.surveymonkey.com). ***Email surveys*** are relatively simplistic and are often little more than text messages (Dillman, 2007). ***Internet surveys*** are becoming more common because of their efficiency and dynamic construction and interaction capabilities such as pop-up instructional boxes, drop-down menus with lists of answers, seamless and invisible skip patterns, audio capabilities, animation, and video clips (Couper, Traugott, & Lamias, 2001; Dillman, 2007). Both of these electronic survey methods generally require access to a sample list of email addresses or notification of potential respondents to visit a website.

Electronic surveys can be more efficient than mail, telephone, and on-site surveys because almost no paper, postage, travel, envelope stuffing, or telephone calls are required. Electronic surveys can eliminate the need for data-entry costs because answers can be automatically transferred to an electronic database spreadsheet. Time required for survey implementation and administration can be reduced from several weeks to just a few days or hours (Dillman, 2007). Once the data collection system has been designed, costs of administering additional surveys are less than most other survey methods (Couper, 2000; Dillman, 2007; Gaede & Vaske, 1999).

There are weaknesses associated with electronic surveys. It cannot be assumed, for example, that everyone has past experience with electronic surveys. These surveys need to explain how to respond and proceed through the instrument. Issues of anonymity, security, and confidentiality of electronic responses should be addressed and communicated to respondents (Sills & Song, 2002). For example, if employees are asked by their supervisor to complete an electronic survey about a sensitive topic such as workplace discrimination, fears associated with answers being traced to email or Internet protocol (IP) addresses may inhibit responses rates.

Researchers often cannot control responses to electronic surveys. Some respondents, for example, could complete the questionnaire more than once and bias findings. It is difficult to control whether the person to whom the survey was addressed actually completed the questionnaire. This makes it challenging to generalize results to a known population. A personal identification number (PIN) or other code should be provided to limit questionnaire access to only individuals who were sampled (Couper, 2000).

Computer system issues such as screen configuration and resolution, connection speed (e.g., dial-up vs. high-speed cable), and software availability also complicate administration of electronic surveys. Surveys with large graphics and many drop-down menus and pop-up instructional boxes, for example, may take several minutes instead of a few seconds to download using older machines or Internet service providers with less capacity and capability.

A major weakness with electronic surveys is that many individuals and households do not have computers or email addresses, especially in poorer areas and developing countries. This is problematic when generalizing from surveys of the general public because there is no possibility for drawing a sample in which every individual has an equal chance of being selected (Dillman, 2007; Gaede & Vaske, 1999). This may be less of an issue for specific populations such as university personnel or government employees who generally have access to computers with Internet service. Although more people are obtaining computers every day, "email and web surveying of the general public is currently inadequate as a means of accessing random samples of defined populations of households and/or individuals" (Dillman, 2007, p. 356).

In addition to mail, telephone, on-site, and electronic surveys, there are other types of surveys that have received some attention in parks, recreation, and human dimensions research. ***Drop-off surveys***, for example, combine on-site (i.e., in-person, face-to-face) and mail surveys. Questionnaires are personally delivered to respondents who then complete the questionnaire on their own time and return it by mail or keep it until a later time when the researcher returns to collect the completed questionnaire. These surveys are useful when contact lists required for mail or telephone surveys are unavailable and the instrument is too long to complete on-site in a short period of time.

Mixed-mode surveys involve using two or more types of surveys to compensate for weaknesses of each method (e.g., Groves & Lepkowski, 1985). The most common mixed-mode approach is to use one method to obtain responses from some members of a sample, and use a second or third method to obtain responses from other members (e.g., Dillman, 2007; Schonlau, Asch, & Du, 2003). Email surveys, for example, may be followed by paper questionnaires sent to nonrespondents simply because not everyone has access to email. Another type of mixed-mode survey is to use a different method to collect panel data from the same respondents at a later time period. An initial on-site trailhead survey, for example, may ask for contact information (e.g., address, telephone number) that would allow for other methods in a follow-up mail, telephone, or electronic survey. Mixed-mode surveys may also be used to collect different types of information from the same respondents during the same data collection period.

Different Methods, Different Results

When selecting among survey methods, researchers should be aware that for some questions, certain types of surveys provide different results than other types (de Leeuw, Mellenbergh, & Hox, 1996). To illustrate, a study of visitors to Colorado State Parks used both telephone and mail surveys (Whittaker, Vaske, Donnelly, & DeRuiter, 1998). The purpose of the study was to estimate visitors' willingness to pay a fee increase to visit the parks. The primary research question was: Do income levels, past visitation experience, and willingness to pay differ between mail and telephone survey respondents? Telephone surveys were completed by 618 visitors (79% response rate); mail surveys were completed by 311 other visitors (78% response).

Results showed that past experience with Colorado State Parks (e.g., number of years visiting, number of visits per year) did not differ by survey mode, whereas reported income was slightly higher for mail survey respondents (Table 7.3, p. 132). Telephone survey participants, however, reported significantly higher willingness to pay fee increases (e.g., $4 to $6 per day, $40 to $60 per year) than mail survey respondents (Table 7.4, p. 132). Answers from mail survey participants suggested that strategic bias may have influenced their responses. ***Strategic bias*** occurs

when respondents deliberately provide a lower willingness to pay response compared with their true feelings so that they do not pay a high fee once implemented (Loomis, 2004). Conversely, answers from telephone survey participants suggested that social desirability bias may have influenced responses. Given that these respondents were completing the survey by talking with interviewers on the telephone, they may have felt obliged as park visitors to pay more for their experiences and not leave interviewers with an impression that respondents were tightfisted and cheap. It is important for researchers to choose among survey methods by thinking about their strengths and weaknesses, and the potential for survey type to influence project outcomes.

Table 7.3 Differences between Mail Survey and Telephone Survey Respondents' Past Experience and Income Levels

	Survey mode [1]			
	Telephone	Mail	*t*-value	*p*-value
Years living in Colorado	26.1	26.4	0.26	.792
Years visiting Colorado State Parks	20.6	20.1	0.57	.569
Number of State Parks visited per year	9.9	9.1	1.10	.272
Income in dollars	$39,129	$44,779	3.34	.001

[1] Cell entries are means (averages).

Table 7.4 Differences between Mail Survey and Telephone Survey Respondents' Willingness to Pay to Visit Colorado State Parks

	Survey mode [1]				
Willingness to pay	Telephone	Mail	χ^2-value	*p*-value	Effect size (ϕ)
$4 per day	85	73	5.89	.015	.15
$5 per day	77	56	14.55	<.001	.22
$6 per day	67	43	15.37	<.001	.23
$40 per year	70	55	5.39	.020	.14
$50 per year	56	47	2.30	.129	.09
$60 per year	43	32	3.69	.056	.11
More on weekends	49	39	9.54	.002	.10
More for some parks	69	56	14.98	<.001	.13
More for water sites	57	52	2.33	.127	.05

[1] Cell entries are percent that said "yes" they would be willing to pay amount.

The First Draft: Writing Good Survey Questions

General Guidelines for Writing Questions

Writing good questions and constructing an attractive and professional questionnaire that is easy to follow and complete in a timely manner are not trivial tasks. The key to producing useful data is taking time to translate ideas that motivated the survey into good questions (Salant & Dillman, 1994). The following guidelines are offered for writing survey questions. These guidelines are based on various sources (e.g., Dillman, 2000, 2007; Mitra & Lankford, 1999; Salant & Dillman, 1994; Tourangeau, Rips, & Rasinski, 2000) and the authors' own research in parks, recreation, and human dimensions of natural resources.

Guideline 1: Identify exactly what kind of information you want respondents to provide.

This should be the first step to writing survey questions. It is important to clarify what type of information is needed to meet project objectives and / or hypotheses because it is easy to ask for one type of information when a researcher really wants another. Willingness to pay for park access, for example, is one area of research in recreation management. If the goal is to find out *whether or not* people would be willing to pay, the following question may be appropriate:

> Would you be willing to pay a daily fee to visit Smith Lakes State Park? (check one)
> ☐ No
> ☐ Yes

Alternatively, if the objective is to estimate *how much* people would be willing to pay for park access, a question such as the following may be more suitable:

> What is the maximum amount that you would be willing to pay per day to visit Smith Lakes State Park? (write response)
>
> I would be willing to pay $ _____ per day to visit Smith Lakes State Park

Parks, recreation, and human dimensions research is often interested in measuring individuals' behavior and attitudes toward that behavior. A recent study, for example, examined residents' behavioral intentions and attitudes regarding lethal control of coyotes in the South Suburban open space area in Colorado (Vaske & Needham, 2007). To measure behavioral intentions, the following question was asked on a seven-point response scale from "extremely unlikely" to "extremely likely:"

> If you had to decide today how to solve a problem with a nuisance coyote, how likely is it that you would support lethal trapping of coyotes in South Suburban open spaces? (Please circle one number that matches your response)

This study also wanted to examine attitudes about lethal coyote control so an additional question was asked on a seven-point response scale from "extremely negative" to "extremely positive:"

> Overall, how do you feel about lethal trapping of coyotes in South Suburban open spaces? (Please circle one number that matches your response)

Information from the first question describes behavioral intentions toward lethal control of coyotes, whereas information from the second question describes how people feel about lethal

control of coyotes. These are two different pieces of information measuring distinctly different concepts described in the literature and outlined in theories such as the theory of reasoned action (Ajzen & Fishbein, 1980; Fishbein & Ajzen, 1975; chapter 2).

Guideline 2: Use fixed-scale or close-ended questions rather than open-ended (i.e., fill-in-the-blank) questions wherever possible.

Open-ended questions do not provide choices from which to select a particular answer. Open-ended questions are easier to construct, but have several weaknesses (see Salant & Dillman, 1994 for a review). These questions, for example, require tremendous personnel time to enter into a database (e.g., as a "string" variable in SPSS), sort through responses, and code answers into categories or groups. This process takes substantially more time than if answers were specified and coded in advance. Open-ended questions can produce hundreds or even thousands of different responses depending on sample size. An open-ended question such as "Where do you live?" for example, may yield responses from different individuals such as Colorado, Larimer County, Fort Collins, and Red Feather Lakes. All of these areas could be categorized into one category labeled Colorado because Larimer County, Fort Collins, and Red Feather Lakes are all in Colorado. Categorization, however, is challenging and time-consuming.

Respondent burden also increases with open-ended questions, which can increase survey completion time and decrease response rates. If people are asked to write sentences about topics that they may not be interested in or familiar with, there is greater likelihood that questionnaires will be returned incomplete or answers may not provide substantive or useful information. If the general public was mailed a questionnaire asking a specific open-ended question such as "What should be done to improve habitat for the Great Grey Slug?" for example, it is likely that most people will either provide uninformed answers or not answer the question.

Open-ended questions limit the ability to measure reliability and validity of concepts examined in a questionnaire, and rarely provide information that can be compared among groups across an entire sample. Finally, some respondents may write long, detailed, and multi-part answers to a particular question, whereas others may write a brief one- or two-word reply. This presents a challenge for researchers when comparing answers.

Open-ended questions, however, are useful for elicitation surveys. Answers from an elicitation survey can be used to develop fixed-scale questions to include in a questionnaire that will be administered later to a larger sample of individuals. This is important when researchers have little prior knowledge about a topic and are unable to specify response choices. In a recent study of hunters' responses to chronic wasting disease (CWD), for example, there was limited literature and past research to help investigators understand what aspects of the disease would influence hunters to stop hunting (Needham, Vaske, & Manfredo, 2004). An elicitation survey was administered to a sample of hunters who were asked "What circumstances related to CWD would cause you to give up deer hunting?" Responses to this open-ended question showed that the most dominant responses were related to CWD prevalence and potential human health risks associated with the disease. In subsequent larger mail surveys, scenarios portrayed increasing CWD human health risks and prevalence levels among deer and elk, and hunters were asked to select from a set of fixed response options (e.g., hunt, give up).

