CANADIAN FORCES COLLEGE / COLLÈGE DES FORCES CANADIENNES
CSC 29 / CCEM 29

MDS RESEARCH PROJECT/PROJECT DE RECHERCHE DE LA MED

PROBLEMS WITH POLLS?: CONCERNS WITH THE DESIGN AND APPLICATION OF SURVEYS IN DND

By /par LCdr Robert E.J. English

ABSTRACT

Canada's Department of National Defence frequently uses surveys for a variety of purposes and has implemented several surveys in recent years. As with any large and complicated organization, the control and coordination of activities such as surveys is problematical. Anecdotal evidence (conventional wisdom) asserts that these surveys have been plagued by design and implementation problems.

This paper reviewed recent DND surveys, identified problems with the design and implementation of surveys within DND and made recommendations for improving the process. While not intentional, these problems do have a negative impact on the credibility of surveys in DND. These issues are found primarily in surveys that do not appear to have been reviewed by DHRRE. Surveys that have been coordinated by DHRRE and gone through the quality control process mandated by DND are generally well designed and implemented. It is recommended that all future survey work in DND be subjected to the coordination and quality control processes mandated by the Department of National Defence.

ACKNOWLEDGEMENTS

The author would like to thank all those who contributed to this project. As the author's academic advisor, Dr Stephen Brown (Director of the Laurier Institute for the Study of Public Opinion and Policy) assisted greatly in focusing my thoughts and research. Lieutenant Colonel (LCol) Ian Creighton and Maj Craig Stone (military staff at the Canadian Forces College Toronto) were invaluable in helping the author to improve his logic, thought processes and writing skills. LCol Stephen A.T. Eyres (DHRRE 4 (Operational Effectiveness and Leadership)) injected the context of conducting survey work in DND and provided a significant part of the case study material for this paper. Colonel (Col) Cheryl D. Lamerson (DHRRE), Captain(Navy) (Capt(N)) A.L. Siew (DQOL), LCol Margaret A. Ramsay (Mental Health Coordinator for the Rx 2000 project), and Mr. Jason R. Dunn (DQOL 9-2 Research) supplied other important research material, suggestions and case study documents that were important to this project. Many thanks to all concerned for their contribution.

TABLE OF CONTENTS

LIST OF TABLES

CHAPTER 1 - INTRODUCTION

Surveys are extensively used for a variety of purposes including market and public opinion research for private, political, public and governmental organizations. Surveys can be particularly helpful in measuring attitudes, preferences, beliefs and facts in a large, complex population or subsets of that population to varying degrees of accuracy.[1] They are assumed by many to be "… the best way to measure public opinion; and … [to be] instruments of democracy because they allow everyone's views to be represented."[2]

Sampling surveys (as opposed to taking a census) are done for several reasons including:

- cost savings
- time (both timely results and the time required to complete a survey vice a census)
- the size of a population that must be contacted for a census
- access problems for a census of the entire population
- potential distortion/destruction of results caused by observation (more of a problem when conducting destructive testing of products rather than asking questions of a population)
- accuracy (carefully crafted surveys can be more accurate than a rushed census).[3]

Each of phase of the survey process can and does introduce threaten the validity of the survey results. If well executed, surveys can provide an accurate estimate of the views of the population of interest at a particular moment in time.[4] A properly designed, implemented and analyzed objective survey will deliver reproducible and valid results.[5] Thus, these tools can make a positive contribution to the understanding of opinions and the actions and policies, which derive from understanding these opinions.

---

[1] Herbert F. Weisberg, Jon A. Krosnick and Bruce D. Bowen, *An Introduction to Survey Research, Polling and Data Analysis*, 3rd ed. (Thousand Oaks: SAGE Publications, 1996), 13.

[2] Herbert Asher, *Polling and the Public: What Every Citizen Should Know* (Washington: Congressional Quarterly Inc., 1998), 2.

[3] Lawrence Lapin, *Statistics: Meaning and Method,* 2nd ed. (New York: Harcourt Brace Jovanvich Inc., 1980), 74.

[4] For a moving picture rather than a 'snapshot', longitudinal studies (including the use of panels) can be conducted over a period of time. Joseph Janes, "Survey Construction," *Library Hi Tech* Vol. 17 Iss. 3 (1999): 321.

SURVEYS IN THE DEPARTMENT OF NATIONAL DEFENCE

Like many public institutions, Canada's Department of National Defence (DND) frequently uses surveys.[6] The DND employs surveys for a variety of purposes including:

- gauging the effectiveness of personnel programmes (e.g. harassment prevention, gender integration, etc.) and
- identifying matters of concern to Canadian Forces members and DND civilian employees.[7]

According to the DND,

> "…a survey is a systematic programme by which opinions, attitudes, or facts about specific issues may be collected through interaction with respondents… Surveys are a method by which leaders in the DND/CF can learn the attitudes, opinions and beliefs of CF members and their families, and that of DND employees; they are also an excellent vehicle for personnel to have their voices heard about the issues that affect their careers, their lives and the lives of their families."[8]

As with any large and complicated organization, the control and coordination of activities such as surveys is problematical.[9] DND has implemented numerous surveys in recent years. Anecdotal evidence (conventional wisdom) asserts that these surveys have been plagued by design and implementation problems. While perhaps unintentional, these problems do have a negative impact on the credibility of surveys in DND and include:

- design problems
- concerns about anonymity of responses
- perceptions of imposed response rates
- control and coordination problems (e.g. overlap in subjects covered)
- too many surveys being implemented within DND

---

[5] E.F. Borgatt, "Survey Research," in *Encyclopedia of Sociology,* Second Edition (New York: Macmillan Reference, 2000), 3087.

[6] DND consists of civilian employees and the military personnel of the Canadian Forces (CF).

[7] Department of National Defence, *Survey Coordination in DND/CF,* CANFORGEN 145/02 ADMHRMIL 079, 131028Z Dec 02.

[8] *Ibid*.

[9] *Ibid*.

This paper will review survey design and application concepts, examine recent DND surveys, identify problems with the design and implementation of surveys within DND and make recommendations for improving the process.

LIMITATIONS OF THIS STUDY

This study will examine surveys implemented in the four-year time frame from 1 January 1999 to 31 December 2002. Surveys to be considered will include those applied to Canadian Forces members and DND Civilian employees on a systematic or stratified random sampling or census premise. Surveys that focus on a specific occupational group, rank group or geographic location (cluster) will not be considered. Only surveys openly available (i.e. of an unclassified nature) were examined during the course of research.

Time, resources and inconsistent availability of survey analysis reports prevented a complete review of the data analysis phase of survey work conducted in DND. Where possible comments will be made on the adequacy of sample size, error and non-response error.

This work was done in the context of a non-expert review based on background research on the design and implementation of surveys and a review of recent surveys implemented in DND. The author does not claim to be an expert in the fields of sociology, survey research or operations analysis. Any gaps, oversights or over-simplifications are the author's. The opinions and conclusions contained herein are the author's and do not represent official DND policy or analysis of this issue.

DEFINITIONS

A number of terms used in this study are defined below for the purposes of clarity and context.

A **question** will be defined as a single item, phrase, statement or sentence to which a respondent must provide a qualitative (e.g. agree, dislike, etc) or quantitative (e.g. 41 years old, 3 times a week, etc) response. This differs slightly from a dictionary definition but will be used because surveys often require the respondent to respond to a phrase, statement or direct question.[10]

A **questionnaire** will be defined as "a formulated series of questions, esp[ecially] for statistical study."[11]

Item non-response will be defined as: not responding to an individual question in a questionnaire.

Unit non-response will be defined as: not responding to a questionnaire in its entirety.

A **poll** will be defined as a process of counting votes normally on one particular question or topic. Polls tend to be very focused on one issue or question (for example, 'did you vote for the Liberal, Conservative or New Democratic candidate?') as compared to a survey which will explores aspects of one or more issues through a series of questions.[12]

A **census** will be defined as an attempt to identify the "…official count of a population … with various statistics noted."[13] A census involves obtaining data about every member of the

[10] The Concise Oxford Dictionary defines a question as "…a sentence worded or expressed so as to seek information." *The Concise Oxford Dictionary of Current English.* 8th ed., Editor R.E. Allen. (New York: Oxford University Press, 1990).

[11] *The Concise Oxford Dictionary of Current English…*

[12] According to the Oxford English Dictionary, a poll is "…taken to estimate public opinion on a *specified* [emphasis added] issue by questioning a sample intended to be representative of the whole people." "Poll," *Oxford English Dictionary* [dictionary on-line]; available from http://dictionary.oed.com/cgi/entry/00182910; Internet; accessed 29 March 2003.

[13] *The Concise Oxford Dictionary of Current English…* Censuses are all-inclusive. The population is not sampled. Rather an attempt is made to identify the entire population and often sub-groups of that population.

population but this is often neither practical nor economical nor better than a properly designed and implemented sampling survey.[14]

A **survey** will be defined as a general view or consideration of something such as issues, subjects or events.[15] In common usage, the terms 'survey' and 'poll' are often used interchangeably.

For the purposes of this analysis, survey length will be categorized as follows:

a. A **short survey questionnaire** will have a length of 50 questions or less;
b. A **medium-length survey questionnaire** will have a length of between 51 and 100 questions; and
c. A **long survey questionnaire** will have a length that exceeds 100 questions.

Abbreviations used in this paper are defined in Annex A.

[14] Floyd J. Fowler, Jr., *Survey Research Methods*, Applied Social Research Methods Series Volume 1 (Newbury Park: Sage Publications, 1988), 12.

[15] According to the Oxford English Dictionary, a survey is a "systematic collection and analysis of data relating to the attitudes, living conditions, opinions, etc., of a population, usu. taken from a representative sample of the latter." "Survey," *Oxford English Dictionary* [dictionary on-line]; available from http://dictionary.oed.com/cgi/entry/00243512; Internet; accessed 29 March 2003.

CHAPTER 2 –SURVEY QUESTIONNAIRE DESIGN CONCEPTS

The quality of questions and construction of the questionnaire threaten the validity and reliability of surveys in conducting research. Survey researchers must pay careful attention to the design of the survey instrument. For self-administered and interviewer-based surveys, a questionnaire is the primary survey instrument. This chapter will review concepts relevant to the design of survey questionnaires (particularly for self-administered mail surveys) and questionnaires.

DND has its own guidelines for the design of questionnaires.[16] This manual provides several "Do's and don'ts" for the design and construction of questionnaires. To paraphrase:

DO…	***DON'T…***
Make the questionnaire attractive	Crowd too many items onto a page
Begin with some easy questions	Split a question onto two pages
Leave sufficient space for open-ended questions	Put difficult or important items at the beginning of a long questionnaire.[17]
Keep questions as brief as possible	
Include clear, concise instructions	
Provide some variety in the types of questions[18]	
Number questions and pages	
Specify what to do with the completed questionnaire	
Include a completion deadline	
Keep the questionnaire as short as possible list of table	

Table 1: DND Survey Design Guidance[19]

[16] Department of National Defence, A-P9-000-012/PT-000 *Manual of Individual Training Volume 12: Design and Use of Questionnaires in Training* (Ottawa: DND Canada, 1991), 1-3.

[17] Similar guidance applies to the placement of sensitive questions. Parten suggests putting sensitive or potentially embarrassing questions in the middle or near the end of a questionnaire but not at the very end. Mildred B. Parten, *Surveys, Polls and Samples* (New York: Cooper Square Publishers, 1966), 215.

[18] There is a balance to be struck between providing some variety in the types of questions asked and confusing the respondent. Weisberg *et al*, *An Introduction to Survey Research, Polling and Data Analysis*, 98.

[19] Department of National Defence, A-P9-000-012/PT-000 *Manual of Individual Training…*, 3-21.

"Good questionnaires maximize the relationship between the answers recorded and what the researcher is trying to measure."[20] There are a number of steps in preparing a questionnaire:

- write the questions
- review questions for errors
- code the questions
- construct the questionnaire
- test the questionnaire[21]

WRITING QUESTIONS

Janes suggests a checklist for writing good questions:

> The words used and the way in which a question is constructed can have profound implications for the answers you get… Good questions are:
>
> - Related to the problem at hand…
> - The correct type to get the best information…
> - Clear, unambiguous, precise…
> - Not leading…
> - Able to be answered by the subjects…
> - Not double-barreled…
> - Short…
> - Not negative…
> - Unbiased.[22]

Questions intended for a survey instrument must be written to ensure that the researcher's intention is clearly and specifically translated into language that will be easily and consistently understood by respondents. This will help in ensuring that differences in responses reflect differences between respondents rather than any misunderstanding of the questions.[23] "The same question can be asked in different ways, all of which seem good, and the different wording may yield different results."[24] Some "…'question effects' are obvious and therefore less likely to

[20] Fowler, *Survey Research Methods*, 74.
[21] Fowler, *Survey Research Methods*, 74.
[22] Joseph Janes, "Survey Construction," *Library Hi Tech* Vol. 17 Iss. 3 (1999): 322-323.
[23] Fowler, *Survey Research Methods*, 75.
[24] Weisberg *et al*, *An Introduction to Survey Research, Polling and Data Analysis*, 90.

mislead people, while others are subtle and more problematic and may indeed manipulate and mislead unsuspecting consumers of public opinion research"[25] When writing questions, it is important to stay on topic. Questions must pertain to the matter or subject under investigation. Furthermore, questions must be written for the intended sample so that respondents can understand the question and respond.