There are other advantages of open-ended questions. These questions, for example, can be useful at the end of questionnaires to allow respondents to provide additional comments or let researchers know if anything was missing. An appropriate open-ended question at the end of a questionnaire would be "Do you have any other comments about issues discussed in this survey? If so, please write your comments below." Open-ended questions are also useful following a close-ended or fixed scale response question to ask respondents to explain, elaborate, or clarify their answer. This can provide researchers with more insight regarding answers to a particular question (Dillman, 2007; Geer, 1991). Finally, open-ended questions are useful when asking people to provide an estimate of a personal characteristic, routine behavior, or situation in which precise information is needed and can be recalled without a list or scale of answer choices (Geer, 1991). Examples where open-ended questions are useful include:

What is your age? (Please write response) _____ years old

In total, about how many years have you fished in your life? (Please write response)

Number of years _____

In what state or province do you currently live? (Please write response) _____

Taken together, open-ended questions should be used sparingly and only in certain circumstances. Close-ended questions are preferred. Different types of close-ended or fixed-scale questions include: (a) close-ended with ordered response choices, (b) close-ended with unordered response choices, and (c) partially close-ended response choices (Salant & Dillman, 1994). Questions that are ***close-ended with ordered response choices*** present response options in a particular order or gradation. These questions are easy to code and less demanding for respondents. Examples of this type of question include:

Overall, how dissatisfied or satisfied were you with your visit to Smith Lakes State Park today? (Please check one)

- ☐ Very Dissatisfied
- ☐ Somewhat Dissatisfied
- ☐ Neither Satisfied nor Dissatisfied
- ☐ Somewhat Satisfied
- ☐ Very Satisfied

Which of the following broad categories best describes your current approximate annual household income before taxes? (Please check one)

- ☐ Less than $10,000
- ☐ $10,000 – $29,999
- ☐ $30,000 – $49,999
- ☐ $50,000 – $69,999
- ☐ $70,000 – $89,999
- ☐ $90,000 – $109,999
- ☐ $110,000 – $129,999
- ☐ $130,000 – $149,999
- ☐ $150,000 – $169,999
- ☐ $170,000 or more

To what extent do you oppose or support each of the following possible management actions at Smith Lakes State Park? (Please circle one number for each possible management action)

	Strongly Oppose	Oppose	Neither	Support	Strongly Support
Improve road access	1	2	3	4	5
Provide more parking	1	2	3	4	5
Provide more trash cans	1	2	3	4	5
Provide more toilets	1	2	3	4	5
Prohibit motorboats	1	2	3	4	5
Require dogs be kept on leash	1	2	3	4	5

Questions that are ***close-ended with unordered response choices*** are similar to those above with one exception — response choices are not in a particular order or gradation; people choose among discrete unordered response categories. With these types of response options, individuals completing the questionnaire are required to read the entire list, compare response categories, and process this information before selecting an answer. This task is progressively more challenging as more choices are added. These types of questions are also difficult for researchers who must ensure that all possible responses are provided and each category is mutually exclusive. Elicitation studies, focus groups, and pretests can help address these issues and improve response categories (see chapter 8). A *poor* close-ended question with unordered choices is:

What one type of deer hunting do you do in Arizona? (Please check one)
- ☐ Gun
- ☐ Rifle
- ☐ Archery
- ☐ Shotgun

This question is poor for three reasons. First, not all possible categories have been listed. Muzzleloading, for example, is a popular type of deer hunting, but was not included in the list. Second, categories are not mutually exclusive because "rifle" and "shotgun" are both forms of the more general "gun" hunting, which was also listed. Third, the question asks for just one type of deer hunting, but many hunters alternate between different types of hunting. For example, a bow hunter may also hunt with a shotgun for the same species. A more suitable response option is "check all that apply" instead of "check one." A *better* version of this question could be:

What types of deer hunting do you do in Arizona? (Please check all that apply)
- ☐ Gun (e.g., rifle, shotgun)
- ☐ Muzzleloading
- ☐ Archery

Questions with ***partially close-ended response choices*** offer a compromise between open-ended and close-ended questions. This type of question gives respondents flexibility to choose from a set of researcher-determined response options or create their own answers(s) by including, for example, an "other" category and asking respondents to write their answer. If the researcher has provided a relatively exhaustive list of mutually exclusive categories, few people will identify

a different response, but at least they have the option of not being forced into a predefined category (Salant & Dillman, 1994). The following is an example of this type of question:

> What activities did you participate in today at this wildlife refuge? (Please check all that apply)
> ☐ Hunting
> ☐ Fishing
> ☐ Wildlife viewing
> ☐ Wildlife photography
> ☐ Other (Please write response) _____

Choosing to structure survey questions as open-ended, close-ended, or partially close-ended is never an easy decision. Each alternative has strengths and weaknesses, and should be evaluated within the context of project objectives and hypotheses, and how other studies have measured the same concepts. It is important to recognize, however, that many statistical techniques such as reliability, regression, and analysis of variance require independent and/or dependent variables to be measured on continuous scales (chapter 5). Five, seven, or nine-point close-ended ordered scales (e.g., 1 "strongly disagree," 2 "moderately disagree," 3 "slightly disagree," 4 "neither," 5 "slightly agree," 6 "moderately agree," 7 "strongly agree") allow for these statistical procedures. In a recent human dimensions experiment; for example, standardized results for the same question did not differ between five and seven-point scales (e.g., slightly or strongly agree or disagree), but responses on these scales were different than those measured on three-point scales (e.g., agree, disagree; Vaske, Needham, Shelby, & Hummer, 2007). It is always possible to collapse and recode longer scales into categorical options (e.g., disagree, neither, agree) at a later time, but not vice versa. Continuous scales provide researchers and analysts with more options when analyzing data and reporting results.

Guideline 3:
Choose simple words and phrases over more specialized alternatives.

When writing questions, it is often effective to use words that are short, simple, and easy to understand. Researchers should never assume that all respondents will have an advanced education and/or a high level of reading comprehension. Respondents should never find themselves consulting a dictionary when completing a questionnaire. Asking people to review drafts of a questionnaire and pretesting the instrument are important for identifying problems with word and phrase choices. Table 7.5 shows examples of how to improve words and phrases.

Table 7.5 Examples of Using Simple Words and Phrases Instead of Specialized Words When Writing Survey Questions

	Worse	Better
Words	Exhausted	Tired
	Candid	Honest
	Highest priority	Most important
	Employment	Work
	Leisure	Free time
	Courageous	Brave
	Rectify	Fix

	Worse	Better
Phrases	Occupants of this residence	People who live here
	Your responses in reply to this survey	Your answers
	Post-school extra-curricular activities	What you do after school
	Work-related employment concerns	Job concerns

Adapted from Dillman (2000)

Guideline 4:
Use as few words as possible to ask a question.

It is often not necessary to provide extra verbiage in a question. Long questions can confuse respondents and may cause them to simply skip over and not respond to the question or even stop filling out the questionnaire altogether. With long questions, people can give unequal attention to each word, important words get missed, and unimportant words may receive too much attention (Dillman, 2000). It is important to strive for brevity and clarity when writing questions. An example of a *poor* question would be:

> Do you strongly oppose, somewhat oppose, neither oppose nor favor, somewhat favor, or strongly favor the National Park Service implementing and charging people fees to enter and visit National Parks? (Please check one)
> ☐ Strongly oppose
> ☐ Somewhat oppose
> ☐ Neither oppose nor favor
> ☐ Somewhat favor
> ☐ Strongly favor

A more succinct and *improved* version of this question would be:

> To what extent do you oppose or favor National Park entrance fees? (Please check one)
> ☐ Strongly oppose
> ☐ Somewhat oppose
> ☐ Neither oppose nor favor
> ☐ Somewhat favor
> ☐ Strongly favor

Guideline 5:
Use complete sentences and avoid cryptic phrases when asking questions.

Incomplete sentences may save a small amount of space in surveys, but they never substitute for good questions. Fragments or cryptic questions may confuse respondents and provide answers that are unrelated to what the researcher was intending when writing the question. The following is an example of an incomplete and cryptic question:

> How long in Colorado? (Please write response) _____

This question is an incomplete sentence, does not specify units of duration (e.g., days, years, decades), and does not specify what is "long" in Colorado (e.g., length of residence, length of winter season, length of employment). A possible revision for this question would be:

> In total, about how many years have you lived in Colorado? (Please write response)
> Number of years _____

Guideline 6:
Avoid vague quantifiers if precise estimates can be obtained, but avoid too much precision if it exceeds a person's potential for accurate, readily accessible answers.

When selecting response categories for close-ended questions, it is important to be as precise as possible without being so specific that it is nearly impossible to answer (Schaeffer, 1991). Although broad categories make respondents' and researchers' jobs easier, categories that are too broad provide little, if any, useful information. Consider the following examples:

About how often did you go hiking during the past year? (Please check one)
- ☐ Never
- ☐ Rarely
- ☐ Occasionally
- ☐ Regularly

About how often did you go hiking during the past year? (Please check one)
- ☐ Never
- ☐ 1 to 12 times
- ☐ 13 to 24 times
- ☐ 24 to 52 times
- ☐ More than 52 times

The first question is problematic because "rarely," "occasionally," and "regularly" mean different things to different respondents. For one person, "rarely" might mean three to five times and "occasionally" might imply six to 10 times. For another person, however, "rarely" might mean once a month (i.e., 12 times in the past year) and "occasionally" may refer to twice a month (i.e., 24 times per year).

The second question is problematic because responses are so precise that it may be impossible to correctly answer the question. This level of precision may provide more detail than the researcher needs (Salant & Dillman, 1994). A problem with both questions is what is meant by "the past year?" If questions were answered in June 2007, for example, it is not clear if the last year refers to January 2007 to June 2007 or the last 12 months (i.e., June 2006 to June 2007). A possible revision for these questions would be:

About how often did you go hiking during the past 12 months? (Please check one)
- ☐ Not at all
- ☐ A few times
- ☐ About once a month
- ☐ Two or three times a month
- ☐ About once a week
- ☐ More than once a week

Guideline 7:
Use an equal number of positive and negative responses for scale questions.

Bias can be created when ordered response categories are weighted in one direction causing an imbalance in response choices. To illustrate, a problematic question would be:

> Overall, how dissatisfied or satisfied were you with your river guide today?
> (Please check one)
> ☐ Dissatisfied
> ☐ Neither Satisfied nor Dissatisfied
> ☐ Somewhat Satisfied
> ☐ Mostly Satisfied
> ☐ Completely Satisfied

This question has only one negative response ("dissatisfied") compared to three positive responses ("somewhat satisfied," "mostly satisfied," "completely satisfied"). The following question provides a more balanced response scale:

> Overall, how dissatisfied or satisfied were you with your river guide today?
> (Please check one)
> ☐ Completely Dissatisfied
> ☐ Somewhat Dissatisfied
> ☐ Neither Satisfied nor Dissatisfied
> ☐ Somewhat Satisfied
> ☐ Completely Satisfied

There is, however, an exception to this guideline. If most respondents are likely to check one extreme or a middle point (e.g., neither, neutral) does not make sense for the question, unequal numbers of positive and negative response choices may be appropriate. The nine-point crowding scale (e.g., Shelby & Vaske, 2007; Shelby, Vaske, & Heberlein, 1989; Vaske & Shelby, 2008; see chapter 4), for example, ranges from "not at all crowded" to "extremely crowded" with interior responses of "slightly crowded" and "moderately crowded." Similarly, survey items measuring importance of characteristics in motivating people to engage in a recreation activity (e.g., to be in nature, to be with friends/family, to get exercise) are often measured on a scale from "not important" to "extremely important."