Questions should be clear (i.e. not vague), uncomplicated and avoid negatives (especially double negatives), jargon or slang.[26] Ambiguous question wording will allow respondents to answer the question as they understand it rather than answering the question that the researcher intended to ask.[27] Phrases such as 'very frequently' or 'usually' can have very different meanings to different individuals.[28] It may be preferable to use an interval scale (e.g. once a week) rather than an ordinal scale (not very often) to provide the respondent with an understandable question and quantifiable data.

Long, run-on or complicated sentences may be confusing. Respondents may not be answering the question as intended by the survey designer. In order to avoid such confusion it may be necessary to write a number of shorter and more easily understood questions rather than one complicated question.[29] Some authors on the topic of survey design use rules of thumb as guides to writing questions. Typical rules of thumb include keeping a question to less than 20 words and using no more than three commas in the question.[30]

---

[25] Asher, *Polling and the Public: What Every Citizen Should Know*, 45.
[26] *Ibid,* 48.
[27] Weisberg *et al*, *An Introduction to Survey Research, Polling and Data Analysis*, 84-85.
[28] Linda B. Bourque and Eve P. Fielder, *How to Conduct Self-Administered and Mail Surveys*, The Survey Kit Volume 3 (Thousand Oaks: SAGE Publications, 1995), 46.
[29] Bourque and Fielder, *How to Conduct Self-Administered and Mail Surveys*, 42.
[30] Robert A. Peterson, *Constructing Effective Questionnaires* (Thousand Oaks: Sage Publications, 2000), 50.

The choice of words in a question can affect the answer provided and may increase non-response considerably.[31] Simple differences in word choice (i.e. 'assistance' vice 'welfare') or dropping names (i.e. the President of the United States) can influence the answer selected by respondents.[32] 'Danger' words such as 'abuse' and 'racist' provoke strong responses.[33] Respondents may fail to identify abusive or racist behaviours for fear that their response may not be truly anonymous or that a certain response is expected. If the reaction is strong enough, a response may not be provided to that particular question (item non-response) or to the entire questionnaire (unit non-response).

Embedded clauses can add considerable complexity to a sentence and thus impede the respondent's understanding of the question. Double-barreled (compound) questions often join more than one idea or phrase together. These questions can be confusing and may appear to ask more than one question.[34] It can be difficult to interpret which phrase a respondent is being asked to comment on.[35] It may be necessary to ask two or more separate questions rather than one complicated, possibly confusing double-barreled question.[36]

Questions with double negatives (i.e. 'Is it not possible to believe that the accident never happened?') are very confusing and should be avoided.[37] If possible, respondents should be asked to respond to a declarative statement as opposed to answering a traditional 'wh' (i.e. who, what, where, when, why) type of question. According to Tourangeau *et al*, respondents find it

[31] Asher, *Polling and the Public: What Every Citizen Should Know*, 45.
[32] "Public-Opinion Polling," *Encyclopædia Britannica* [Encyclopedia on-line]; available from http://search.eb.com/eb/article?eu=117356; Internet; accessed August 25 2002.
[33] Parten, *Surveys, Polls and Samples*, 200.
[34] Bourque and Fielder, *How to Conduct Self-Administered and Mail Surveys*, 42.
[35] Asher, *Polling and the Public: What Every Citizen Should Know*, 46.
[36] Weisberg *et al*, *An Introduction to Survey Research, Polling and Data Analysis*, 88.
[37] *Ibid,* 88.

easier to identify their attitude to a declarative statement rather than answer a traditional question.[38]

The questions in survey questionnaires generally fall into one of two types: closed or open-ended. Normally, self-administered questionnaires consist primarily of closed questions where respondents select their answer from a set of choices provided in the questionnaire. Closed questions do not normally provide the respondent an option to answer in their own words but can provide neutral, 'don't know', or 'not applicable' responses.

There are four general types of response scales for closed questions: nominal, ordinal, interval, and ratio scale. Nominal scale questions offer choices of class but not necessarily ranking or importance. An example of a nominal scale question is: 'What is your gender? Male or female'.

Ordinal scale questions provide responses in an ordered series such as "never, rarely, occasionally, often, always". Responses to ordinal scale questions should have a logical order, permit quick selection, have a balance between the extremes of the scale, include all possible responses and should not have overlapping categories of response. An imbalance in the selection of potential responses (i.e. more positive responses than negative ones) may bias results or lead to a refusal to respond. Even minor differences between the choices presented can affect a survey's results.[39] Normally there are an odd number (five or seven) of ordinal scale responses in order to allow for a middle or 'neutral' point. Equally important is the consistent use of common scales and scale anchors in a survey wherever possible.[40] An appropriate balance must be found between providing some variety to maintain interest and creating confusion by too

[38] Roger Tourangeau, Lance J. Rips, and Kenneth Rasinski, *The Psychology of Survey Response* (Cambridge: Cambridge University Press, 2000), 35.

[39] Asher, *Polling and the Public: What Every Citizen Should Know*, 51.

many changes in the response scale.[41] Similarly, and where logical, providing a 'don't know' response option can encourage a respondent to acknowledge that they hold such a position on an issue.[42]

When using a numerical scale, there is research that has identified a tendency to avoid negative numbers. For example, given a scale from –3 to 3, respondents tend to bias their responses to the positive range and select options in the 0 to 3 range.[43] The five point Likert scale (1-5) is most commonly used.

Interval scale questions provide responses in a logical sequence of intervals or ranges such as '0-1 hours, 1-2 hours, 2-3 hours, 3-4 hours etc.'. Overlapping intervals can create confusion and should be avoided.[44]

Ratio scale variables are numerical in nature such as income, age or number of computers in a home.[45] Ratio responses can be subjected to mathematical processes such as averaging or ratio comparisons.

A few open-ended questions are normally included in self-administered surveys. These allow respondents to expand on points or responses and provide some latitude in expressing opinions or answers in the respondents' own manner. Researchers and survey designers should take care in phrasing open-ended questions. Respondents' answers are not controlled by a series of pre-determined choices and may not be expressed so as to be useful for analysis.[46] Responding to open-ended questions requires more effort on the part of respondents in

---

[40] Karen B. Paul and David W. Bracken, "Everything you always wanted to know about employee surveys," *Training & Development* Vol. 49 Issue 1 (Jan 95): 46.

[41] Weisberg *et al*, *An Introduction to Survey Research, Polling and Data Analysis*, 98.

[42] Providing a 'no opinion' option can lead to significantly more to noncommittal responses (as much as 25%). The implication is that the absences of such an option forces respondents to take positions on subjects when they may not, in fact, have an opinion. Asher, *Polling and the Public: What Every Citizen Should Know*, 36.

[43] Tourangeau *et al*, *The Psychology of Survey Response*, 241.

[44] Department of National Defence, A-P9-000-012/PT-000 *Manual of Individual Training…*, 3-4 – 3-9.

[45] Weisberg *et al*, *An Introduction to Survey Research, Polling and Data Analysis*, 182.

comparison to closed questions.[47] Responses to open-ended questions also require significantly more analytical effort and should be used either in short surveys or sparingly in larger surveys with predominantly closed questions.[48]

There are other question options used to obtain survey data including case studies in which the respondent is asked to read a piece of text and answer a series of question and checklists in which the respondent can identify all relevant choices.[49] The responses to these question structure can be either open-ended or closed with a nominal, ordinal, interval, or ratio scale.

After the questions have been drafted, a thorough review is needed to validate the questions against the intended research objective, to determine clarity and consistency of meaning and to identify any potential pitfalls, misunderstandings or bias.

REVIEWING QUESTIONS

When reviewing the questions, they should be checked for problems that may affect the respondent's understanding of the question or the response rate. Errors in question and questionnaire design may also encourage 'response set', bias responses unnecessarily, or lead a respondent to 'expected' responses.

Survey designers should bear in mind the intended participants.[50] "Questionnaires must be designed to accommodate the literacy skills of respondents; data quality will vary, depending on how well this is done…"[51] The literacy of members of the population can have a negative

---

[46] Floyd J. Fowler, Jr., *Improving Survey Questions* (Thousand Oaks: Sage Publications, 1995), 3-4.
[47] Fowler, *Survey Research Methods*, 64.
[48] Parten, *Surveys, Polls and Samples*, 182.
[49] *Ibid,* 182.
[50] Peterson, *Constructing Effective Questionnaires,* 10.
[51] Department of National Defence, A-P9-000-012/PT-000 *Manual of Individual Training…*, 1-8

influence on the validity of mail or Web surveys especially if the questionnaire uses language beyond the skills of a respondent.[52]

Respondents may be very sensitive to questions that may be personal, delicate or offensive. Particular attention must be paid to the design of questions on potentially sensitive topics such as illicit substance use or sexual behaviour, which tend to be under-reported by respondents due to a social desirability bias.[53] Participants may be reluctant to provide unpopular responses to questions. Respondents will therefore tend to give the 'expected' or socially acceptable answer.[54] They may also have concerns about the risk of disclosure to a third party or invasion of their privacy. "Most survey researchers regard sensitive topics as serious impediments to high response rates…."[55] In cases where asking sensitive questions is unavoidable, it may be necessary to develop an adjustment method for the set of responses.[56]

This may prove to be a prominent concern for surveys done in DND. Military culture is rife with rules, obligations, traditions, structure and oversight. This culture may be an impediment to frank replies to questions of a sensitive nature (i.e. sexual behaviour, illicit drug use, etc). Considerable caution is necessary particularly when conducting interview surveys on these sensitive subjects. Canadian Forces members may tend to provide socially acceptable responses when asked questions about their health, mental state, post-traumatic stress and other delicate issues.

Similar problems of item or even unit refusal may arise from difficult questions such as those requiring some mathematics or locating required data (i.e. Social Insurance Numbers) in

---

[52] Mick P. Couper, "Web Surveys: A review of issues and approaches," *Public Opinion Quarterly* Vol. 64 Iss. 4 (Winter 2000): 467.

[53] Fowler, *Survey Research Methods*, 93-94.

[54] Fowler, *Improving Survey Questions*, 28.

[55] Tourangeau *et al*, *The Psychology of Survey Response*, 261.

[56] *Ibid,* 261.

order to respond to a question.[57] According to Dillman *et al*, "…asking even a single objectionable/difficult question can lower questionnaire response."[58]

"Response set' can be established if there is a long uninterrupted string of similar questions, similar response patterns or several questions with the same language or perspective. Survey respondents may begin to mark the same response category after a pattern develops such as several 'true' responses in a row. Designers of surveys, which may need to ask long sequences of questions, should consider varying the pattern of questions or responses to alleviate this 'response set' phenomenon.[59]

Bias or assumptions may be introduced in very subtle ways in comparative or filter questions. Comparative questions such as "Do you prefer product X or Y?" are frequently used in surveys. Research has shown that the order of the comparison ('Y or X' compared to "X or Y') can have a statistically significant impact on results. Generally speaking, respondents tend to answer based on their reaction to the first of the two items being compared.[60] In some cases, this difference can actually reverse the order of comparison.[61] Researchers should pay attention to this phenomenon to ensure that they understand the potential effect on survey results.

Knauper's work suggests that filter questions and direct questions can imply very different assumptions especially for questions that investigate the frequency of occurrence of the subject being investigated. Filter questions such as "Have you experienced X?" may predispose respondents to admit a lack of concern. Direct questions such as 'How often have you experienced X?' can imply that respondents should be concerned about 'X' or that they should

---

[57] Fowler, *Survey Research Methods*, 66.

[58] Don A. Dillman, Michael D. Sinclair, and Jon R. Clark, "Effects of Questionnaire Length, Respondent-Friendly Design, and a Difficult Question on Response Rates for Occupant-Addressed Census Mail Surveys," *Public Opinion Quarterly* Vol. 57 Iss. 3 (Fall 1993): 302.

[59] Weisberg *et al*, *An Introduction to Survey Research, Polling and Data Analysis*, 98.

[60] Asher, *Polling and the Public: What Every Citizen Should Know*, 53-54.

have experienced 'X'. In either case, a bias can be created. For filter questions, that bias could be to the 'no response' or 'no experience' option while direct questions could bias to at least a minimal experience rate. These biases are prevalent in questions that explore behaviour or experiences as opposed to questions of fact (i.e. 'Do you own a car?'). In order to reduce these unwanted shifts, "… surveyors can provide more concrete definitions of the target issue or can pretest questions to make sure that the intended definition matches what respondents understand."[62]

The entire question or questionnaire, and not just a particular word, may also be loaded. The language of the question could provide a bias or guide the respondent to a desired result. Bias in a questionnaire influences respondents to select a particular response even if that response does not accurately reflect the respondent's view.[63] Attempts to provide background information that will clarify the intent of a question can also influence the responses selected.[64] Again, loaded or sensitive questions could lead to item or unit non-response.

Similarly a leading question may invoke responses that are expected by the researcher or that inaccurately report someone's point of view. "Individuals or groups with an ax to grind can easily construct questions that will generate desired responses. The response alternatives they provide to the interviewees also can help them achieve the intended results."[65]

CODING OF QUESTIONNAIRES

Coding is a process of assigning values to possible responses so as to assist in recording responses and data analysis. There are a variety of approaches to coding; especially the coding

---

[61] Michaela Wanke, Norbert Schwarz and Elisabeth Noelle-Neumann, "Asking Comparative Questions: the Impact of the Direction of Comparison," *Public Opinion Quarterly* Vol. 59 Ii10.2 I3ps7879 381.44974 131.8196 Tm(o)Tj10.00

of types of closed questions.[66] Due to a lack of readily available information on coding of the case studies, the coding of questions and questionnaires will not be discussed in this paper.

CONSTRUCTING THE QUESTIONNAIRE

The physical design of a questionnaire (i.e. document layout, font size, and even paper colour) can also influence responses and response rates.

> While the importance of question wording in influencing respondent answers is well recognized, there is a growing literature that suggests that the design of the survey instrument (such as the placement of questions, flow of instrument, typographical features, etc.) also plays an important role, in both self-administered and interviewer-administered surveys.[67]

A 'respondent-friendly' questionnaire is "…a form that is easy for respondents to complete, avoids confusion about what or how to answer it, and results in respondents feeling neutral or positive, as opposed to negative, about the form itself."[68] An attractive, professional looking questionnaire (perhaps with a personalized cover letter) is likely to result in higher response rates.[69] Care should be taken to avoid splitting instructions, the associated question(s) and potential responses between pages. While such splitting may reduce the document length, it could also confuse respondents by breaking the flow from instruction to question or apparently present the respondent with a shorter list of alternative responses than was intended by the designer.[70] Complicated and/or cluttered layouts with folds in the page, extraneous inserts, requirements to repeat information already given, detailed and/or long instructions, changes in fonts or graphics between pages, and distracting marks (such as used for optical readers) can

[66] Department of Nation

annoy potential respondents and possibly lead to unit refusal entirely.[71] The layout of the questionnaire should clearly separate the question from the response set, align questions with responses, and allow a respondent to quickly determine if a question has been answered already.[72] In addition to allowing enough space for open-ended questions, response structure and space should permit all possible responses.[73]

The sequence of topics and questions is also important and can affect the results obtained.[74] One explanation for this is that question sequence alters the context in which a respondent addresses the question.[75] This problem may not be as prevalent in self-administered mail surveys because of the freedom that respondents have to review the complete questionnaire or the questions in a particular section before responding.[76] However, as a general guide, the questionnaire should begin with easier (i.e. warm-up) questions and progress to more complicated or sensitive issues.[77] Similarly, questions should be grouped together logically or based on a common theme.[78]

The influence of survey length is somewhat less clear. Parten indicates that response rates vary notably with survey lengths from one to ten pages but that the response rate is fairly consistent in longer surveys of 10 to 35 pages. The research conducted by Dillman *et al* supports this premise.[79] Some research supports maximum survey lengths of 80 to 100 questions or

---

[71] Dillman *et al* examined many aspects of questionnaire design. Their work showed that 'respondent-friendly' forms can improve response rates in some applications. Dillman *et al*, "Effects of Questionnaire Length, Respondent-Friendly Design…: 290.

[72] Parten, *Surveys, Polls and Samples*, 162.

[73] *Ibid,* 200.

[74] Borgatt, "Survey Research," in *Encyclopedia of Sociology,* 3089.

[75] Asher, *Polling and the Public: What Every Citizen Should Know*, 55.

[76] Asher, *Polling and the Public: What Every Citizen Should Know*, 59, quoting Norbert Schwarz and Hans-J. Hippler, "Subsequent Questions May Influence Answers to Preceding Questions in Mail Surveys," *Public Opinion Quarterly* 59 (Spring 1995): 93-97.

[77] Bourque and Fielder, *How to Conduct Self-Administered and Mail Surveys*, 50.

[78] *Ibid,* 55.

[79] Dillman *et al* examined changes to the 1990 US census form, a relatively short questionnaire (eight housing questions and eight questions per person in the house). They found that reducing the questionnaire length

which take no longer than approximately 30 minutes to complete.[80] Jackson suggests that the maximum length of a mail survey should be 60 questions and 80 questions for an interview based survey.[81] These are rough guides only. Longer surveys will have more errors introduced related to completing the survey properly and in accordance with instructions.[82] Errors could also be introduced if there is a long string of responses on a date sheet and the respondent simply drops out of sequence between the question and the associated response field. The nominal length depends upon many factors such as the difficulty of the questions, respondent interest, characteristics of the sample group, the requirements of the study itself, etc. Longer surveys may be appropriate if the length derives from improving readability or if the respondents are interested/motivated to complete the questionnaire.[83]

The level of respondent interest in the subject or goals of the survey may be more decisive than survey length in deciding participation.[84]

> One clear generalization that holds up for most mail surveys is that people who have a particular interest in the subject matter or the research itself are more likely to return mail questionnaires than those who are less interested. This means that mail surveys with low response rates almost invariably will be biased significantly in ways that are related directly to the purposes of the research.[85]

The end of the questionnaire (or the cover letter or instructions) should provide respondents with an opportunity to comment on the survey, include directions for returning the

---

improved response rates by as much as 4.6%. Similar work by other researchers on longer survey questionnaires produced inconclusive results. Dillman *et al*, "Effects of Questionnaire Length, Respondent-Friendly Design…: 290,298.

[80] Paul and Bracken, "Everything you always wanted to know about employee surveys," *Trainin166.3201 Tm(Br)Tj10r4 900*

completed survey questionnaire and express gratitude for the effort and time required to complete the survey instrument.[86]

TESTING THE QUESTIONNAIRE

Testing a questionnaire and its constituent questions is necessary to make certain that respondents understand the questions and instructions as intended and that respondents can meet any other requirements of the instrument (i.e. determine the percentage of income spent on food).[87] Once the questionnaire has been developed, reviewed, had its coding determined and constructed, it should be tested by members of the intended population (and not the designer's colleagues).[88] Testing of questionnaires will identify problems before administering the survey and thus help to ensure the validity of the results.[89] Such a test is a very important part of the planning phase and will help to identify problems with the layout, length or instructions of the questionnaire and any particular problems with questions such as clarity or loaded words.[90]

[86] Bourque and Fielder, *How to Conduct Self-Administered and Mail Surveys*, 104.
[87] Fowler, *Improving Survey Questions*, 104.
[88] Department of National Defence, A-P9-000-012/PT-000 *Manual of Individual Training…*, 3-22.
[89] Weisberg *et al*, *An Introduction to Survey Research, Polling and Data Analysis*, 93.
[90] Peterson, *Constructing Effective Questionnaires,* 11.

CHAPTER 3 – CONDUCTING SURVEYS, SAMPLING AND ERROR

The method of implementation, the selection of the sample and the sources and extent of error represent threats to the external validity of survey research. The survey researcher must therefore consider the methods used in administering the survey, the impact on the design of the questionnaire, the extent of access to members of the sample group and even the margins of error to be expected in the results. In any form of survey research, the researcher has several options when choosing members of the sample group. Error can be introduced into survey data and results from a variety of sources. This chapter will review concepts relevant to the implementation of survey questionnaires (particularly for self-administered mail surveys), sampling and potential sources of error.

CONDUCTING SURVEYS

Researchers should consider actions to improve response rates and reduce bias during the design, development, testing and implementation of surveys.[91] There are measures that can be taken when administering a survey questionnaire that will improve response rates (both unit and item).[92]

The method of administering alone can affect the results in addition to the effects of questionnaire design, sampling, and analysis.[93] For example, the results of an interview survey which contains questions on sensitive subjects such as drug use or sexual habits may be affected by the one-on-one nature of a telephone interview.[94] A respondent may hesitate to offer frank opinions to a person because the situation may detract from the belief in anonymity.[95] Similarly, the phenomena of 'positivity bias' can arise in face-to-face interview situations. Respondents

[91] Fowler, *Survey Research Methods*, 52.
[92] Department of National Defence, A-P9-000-012/PT-000 *Manual of Individual Training…*, 4-4.
[93] Borgatt, "Survey Research," in *Encyclopedia of Sociology,* 3090.
[94] Fowler, *Survey Research Methods*, 66.

can be reluctant to offer a negative opinion of a third person to the interviewer. This positivity bias shifts the response to the positive end of the scale provided.[96]

Self-administered surveys can provide a 'safer' environment for respondents and thus may alleviate social desirability bias.[97] "The privacy in which a mailed survey can be completed may reassure respondents about the anonymity and confidentiality of their responses and may encourage them to respond more frankly, particularly on sensitive topics."[98]

However, when compared to telephone or personal interviews, low response rates can be expected with self-administered mail surveys. A well-written covering letter for self-administered mail surveys can help to maintain a high rate of responses. Such a letter should identify the purpose of the survey, its importance, the importance of the respondent to the survey process. The letter should also reassure potential respondents of the confidentiality of their responses, provide a time frame for returning the questionnaire and express thanks for the respondent's participation.[99] DND guidelines suggest a carefully written covering letter can help to maintain a high rate of responses.[100] It is unclear if assurances of privacy, alone, will improve response rates and accuracy.[101]

Other methods of improving response rates include providing postage for completed responses, incentives, undertakings to provide the results to respondents, pre-survey contact by

---

[95] Tourangeau *et al*, *The Psychology of Survey Response*, 257.
[96] *Ibid,* 240.
[97] Couper, "Web Surveys: A review of issues …: 469.
[98] Asher, *Polling and the Public: What Every Citizen Should Know*, 79.
[99] Department of National Defence, A-P9-000-012/PT-000 *Manual of Individual Training…*, 4-4.
[100] *Ibid,* 4-4.
[101] Tourangeau *et al*, *The Psychology of Survey Response*, 262.

telephone or mail and reminders after the initial mailing of the survey questionnaire.[102] The efficacy of such measures has not been consistent.[103]

Self-administered surveys have both advantages and disadvantages when compared to surveys administered by interviews (in person or by telephone). These advantages and disadvantages are summarized in Table 3 below.

ADVANTAGES	*DISADVANTAGES*
• Lower cost in comparison to other methods	• Inaccurate lists for distribution[104]
• A wider geographic area can be covered (especially when compared to face-to-face interviews)	• Response rates are lower than interviewer administered surveys
• A larger sample can be studied because of reduced costs	• Difficult for people with literacy or vision problems to complete
• Populations that may resist a personal interview or may not be accessible by phone or in person can be reached	• The object of the survey must be readily understood
• Respondents can complete at their convenience	• The length and composition of the questionnaire is constrained. Normally self-administered surveys are shorter and use more close-ended questions than interview administered surveys
• Easier to implement	• No control of the order of answering questions
• Potential respondents receive the questionnaire at approximately the same time	• No control over who completes the questionnaire
• Respondents may answer sensitive questions more honestly in comparison to interview situations	• Difficult to take quick snapshots. Turnaround time may be two to three months

Table 2: Advantages and Disadvantages of Self-administered Surveys[105]

[102] Fowler, *Survey Research Methods*, 54.

[103] Srinivasan Ratneshwar and David W. Stewart, "Nonresponse in Mail Surveys: An Integrative Review," *Applied Marketing Research* 29, no. 3 (Summer 1989): 38.

[104] Inaccurate mailing or phone lists contributed to non-delivery and thus complicate obtaining survey data. Fowler, *Survey Research Methods*, 62.

[105] Bourque and Fielder, *How to Conduct Self-Administered and Mail Surveys*, 9-21.

According to DND's manual, *Design and Use of Questionnaires in Training,* the advantages and disadvantages of self-administered questionnaires are:

METHOD	*ADVANTAGES*	*DISADVANTAGES*
Questionnaire	• The method is inexpensive	• Missing data can be a problem
	• The questionnaire can be administered by a less skilled individual	• Clarification is difficult to seek
	• Data can be gathered from many locations	• Low response rates are a problem
	• The questionnaire can be administered to groups or individuals	• It may be difficult to generalize about results on a small sample
	• Uniformity is guaranteed (the same questions for all)	• Questionnaires must be designed to accommodate the literacy skills of respondents; data quality will vary, depending on how well this is done
	• Anonymity can promote open, candid responses	• The style of questionnaire may limit the complete explanation of an answer

Table 3: Advantages and Disadvantages of Self-administered Surveys in DND[106]

Supervised administration of questionnaires can have advantages over mailed questionnaires. Such a method can permit the designer to ask important but perhaps more complicated questions than in a mail survey and control the conditions of administering the questionnaire. Supervised administration of questionnaires can have advantages over mailed questionnaires and is preferred by DND guidelines. Conversely, respondents may feel uncomfortable in providing frank opinions and there are added costs in supervising a survey questionnaire.[107] Supervised administration of surveys also creates pressure on individuals to

[106] Department of National Defence, A-P9-000-012/PT-000 *Manual of Individual Training…*, 1-8.
[107] *Ibid,* 4-5.

complete the survey. Researchers should reassure respondents of their right to refuse to answer an item or the entire survey.[108]

SAMPLING

"Sampling is the selection of a subset of respondents from a broader population."[109] Ideally, the sample selected for a survey will fully reflect the entire population under consideration. If this is so, the results of a sample survey can be extrapolated to the population as a whole thus saving time, resources and effort to obtain the same results as a full census.[110] Mistakes in selecting the sample can introduce error and bias into survey results.