Guideline 8:
Distinguish "neither" from "no opinion" response options for scale questions.

It is important to recognize that "neither" can mean something completely different than "no opinion" (e.g., Blasius & Thiessen, 2001; Dillman, 2000). A survey question, for example, may ask about the extent to which respondents oppose or support wolf reintroduction in Colorado. One respondent may never have given any thought to wolf reintroduction and knew little about the topic. For this individual, a correct answer is "no opinion." A second respondent who carefully researched the topic and weighed pros and cons of wolf reintroduction without coming to any resolution may say "neither support nor oppose." It is useful to consider providing both of these responses in addition to positive and negative choices:

To what extent do you oppose or support wolf reintroduction in Colorado? (Please check one)
☐ Strongly Oppose
☐ Somewhat Oppose
☐ Neither Support nor Oppose
☐ Somewhat Support
☐ Strongly Support
☐ No Opinion

Guideline 9:
Avoid double-negatives or asking people to say "yes" in order to mean "no."

Double-negatives almost always confuse respondents. Although this seems obvious, such questions are still commonly asked. The following question is an example of a double-negative:

Do you oppose or support not requiring catch-and-release fishing at Smith Lakes State Park? (Please check one)
☐ Oppose
☐ Support

If respondents quickly read or skim this question, they are likely to miss the word "not." The mental connection of supporting a "not" is challenging for respondents (Dillman, 2000). A revision of this question would be:

Do you oppose or support requiring all anglers to catch and release their fish at Smith Lakes State Park? (Please check one)
☐ Oppose requiring catch-and-release at Smith Lakes State Park
☐ Support requiring catch-and-release at Smith Lakes State Park

Guideline 10:
Do not write double-barreled questions.

A double-barreled question contains two different questions or components, but asks for only one answer. Respondents may feel differently about each component. The following example illustrates a double-barreled question:

When you go to work, do you walk or carry your lunch? (Please check one)
☐ No
☐ Yes

This question is double-barreled because a respondent may walk to work, but not carry his or her lunch. Another respondent may not walk to work, but carries his or her lunch with them when driving to work. It is unclear what part of the question to which a response of "no" or "yes" refers. The question contains two questions: (a) Do you walk to work? and (b) Do you carry your lunch to work? The questionnaire should be revised to include two separate questions:

Do you walk to work? (Please check one)
☐ No
☐ Yes

Do you carry your lunch to work? (Please check one)
☐ No
☐ Yes

A more subtle example of a double-barreled question was asked in a recent study of residents' attitudes toward selling timber harvested from a watershed near a small Oregon town. The question asked residents to read a belief statement and respond on a five-point scale from 1 "strongly disagree" to 5 "strongly agree." The statement was:

Plants and wildlife will benefit from the proposed timber sale. (Please circle one number)

This question is double-barreled because a respondent may agree that wildlife would benefit from the timber sale, but disagree that plants would benefit (or vice versa). It is unclear what part of the statement (plants or wildlife) to which people are agreeing or disagreeing. The statement should be split into two statements, each with their own response scale:

Plants will benefit from the proposed timber sale. (Please circle one number)

Wildlife will benefit from the proposed timber sale. (Please circle one number)

Guideline 11: Make every question count.

Similar to Guideline 1, it is important to define exactly what information is needed and to make every question important. Otherwise, questions simply waste questionnaire space and respondent time. To illustrate, a survey was conducted with downhill skiers and asked:

Do you downhill ski? (Please check one)
☐ No
☐ Yes

Although this is a perfectly acceptable question, questionnaires were administered on-site in lineups of downhill skiers waiting to get on chairlifts. Snowboarding, cross-country skiing, and telemark skiing were prohibited at this downhill ski area at the time of the study. As a result, all respondents selected "yes." A more useful and informative question might be:

On average, about how often do you downhill ski during a typical season? (Please check one)
☐ Once
☐ Twice
☐ 3 to 5 times
☐ 6 to 10 times
☐ 11 to 20 times
☐ More than 20 times

Guideline 12: Use an appropriate timeframe for questions and responses.

A common topic of interest in parks, recreation, and human dimensions research is how often people participate in a specific behavior during a particular period of time. Surveys of hunters,

for example, often ask respondents how often they hunted a particular species (e.g., Needham, Vaske, Donnelly, & Manfredo, 2007). According to Dillman (2000), several issues should be considered when using time referents in questionnaires. First, when something is so common or mundane in a person's life (e.g., watching television, walking the dog), it is hard for them to quantify exactly how often they engaged in the behavior. Consequently, it may be more appropriate to ask for a general estimate (e.g., about once a day) rather than specific counts.

Second, memory tends to diminish over time and people may find it difficult to categorize information by precise time periods (e.g., month, year). An avid hiker, for example, may find it difficult to respond to a question asking how often they went hiking in the last five years. Depending on project objectives, it is typically appropriate to shorten the timeframe.

Third, some studies focus on specific short time periods such as engaging in a behavior in the last three days or one week (e.g., smoking, eating out, walking). Participation in the behavior, however, may differ substantially by day of week so different responses may be obtained depending on when respondents complete the questionnaire.

Finally, as mentioned above in Guideline 6, questionnaires often ask people to report their participation in an activity "during the past year" or "this year." A problem with these phrases is that responses are likely to be higher later in the year. Respondents may also be confused with the timeframe. If questionnaires were administered in June 2007, for example, it is not clear if the last year refers to January 2007 to June 2007 (i.e., "this year") or the last 12 months (i.e., June 2006 to June 2007). An example of a poor question is:

> How many fishing trips have you taken in the last year? (Please write response)
>
> I have taken _____ fishing trips in the last year

This question could be improved by asking:

> How many fishing trips have you taken in the last 12 months? (Please write response)
>
> I have taken _____ fishing trips in the last 12 months

The revised question is better, but an avid angler may find it difficult to report a precise count of the number of times they went fishing in such a long period of time (i.e., 12 months). It may be more appropriate to ask the following question:

> About how many fishing trips have you taken in the last three months? (Please write response)
>
> I have taken _____ fishing trips in the last three months

Other alternatives for reducing item nonresponse for questions involving timeframes are to add phrases such as "provide your best estimate" or "your best estimate is fine," or to prelist responses in categories (e.g., 1 to 5 trips, 6 to 10 trips) instead of using open-ended response options. This latter approach, however, constrains the types of analyses that can be performed on data. Chapter 13 discusses strategies for analyzing categorical data.

Guideline 13:
Reduce impact of sensitive or objectionable questions.

Respondents may be reluctant to answer sensitive or potentially objectionable questions. This is especially problematic if the nonresponse reduces sample sizes and inflates social desirability bias (Tourangeau & Yan, 2007). Asking respondents about their income is one potentially objectionable question. Open-ended formats for income questions are especially problematic because people consider such specific personal information to be nobody else's business. In addition, few people can easily recall their exact annual income to the precise dollar amount. A problematic income question would be:

> What was your total household income before taxes in 2007? (Please write response)
>
> $_____ total income for 2007

Changing from an open-ended response option to broader categories can reduce nonresponse for this type of question. An alternative approach for measuring income is:

> Which of the following broad categories best describes your approximate annual household income before taxes in 2007? (Please check one)
>
> ☐ Less than $10,000
> ☐ $10,000 – $29,999
> ☐ $30,000 – $49,999
> ☐ $50,000 – $69,999
> ☐ $70,000 – $89,999
> ☐ $90,000 – $109,999
> ☐ $110,000 – $129,999
> ☐ $130,000 – $149,999
> ☐ $150,000 – $169,999
> ☐ $170,000 or more

Researchers should consider response options for income questions in relation to research objectives and the target population. If the study is concerned with the impact of recreation fee increases on poor individuals, for example, finer distinctions at the low end of the response scale may be necessary. Alternatively, if the project examines recreation behaviors and attitudes of the extremely wealthy, more response options at the high end of the scale are likely appropriate.

Asking questions about behaviors in which people should or must engage (but many people do not) can also be objectionable to some respondents. In some areas, for example, it is mandatory for all hunters to submit all of their harvested deer or elk to be tested for chronic wasting disease (CWD). An objectionable question would be:

> Did you submit your deer or elk for CWD testing? (Please check one)
> ☐ No
> ☐ Yes

Hunters may feel offended by this question because if they said "no," they may be admitting to an illegal behavior. Hunters who did not submit their deer or elk are likely to say "yes" or skip over this question without providing an answer. One way to soften the impact of this type of objectionable question is:

> For a variety of reasons, some hunters may not have had a chance to submit their deer or elk for CWD testing. Did you happen to submit your deer or elk for CWD testing? (Please check one)
> ☐ No
> ☐ Yes

Guideline 14:
Use terminology that makes sense to respondents and define terms that may be vague and unclear.

Some terminology can be unclear and may not make sense to respondents. Vague terms cause respondents to misunderstand questions, which can produce bias and error in responses (Fowler, 1992). Surveys examining participation in a recreation activity, for example, may ask "how many trips" people have taken. The definition of what constitutes a "trip" is potentially confusing. The following question uses potentially unclear terminology:

> How many fishing trips have you taken in the last three months? (Please write response)
>
> I have taken _____ fishing trips in the last three months

For this question, it is not clear what defines "a fishing trip." To some people, a fishing trip may simply involve walking a few blocks from their house to a nearby lake or stream. For other individuals, a fishing trip might constitute a multi-day excursion to hike-in lakes in another state or province. Researchers need to clarify or define potentially unclear terms. For example:

> How many fishing trips have you taken in the last three months? (Please write response; a fishing trip is defined as a trip of more than 50 miles)
>
> I have taken _____ fishing trips in the last three months

Other terms can confuse respondents. For a class assignment, for example, a student designed a questionnaire to be administered to skiers. One question in the instrument asked:

> How many times did you go Nordic skiing in the last six months? (Please write response)
>
> I went Nordic skiing _____ times in the last six months

This question is problematic because some skiers may not be familiar with the terminology "Nordic skiing." As discussed in Guideline 3 and Table 7.5 (p. 137), it is important to choose simple words that make sense for all respondents. This question could be improved by substituting "Nordic" with the more generic term "cross-country."

> How many times did you go cross-country skiing in the last six months? (Please write response)
>
> I went cross-country skiing _____ times in the last six months

Guideline 15:
Define abbreviations and acronyms that respondents may not understand.

Undefined abbreviations and jargon should never be used in questionnaires (Salant & Dillman, 1994). There is, however, an exception to this rule. Some abbreviations and jargon may be appropriate if the questionnaire is being completed by a specific group who use certain phrases or abbreviations frequently, and will definitely not be confused. A survey of professors, for example, may include the abbreviation "P&T" in questions because this group of respondents is likely to know that P&T refers to "Promotion and Tenure." An example where abbreviations would not be appropriate would be a survey of the general public asking:

> Do you believe that the EPA should continue funding CFC research? (Please check one)
> ☐ No
> ☐ Yes
> ☐ Unsure

Given that few people are likely to know what CFC and EPA mean, these abbreviations should be briefly defined. An alternative approach for asking the question is:

> Chlorofluorocarbons (CFCs) are compounds that have been used in the past by industry for such things as refrigeration and cleaning solvents. They are now banned from general use. The United States Environmental Protection Agency (EPA) has funded research on CFCs. Do you believe that the EPA should continue funding CFC research? (Please check one)
> ☐ No
> ☐ Yes
> ☐ Unsure

Guideline 16:
Avoid bias from unequal comparisons.