Sample Types

The four types of sample are:

- convenience
- judgment
- random
- cluster

A convenience sample is one in which the most convenient participants (i.e. available, willing to participate etc) are selected for the survey. A convenience sample may be used if a high level of accuracy is not required (i.e. a general indication only). A convenience sample can introduce significant error but is sometimes used because the cost of collecting responses can be reduced due to the cooperation of the sample. Such sampling methods are not suitable for accurate estimation of error or extrapolation to larger populations.[111]

A judgment sample is selected by someone familiar with the population being sampled. One major concern with this sampling method is the introduction of bias (unintentional or intentional) by the selector. This type of sample can still be useful in certain types of surveys

[108] Jackson, *Research Methods: Rules for Survey Design and Analysis*, 29.
[109] Asher, *Polling and the Public: What Every Citizen Should Know*, 61.
[110] Department of National Defence, A-P9-000-012/PT-000 *Manual of Individual Training…*, 2-5.

where the sample size may be small or some thought must be paid to ensuring a representative sample is used.

Random and pseudo-random samples can be classified as simple, systematic, stratified or cluster random samples. In a simple random sample, potential respondents are selected from the population so that all possible respondents have the same chance of being chosen. Completely (simple) random sampling can produce anomalies with a concomitant biasing of results.[112] A systematic random sample uses a selection system to choose units (i.e. every tenth unit). However, in many research projects, the researcher may be interested in differences between subsets of the population of interest.[113] In order to make certain that these distinct subsets are included, a stratified random sample will randomly select potential respondents from each sub-set (in proportion to their representation in the population) rather than selecting randomly from the entire population as a whole.[114] Sample error can be reduced by the appropriate use of stratified sampling.[115] Carefully chosen strata will ensure that the sample adequately represents the distribution of characteristics of interests in the population (i.e. men and women).[116]

Cluster samples are focused on a group with a shared characteristic such as geographic location. This type of sample can introduce bias from a variety of sources such as choosing a community with low or high-income levels. Cluster sampling is however very cost effective[117].

Sample Size

A sample size that is too small may not have the accuracy or dependability (confidence level) to permit extrapolation of the results to the entire population. Consequently, much of the

---

[111] Borgatt, "Survey Research," in *Encyclopedia of Sociology,* 3088.
[112] Fowler, *Survey Research Methods*, 24-25.
[113] Asher, *Polling and the Public: What Every Citizen Should Know*, 64.
[114] Weisberg *et al*, *An Introduction to Survey Research, Polling and Data Analysis*, 45.
[115] Fowler, *Survey Research Methods*, 39.
[116] Weisberg *et al*, *An Introduction to Survey Research, Polling and Data Analysis*, 45.
[117] Lapin, *Statistics: Meaning and Method,* 85-93.

effort and expense of carrying out the survey may be wasted. If the sample size is larger than required for accuracy and confidence levels, time, money and resources could also be wasted.[118] The sample size used will depend upon several variables including:

- accuracy required
- confidence level required
- number of variations
- size of the total population
- resources available for the survey

Typically for a population of 60,000 (the rough size of the Regular Force population of the Canadian Forces), a simple random sample size of 381 will produce an accuracy of plus or minus 5% with a 95% confidence level.[119] However, if there is a need to examine and compare the opinions of sub groups (i.e. by gender, by rank, by specialty), a stratified random sample will be necessary. The total sample size will have to be much larger in order to obtain a statistically significant sample from each sub group with reasonable margins of error.[120]

UNCERTAINTY AND ERROR

In any measurement process there is a degree of uncertainty. This is particularly true in sampling surveys. It is possible to consciously or unconsciously introduce bias and error into a survey. A degree of error is inherent in the process of using a sampling process rather than conducting a census (sampling error). Error not related to sampling can compound this situation through the design, administration, coding and analysis of surveys and the resulting data.

---

[118] Asher, *Polling and the Public: What Every Citizen Should Know*, 69.
[119] Department of National Defence, A-P9-000-012/PT-000 *Manual of Individual Training…*, 2-14.
[120] "Public-Opinion Polling," *Encyclopædia Britannica* [Encyclopedia on-line]; available from http://search.eb.com/eb/article?eu=117356; Internet; accessed August 25 2002.

Sampling Error

The selection of a sample can introduce error and bias. "Sampling error is a random (and hence not a systematically biasing) result of sampling."[121] Sampling error arises from differences between the sample selected and the total population being considered. "Consequently, researchers should not take sample results as absolutes, but rather as approximations."[122] For example, if by chance a disproportionate number of employed men are randomly sampled in a survey of working conditions, error can be introduced because employed women are not fully included. The appropriate selection method and sample size will minimize this type of error. Large sample ratios (sample sizes divided by population size) can reduce sampling error further.[123]

Sampling bias, a form of sample error, is a much more difficult to minimize. Sampling bias arises from a tendency to selectively favour certain potential respondents over others.[124] A telephone survey conducted in homes during the day will result in contacts with at-home parents, shut-ins, the unemployed etc and will not necessarily be representative of the entire adult population of a region.

Non-Sampling Uncertainty In Surveys

Uncertainty in surveys can arise from inherent shortcomings in the survey itself such as "missing the point… [and] measuring properties of the material not fully suited to the problem."[125] Uncertainty is introduced into the design of the test procedure or of the questionnaire and is not a function of carrying out the prescribed procedure. A "…recanvass

---

[121] Fowler, *Survey Research Methods*, 35.

[122] Weisberg *et al*, *An Introduction to Survey Research, Polling and Data Analysis*, 67.

[123] Sampling error is reduced by a factor of (1-*f*) in the standard equation for sampling error, where *f* is the sampling ratio expressed as a fraction. Fowler, *Survey Research Methods*, 40.

[124] Lapin, *Statistics: Meaning and Method,* 81.

[125] W. Edwards Deming, *Sample Design in Business Research* (New York: John Wiley and Sons, 1960), 64.

(audit or control: *vide* infra) will not discover it. It is independent of the size of the sample."[126] Rather, such uncertainties could be introduced by complicated language, which may not be suitable for a portion of the intended sample, questions that require substantial written responses, sequencing of questions, etc.

Another source of uncertainty (according to Deming) is introduced by problems in the conduct of fieldwork, interviews, coding, and statistical analysis. Coding and data reduction (data entry) error can be reduced to minor levels (i.e. one percent or less for closed responses) through management of data recording and input including systems for checking accuracy.[127] These uncertainties can be identified and compensated for by redoing the survey, audits, and recanvassing. Aside from uncertainty introduced by problems in interviewing, data handling and manipulation, error can also be introduced because of non-response or a refusal to respond.

Measurement Error

Measurement error occurs when the results from a sample are different than those of the entire population. This type of error can be introduced by asking sensitive questions (i.e. drinking habits), human error in responding or failing to understand the question asked. Measurement error varies with the method of administering the survey.[128] Concerns about sensitive, difficult or complicated questions were discussed in the Reviewing Questions section of Chapter 2.

Non-response Error

> "The major disadvantage associated with mail surveys is low return rates and indeed this often poses a major threat to the validity of the survey findings."[129]

---

[126] *Ibid,*64.
[127] Fowler, *Survey Research Methods*, 138.
[128] Matthias Schonlau, Ronald D. Fricker Jr., and Marc N. Elliott, *Conducting Research Surveys via E-mail and the Web* (Santa Monica: RAND, 2002), 49.
[129] Ratneshwar and Stewart, "Nonresponse in Mail Surveys: An Integrative Review": 37.

A portion of error in surveys can be attributed to non-response by a sample unit or refusal to respond. Non-response error happens because the opinions or impressions of a portion of the sample population will not be included in the results and subsequent analysis. Such error may be substantial and should be considered in the analysis of survey results.[130] The Encyclopedia of Sociology contends that discussion of non-response is an indicator of the survey analysis' adequacy.[131]

"Response rates in marketing and advertising research surveys are declining and, correspondingly, the potential for non-response bias is increasing."[132] For mail surveys, time should be included in the survey plan for 2 or 3 reminders to reduce non-response rates.[133] Other techniques such as incentives can also improve response rates.[134]

Significant non-response bias in a survey will yield results that do not accurately reflect the population as a whole. The magnitude of non-response bias is a function of the extent of non-response (how many do not respond to the survey) and "…the extent to which those not responding are biased – that is, statistically different from the whole population."[135]

Results are distorted because surveys are completed by those people who wish to and can complete the survey.[136] Colombo has shown that minor differences between the opinions of non-

[130] Fowler, *Survey Research Methods*, 44.
[131] Borgatt, "Survey Research," in *Encyclopedia of Sociology,* 3088.
[132] Richard Colombo, "A Model for Diagnosing and Reducing Nonresponse Bias," *Journal of Advertising Research* Vol. 40 Iss. 1/2 (Jan/Apr 2000): 86.
[133] Deming, *Sample Design in Business Research*, 68.
[134] Borgatt, "Survey Research," in *Encyclopedia of Sociology,* 3091, citing the work of Don A. Dillman, *Mail and Telephone Surveys: The Total Design* Method (Upper Saddle River, N.J.: Prentice Hall, 1978).
[135] Fowler, *Survey Research Methods*, 446-48.
[136] Deming, *Sample Design in Business Research*, 67.

respondents and respondents can introduce dramatic bias and thus survey results may misrepresent the true situation being studied.[137]

"…[N]ot all people included in the sample are willing or able to complete the survey."[138] For example, some individuals are not able or willing to respond because of literacy skill issues (or the accompanying emotional reaction) when presented with long or complicated survey questionnaires.[139] Non-response error can also be introduced by the manner of conducting a survey such as the word choice in questions or the skills of an interviewer.[140] Non-response has a variety of causes including:

- inability to complete the survey (i.e. literacy/ education level of potential respondents)[141]
- interest level of potential respondents in the subject under consideration[142]
- degree of personal involvement of potential respondents in the subject
- income level of respondents[143]

With mail surveys, this bias can be partially compensated for by resorting to an interview of a sample of non-respondent people. There are other methods of compensating for non-response bias such as that proposed by Colombo.[144] For any remaining non-response, Deming identifies 4 options available:

- renewed attempts on a sample of non-responses
- assume the worst case for non-responses (extreme skew)
- determine plausible results for responses and non-responses

[137] In one simplified example, Colombo demonstrated that an 88% return rate would be needed merely to keep the error due to nonresponse bias under the acceptable sampling error (+/- 6%). Colombo, "A Model for Diagnosing and Reducing Nonresponse Bias": 86.

[138] Couper, "Web Surveys: A review of issues …: 469.

[139] *Ibid*: 469.

[140] Lapin, *Statistics: Meaning and Method,* 80-83.

[141] Fowler, *Survey Research Methods*, 45.

[142] Asher cites the work of Converse on education and interest level of survey respondents. Converse found that item response decreased as respondent interest in the survey subject decreased. Asher, *Polling and the Public: What Every Citizen Should Know*, 37, quoting Jean M. Converse, "Predicting No Opinion in the Polls," *Public Opinion Quarterly* 40 (Winter 1976-1977): 515-530.

[143] According to research cited by Ratneshwar and Stewart, higher non-response rates can be found at the extreme ends of the income range. Ratneshwar and Stewart, "Nonresponse in Mail Surveys: An Integrative Review": 39.

[144] Colombo, "A Model for Diagnosing and Reducing Nonresponse Bias": 88-92.

- simply report the results of response by class and the size and types of non-response.[145]

However these compensation methods must be carefully applied.[146] Simple extrapolation, based upon responses received, assumes that those who do not respond would respond with the same distribution as those who do respond. This assumption is not always valid.[147]

Coverage Error

Error can be introduced to survey results "… when some part of the population of interest cannot become part of the sample."[148] Coverage error might be introduced for a variety of reasons such as attempting to administer a survey very near to a holiday when many people may not be home, inaccurate mailing lists or unintentional selection bias. Coverage error can by attributed to both sampling and non-sampling causes. Regardless, portions of the population of interest are not included in the survey process therefore; their opinions, attitudes, beliefs and circumstances are not included in the results.

[145] Deming, *Sample Design in Business Research*, 68-69.
[146] *Ibid,* 67.
[147] Asher, *Polling and the Public: What Every Citizen Should Know*, 75.
[148] Schonlau *et al*, *Conducting Research Surveys via E-mail and the Web*, 13.

CHAPTER 4 – ETHICAL AND COMMON SURVEY CONCERNS

In addition to concerns about the design and implementation of individual surveys, there are more general concerns that should be taken into account when using a survey to do research. Ethical issues, population over-exposure to surveys, previously existing research and regulations applicable to the population of interest should be included in a researcher's deliberations. This chapter will examine some of the ethical and more general matters to be considered when conducting survey research.