When asking close-ended questions with unordered response categories, it is possible to create bias when responses are skewed. Consider, for example, the following question:

> Who do you feel is most responsible for the litter at Smith Lakes State Park? (Please check one)
> ☐ Careless anglers
> ☐ Hikers
> ☐ Campers

The word "careless" adds a value connotation for anglers, which is not present for hikers or campers. This question should be revised to eliminate possible bias:

> Who do you feel is most responsible for the litter at Smith Lakes State Park? (Please check one)
> ☐ Anglers
> ☐ Hikers
> ☐ Campers

A subtle way to create unequal comparisons is to blame a small group by using two or more similar categories for the group. Salant and Dillman (1994) offer the following example:

Who do you feel is most responsible for the high cost of U.S. automobiles? (Please check one)
☐ Autoworkers
☐ Auto company executives
☐ Consumers

The following revision helps to reduce bias and make comparisons more equal:

Who do you feel is most responsible for the high cost of U.S. automobiles? (Please check one)
☐ Workers who produce automobiles
☐ Auto company executives who manage manufacturing plants
☐ Consumers who buy automobiles

Guideline 17:
Avoid using slanted / leading and loaded introductions and questions.

Questions can be biased when they are written in a way that makes it appear as though everyone shares the same opinion or participates in a certain behavior, and as a result, the respondent should too. Slanted or leading introductions introduce social desirability bias (i.e., respondents give answers that are consistent with perceived societal norms or shared viewpoints). An example of a slanted introduction is:

More Americans participate in wildlife viewing now than they did 10 years ago. Do you participate in wildlife viewing? (Please check one)
☐ No
☐ Yes

This introduction should be revised by providing a simple, objective, and neutral question:

Do you participate in wildlife viewing? (Please check one)
☐ No
☐ Yes

Guideline 18:
State both sides of scales in question stems or introductions.

Researchers may try to reduce the length of questionnaires by minimizing the number of words in questions. One approach for reducing question length is to mention only one side of a response scale:

To what extent do you support lethal trapping of coyotes in urban areas? (Please check one)
☐ Strongly oppose
☐ Somewhat oppose
☐ Neither support nor oppose
☐ Somewhat support
☐ Strongly support

Leaving out any mention of disagreement or opposition in the question can potentially influence responses. Mentioning "support or oppose" conveys a greater range of response options and that opposition or disagreement is an acceptable answer. This question might be revised as:

> To what extent do you oppose or support lethal trapping of coyotes in urban areas? (Please check one)
> ☐ Strongly oppose
> ☐ Somewhat oppose
> ☐ Neither support nor oppose
> ☐ Somewhat support
> ☐ Strongly support

Guideline 19: Minimize number of "check all that apply" questions to avoid "primacy" and "recency" effects.

For some topics, "check all that apply" questions are essential. For example, individuals can participate in multiple activities in a single day so asking the following type of question is often necessary:

> Please check all of the activities in which you are participating at Copper Beach Park today. (Please check all that apply)
>
> ☐ Sunbathing ☐ Snorkeling ☐ Boating
> ☐ Swimming ☐ SCUBA Diving ☐ Surfing
> ☐ Fishing ☐ Beach Walking ☐ Windsurfing/Kitesurfing

There are, however, problems with "check all that apply" questions (Rasinski, Mingay, & Bradburn, 1994). Respondents may "***satisfice***" when answering these types of questions by checking answers and proceeding down the list until they believe that they have provided a "satisfactory" answer (Dillman, 2000). Although almost all respondents will read the first few options listed, some will not read the entire list. Options that are listed first are more likely to be checked. This is analogous to a ***primacy effect*** or a tendency to select from the first few answers, which is common in mail surveys and respondent-completed on-site surveys. These questions can also cause a ***recency effect*** or tendency to select among the last answers mentioned, which tends to be common in telephone and interviewer-completed on-site surveys (Dillman, 2000). An example where primacy and recency effects may occur is:

> People go deer hunting for many reasons. Listed below are several reasons why deer hunting may be important to you. Please select reasons that influence you to go deer hunting. (Please check all that apply)
>
> ☐ Harvesting a deer ☐ Being with friends of family
> ☐ Bringing deer meat home to eat ☐ Experiencing the challenge of the hunt
> ☐ Harvesting only a trophy deer ☐ Testing hunting skills
> ☐ Being in nature ☐ Getting physical exercise
> ☐ Experiencing solitude

To minimize primacy and recency effects from this type of "check all that apply" question, it is recommended that researchers use scale responses similar to the following example:

People go deer hunting for many reasons. Listed below are several reasons why deer hunting may be important to you. Please indicate how important each of these reasons is in influencing you to go deer hunting. (Please circle one number for each statement)

	Not at all Important	Slightly Important	Moderately Important	Extremely Important
Harvesting a deer	1	2	3	4
Bringing deer meat home to eat	1	2	3	4
Harvesting only a trophy deer	1	2	3	4
Being in nature	1	2	3	4
Experiencing solitude	1	2	3	4
Being with friends or family	1	2	3	4
Experiencing the challenge of the hunt	1	2	3	4
Testing hunting skills	1	2	3	4
Getting physical exercise	1	2	3	4

Guideline 20: Use response categories that are mutually exclusive.

As noted in Guideline 2, all answers should be ***mutually exclusive***. If response categories overlap, there is potential for a respondent to select two or more answers for a "check one" question. This confuses respondents and complicates data entry and analysis. The following question, for example, asks respondents to choose one answer to a question that asks them how they learned about a recent attack on a human by a mountain lion.

How did you first learn about the mountain lion attack on March 17, 2007? (Please check one)

- ☐ From a friend or family member
- ☐ From my spouse
- ☐ From the radio
- ☐ While at home
- ☐ While at work
- ☐ While attending a meeting

Problems with this question are: (a) choices combine sources and locations so someone could have heard about the attack from their spouse while at home, or from a friend who they work with while attending a meeting; (b) sources are not mutually exclusive because a spouse is also a friend and family member; and (c) locations are not mutually exclusive because a person could have heard about the attack while at work and attending a meeting. The question should be separated into two questions with revised choices:

From whom or what did you first learn about the mountain lion attack on March 17, 2007? (Please check one)

- ☐ From my spouse
- ☐ From another friend or relative
- ☐ From the radio

> Where were you when you first learned about the mountain lion attack on March 17, 2007? (Please check one)
> ☐ At home
> ☐ At work
> ☐ At a meeting at a place other than my work

These response items could be improved further by including other possible sources (e.g., television, newspaper, Internet) or locations (e.g., in car, at airport). Some items such as "at home" and "at work" may still not be mutually exclusive because some people work from home. Researchers may want to reconsider these types of lists and use scales or partially close-ended response choices (i.e., provide an "other" open-ended category) instead.

Guideline 21: Make sure that each question or statement is accurate.

Statements, questions, or words that are inaccurate can reduce credibility of the survey, researcher, and even the organization funding the study. Errors in accuracy range from spelling or grammar mistakes to inaccurate or false information. An example of an ***inaccurate*** question is:

> The ivory-billed woodpecker is considered by the National Conservation Union as a "threatened" species, meaning that it is vulnerable to extinction in the distent future. Should the U.S. federal government provide more funding for research on this species? (Please check one)
> ☐ No
> ☐ Yes
> ☐ Unsure

There are three major problems with this question; some are more subtle than others. First, the ivory-billed woodpecker is actually classified as "endangered," which means that it is at high risk of becoming extinct in the immediate future. Second, the organization that classifies species (e.g., threatened, endangered) is actually named the World Conservation Union, not the National Conservation Union. Third, "distent" is misspelled; it should be spelled "distant." A possible revision of this question could be:

> The ivory-billed woodpecker is considered by the World Conservation Union as an "endangered" species, meaning that it is at high risk of becoming extinct in the immediate future. Should the U.S. federal government provide more funding for research on this species? (Please check one)
> ☐ No
> ☐ Yes
> ☐ Unsure

Asking experts to review the questionnaire and conducting a pretest of the instrument are critical to ensure technical accuracy (see chapter 8).

Guideline 22: Select questions and responses that permit comparisons with existing information and / or previously collected data.

A benefit of conducting survey research is the ability to compare results to other studies. To compare data, researchers must ask for information in the same way as earlier studies.

Measurement consistency can allow for statistical approaches such as meta-analysis to examine generalizability, and longitudinal analysis to assess change over time. In addition, comparisons can be used to ensure that samples are representative of the larger population from which they were drawn, and assist with any necessary weighting procedures. In the 2000 U.S. Census, for example, responses for marital status were:

> What is your marital status? (Please check one)
> ☐ Now married
> ☐ Widowed
> ☐ Divorced
> ☐ Separated
> ☐ Never married

Using these categories in a smaller study of the public allows researchers to use U.S. Census data to ensure that characteristics of participants in the sample are representative of the population. If not, the data may need to be weighted (see chapter 8).

Another example of measurement consistency is the nine-point scale used to measure perceived crowding in recreation settings (see chapter 4 and Vaske & Shelby, 2008):

> To what extent did you feel crowded on the Black Butte trail today? (Please circle one number)

1	2	3	4	5	6	7	8	9
Not At All Crowded		Slightly Crowded			Moderately Crowded			Extremely Crowded

This scale has been used in at least 180 studies (see Vaske & Shelby, 2008, for a review), which allows for comparisons across time, settings, activity groups, geographical regions, and other contexts. It is important to consult the literature prior to survey writing and construction to examine how others have measured particular questions and concepts.

Guideline 23: Provide information instead of assuming too much respondent knowledge.

Researchers should never assume that all respondents know enough to answer every question (Salant & Dillman, 1994). When asking about a specific topic that some respondents may not be aware of, it is useful to provide some background information before asking the question. An example of a question that assumes too much respondent knowledge is:

> To what extent do you oppose or support the Oregon Department of Fish and Wildlife's new regulation on fishing for both salmon and steelhead in the Santiam River? (Please check one)
> ☐ Strongly oppose
> ☐ Somewhat oppose
> ☐ Neither support nor oppose
> ☐ Somewhat support
> ☐ Strongly support

This example assumes that all respondents are aware of the new regulation, which is unlikely. The question could be improved by: (a) providing respondents with more information about the regulation, (b) asking if they were aware of the regulation, and then (c) asking if they supported or opposed the regulation:

> Oregon Department of Fish and Wildlife has introduced a new regulation requiring all anglers to release wild (nonhatchery) salmon and steelhead caught in the Santiam River. Prior to receiving this survey, were you aware of this regulation? (Please check one)
> ☐ No, I was not aware of this regulation
> ☐ Yes, I was aware of this regulation
>
> To what extent do you oppose or support this new regulation? (Please check one)
> ☐ Strongly oppose
> ☐ Somewhat oppose
> ☐ Neither support nor oppose
> ☐ Somewhat support
> ☐ Strongly support

Guideline 24:
Avoid questions that are too difficult for respondents such as those asking respondents to make unnecessary calculations.