ETHICAL CONCERNS

Rights and Expectations of Respondents

Survey respondents are contributing their time, effort, beliefs and knowledge to the research project. They therefore have some rights and expectations. First and foremost, their participation should not cause them any harm or injury.[149] This principle may have a more direct meaning in fields such as medical research but has applications in survey research as well. Participation in a survey should not result in retribution. Thus, there is an element of trust that should be established between the researcher and the respondents that responses will be handled responsibly, for the purposes stated and that confidentiality will be maintained.[150] Confidentiality is a necessary prerequisite to acquiring honest and accurate responses. Survey researchers should provide reassurances of confidentiality if they wish to reach a representative sample of the population. Providing confidentiality does have drawbacks. Complete anonymity makes it difficult for researchers to follow up or prompt respondents in mail surveys.

[149] Weisberg *et al*, *An Introduction to Survey Research, Polling and Data Analysis*, 355.
[150] Fowler, *Survey Research Methods*, 138-139.

Researchers have come up with a variety of mechanisms for addressing these complications such as identifying codes.[151]

In order for their participation to be voluntary, potential respondents should be informed of the aim of the research and should provide informed consent before participating. This is a double-edged sword though. Researchers must strike a balance between gaining voluntary participation (and thus allowing people to refuse to participate) and the impact that foreknowledge of the subject can have on responses.[152]

Incentives

Direct and indirect incentives to respondents may improve response rates but a degree of caution should be exercised in using incentives. Direct incentives such as small cash payments or lottery tickets are occasionally provided to respondents of surveys in return for their completion of the survey device. Indirect benefits such as endeavouring to send the survey results back to respondents may also help to increase response rates.[153] Other more intrinsic benefits come from the respondent feeling that their input is making a difference.

Research Involving Human Subjects

DND has a set of orders which outline the requirements to be met before carrying out research involving human subjects including obtaining confidential information and opinions. A cornerstone of these orders is that "…participation is voluntary and is based on the full, informed consent of the human subjects."[154] In order to give informed consent, potential respondents should be given enough information about the survey and its goals to allow them to decide on

[151] Weisberg *et al*, *An Introduction to Survey Research, Polling and Data Analysis*, 357.
[152] *Ibid*, 355-357.
[153] Schonlau *et al*, *Conducting Research Surveys via E-mail and the Web*, 49.
[154] Department of National Defence, *Research Involving Human Subjects.* Defence Administrative Orders and Directives (DAOD) 5061-0 (Ottawa: DND Canada, 20 August 1998), 2.

participation.[155] However, informed consent presents challenges in conducting surveys. Potential respondents may refuse to participate if fully aware of the content, length or intent of a survey. Researchers must look at the situation from a wider perspective and strike a balance between their scientific purpose and the rights/needs of members of the sample.[156] Confidentiality is an important tenet of DND's orders for conducting research.[157] Respondents should feel secure that their input will be held in confidence against disclosure except for analysis in the study.[158]

Survey research proposed by DND/CF organizations must be reviewed and approved by a human research ethics committee, which will consider both the protocol of the project and the proposed participation of DND employees and CF members. These committees are expected to conduct themselves in accordance with the Tri-Council Policy Statement: Ethical Conduct for Research Involving Humans and relevant DND orders.[159] The Tri-Council Policy Statement provides guidance on the ethical conduct of research involving human subjects.[160] Many of the provisions of this statement closely resemble the ethical codes of other organizations involved in survey research.

The AAPOR Code of Professional Ethics and Practices

The American Association for Public Opinion Research (AAPOR) is a professional organization for those working in the field of public opinion research. As a requirement for

[155] Peterson, *Constructing Effective Questionnaires,* 7.
[156] Borgatt, "Survey Research," in *Encyclopedia of Sociology,* 3093-3094.
[157] Department of National Defence, *Research Involving Human Subjects – Approval Procedures*. Defence Administrative Orders and Directives (DAOD) 5061-1 (Ottawa: DND Canada, 20 August 1998), 3.
[158] Fowler, *Survey Research Methods*, 137-138.
[159] Department of National Defence, *Research Involving Human Subjects.* Defence Administrative Orders and Directives (DAOD) 5061-0 (Ottawa: DND Canada, 20 August 1998), 3.
[160] The Tri-Council Policy Statement is a joint statement by the Natural Sciences and Engineering Research Council of Canada, the Canadian Institutes of Health Research, and the Social Sciences and Humanities Research Council of Canada on ethical conduct of research involving human subjects. *Tri-Council Policy Statement: Ethical*

joining the AAPOR, prospective members subscribe to the AAPOR Code of Professional Ethics and Practices.[161] This code established principles for "…sound and ethical practice in the conduct of public opinion research…"[162] The AAPOR code includes statements of principle and standards for:

- developing suitable, effective research and survey methods and instruments,
- valid interpretation of data,
- accurate disclosure of findings,
- investigating potential violations of the Code,
- correcting distortions of research,
- confidentiality of proprietary information,
- the limitations of public opinion research,
- the development of public opinion research science,
- lack of professional status,
- prevention of harm to respondents,
- protecting respondent confidentiality except when waived, and
- disclosure of essential information about how any research is conducted.[163]

Other Codes of Conduct

Other polling organizations also have codes of conduct, ethics and standards. The Council of American Survey Research Organization's Code of Standards and Ethics for Survey Research sets out obligations to respondents, clients, contractors and reporting of research.[164] The Professional Marketing Research Society Code of Conduct clearly states the rights of respondents to informed consent and confidentiality.[165] The Canadian Survey Research Council Declaration of Principles sets standards for ethical issues but also takes a stand on some practical

---

Conduct for Research Involving Humans [Web-site on-line]; available from http://www.nserc.ca/programs/ethics/english/policy.htm; Internet; accessed 6 May 2003.

[161] Weisberg *et al*, *An Introduction to Survey Research, Polling and Data Analysis*, 351.

[162] American Association for Public Opinion Research, *AAPOR Code of Professional Ethics and Practices* (Ann Arbor: AAPOR, 1996), quoted in Weisberg *et al*, *An Introduction to Survey Research, Polling and Data Analysis*, 352-354.

[163] *Ibid,* 352-354.

[164] *CASRO Code of Standards and Ethics for Survey Research* [Web-site on-line]; available from http://www.casro.org/codeofstandards.cfm; Internet; accessed 6 May 2003.

[165] *PMRS Code of Conduct* [Web-site on-line]; available from http://www.pmrs-aprm.com/What/Code.pdf; Internet; accessed 6 May 2003.

survey concerns (e.g. "Overly long questionnaires or confusing or misleading questions will be avoided.").[166]

COMMON CONCERNS

Survey Fatigue

Another area of concern for surveys conducted in DND is that of 'survey fatigue.' The sheer number of surveys that sample groups are asked to complete may overwhelm populations of interest. This may lead to unit refusal. The over-surveying effect, such as already seen in telephone surveys, reduces the statistical value of survey results.[167]

Redundant Surveying

Item or unit refusal rates may also be affected by surveys covering topics already investigated in previous research. Researchers should investigate recent survey activity in the population of interest to ensure that topics have not been previously examined. If previous survey data and analysis is available, it may be possible to use information from previous surveys or other accessible sources.[168]

[166] *CSRC-CCRS Declaration of Principles* [Web-site on-line]; available from http://www.csrc.ca/CSRC/whoweare/principles.php; Internet; accessed 6 May 2003.
[167] Couper, "Web Surveys: A review of issues …: 465.
[168] Department of National Defence, A-P9-000-012/PT-000 *Manual of Individual Training…*, 1-5.

CHAPTER 5 - SURVEY REVIEW METHODOLOGY

The aim of this study was to determine problems in the design and implementation of recent surveys in DND. In order to make that determination, a method of reviewing and identifying problems is needed. This chapter briefly discusses the protocol that was used for the review of individual surveys. It also discusses more general issues that were also considered during the review of DND surveys.

SURVEY REVIEW PROTOCOL

The surveys identified as case studies were subjected to review against a battery of questions and potential problems developed from the previous chapters on survey design, the application of surveys, sampling error, principles and standards. Several of the evaluation points were taken from DND's guidance on survey design (Table 1). The list of review questions and observation points can be found at Annex B.

The survey review protocol (annex B) will be used examine problems that may arise in the development and administration of surveys and some associated concerns such as the frequency of surveying a population on the relevant case study surveys.

The total length of a particular survey was determined by counting all questions. The length is expressed as the number of questions to be responded to and were taken to be the worst case (longest possible) for branching questions. The component statements of questions requiring multiple statements of opinion or fact were counted individually. For example:

> In the past 12 months, how many times have you seen or talked to any of the following types of alternative health care providers about your physical, emotional or mental health?
>
> a) Massage therapist
> b) Acupuncturist

c) Homeopath or naturopath
d) Relaxation therapist
e) Biofeedback teachers
f) Herbalist
g) Reflexologies
h) Other (specify)

In this review, the above question area was counted as eight questions because it required reading, consideration, decision and input on eight different types of health care provider. A question that asked a respondent to select all applicable options of a list provided was considered only one question because the mental effort required was considered by the author to be appreciably less than that required by the multiple component question. Given the method described above, questionnaire lengths are only the author's estimate.

REVIEW OF COMMON CONCERNS WITH DND SURVEYS

This portion of the analysis examined DND surveys as a body. Questions to be considered include:

- How many surveys have been implemented within DND during the time frame under consideration (survey fatigue)? Is this too many?
- Is there potential for imposed response rates (e.g. mandatory completion)?
- Have there been control and coordination problems (e.g. overlap in subjects covered)?

CHAPTER 6 – CASE STUDIES OF RECENT DND SURVEYS AND CENSUSES

During the period under discussion (1 Jan 99-31 Dec 02), DND has administered several surveys. Those surveys that are openly available include:

1. the Armed Forces and Society Questionnaire
2. 1999 Diversity Climate Survey
3. Health and Lifestyle Information Survey 2000
4. CF Household Survey
5. RX2000 Mental Health survey
6. Officer Challenges in Leadership survey
7. Ombudsman's Office Survey May 2000
8. CF Personnel Survey 1999 consisting of:
    a. Biographical Information Sheet
    b. The D2000 Change and Renewal Survey
    c. The Ethics Survey
    d. Harassment Questionnaire[169]
9. Quality of Life Survey 2001
10. DND/CF Self-Identification Census
11. CF Terms of Service Survey Feb 2000
12. Fall 1999 Veterans Affairs Canada Survey
13. Work Conditions Survey.

Table 4 summarizes the characteristics of these recent surveys. The topics covered by recent DND surveys are identified in Annex C. The following paragraphs provide a brief summary of these surveys, their aims and response rates (if available).

The Armed Forces and Society Questionnaire

The purpose of the 'Armed Forces and Society Questionnaire' "…is to explore military members' personal attitudes, beliefs, and opinions about a wide variety of social and national issues."[170] This long survey (223 questions) was first administered to the students of the Canadian Forces Command and Staff Course at the Canadian Forces College in Toronto, Ontario in August of 2002. The original intention was to have the students complete the questionnaire in

[169] Due to the different topics and aims 8.b, 8.c, and 8.d were considered to be three separate surveys for the purposes of this analysis.

[170] Sarah A. Hill, Douglas Bland, and Capt(N) Al Okros, *Armed Forces and Society Questionnaire,* Cover letter for survey implemented at CFC Toronto, (Ottawa: DND Canada, 14 August 02), no page number.

a supervised environment but a decision was made to permit self-administration at the student's discretion. The students at the Canadian Forces College were ol172j0.00011 8c -0.0029 Tw 1291.9801235.0200

long survey (120 questions) as defined in this paper. It was administered in the spring of 1999 to Regular and Reserve members of the Canadian Forces. The sample sizes obtained were 1888 Regular members (out of 3573 potential respondents) and 360 Reservists (out of 784 potential respondents) for response rates of 52.8% and 45.9% respectively; not unusual for mail surveys.[172]

Ethics Survey

The aim of the Ethics Survey administered in the Spring of 1999 was to "…establish a baseline assessment of the ethical values DND members currently adhere to, or perceive as appropriate."[173] This long survey (129 questions) was one of three surveys included in the CF Personnel Survey 1999. Response rates were typical for a self-administered mail survey with 47.8% (1658 responses from 3470 surveys mailed) of military personnel and 37.6% (1205 responses from 3204 surveys mailed) of civilian DND employees responding.[174]

Harassment Questionnaire

The aims of the Harassment Questionnaire were to:

a. examine the knowledge of and compliance with the Standard for Harassment and Racism Prevention (SHARP);
b. examine the occurrence of harassment among DND civilian personnel; and
c. provide an indication of the effectiveness of the administrative procedures to resolve complaints.[175]

---

[171] V. Catano, A. Day, and Major J.E. Adams-Roy, *Change and Renewal in DND: Results of the 1999 D2000 Survey Sponsor Research Report 99-16,* Report prepared for Director Human Resources Research and Evaluation (Ottawa: DND Canada, 1999) 9.

[172] H. Pike and R.N. MacLennan, *Canadian Forces Diversity Climate Project: 1999 Survey: Contractor's Report (CR) 00-01,* Report prepared for Director Human Resources Research and Evaluation (Ottawa: DND Canada, March 2000), 5.

[173] Department of National Defence, *Results of the Baseline Survey on Ethical Values in the Department of National Defence,* CANFORGEN 133/00 CRS 0043, 2121447Z Nov 00.

[174] V. Catano, K. Kelloway, and Major J.E. Adams-Roy, *Measuring Ethical Values in the Department of National Defence: Results of the 1999 Research Sponsor Research Report 00-1,* Report prepared for Director Human Resources Research and Evaluation (Ottawa: DND Canada, July 2000), 4.

[175] Department of National Defence, *Harassment in DND's Civilian Workforce: Results of the 1999 Survey Sponsor Research Report 99-17,* Report prepared for Director Human Resources Research and Evaluation (Ottawa: DND Canada, 1999), 11.

This long survey (133 questions) was administered in the Spring of 1999 as one of three surveys included in the CF Personnel Survey 1999. The population of interest was civilian employees of the Department of National Defence. Response rates were typical for a self-administered mail survey with 37.6% (1205 responses from 3204 surveys sent) of civilian DND employees responding.[176]

Health and Lifestyle Information Survey 2000

The Health and Lifestyle Information Survey 2000 (HLIS 2000) was administered in December 2000 and January 2001 as the sixth of a series of studies examining health and lifestyle issues for members of the Canadian Forces. This was a very long questionnaire (483 questions!). It would take a typical respondent nearly three hours to complete.[177] The HLIS 2000 questionnaire explores many sensitive subjects including substance abuse and sexual behaviours. Although intended as a census of the entire military population, the response rates for this survey were only 48% (27615 of 57,474) for Regular CF members and 30% (6,643 of 21,886) for Reservists.[178]

CF Household Survey

The goal of the 1999 CF Household Survey was to gather information on the income, employment and cash flow of Canadian Forces members and their spouses. The information was needed to determine the justification for regional enhancements to compensation and benefits. The return rate on this short survey (34 questions) was very low (approximately 15.4%). The results may have been heavily influenced by the original delivery method through a Canadian

[176] *Ibid*, 12.

[177] The time estimate for this survey was 2 hours 52.5 minutes. A question response rate of 2.8 questions per minute was used. The rate used in this estimate was an average of the expected response rates from the instructions of three DND surveys (Armed Forces and Society, Self-identification Census and Terms or Service) and Paul and Bracken.

Forces magazine (35,500 questionnaires). This was followed by mailings (20,000 questionnaires) when it was discovered that the magazine was not uniformly distributed to CF members.[179]

Mental Health Survey

The Mental Health survey was conducted in May to December of 2002 as a part of the Rx2000 project to identify the extent and nature of mental health issues affecting Canadian Forces personnel. This 90 minute long face-to-face interview was done nation wide in parallel with a similar study conducted by Statistics Canada.[180] A 'worst case' review of the survey questionnaire used by interviewers resulted in an estimated length of 874 questions. The intended sample size was 5000 Regular Force members and 3000 Reserve Force personnel.

Data on the administration and response rate of the Rx2000 Mental Health Survey were not available to the author by the time of writing.

The Office of the Ombudsman Survey May 2000

The 'Office of the Ombudsman' survey was conducted in May 2000 with the aim of identifying the level of awareness and general opinions of CF personnel towards the Office of the Ombudsman.[181] The response rate (40.3%) for this short survey (41 questions) is fairly typical for a self-administered mail survey.

---

[178] Decima Research Inc., *CF Health and Lifestyle Information Survey 2000: Regular Force Report,* Report prepared for Canadian Forces (Ottawa: DND Canada, June 2002), Health and Lifestyle Survey of Canadian Forces Personnel Questionnaire page 27.

[179] Captain J.E.M. Ewins, *CF Household Survey: Reaction Research Report 00-1,* Report prepared for Director Human Resources Research and Evaluation (Ottawa: DND Canada, 2000), 3-4.

[180] Department of National Defence, *ADM (HR-MIL) Mental Health Survey,* CANFORGEN 078/01 ADMHRMIL 042, 091300Z Jul 01.

[181] Ekos Research Associates Inc., *Survey for the Office of the Ombudsman,* Survey developed for the Office of the Ombudsman, Department of National Defence (Ottawa: DND Canada, May 2000), 1.

Officer Challenges in Leadership Survey

The Officer Challenges in Leadership survey was carried out in the 1999-2000 timeframe as part of a larger project aimed at determining "…if leadership challenges were posed in post cold war multi-dimensional peace operations that required significant modification of the way in which the CF educates, trains and prepares officers for such duty…."[182]

This medium length (62 questions) survey was administered to officers with experience in peace operations in the 1990s. The intended sample size was 2200 personnel but the response rate was only 24.4% (537 returns). This high non-response rate was attributed to inconclusive records of officers with peace operation experience. The distribution of the instrument was delegated to units likely to have recent (i.e. the 1990s) foreign peace operations experience for onward distribution to personnel with the requisite experience.[183]

CF Personnel Survey 1999

The CF Personnel Survey 1999 was actually three different survey instruments collected together into an annual survey package. The long version of this package consisted of four sub-surveys: the biographical information sheet, the D2000 Change and Renewal Survey, the Ethics Survey and the Harassment Questionnaire. Each of these is considered to be a separate survey for the purposes of this analysis.[184]

Quality of Life Survey 2001

A number of major and recent initiatives have been undertaken by the Department of National Defence to improve the Quality of Life for Canadian Forces members. As a part of the

[182] Major J.E.Adams-Roy, R MacLennan, and L. Rossiter, *Meeting the Challenges of Peace Operations: The Experiences of Canadian Forces Officers: Sponsor Research Report 00-01,* Report prepared for Director Human Resources Research and Evaluation (Ottawa: DND Canada, August 2000), 6.

[183] *Ibid*, 8.

[184] Major J.E. Adams-Roy, *1999 Personnel Survey,* (National Defence Headquarters: file 5762-5-8 (DHRRE)), 31 March 1999.

Quality of Life Project mandate, the Project Management Office Quality of Life (PMO QOL) was obligated to measure the effectiveness of the measures that had been recently implemented. DHRRE developed the Quality of Life Survey to fulfill that commitment. This long (169 questions) survey was distributed in February of 2001 with a designed sample size of over 12000 potential respondents. The response rate was less 32.8% (3942 responses).[185]

DND/CF Self-Identification Census

The DND/CF Self-Identification Census was intended to meet the requirements of the Employment Equity Act by identifying the composition of its work force. Completion of a brief initial portion was considered mandatory for all CF members and DND employees. Two other sections on aboriginal, minority and disability status and disclosure were optional. The census was conducted in October of 2001. As a census, this questionnaire was to be completed by all CF members and DND employees. Figures on response rates were not available at the time of writing this paper.[186]

CF Submarine Service Survey

This short survey (only 16 questions) was sponsored by the Navy to determine "…attitudes of naval personnel towards two issues; that of women serving in submarines and the viability of having a volunteer only policy for submarine service."[187] Survey administration took place in February of 1999 with a response rate of 66.2 % (826 returns from 1248 survey questionnaires administered).[188]

---

[185] J.E. Jefferies, *Quality of Life in the Canadian Forces: Qualitative Analysis of the Quality of life Questionnaire for CF Members Sponsor Research Report 01-11,* Report prepared for Director Human Resources Research and Evaluation (Ottawa: DND Canada, August 2001), 1.

[186] Canada, Department of National Defence, *CF Self-ID Census – Warning Order,* CANFORGEN 086/01 ADMHRMIL 048, 021930Z Jul 01.

[187] Major J.E. Adams-Roy, *Service in Canadian Forces Submarines: Exploring the Attitudes of Naval Personnel towards Volunteer Service and Mixed Gender Crews: Sponsor Research Report 99-8,* Report prepared for Director Human Resources Research and Evaluation (Ottawa: DND Canada, 1999), 3.

[188] *Ibid*, 3.

CF Terms of Service Survey

The CF Terms of Service Survey was administered in February of 2000 with the aim of determining the opinions of CF members on Terms of Service (TOS) policy. Response rates for this medium length survey (67 questions) were not available at the time of writing this report.[189]

Fall 1999 Veterans Affairs Canada Survey

The Veterans Affairs Canada Survey of serving CF members receiving disability pensions was conducted in the Fall of 1999. The survey covered a wide range of topics but a clearly stated aim was not identified in the questionnaire. Information on the sample size and response rates was not available at the time of writing this report.[190]

Work Conditions Survey

The 1999 Work Conditions Survey was intended to quantify the extra hours worked by CF members on a weekly basis and to determine there was some form of compensation for extra hours worked. This short survey (11 questions) was administered in October of 1999 with a response rate of 52% (1876 responses from 3599 surveys mailed).[191]

[189] K.W.J. Wenek, *The Canadian Forces Terms of Service Survey,* Survey developed for the Director of Policy Analysis and Development, Department of National Defence (Ottawa: DND Canada, February 2000), no page number.

[190] Veterans Affairs Canada, *Fall 1999 Veterans Affairs Canada Survey,* Survey developed for the Department of Veterans Affairs (Ottawa: VAC Canada, 1999), unnumbered first page.

[191] Captain K. Myklebust, Rachel White, and Major Rob Morrow, *Research Investigating Hours Worked and Compensatory Time Off in the Canadian Forces: Results of the 1999 Working Conditions Survey: Sponsor Research Report 2000-15,* Report prepared for Director Human Resources Research and Evaluation (Ottawa: DND Canada, March 2002), 1.

TITLE	*TIMEFRAME*	*LENGTH (# of Qs)*	*CATEGORY*	*POPULATION*	*PROCEDURE*	*SAMPLE TYPE*	*SAMPLE SIZE - DESIGN*	*SAMPLE SIZE - ACHIEVED*	*T [192]*
ARMED FORCES AND SOCIETY	Aug '02	223	Long	CF members	Mail survey			[193]	80
D2000 CHANGE AND RENEWAL SURVEY	March 1999	112[194]	Long	DND Military and Civilian personnel	Mail survey		3470 CF members 3204 civilian employees	1658 CF members 1205 Civilian employees	40
DIVERSITY CLIMATE SURVEY	Spring 1999	120	Long	CF Reg & Res members	Mail survey	Random Stratified	3573 Reg/ 784 Res	1888 Reg 360 Res	43
ETHICS SURVEY	Spring 1999	129[195]	Long	DND Military and Civilian personnel	Mail survey		3470 CF members 3204 civilian employees	1658 CF members 1205 Civilian employees	46
HARASSMENT QUESTIONNAIRE	Spring 1999	133	Long	DND Civilian employees	Mail Survey	Random Stratified (by gender)	3204 civilian employees	1205	48
HEALTH AND LIFESTYLE INFORMATION SURVEY	2000-2001	483	Long	CF Reg & Primary Res members	Mail Survey	Census	57,474 Reg 21,886 Res	27,615 (48%) 6,643 (30%)	2h 52
HOUSEHOLD SURVEY[196]	1999	34	Short	CF Regular members	Combined Magazine & Mail Distribution	Census	55,500	8,538 (only 5,456 used)	12

[192] The '**T**' column is the estimated time to complete the survey based on a rate of 2.8 questions per minute.

[193] This survey is still underway. The total sample size achieved is not yet available.

[194] This figure (112) includes the 11 common biographical questions that accompanied the DND Personnel Survey package.

[195] Several 'questions' in this survey were actually two questions asking for opinions on 'how things are now' and 'how things should be'. Thus they have been counted as two questions in this analysis.

[196] The return rate on this survey was very low (approximately 15.4%). The results may have been heavily influenced by the delivery method through a Canadian Forces magazine (35,500 questionnaires). This was followed by mailings (20,000 questionnaires) when it was discovered that the magazine was not uniformly distributed to CF members.

TITLE	TIMEFRAME	LENGTH (# of Qs)	CATEGORY	POPULATION	PROCEDURE	SAMPLE TYPE	SAMPLE SIZE - DESIGN	SAMPLE SIZE - ACHIEVED	T [192]
MENTAL HEALTH SURVEY	May-Dec 2002	874. 90 minutes	Long	CF Reg & Res Members	Interview	Random	5,000 Reg 3,000 Res	Unknown	90
OFFICE OF THE OMBUDSMAN SURVEY	May 2000	41	Short	CF Members	Mail Survey	Unknown	2653	1070	15
OFFICER CHALLENGES IN LEADERSHIP SURVEY	1999-2000	62	Medium	CF members (Reg/Res not specified)	Mail survey	Stratified sample.[197]	2200	537	22
QUALITY OF LIFE SURVEY	February 2001	169	Long	CF Members	Mail Survey	Unknown	>12,000	3942	60
SELF-IDENTIFICATION CENSUS	October 2001	13 max.	Short	All CF personnel	Mail Survey	Census			5
SERVICE IN CF SUBMARINES SURVEY	February 1999	16	Short	Women in sea occupations. Submariners. Stratified male group in sea occupations.	Mail survey	Stratified Judgment	1248	826	6
CF TERMS OF SERVICE SURVEY	February 2000	67	Medium	Unknown	Mail Survey	Unknown	Unknown	Unknown	30-45
FALL 1999 VETERANS AFFAIRS CANADA SURVEY	Fall 1999	224[198]	Long	Unknown	Unknown	Unknown	Unknown	Unknown	80
WORK CONDITIONS SURVEY	October 1999	11	Short	CF members	Mail Survey	Unknown	3599	1876	4

Table 4: Summary of Recent DND Survey Characteristics

[197] Questionnaires were meant to go only to CF members who had served in foreign operations since 1990.