Asking respondents to report percentages or make other complex calculations should be avoided because errors are common, especially in on-site or telephone surveys where people are pressured to provide answers quickly (Dillman, 2000; Salant & Dillman, 1994). Although some people will attempt to report a precise number, most will make an estimate. Chapter 19 discusses impacts of numerical estimates (e.g., response heaping, digit preference). An example of a question asking for an unnecessary calculation is:

> What percent of days that you fished in the last three months were spent at Foster Lake? (Please write response)
>
> _____ % of days fishing in last three months spent at Foster Lake

This calculation is challenging, especially for avid anglers who may have fished many days at multiple locations. Asking for approximates and separating questions into: (a) total number of days fishing, followed by (b) number of days fishing at the specific site, reduces respondent burden and leaves the calculations to the researcher, not the respondent:

> Approximately how many days did you go fishing in the last three months? (Please write response)
>
> I fished approximately _____ days in the last three months
>
> Now, approximately how many of these days did you go fishing at Foster Lake? (Please write response)
>
> I fished approximately _____ days at Foster Lake in the last three months

These two questions allow the researcher to perform the calculation after the questionnaire has been completed. The SPSS `Compute` command (chapter 12) can perform these calculations.

Guideline 25:
Use multiple questions to measure complex concepts because no single question is a perfect measure of a particular concept.

For questions about topics such as demographics (e.g., age), experiences (e.g., encounters with other visitors), and behavior (e.g., activity participation), respondents will usually attempt to give accurate estimates or correct answers. If asked the identical question in a questionnaire administered a day or two later, people are likely to provide the same responses because they possess many of these attributes. Questions about beliefs, norms, attitudes, or intentions, however, are more prone to measurement error and imprecision because we do not possess these characteristics in the same way as we possess things such as age and gender. Opinions can change from day to day and may not be well-thought-out before questionnaire completion (Salant & Dillman, 1994). For example, consider the following question:

> To what extent do you disagree or agree with the statement: "A moose hunt in Anchorage would benefit the future moose population in the area?" (Please check one)
> ☐ Strongly disagree
> ☐ Somewhat disagree
> ☐ Neither agree nor disagree
> ☐ Somewhat agree
> ☐ Strongly agree

Questions such as this may evoke uncertainty and take a while for respondents to think about before answering. As a result, people may give a different response if asked again at a later time.

No single question is a perfect measure of a complex concept such as an attitude or a belief. To improve reliability and validity of concepts measured in a survey, researchers typically use scales asking multiple questions about a single concept or issue. Statistical approaches such as reliability analysis (chapter 18) can be employed to examine patterns in how people answer questions, which can then be used to justify combining answers into a single numerical estimate of the concept being measured. The following example lists multiple questions that asked about Anchorage residents' attitudes toward a proposed urban moose hunt (modified from Whittaker, Manfredo, Fix, Sinnott, Miller, & Vaske, 2001):

> Please tell us whether you think each of the following outcomes of the proposed moose hunt would be good or bad. (Please circle one number for each item)

	Very Bad	Slightly Bad	Neither	Slightly Good	Very Good
Reducing number of accidents involving moose is…	1	2	3	4	5
Reducing number of potentially dangerous encounters between people and moose is…	1	2	3	4	5
Keeping moose from becoming overpopulated is…	1	2	3	4	5
Reducing number of moose in Anchorage is…	1	2	3	4	5
Providing more opportunities for moose hunters is…	1	2	3	4	5
Holding a hunt that might injure someone else is…	1	2	3	4	5
A hunt that costs a lot to administer is…	1	2	3	4	5
A hunt that generates a lot of conflict between people who favor and oppose the hunt is…	1	2	3	4	5
A hunt that prevents nonhunters from using the area is…	1	2	3	4	5
Being able to see moose as often as I like is…	1	2	3	4	5

Diagnosing Wording Problems: Questions to Ask Yourself

Writing good survey questions always takes several rounds of editing and rewriting. *The key to good writing is rewriting*. It is not uncommon to go through five, 10, or even 20 drafts before the final questionnaire is administered. Questionnaires require tremendous time and attention because multiple issues need to be considered when writing questions and designing the layout. Input from experts and one or more pilot tests help to diagnose problems. Questions to ask yourself when writing questions include:

- Can the question be misunderstood?
- To what extent would survey respondents have an accurate answer for the question?
- Can people accurately recall and report past behaviors?
- Is the respondent willing to reveal the requested information?
- Is the frame of reference clear and uniform for all respondents?
- Is the wording biased?
- Is the wording likely to be objectionable to respondents?
- Does the wording create a double-negative?
- Can the question be asked in a more direct or indirect form using simpler words?
- Is the question misleading because of unstated assumptions and implications?
- Is changing a question acceptable to the survey sponsor?

Diagnosing Content Problems Other than Wording: Questions to Ask Yourself

Researchers should also ask themselves several questions about the content of questions (apart from specific wording), including:

- Is the question necessary and related to project objectives or hypotheses?
- How will the information be used?
- Are several questions necessary to examine the subject matter?
- Should the question be subdivided into narrower or more specific questions?
- Is information needed on respondents' intensity of conviction or degree of feeling?
- Is information on the importance of the issue to the respondent needed?
- Is information in the question accurate?
- Does the respondent have the information necessary to answer the question?
- Does the question need to be more specific?
- Are complete sentences used in the question?
- Is the question loaded or biased in one direction?
- Does the question contain two questions (i.e., double-barreled)?
- Have important terms and abbreviations been clearly defined?
- Has an appropriate timeframe been selected?
- Has the correct type of response scale been selected?
- Are all possible response options provided and mutually exclusive?

- Will the respondent offer the information that is being asked for?
- Has the literature been consulted to determine if comparisons are possible?

The First Draft: Constructing Good Surveys

General Recommendations for Constructing Surveys

Once the list of survey questions has been written and potential problems have been identified and corrected, the next step is to construct an attractive and professional questionnaire that is easy for respondents to follow and complete in a timely manner. Well-designed questionnaires take time to construct, but the payoff is large because people are more likely to respond (Dillman, 2000, 2007; Salant & Dillman, 1994).

Questionnaires should minimize ***respondent burden***, which means: (a) keeping time required to complete the questionnaire to a minimum, (b) decreasing time that respondents need to think about questions, and (c) respecting respondents by ensuring that they will not be embarrassed by not understanding what is expected (Salant & Dillman, 1994). This section offers recommendations for constructing questionnaires and minimizing respondent burden.

Recommendation 1: Start with an interesting, easy, and relevant question.

The first few questions receive more scrutiny than most, if not all, of the other questions. The first question should ***never***:

- be boring or uninteresting,
- be unrelated to the topic of the study,
- embarrass a respondent,
- be difficult to answer,
- take a long time to answer,
- require an open-ended response,
- involve long scale responses,
- be something that does not apply to all respondents, and
- ask people about themselves (e.g., personal characteristics, demographics).

The first question should be simple to answer, short, related to the topic of the study, relevant to respondents, and should motivate respondents to complete the rest of the questionnaire. The first question should catch the interest of respondents and give them a context for more challenging questions later in the questionnaire. Examples of starting questions would be:

> There has not been a moose hunt in the state of New Hampshire since the early 1900s. Do you feel that there should be a moose hunt in New Hampshire again? (Please check one)
> ☐ No
> ☐ Yes
> ☐ Unsure

Our records show that you purchased a license to hunt deer in Arizona during the 2007 deer hunting season (fall / winter 2007). Did you go deer hunting in Arizona during the 2007 deer hunting season? (Please check one)

☐ No
☐ Yes

Recommendation 2: Never start with demographic questions.

Some respondents consider demographic questions to be asking for information that is none of the researcher's business. Demographic questions such as age, marital status, and income can be objectionable or sensitive. These questions should never be positioned at the beginning of a questionnaire. Respondents who find such questions objectionable may be reluctant to answer the question and any remaining questions, which reduces the sample size and response rate.

In the authors' experience, conducting parks, recreation, and human dimensions surveys, many demographic questions remain unanswered by 5% to 10% of respondents. Even when income is measured with broad categories, approximately 10% of participants avoid answering the question. It is recommended, therefore, that demographic questions be grouped together in a section at the end of the survey. To mitigate concerns regarding confidentiality and anonymity, this last section should be prefaced with a statement such as: "Finally, we would like to ask you a few questions about yourself to help us understand different characteristics of respondents and allow us to compare your answers with those of other people. You will remain anonymous and your answers will be confidential." If these demographic questions still go unanswered, respondents have probably already answered other questions earlier in the survey so useful information can still be salvaged.

Recommendation 3: Segment a questionnaire by grouping similar questions into logical sections.

Questionnaires should be arranged logically. Questions at the *beginning* of the instrument should be simple and catch the interest of respondents. The section at the *end* of the questionnaire should include questions that are most likely to be objectionable. Questions in the *middle* should be those that are the most difficult but important for respondents to answer.

Questions examining the same specific subject or concept should be grouped together on the same page or in the same section. In a recent mail survey of hunters, for example, questions about hunters' motivations were on one page, items examining trust in wildlife agencies were on another page, and questions asking about demographic characteristics were on a separate page at the end of the questionnaire (Needham, Vaske, & Manfredo, 2005). This improves readability and flow, and reduces burden on respondents because they will not need to constantly switch from one topic to another and have their thought and response patterns disrupted.

Questions examining the same specific subject should also be grouped according to those that are similar in structure and response pattern. For example, questions about a topic using a five-point scale from "very unacceptable" to "very acceptable" should be grouped together, whereas "yes/no" questions examining a similar topic should be grouped together. This makes it easier for respondents to remember response scales, which can reduce survey completion time.

The order in which questions appear can occasionally influence how people answer. Although researchers may purposely want questions to build on each other, it is typically undesirable to have questions that may bias responses to other questions positioned near each other. Pairs of questions in which the first might have an influence on the second should be separated (Salant & Dillman, 1994). Chapter 19 discusses response patterns in greater detail.

Recommendation 4: Use transitions to guide respondents through the questionnaire.

Questionnaires should be organized so that respondents proceed smoothly and expeditiously from question to question and section to section. One approach for improving flow is to periodically use transition phrases such as "Now, we would like to ask you…" or "Finally, we would like to ask you…" These kinds of transitions provide a conversational tone and act like a roadmap for respondents to signal changes in topic or types of questions that will come next in a questionnaire. Transitions are especially beneficial in telephone and on-site surveys, but can also be useful in mail and electronic surveys.

Salant and Dillman (1994) suggest using transitions: (a) *regularly* when beginning a new line of inquiry, (b) *sometimes* at the top of pages to catch the eye of a respondent flipping through the questionnaire to see what topics are addressed, and (c) *occasionally* to break the monotony of long lists of questions or statements and to increase respondent motivation.

Recommendation 5: Short surveys are not always better, so provide enough "white space."

Questionnaire layout is one of the most important factors influencing response rates and data quality, especially for mail, on-site, and electronic surveys. Some researchers believe that short questionnaires (e.g., one or two pages) are always best. This is not true. Condensing questions on pages can cause the questionnaire to look cluttered and makes it challenging to read and reply to questions. Respondents may be less motivated to complete the questionnaire.

There are several things to consider when structuring the layout of questions. First, questions should not appear on one page with their response categories on the next page. If items in a series or scale must be split between two or more pages, headings (e.g., questions, response scales) should be repeated on each page. Second, a questionnaire should never contain pages with large blank spaces while other pages are crammed with questions. Third, there should be adequate "white space" between each question to allow respondents to progress relatively quickly through the pages. Fourth, do not add extra questions that are somewhat irrelevant simply to fill space. Too many questions can increase respondent burden and item nonresponse, and decrease response rates (Heberlein & Baumgartner, 1978).

Adequate spacing within and between questions can create an attractive and professional looking questionnaire that will encourage people to respond. Compared to short questionnaires, slightly longer instruments can also convey a perception that the study is more important. Researchers, however, should consider a few things before adding more "white space" in questionnaires. First, questionnaires that are longer in terms of pages rather than questions can still be perceived as "too long" by respondents. Second, adding pages to mail and on-site questionnaires increases costs associated with purchasing more paper and printing more pages. Third, more pages add thickness and weight to mail surveys, which increase postage costs.

Side 1 of Postcard Questionnaire

New Hampshire Scenic Byways Survey

The New Hampshire Department of Transportation and the Office of State Planning are conducting this survey to learn more about those features that affect your trips to New Hampshire. It will be an important component of a scenic byways plan to be developed for the State in the near future. Thank you for taking the time to fill out this questionnaire.

1. Have you ever traveled along the Kancamagus Highway? ___no___yes___don't know
2. Prior to visiting New Hampshire, had you heard about the Kancamagus Highway?
   ___no ___yes
3. How did you first hear about the Kancamagus Highway?
   ___Highway Signs___Newspaper or Magazine___Tourist Information Center
   ___Radio or TV___Friends / Family___ Brochure___Other_____
   ___I have not heard about the Kancamagus
4. In planning vacations, to what extent do you look for scenic byways?
   ___Never___Sometimes___Always
5. When in New Hampshire, to what extent do you travel on scenic back roads as opposed to major highways?___Almost never___Sometimes___Always
6. In the designation of a scenic byway, which of the following would you consider important? (Check all that apply)
   ___Mountains___Covered Bridges___Backroads___Farms___Old Mills___Scenic Vistas
   ___Rivers___Historic Sites___Stonewalls___Camping Areas___Inns & Taverns
   ___State Parks___Lakes___Other_____

Side 2 of Postcard Questionnaire

7. When visiting New Hampshire do you *usually:* ___go to a single destination, or ___tour different parts of the state?
8. Do you have a *primary* destination on this trip?___no___yes; what is it: _____
9. On this particular visit are you:___vacationing in the area___on a day trip
10. On this trip, which of the following activities are you planning to do in New Hampshire? (CHECK ALL THAT APPLY)
    ___Personal or official business___Visiting scenic areas___Attending a cultural or sporting event___Driving for pleasure___Shopping___Visiting museums/historical sites___Outdoor recreation (Hiking, Camping, etc.)___Entertainment (Music or Theater)___Visiting family/friends
    ___Sports (Golfing, Tennis, etc.)___Other_____
11. About how many nights do you plan to spend in the area? (CHECK ONE)
    ___None___1 night___2 to 3___4 to 7___More than a week
12. If you are staying overnight on this trip to New Hampshire, where are you staying? (CHECK ALL THAT APPLY)___I am not staying overnight___Condominium
    ___Hotel/Motel___Inn___with friends___Campground___other:_____
13. How many are in your travel party?___Number of adults___Number of children (Under 18)
14. For *each* of the following items, about how much money will you spend *per day* (on average) for this trip? $_____Lodging $_____Souvenirs $_____Entrance Fees $_____Transportation $_____Food $_____Entertainment

Thank you for your help! Enjoy New Hampshire!

Note: Postcard questionnaire shown at 71% of original size

Figure 7.1 Example of Questionnaire with No "White Space"

Figure 7.1 is an example of an actual questionnaire that the State of New Hampshire was going to use to evaluate its scenic byways program. Questions were to be printed on both sides of a postcard. This is an example of how *not* to construct a questionnaire. The version in Figure 7.2

New Hampshire Scenic Byways Survey

The New Hampshire Department of Transportation and the Office of State Planning are conducting this survey to learn more about those features that affect your trips to New Hampshire. It will be an important component of a scenic byways plan to be developed for the State in the near future. Thank you for taking the time to fill out this questionnaire.

1. Have you ever traveled along the Kancamagus Highway? ____ no ____ yes ____ don't know
2. Prior to visiting New Hampshire, had you heard about the Kancamagus Highway? ____ no ____ yes
3. How did you first hear about the Kancamagus Highway?

   ____ Highway Signs
   ____ Tourist Information Center
   ____ Friends / Family
   ____ Brochure
   ____ Newspaper or Magazine
   ____ Radio or TV
   ____ Other _____
   ____ I have not heard about the Kancamagus

4. *In planning vacations*, to what extent do you look for scenic byways?

   ____ Never ____ Sometimes ____ Always

5. When in New Hampshire, to what extent do you travel on scenic back roads as opposed to major highways?

   ____ Almost never ____ Sometimes ____ Always

6. In the designation of a scenic byway, which of the following would you consider important (Check all that apply)

   ____ Mountains
   ____ Backroads
   ____ Old Mills
   ____ Rivers
   ____ Stonewalls
   ____ Inns & Taverns
   ____ Lakes
   ____ Covered Bridges
   ____ Farms
   ____ Scenic Vistas
   ____ Historic Sites
   ____ Camping Areas
   ____ State Parks
   Other _____

7. When visiting New Hampshire, do you *usually*:

   ____ go to a single destination, or ____ tour different parts of the state

8. Do you have a *primary* destination on this trip? ____ no ____ yes; what is it? _____
9. On this particular visit are you: ____ vacationing in the area ____ on a day trip
10. On this trip, which of the following activities are you planning to do in New Hampshire? (CHECK ALL THAT APPLY)

    ____ Personal or official business
    ____ Attending a cultural or sporting event
    ____ Shopping
    ____ Outdoor recreation (Hiking, Camping, etc.)
    ____ Visiting family and friends
    ____ Sports (Golfing, Tennis, etc.)
    ____ Visiting scenic areas
    ____ Driving for pleasure
    ____ Visiting museums/historical sites
    ____ Entertainment (Music or Theater)
    ____ Other _____

11. About how many nights do you plan to spend in the area? (CHECK ONE)

    ____ None ____ 1 night ____ 2 to 3 ____ 4 to 7 ____ More than a week

12. If you are staying overnight on this trip to New Hampshire, where are you staying? (CHECK ALL THAT APPLY)

    ____ I am not staying overnight
    ____ Inn
    ____ Condominium
    ____ with friends
    ____ Hotel/Motel
    ____ Campground
    ____ other: _____

13. How many are in your travel party? ____ Number of adults ____ Number of children (Under 18)
14. For *each* of the following items, about how much money will you spend *per day* (on average) on this trip?

    $ _____ Lodging
    $ _____ Entrance Fees
    $ _____ Food
    $ _____ Souvenirs
    $ _____ Transportation
    $ _____ Entertainment

Thank you for your help! Enjoy New Hampshire!

Note: Questionnaire shown at 67% of original size

Figure 7.2 Revised Version of Questionnaire in Figure 7.1, but with More "White Space"

was ultimately used for this project. The two versions of the questionnaire (i.e., Figures 7.1, 7.2) are identical in terms of questions asked. The revised version shown in Figure 7.2, however, is much easier to read and answer. These two versions clearly demonstrate the value of creating more "white" space and properly formatting a questionnaire.

Recommendation 6: Minimize use of skip patterns.

A skip pattern asks a respondent who provided a particular answer to one question to skip over and not answer one or more questions that do not apply to him or her. Skip patterns tell respondents where to go next. An example of a skip pattern is:

1. Are you fishing at Lost Lake today? (Please check one)
   ☐ No → If no, skip to question 3
   ☐ Yes
2. In total, about how many days have you fished at Lost Lake in the last three months?

   (Please write response) _____ days
3. What other activities are you participating in at Lost Lake today? (Please check all that apply)

☐ Picnicking	☐ Having a campfire	☐ Hunting
☐ Hiking	☐ Mountain biking	☐ Boating without fishing
☐ Overnight camping	☐ Swimming	☐ Other (please write response) _____

People who answered "no" in question 1 skip over the other fishing-related question (i.e., question 2) and proceed to question 3.

Skip patterns are sometimes unavoidable, but researchers should try to minimize the number of skip patterns in a questionnaire. Multiple skip patterns create confusion among respondents and can be time consuming and cumbersome when entering data into SPSS. Although SPSS offers a module that resolves some data entry concerns, the module is not part of the base program. If the data entry module is unavailable, data-entry technicians must remember to distinguish answers that were purposefully not provided as directed by skip patterns (i.e., "does not apply") from questions that were voluntarily not answered (i.e., "respondent chose not to answer" or "missing"). In the above set of questions, for example, a respondent who answered "no" to question 1 would have the answer coded as "does not apply" for question 2. If another respondent answered "yes" to question 1, but failed to answer question 2, the answer would be coded by the researcher as "missing" for question 2.

Recommendation 7: Use sequential numbering of questions within sections or throughout the questionnaire.

It is important to number questions so that respondents know which question to read and answer next. Numbering is also required for skip patterns. For relatively short questionnaires, questions should likely be numbered sequentially throughout the entire instrument. For longer question-

naires, however, it might be worthwhile to number questions only within individual sections or particular pages because respondents may be reluctant to complete a questionnaire where the last question is an extremely high number (e.g., question 172). There is no particular rule for numbering questions; researchers should simply be aware of any hidden message that may be communicated by numbering all questions sequentially in a long questionnaire.

Recommendation 8: Be consistent when formatting response categories.

One of the most important things when designing a questionnaire is to be consistent, especially when formatting response categories. Salant and Dillman (1994) suggest using numbers for all close-ended answer categories rather than boxes or lines:

> What is your marital status? (Please circle the number of your answer)
> 1. Never Married
> 2. Married
> 3. Divorced
> 4. Separated
> 5. Widowed

Their rationale for this approach is that it "precodes" answers so the codes can be more easily and quickly entered directly as numbers into software packages such as SPSS. More recently, however, Dillman (2000, 2007) has used boxes for some close-ended response categories:

> What is your marital status? (Please check one)
> ☐ Never Married
> ☐ Married
> ☐ Divorced
> ☐ Separated
> ☐ Widowed

In the authors' recent studies using respondent-completed mail and on-site questionnaires, respondents have commented that it is easiest to answer questions when the following design guidelines have been followed throughout the instrument:

- Use ***lines*** (i.e., fill-in-the-blank) and "write response" commands for open-ended items:

  > What is your age? (Please write response) _____ years old

- Use ***boxes*** and "check one" or "check all that apply" commands for close-ended questions with unordered or ordered responses that are not part of a scale or list of items:

  > What types of deer hunting do you do in Wisconsin? (Please check all that apply)
  > ☐ Gun (e.g., rifle, shotgun)
  > ☐ Muzzleloading
  > ☐ Archery

- Use ***numbers*** and "circle one number" commands for close-ended questions with ordered choices that are part of a scale or list of items. The authors' preference is to give the most negative response the lowest number (e.g., 1 = strongly disagree, 1 = very dissatisfied) and most positive response the highest number (e.g., 7 = strongly agree, 7 = very satisfied). Regardless of approach, it is important to be consistent throughout the questionnaire:

To what extent do you oppose or support each of the following possible management actions at Smith Lakes State Park? (Please circle one number for each action)

	Strongly Oppose	Oppose	Neither	Support	Strongly Support
Improve road access	1	2	3	4	5
Provide more parking	1	2	3	4	5
Provide more trash cans	1	2	3	4	5
Provide more toilets	1	2	3	4	5
Prohibit motorboats	1	2	3	4	5
Require dogs be kept on leash	1	2	3	4	5

There is no "perfect" way to format different types of response categories. It is crucial, however, that researchers maintain ***consistency*** throughout the entire questionnaire to minimize respondent confusion and maximize ease of questionnaire completion and data entry.