[198] A degree of judgment was used to enumerate the questions in this survey. Several questions were clearly multiple questions. Others appeared to be multiple questions but only required one decision from the respondent.

CHAPTER 7 –DND SURVEY REVIEW FINDINGS

Each of the case study surveys was evaluated using the protocol at Annex B. This review of DND/CF surveys conducted between 1 January 1999 and 31 December 2002 is summarized in the table at Annex D. This chapter details the most significant findings of the review of recent DND surveys.

The questionnaire and instructions for the Quality of Life Survey were not available at the time of writing. Comments can only be made on a few areas based on analytical reports and correspondence for this project. The findings of the review of case studies are described in the following paragraphs.

Post-survey analysis reports were not available for the Armed Forces and Society Survey the Rx 2000 Mental Health Survey, the CF Self-Identification Census, the Terms of Service Survey or the Veteran's Affairs Canada Survey.

SURVEY QUESTIONNAIRE DESIGN

Writing and Reviewing Questions

There were occasions when the word choice in some questions could have different meanings for different sub-groups of the sample. For example, the word 'deployment' has very different meanings in the Navy and the Army.[199] Respondents may also not clearly or consistently understand other words, such as 'clients', 'extremely glad', and 'ethno-cultural'.

Complicated sentence structures in the Terms of Service and Veteran's Affairs Canada surveys could prove difficult to understand.

[199] Decima Research Inc., *CF Health and Lifestyle Information Survey 2000…* Health and Lifestyle Survey of Canadian Forces Personnel Questionnaire page 2.

Six of the available survey questionnaires used long and potentially complicated questions or instructions: the Rx 2000 Mental Health Survey, the Office of the Ombudsman survey and the Terms of Service Survey in particular.

In typical DND survey practice, self-administered questionnaires consisted primarily of closed questions where respondents select their answer from a set of choices provided in the questionnaire. The response scales were well-balanced and provided neutral opinion, 'don't know', or 'no opinion' response options where appropriate.

Most surveys considered in this study varied the types of questions with the exception of the D2000 Change and Renewal Survey, the 1999 Diversity Climate Survey, and the Work Conditions Survey (a relatively short questionnaire).

Problems were identified in survey instruments that do not appear to have been vetted by DHRRE.

The sensitive nature of the questions, the extreme length of the survey and some confusing terms such as 'deployment' could have a significant influence on the validity of the results of the Health and Lifestyle Information Survey. The comment at the beginning of section 8 'Lifestyle Behaviours' section may bias respondents to socially acceptable answers. It states: "A number of behaviors and lifestyle choices can increase your risk of illness, family or emotional problems…"[200]

The potential for providing socially acceptable responses also exists with the Rx 2000 Mental Health survey; an interviewer administered survey. Canadian Forces members may tend to provide socially acceptable responses when asked questions in person about their health, mental state, post-traumatic stress and other delicate issues.

[200] *Ibid,* Health and Lifestyle Survey of Canadian Forces Personnel Questionnaire page 27.

Difficult questions that may involve research or arithmetic were a problem with only two of the surveys reviewed. The Health and Lifestyle Information Survey asked a detailed question on deployment history at the beginning of the document, which might require respondent research to complete accurately. The Household Survey posed questions at the very end of the questionnaire on income, credit and savings, which may have required research and arithmetic by the respondent.

The results of a few (six) of the survey questionnaires could suffer from 'response set' phenomena due to long lists of similar questions and responses. This may have been a problem for the D2000 Change and Renewal Survey, the 1999 Diversity Climate Survey, the Ethics Survey, the Health and Lifestyle Information Survey, the Officers Challenges in Leadership Survey and the 1999 Veteran's Affairs Canada Survey.

This review of DND surveys identified a concern with the amount and nature of information provided in the Office of the Ombudsman survey. This instrument seemed to be as concerned with teaching the CF population about the roles and abilities of the Ombudsman and the restrictions imposed on this office as it was concerned with measuring the opinion of CF personnel.

Questionnaire Construction

Questionnaires were almost universally well laid out with the alignment between questions and responses easily determined. The one exception was the Veteran's Affairs Canada survey, which suffered from a very complicated and busy lay out. With very few exceptions, pages and questions were laid out so as to maintain continuity in questions and groups of questions. Some pages were quite crowded in the Ethics Survey, the Harassment Questionnaire, the Health and Lifestyle Information Survey, and the CF Household Survey.

The instructions for survey questionnaires were clear and concise on the whole. The Harassment Questionnaire instructions were lengthy. However, these definitions and explanations were included to ensure that respondents understand the researcher's intent for questions.

Four of the reviewed questionnaires did not have clear instructions for the return of completed survey forms. The lack of an identified deadline for completing or returning the questionnaire was more important. This was observed in nine of the sixteen case studies. Instructions were not available for review in another four cases. The Household Survey report mentioned survey responses that were discounted or not considered because they were not received before the analysis process started or to meet project milestones.[201]

The Armed Forces and Society Survey was the only instrument reviewed which did not appear to group questions logically. In general, all survey questionnaires avoided placing difficult or challenging questions at the very beginning or the end of the document. Exceptions to this were the Armed Forces and Society survey and the Office of the Ombudsman survey.

In general, the survey questionnaires that were reviewed were long enough to adequately cover the subject being considered. The Health and Lifestyle Information survey included topic groups that appeared to overlap (i.e. 'Taking Action to Improve Health & Well Being', 'Health Seeking Behaviours', and 'Lifestyle Behaviours'). It was difficult to determine the adequacy of the length of the Veteran's Affairs Canada survey due to its complicated structure.

Of the sixteen surveys considered in this review, nine were considered to be long questionnaires with over 100 questions. Such long surveys would take a considerable amount of time to complete. By the author's estimate (and his own experience in completing this

[201] Only 5,546 responses were received before the deadline for data entry. Ewins, *CF Household Survey: Reaction Research Report 00-1,* 4.

questionnaire), the Health and Lifestyle Information Survey would take nearly three hours to complete. The fact sheet for the CF Mental Health Survey claimed that the interview would only take 90 minutes. That alone placed this survey in the 'long' category but the estimate of the number of questions is 874; which would require substantially longer than 90 minutes to complete and certainly exceeded the time for an interview-based survey recommended by Jackson.[202]

The length of the D2000 Change and Renewal Survey and the 1999 Diversity Climate Survey could also have contributed to 'response set' concerns in addition the long lists of questions with similar response patterns found in these surveys.

Most questionnaires provided at least some space for respondents to add additional or general comments. However, the Harassment Questionnaire, the Office of the Ombudsman survey, the Self-identification Census, the Veteran's Affairs Canada and the Work Conditions Survey did not provide for general comments.

Questionnaire Testing

Only four of the available post-survey reports clearly stated that survey instruments were subjected to testing prior to implementation. No comments on testing were made in the remainder of the reports.

CONDUCTING SURVEYS, SAMPLING AND ERROR

Conducting Surveys

The observation procedure most commonly used in recent DND surveys was the mail survey. Fifteen of the sixteen case studies examined were self-administered mail surveys. One notable exception was the RX 2000 Mental Health survey, which was a face-to-face interviewer-administered survey, lasting approximately 90 minutes.

[202] Jackson, *Research Methods: Rules for Survey Design and Analysis*, 83.

Despite having articulated a preference for supervised administration of questionnaires, none of the surveys considered in the review were supervised self-administered surveys.[203]

Four survey reports (the Health and Lifestyle Information Survey, the CF Household Survey, the Officer Challenges in Leadership Survey, and the Office of the Ombudsman survey) discussed problems with distributing questionnaires to members. Problems included inaccurate mailing lists, erroneous records, gaps or the lack of information in personnel databases with regards to relevant experience (i.e. peacekeeping duty) and the use of an internal DND publication to distribute the questionnaire. In at least one case, survey questionnaires for the Health and Lifestyle Information Survey were sent to retired and even deceased former members. These problems led to non-delivery of survey instruments to potential respondents or to non-response in the target stratified sample group. A second distribution of HLIS 2000 questionnaires was necessary.[204] The Household Survey resorted to a secondary mailing of questionnaires after the initial distribution through an internal publication failed to produce an acceptable response rate.

Sampling

The population for the case studies was Canadian Forces members, Department of National Defence civilian employees and various subsets of these groups (e.g. Regular and Reserve military personnel) as appropriate to the research. In some cases, the results of these surveys were to be compared against civilian Canadian populations to identify differences.

Quite often, DND used stratified random sampling to ensure that the opinions and concerns of and impacts on relevantly affected groups are obtained. Stratified sampling may

[203] Department of National Defence, A-P9-000-012/PT-000 *Manual of Individual Training…*, 4-5.
[204] DHRRE and DCOS FHP, *Detailed Survey Methodology* [Report on-line]; available from http://www.forces.gc.ca/health/information/Word/Engraph/HLIS_Methodology_e.doc; Internet; accessed 2 March 003.

also reveal differences between the subgroups. For example, survey respondents may be chosen randomly from within subgroups such as officers, senior non-commissioned members and junior non-commissioned members.

The Service in CF Submarines Survey was sent to a very specific target sample of CF personnel in 'hard sea' occupations.[205]

The CF Household, Officer Challenges in Leadership and Quality of Life survey reports identified low response rates that could affect the accuracy and confidence levels of the survey findings.

Error

Survey analyses routinely discussed margins or error but did not consistently clarify the impact of stratified random sampling or non-response on error.

A number of the surveys reviewed experienced response rates below the typical 40-50% rates expected for self-administered mail surveys. For example, two of the three analytical reports of the Quality of Life Survey specifically stated that the margin of error was increased to 7.5% (vice a target of 5%) due to low response rates in the 35-45% range.[206] Even census instruments failed to achieve results approaching 100% response.

The error margins for the HLIS 2000 survey and the Household survey would be less than standard statistical predictions because of the sampling ratios of these studies. Sampling ratio (f) is the portion of the entire population sampled. Error margins are reduced by a (1-f) factor.

---

[205] 'Hard sea' occupations are those trades and specialties, which are primarily employed in Canadian warships. Supporting trades, such as 'Supply Technician', are not considered to be 'hard sea' occupations. Major J.E. Adams-Roy, *Service in Canadian Forces Submarines: Exploring the Attitudes of Naval Personnel towards Volunteer Service and Mixed Gender Crews: Sponsor Research Report 99-8,* Report prepared for Director Human Resources Research and Evaluation (Ottawa: DND Canada, 1999), 3.

No evidence of the use of reminders to increase response rates was found.

ETHICAL CONCERNS

Instructions were generally very clear at reassuring respondents that their answers will be kept in strict confidence.

Most survey questionnaires did not specifically require expressed informed consent but this is not a problem unique to self-administered surveys in DND. The survey research industry often assumes informed consent if the questionnaire is completed and returned for analysis.

No examples of benefits such as small payments to respondents were found with recent DND surveys.

COMMON CONCERNS

This research effort identified 16 surveys that were conducted in the four-year period of consideration. There may have been other surveys administered in that period but they were either aimed at a very specific sub-group or locally administered or classified.

The original intention with the Armed Forces and Society survey was for supervised administration but this was changed to a self-administered mail survey with the first sample group. There was also some concern that surveys delivered to military personnel may have suffered from imposed response rates due to the unique aspects of military culture but response rates were typical or even lower than expected for self-administered mail surveys.