Constructing Mail and On-Site Surveys Completed by Respondents

Front Cover

Mail and respondent-completed on-site surveys (i.e., where respondents complete questionnaires on their own) rely on visual techniques to motivate people, which makes layout important when designing these questionnaires. One way to make multi-page questionnaires look interesting and professional is to use a graphic on the ***front cover***. Graphics not only help to stimulate interest, but also they convey a message that the survey is important and someone has worked hard to develop the questionnaire (Salant & Dillman, 1994). Covers should be free of clutter, *never* used as a cover letter (i.e., never include details about the study, how to respond, or researcher signatures), and should *not* include detailed instructions or the first few questions.

Covers should only include a few items. First, covers should have a short (i.e., one or two lines of text) ***title*** of what the survey is about. Subtitles of one or two additional lines of text can be added to provide more information about the survey or who is being surveyed. Titles should not be boring (e.g., "Smith Lakes State Park Survey"), biased (e.g., "Why You Should Vote in Favor of Wolf Reintroduction"), or academic (e.g., "A Stated-Choice Model for Examining Mutivariate Tradeoffs in Campers' Preferences"). Examples of acceptable titles would be "Public Responses to Wolf Reintroduction" or "Visitors' Experiences at Smith Lakes State Park."

Second, covers should contain an attractive and neutral ***graphic design, photograph, or illustration*** that generates interest in the study. Like titles, cover graphics should not be boring or suggest bias or controversy. A survey addressing urban wildlife management, for example, should not show a photograph of a collision between a deer and a vehicle. Figure 7.3 shows examples of acceptable cover graphics.

Third, the front cover should show ***names and logos*** (if available) of: (a) the funding or sponsoring agencies, and (b) the organizations or institutions conducting the survey. These names and logos demonstrate an objective and professional approach, and convey the impor-

tance of the study. For mail questionnaires, it might be useful to provide a return address on the cover, but this can be provided at the end of the questionnaire instead to reduce clutter on the cover. Figure 7.4 provides examples of acceptable cover pages for mail and on-site surveys.

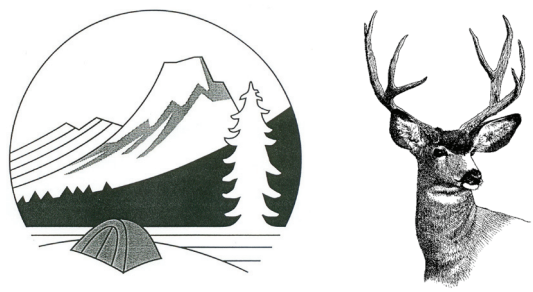
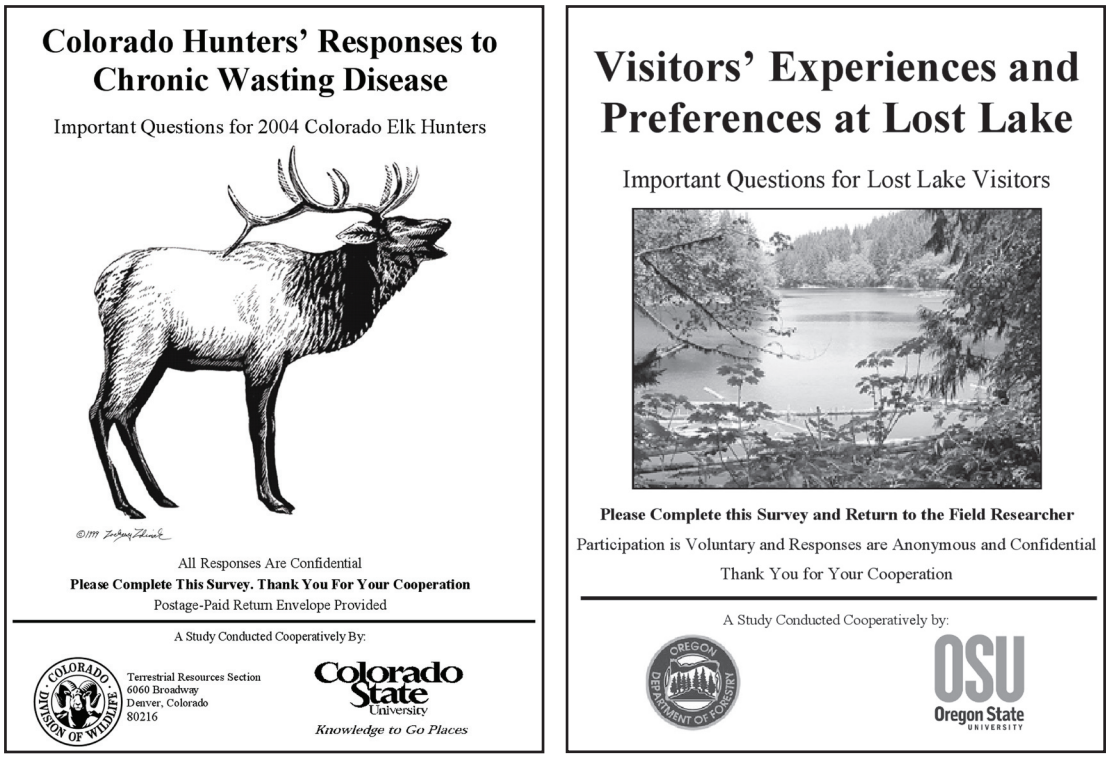


Figure 7.3 Examples of Acceptable Cover Graphics for Questionnaires

Back Cover

If space permits, back covers of questionnaires can be used to give respondents an invitation to make additional open-ended comments. An appropriate question on the back cover would be "Finally, do you have any other comments? If so, please write your comments below." If space is not available, the back cover could be used for asking objectionable or sensitive questions such as asking about demographic characteristics (e.g., age, income, marital status; Dillman, 2007). For mail surveys or on-site questionnaires that are handed to people and ask respondents to mail their completed form, the back cover should include a return address and directions for returning the completed questionnaire (e.g., "Please return your completed questionnaire in the enclosed self-addressed stamped envelope as soon as possible"). Back covers of printed questionnaires should always thank respondents for taking time to respond.



Colorado Hunters' Responses to Chronic Wasting Disease

Important Questions for 2004 Colorado Elk Hunters

All Responses Are Confidential

Please Complete This Survey. Thank You For Your Cooperation

Postage-Paid Return Envelope Provided

A Study Conducted Cooperatively By:

Colorado Division of Wildlife
Terrestrial Resources Section
6060 Broadway
Denver, Colorado
80216

Colorado State University
Knowledge to Go Places

Visitors' Experiences and Preferences at Lost Lake

Important Questions for Lost Lake Visitors

Please Complete this Survey and Return to the Field Researcher

Participation is Voluntary and Responses are Anonymous and Confidential

Thank You for Your Cooperation

A Study Conducted Cooperatively by:

Oregon Department of Forestry

OSU Oregon State University

Figure 7.4 Examples of Cover Pages for Mail and On-Site Questionnaires

Formatting, Printing, and Length

Mail surveys should be printed in ***booklet format*** using paper folded and stapled down the fold. Placing a staple in the top left or right corner is not as professional, is more awkward for respondents when turning pages, and should never be considered when two-sided printing is used. Booklets can be created from 8½ by 14 inches (i.e., legal) or 11-by-17 inches paper folded in the middle and stapled down the fold. With this approach, questionnaire length will be in multiples of four when printed on both sides. A single sheet of paper, for example, creates four pages when folded, whereas two sheets create eight pages and three sheets create 12 pages. For mail surveys, always consult the postal service before designing print material.

On-site surveys should be shorter in number of questions and physical length. In the authors' experience conducting on-site surveys in recreation and tourism settings, a single sheet of legal (i.e., 8½-by-14 inches) paper printed on both sides, but *not* folded or stapled has been most effective. This format is easiest to use with a legal-size clipboard and does not require respondents to constantly flip pages (i.e., only once) when completing questionnaires on-site. With this approach, however, cover pages with graphics are not always possible because they take up an entire page, which may not be feasible for such a short questionnaire. In this case, the top of the first page should have text stating a title, brief (i.e., one or two sentences) introduction to the study, and agencies and organizations involved in funding and conducting the study.

For both mail and on-site surveys, questions should be printed on paper that is thick enough to prevent ink "bleed through." Color paper can sometimes improve attractiveness of questionnaires. Colors, such as light green, light blue, off-white or beige, pale yellow, tan or light brown, can be more unique and attractive than standard white paper. For on-site questionnaires that are completed outdoors, white paper can also create a glare that makes it difficult to read questions, so color paper may be more practical. If on-site questionnaires are administered in particularly rainy or damp locations, "Rite in the Rain" water-resistant paper may be useful.

When designing questionnaires, researchers should treat their word processor as a desktop publisher, not a typewriter. Default margins in word processing software, for example, are often larger (1 or 1½ inches) than necessary, so they should be adjusted. "Hanging" paragraphs can also be useful when numbering questions. Instead of double-spacing or hitting "enter" multiple times, "before" and "after" spacing capabilities can adjust the amount of space between questions and response categories. The "insert table" function instead of "tab" function should be used to create multi-item questions with scale responses (e.g., 1 "strongly disagree" to 5 "strongly agree"). Font sizes can be adjusted to fit the page and font styles can be changed to highlight text. Fonts should generally not be smaller than 10-point and font sizes may need to be larger for some audiences such as the elderly. Using bold, italics, capital letters, and underlining can also be useful for emphasizing and differentiating text. Finally, some word-processing software has the capability of translating questionnaires into different languages, which is critical if the target sample population does not speak English (e.g., Potaka & Cochrane, 2004). The software-generated translations should be checked by a speaker of the native language to ensure accuracy.

Constructing Telephone and On-Site Surveys Completed by Interviewers

Unlike mail surveys, telephone surveys and interviewer-completed on-site surveys (i.e., interviewers read questions and record answers) must sound rather than look good. Layout is less important because respondents seldom see the questionnaire, but layout should be consistent to make the interviewer's job as straightforward and routine as possible. Recommendations discussed above for designing mail and respondent-completed on-site questionnaires should be followed when constructing telephone or other interviewer-completed questionnaires (e.g., short, easy, relevant, and close-ended first question; use transition phrases; place difficult questions in the middle and objectionable questions at the end; group questions on the same topic). Salant and Dillman (1994), however, offer additional suggestions for these types of surveys:

- Select one font type for text that is always read, another font type (e.g., italics) for words or phrases that are sometimes read (e.g., "*feel free to provide your best guess if you are unsure*"), and a third font type (e.g., capital letters) for instructions to the interviewer that are not read to respondents (e.g., CODE ANSWER FROM CATEGORIES BELOW).
- Ensure that interviewers do not turn pages in the middle of questions or responses.
- In addition to answer categories that are read to respondents, include possible additional response categories that are not read to respondents but may be needed (e.g., Does not apply, Refused).
- Place response categories toward the right side of the page instead of the left side.
- The best check for a telephone questionnaire is whether it can be read to respondents exactly as it is written.

When writing questions for these surveys, it is important to remember that respondents are unable to see the questionnaire, so communicating response options is more tedious (Gad, 2000). Answer categories and response scales that are listed separately in mail questionnaires must now be incorporated into the question and read aloud by the interviewer:

> Which of the following activities did you participate in during your most recent visit to Findlay National Wildlife Refuge: hunting, fishing, wildlife viewing, wildlife photography, or something else? [CHECK ANSWER FROM CATEGORIES BELOW]
>
> Hunting ☐
> Fishing ☐
> Wildlife viewing ☐
> Wildlife photography ☐
> Other (write response) ☐ _____
> Refusal/No answer ☐

The task of communicating longer scales is even more challenging. If a seven-point response scale is used, for example, it would be cumbersome for interviewers and confusing for respondents if the question asked "Do you strongly oppose, moderately oppose, slightly oppose, neither support nor oppose, slightly support, moderately support, or strongly support reintroducing wolves to Colorado?" This can be even more challenging and time-consuming if multiple items are measured using these scales. Two steps are needed for these questions:

1. Ask if the respondent supports, opposes, or neither supports nor opposes (or agree / disagree; satisfied / unsatisfied, depending on response scale).
2. Then ask for the extent of support or opposition (i.e., slightly, moderately, strongly).

Some of the most important aspects of telephone or other in-person surveys are the interviewer's introduction, tone, and pace. The introduction sets the stage for the questionnaire and can make the difference between whether a respondent answers questions or refuses and hangs up the telephone (i.e., telephone survey) or walks away from the interviewer (i.e., on-site survey). Introductions should be short, simple, and include: (a) the interviewer's first name, (b) the organization and city from which they are calling, (c) a summary of the purpose of the survey, (d) a statement that their responses are confidential, (e) an estimate of how long the interview will take, and (f) permission to continue and ask questions (e.g., Houtkoop-Steenstra & van den Bergh, 2000; Salant & Dillman, 1994). An example of an acceptable introduction is:

> Hello, may I please speak with _____? My name is _____. I'm calling from Colorado State University in Fort Collins where we have been asked by the Colorado Division of Wildlife to talk with hunters about their opinions regarding deer management in the state. Would you be willing to answer a few quick questions, which will take less than 10 minutes to complete? Your responses will be completely confidential.

Throughout the introduction and remainder of the interview, the interviewer should set a neutral and professional tone and should maintain a moderate pace when asking questions. Once all questions are completed, the interviewer should thank the respondent with a statement such as "That is all the questions that I have. Thank you for your time and have a wonderful day."

Constructing Electronic Surveys

Email Surveys

It would seem that constructing an email survey simply involves writing a series of questions on the computer, sending the email to a selected group of email addresses, and asking people to answer in the spaces provided and hit the reply function (Dillman, 2007). Many recommendations for constructing mail surveys, however, should also be followed when designing email surveys. Dillman (2007) offers additional tips for constructing email surveys:

- Use multiple contacts (e.g., prenotice email, follow-up emails to nonrespondents) to improve response rates and leave a positive impression of the importance of the survey.
- Personalize each email contact so emails do not appear to be part of a bulk or mass mailing (e.g., multiple recipient addresses, listserv).
- Keep the cover letter short so respondents can see the first question without having to scroll down the page.
- Provide and inform respondents of alternative ways to respond (e.g., print and mail, call).
- Include a replacement electronic version of the questionnaire with reminder messages.
- Limit column width to approximately 70 characters to minimize likelihood of wrap-around text.
- Ask respondents to place an "X" inside brackets or boxes to indicate their answers to close-ended questions.

Although email surveys increase the speed at which data may be collected, they have many limitations that can make them somewhat inferior to other survey methods. Email surveys, for example, can have low response rates because using the delete key makes disposing of the questionnaire easy. The questionnaire must be short and the questions simplified due to formatting constraints of many email software packages. Using the Internet to distribute electronic surveys offers more flexibility and power than email (Dillman, 2007).

Internet Surveys

Unlike email surveys where questionnaires are sent to email addresses, Internet questionnaires are constructed on a website that is accessed by respondents. These types of questionnaires can be designed so that a new page appears for each question or respondents can scroll through questions on a single webpage. "Click here" boxes, drop-down menus, animation, sound, and color graphics can be used to improve interactive design beyond what is capable for most paper questionnaires (e.g., Couper et al., 2001; Dillman, 2007).

Gains in creative and advanced design tools, however, must be balanced against costs of making it difficult or impossible for some people to respond because of: (a) hardware and software performance or incompatibility, and (b) different levels of computer literacy among respondents (Dillman, 2007; Gaede & Vaske, 1999; Sills & Song, 2002). Researchers often need to restrain from using advanced and complex approaches for designing Internet questionnaires, and opt for simpler and more generic questionnaires that can be accessed by most respondents. Many recommendations for constructing mail and on-site questionnaires still apply in much the same way for Internet questionnaires (e.g., short, easy, relevant, and close-ended first question; difficult questions in the middle; objectionable questions at the end; group questions on same topic). Dillman (2007), however, discusses additional considerations for Internet questionnaires:

- Use a welcome screen to introduce the questionnaire, emphasize ease of responding, and provide instructions on how to proceed through the questionnaire.
- Provide a personalized access number (PIN) to limit access only to people in the sample.
- Restrain use of color to maintain and not interfere with consistency, readability, navigational flow, and measurement properties. If colors are used, use high-contrast colors to improve readability.
- Avoid differences in visual appearance of questions that result from different screen configurations, operating systems, Internet browser software, partial screen display, and wrap-around text.
- Give precise instructions on how to use a computer to respond to the questionnaire, and give necessary instructions at the point where they are needed (e.g., use floating windows to show how to respond to types of questions, although this can introduce technical problems with some Internet browsers and software packages).
- Use drop-down menus sparingly and identify each with a "click here" instruction.
- Do not require all respondents to give an answer for each question before being allowed to proceed further in the questionnaire because it can frustrate respondents who may have a legitimate reason for not answering a particular question.
- Design Internet questionnaires so respondents scroll from question to question instead of having a new question appear on each page.

- Use symbols, a task bar, or text (e.g., percent complete) to give people an idea of where they are in the completion process.

- Always test thoroughly and debug your survey on the server before going live.

Internet surveys offer tremendous potential for little cost. However, there are limitations to this data collection method (e.g., coverage errors because not everybody has computer access; lack of control over who responds; issues related to anonymity, security, and confidentiality of responses; Couper, 2000). Although technological advances will continue to improve flexibility and power of Internet surveys, it is unreasonable to assume that everyone will have access to computers with the most recent and powerful technology (Dillman, 2007; Gaede & Vaske, 1999). As a result, researchers should consider their target population when deciding whether an Internet survey or other form of survey is appropriate for addressing project objectives.

Chapter Summary

This chapter discussed advantages, disadvantages, and guidelines for conducting different types of surveys (e.g., mail, on-site, telephone, electronic). Several suggestions for writing questions and constructing questionnaires were provided. It should be clear after reading this chapter that writing and constructing questionnaires are complex tasks. Researchers and funding agencies should not treat these tasks as afterthoughts. Questionnaires should never be finalized in a single sitting; experienced researchers often need 10, 15, or even 20 or more drafts and revisions of a single questionnaire before guidelines discussed in this chapter have been addressed and the instrument is ready to administer.

This chapter discussed advantages and disadvantages of survey research. Advantages of surveys are that they can describe characteristics of a larger population, large sample sizes can be obtained in a short period of time, they facilitate comparisons among groups, and numerous questions can be asked in a single instrument. Disadvantages of surveys are that all questions must be understandable to all respondents, and some questionnaires are not flexible and may not be changed once they are administered. Questionnaires may also seem artificial to respondents and may not always provide rich enough data to address particular topics. If surveys are not likely to provide the information desired, alternative methodologies should be considered (e.g., interviews, diaries, Delphi approach, document analysis, personal observation).

Several steps should be followed if the researcher decides survey research would be the best method for completing the study. The researcher must start by identifying the problem, objectives, and/or hypotheses that the project is trying to solve and information needs for addressing these issues. Following this, he or she should review the relevant literature to identify knowledge gaps and inform questions to be included in the questionnaire. The next step is to select the most appropriate type of survey for attaining project goals. This chapter discussed advantages and disadvantages of mail, on-site, telephone, electronic (i.e., email, Internet), drop-off, and mixed-mode surveys. Once the researcher has selected the type of survey to be used, he or she should proceed by writing questions and constructing a first draft of the questionnaire.

This chapter discussed 25 guidelines to consider when writing survey questions. Researchers, for example, should avoid double-barreled questions, vague quantifiers, double-negatives, leading or loaded questions, and questions that are too difficult or require unnecessary calculations. Questions should also include accurate and complete sentences with as few words as possible, an appropriate timeframe, and simple words and phrases that make sense to respondents. Response categories should be mutually exclusive, fixed or close-ended whenever possible, use an equal number of positive and negative response options, and ask respondents to provide a single answer rather than "check all that apply" whenever possible. Finally, researchers should strive to make every question count, reduce the impact of sensitive or objectionable questions, define abbreviations, select items that allow for comparisons with existing information or data, and use multiple questions to measure a complex theory or concept.

Once questions have been written, the researcher must construct the instrument. When designing questionnaires, it is important to start with easy, relevant questions that do not ask for demographic information. Questionnaires should be segmented by grouping similar questions into sections and numbering questions sequentially. Transitions should be included to guide respon-

dents, and skip patterns should be avoided whenever possible. Response categories should be consistent; formatting should be used to provide adequate "white space." In addition to these guidelines, this chapter also provided specific recommendations for designing particular types of surveys such as respondent-completed mail and on-site surveys (e.g., booklet, cover graphics, title, formatting), interviewer-completed telephone and on-site surveys (e.g., layout, interviewer introduction, communicating response options), and electronic surveys (e.g., brief introduction or cover letter, personalized message or identification number).

Writing and designing questionnaires is just an initial step in survey research. Next steps include pretesting the instrument, asking and encouraging a sample of people to respond, establishing procedures for coding responses and entering data, analyzing data, and reporting findings. Chapter 8 provides details regarding sampling potential respondents and administering questionnaires to these individuals. Chapters 9 and 10 discuss procedures for coding responses and entering data into software to assist in data analysis. Chapter 11 through the end of this book presents various statistical approaches for analyzing data and reporting results using SPSS.

Review Questions

1. Discuss two advantages and two disadvantages of survey research.
2. List three alternative data collection techniques other than survey research.
3. What are two important questions to ask *before* deciding on the type of survey to administer and focusing on mechanics of constructing and implementing a survey?
4. Provide an example of a *vague* research question and suggest ways for improvement.
5. Define and differentiate *elicitation surveys* and *focus groups*.
6. Discuss three criteria that you might use when deciding whether to use a mail, on-site, telephone, or electronic survey.
7. What is *social desirability bias*?
8. Discuss one strength and one weakness for *each* of the following types of surveys: mail, on-site, and telephone.
9. Discuss one strength and one weakness of open-ended questions.
10. Give one example of *each* of the following types of questions: close-ended with ordered response choices, close-ended with unordered response choices, and partially close-ended response choices.
11. Discuss five general guidelines for improving question wording.
12. Why should a researcher distinguish *neither* from *no opinion* in response scales?
13. What does it mean when a question is *double-barreled*? Give an example of a double-barreled question.
14. Define and differentiate *primacy* and *recency* effects.
15. Response categories and answers should be *mutually exclusive*. What does this mean?
16. Why should multiple questions be used to measure a single complex concept or theory?
17. Discuss three general recommendations for constructing surveys.
18. List three things that should be on the cover of a mail survey.
19. Discuss the two steps that should be used when communicating long scale responses in telephone surveys.
20. Discuss two specific ways to improve design of Internet surveys.