The review of survey subjects, topics and question groups did find a degree of overlap in subjects. In some cases, these overlaps were expected (e.g. demographic/biographical

[206] Craig Dowden, *Quality of Life in the Canadian Forces: Results from the National Survey Sponsor Research Report 01-13,* Report prepared for Director Human Resources Research and Evaluation (Ottawa: DND Canada, October 2001), 4/204.

information, income, etc) but in other cases the recurrence of themes could reflect coordination problems with the design and implementation of surveys in DND. Areas of concern include:

a. Ethics. There is considerable overlap between the questions of the 2002 Armed Forces and Society survey's on ethics and the Ethics Survey of 1999;
b. Health. Significant overlap was found in the Health and Lifestyle Information Survey, the Quality of Life Survey and the Veteran's Affairs Canada survey on the themes of health and health care;
c. Harassment. Both the 1999 Diversity Climate Survey and the Harassment Questionnaire of the 1999 Personnel Survey have a substantial number of questions on harassment in its various forms. These two surveys were administered in the Spring of 1999 but they had different target populations. The Diversity Climate survey was aimed at military personnel while the Harassment Survey was administered to civilian employees of DND;
d. Leadership. The Armed Forces and Society survey overlaps with another 1999 Personnel Survey questionnaire; the D2000 Change and Renewal Survey on questions about leadership. There are also questions on leadership in the Officers Challenges in Leadership survey but these are focused on the peacekeeping experience of officers;
e. Media. Again, the Armed Forces and Society survey overlaps with another 1999 Personnel Survey questionnaire; the D2000 Change and Renewal Survey. On this occasion the surveys intersect in investigating attitudes about the media;
f. Social Policies. Both the Armed Forces and Society survey and the 1999 Diversity Climate survey investigate attitudes towards social policies and issues as they affect Canadian Forces personnel;
g. Social Support. The Social Support questions of the Health and Lifestyle Information Survey are repeated verbatim in the Rx 2000 Mental Health survey with additional questions;
h. Stress. Two questionnaires contained in the 1999 Personnel Survey, the D2000 Change and Renewal Survey and the Harassment Survey, ask similar and overlapping questions about stress. The Rx 2000 Mental Health Survey also has two sections of questions on stress; one on stress in general and one on stress in the work place; and
i. Work climate/environment. Both the 1999 Diversity Climate Survey and the Harassment Questionnaire of the 1999 Personnel Survey have a substantial number of questions on the work environment/climate. These two surveys were administered in the Spring of 1999 but they had different target populations. The Diversity Climate survey was aimed at military personnel while the Harassment Survey was administered to civilian employees of DND.

CANFORGEN 145/02 "SURVEY COORDINATION IN DND/CF"

This is a particularly revealing document. A CANFORGEN is a general message intended for distribution to Canadian Forces members and civilian employees throughout the Department of National Defence (except where security precautions require otherwise). This particular document reminds anyone considering the use of surveys in DND that there is a central coordinating authority, the Director of Human Resources Research and Evaluation (DHRRE); a DND agency responsible to the Assistant Deputy Minister for Human Resources (Military) (ADM HR (Mil)). DHRRE is responsible for coordination and quality control of opinion surveys administered to Canadian Forces members and their families, DND civilian employees and applicants for the Canadian Forces. There are a few agencies that are exempt from DHRRE's quality control review but all surveys administered in DND and in the CF are subject to DHRRE coordination.[207]

CANFORGEN 145/02 acknowledged a variety of problems with the design and implementation of surveys in DND including:

1. increasingly bypassing DHRRE and the required quality control and coordination process
2. interference between unauthorized and approved surveys
3. surveys carried out without permission of the appropriate chain of command
4. problems in survey design including:
    a. excessive length
    b. inappropriate, inaccurate or ambiguous instructions
    c. ambiguous or inappropriate questions
    d. failure to meet ethical standards

CANFORGEN 145/02 admits that refusal rates are on the rise because of the excessive number of surveys that CF members, their families and DND employees are being asked to

[207] Department of National Defence, *Survey Coordination in DND/CF,* CANFORGEN 145/02 ADMHRMIL 079, 131028Z Dec 02.

complete. It also recognizes that this increase in unit refusal raises questions about the validity of statistical data and may have a longer-term impact on DND's ability to use surveys.

It is interesting to note that this is not the first such message to DND employees and CF members. A similar instruction was issued in 2001.[208]

[208] Department of National Defence, *Survey Coordination in DND/CF,* CANFORGEN 061/01 ADMHRMIL 031, 011300Z Jun 01.

CHAPTER 8 – CONCLUSIONS AND RECOMMENDATIONS

This paper reviewed survey design and application concepts. A number of recent DND surveys were examined using a review methodology that identified problems with the design and implementation of surveys within DND. A number of conclusions can be drawn from and recommendations made based on the findings of this review of recent DND surveys. This final chapter presents these conclusions and recommendations.

CONCLUSIONS

Survey Questionnaire Design

Most survey questionnaires seemed to be well designed. Surveys which went through the requisite review by DHRRE are relatively problem free. Problems were identified in survey instruments that do not appear to have been vetted by DHRRE.

There were some problems with potentially ambiguous word choice, complicated or difficult sentences and questions, and long lists of similar questions in some surveys.

In a minority of the surveys examined, the questionnaire or its instructions were overly complicated.

Responses to sensitive questions in the Rx 2000 Mental Health survey may have suffered from bias to socially acceptable responses because of the method of administering the survey (interviewer-administered).

The surveys did not consistently apply practical measures to improve responses such as instructions on how to return the questionnaire or when the questionnaire should be returned.

There were several long and very long surveys in the case study group.

Only four of the survey reports clearly identified that survey instruments were tested prior to implementation.

Conducting Surveys

The use of self-administered mail surveys was appropriate given the sensitive nature of some of the subjects of research and the military culture in which these surveys were administered. The cost of implementing supervised questionnaires on a statistically significant sample was considered (by the author) to be a determining cause of the use of self-administered surveys.

A number of surveys were affected by problems (i.e. accurate distribution list) with delivery of the questionnaire to potential respondents. By the nature of service in the military, military personnel relocate frequently. This mobility will continue to affect the ability of researchers to contact potential respondents of DND/CF surveys.

Sampling

Sample types and sizes were appropriate for most of the case study surveys. The HLIS 2000 census achieved only a 48% return rate from Regular CF members. Low response rates were a problem in three other case study surveys.

Error

Survey reports covered margin of error estimates well but do not consistently discuss non-response error.

Ethical Concerns

Reassurances of confidentiality were consistently provided in available survey instructions and questionnaires.

Informed consent was implied by the voluntary return of completed self-administered questionnaires.

The Office of the Ombudsman survey served a purpose other than one of obtaining information. Additionally, there were design concerns with this survey.

No evidence of conscious bias was found in the design of other case study surveys.

Common Concerns

There have been several surveys administered in recent years. There is a potential for the population of interest to lose interest because they have been asked to complete too many surveys.

The potential for imposed response rates is minimal.

Subject overlap did occur with these surveys. For example, the topics investigated in the Armed Forces and Society survey intersect with three other surveys (the D2000 Change and Renewal Survey, the 1999 Diversity Climate Survey and the 1999 Ethics Survey).

CANFORGEN 145/02 "Survey Coordination in DND/CF"

The findings of this review aligned closely with the statements of CANFORGEN 145/02. A variety of problems exist with the design and implementation of surveys in DND including:

a. increasingly bypassing DHRRE and the required quality control and coordination process;
b. interference between unauthorized and approved surveys;
c. surveys carried out without permission of the appropriate chain of command; and
d. problems in survey design including:
    i. excessive length,
    ii. inappropriate, inaccurate or ambiguous instructions,
    iii. ambiguous or inappropriate questions, and
    iv. failure to meet ethical standards.[209]

[209] Department of National Defence, *Survey Coordination in DND/CF,* CANFORGEN 145/02 ADMHRMIL 079, 131028Z Dec 02.

RECOMMENDATIONS

Survey Questionnaire Design

Survey analysis reports should mention if the survey was evaluated by DHRRE and if pre-survey testing of questionnaires. This provides some reassurance of the quality of the design process.

Conduct of Surveys

It is recommended that all authorized surveys include a requested return date. This may assist in receiving responses in a timely fashion.

A method of maintaining accurate distribution lists should be identified and implemented.

Sampling

In order to improve the distribution of approved surveys, tools such as the PeopleSoft software (used by ADM HR (Mil)) should be consulted prior to administering a survey.

Error

Survey analysis reports should also discuss error in all of its forms (sampling, measurement, non-response, and coverage).

Ethical Concerns

DHRRE should continue its work in coordinating and ensuring the quality of all surveys proposed for application to DND personnel.

Common Concerns

The instruction for the coordination and quality control of survey research through DHRRE should be vigorously reinforced.

A FINAL WORD

As with any large and complicated organization, the control and coordination of activities such as surveys in DND is problematical. There have been design and implementation problems in some of the surveys that have been implemented in DND in recent years. While almost certainly unintentional, these problems do have a negative impact on the credibility of surveys in DND. These issues are found primarily in surveys that do not appear to have been reviewed by DHRRE.

Surveys that have been coordinated by DHRRE and gone through the quality control process mandated by DND are generally well designed and implemented. It is recommended that all future survey work be subjected to the coordination and quality control processes mandated by the Department of National Defence.

BIBLIOGRAPHY

Adams-Roy, Major J.E. *1999 Personnel Survey*. National Defence Headquarters: file 5762-5-8 (DHRRE), 31 March 1999.

Adams-Roy, Major J.E. *Service in Canadian Forces Submarines: Exploring the Attitudes of Naval Personnel towards Volunteer Service and Mixed Gender Crews: Sponsor Research Report 99-8*. Report prepared for Director Human Resources Research and Evaluation. Ottawa: DND Canada, 1999.

Adams-Roy, Major J.E., R MacLennan, and L. Rossiter. *Meeting the Challenges of Peace Operations: The Experiences of Canadian Forces Officers: Sponsor Research Report 00-01*. Report prepared for Director Human Resources Research and Evaluation. Ottawa: DND Canada, August 2000.

American Association for Public Opinion Research. *AAPOR Code of Professional Ethics and Practices.* Ann Arbor: AAPOR, 1996. Quoted in Herbert F. Weisberg, Jon A. Krosnick and Bruce D. Bowen, *An Introduction to Survey Research, Polling and Data Analysis*, 3rd ed. (Thousand Oaks: SAGE Publications, 1996), 352-354.

Asher, Herbert. *Polling and the Public: What Every Citizen Should Know*. Washington: Congressional Quarterly Inc., 1998.

Borgatt, E.F. "Survey Research." *Encyclopedia of Sociology*. Second Edition. New York: Macmillan Reference, 2000: 3087-3094.

Bourque, Linda B. and Eve P. Fielder. *How to Conduct Self-Administered and Mail Surveys*. The Survey Kit Volume 3. Thousand Oaks: SAGE Publications, 1995.

Canada, Department of National Defence. *ADM (HR-MIL) Mental Health Survey.* CANFORGEN 078/01 ADMHRMIL 042, 091300Z Jul 01.

Canada, Department of National Defence. A-P9-000-012/PT-000 *Manual of Individual Training Volume 12: Design and Use of Questionnaires in Training*. Ottawa: DND Canada, 1991.

Canada, Department of National Defence. *CF Self-ID Census – Warning Order.* CANFORGEN 086/01 ADMHRMIL 048, 021930Z Jul 01.

Canada, Department of National Defence. *Harassment in DND's Civilian Workforce: Results of the 1999 Survey Sponsor Research Report 99-17*. Report prepared for Director Human Resources Research and Evaluation. Ottawa: DND Canada, 1999.

Canada, Department of National Defence. *Research Involving Human Subjects.* Defence Administrative Orders and Directives (DAOD) 5061-0. Ottawa: DND Canada, 20 August 1998.

Canada, Department of National Defence. *Research Involving Human Subjects – Approval Procedures*. Defence Administrative Orders and Directives (DAOD) 5061-1. Ottawa: DND Canada, 20 August 1998.

Canada, Department of National Defence. *Results of the Baseline Survey on Ethical Values in the Department of National Defence.* CANFORGEN 133/00 CRS 0043, 2121447Z Nov 00.

Canada, Department of National Defence. *Survey Coordination in DND/CF*. CANFORGEN 061/01 ADMHRMIL 031, 011300Z Jun 01.

Canada, Department of National Defence. *Survey Coordination in DND/CF*. CANFORGEN 145/02 ADMHRMIL 079, 131028Z Dec 02.

Canadian Survey Research Council. *CSRC-CCRS Declaration of Principles*. Web-site on-line; available from http://www.csrc.ca/CSRC/whoweare/principles.php; Internet; accessed 6 May 2003.

Catano, V., A. Day, and Major J.E. Adams-Roy. *Change and Renewal in DND: Results of the 1999 D2000 Survey Sponsor Research Report 99-16*. Report prepared for Director Human Resources Research and Evaluation. Ottawa: DND Canada, 1999.

Catano, V., K. Kelloway, and Major J.E. Adams-Roy. *Measuring Ethical Values in the Department of National Defence: Results of the 1999 Research Sponsor Research Report 00-1*. Report prepared for Director Human Resources Research and Evaluation. Ottawa: DND Canada, July 2000.

Colombo, Richard. "A Model for Diagnosing and Reducing Nonresponse Bias." *Journal of Advertising Research* Vol. 40 Iss. 1/2 (Jan/Apr 2000): 85-93.

Council of American Survey Research Organizations. *CASRO Code of Standards and Ethics for Survey Research.* Web-site on-line; available from http://www.casro.org/codeofstandards.cfm; Internet; accessed 6 May 2003.

Couper, Mick P. "Web Surveys: A review of issues and approaches." *Public Opinion Quarterly* Vol. 64 Iss. 4 (Winter 2000): 464-494.

Decima Research Inc. *CF Health and Lifestyle Information Survey 2000: Regular Force Report.* Report prepared for Canadian Forces. Ottawa: DND Canada, June 2002.

Deming, W. Edwards. *Sample Design in Business Research.* New York: John Wiley and Sons, 1960.

DHRRE and DCOS FHP. *Detailed Survey Methodology.* Report on-line; available from http://www.forces.gc.ca/health/information/Word/Engraph/HLIS_Methodology_e.doc; Internet; accessed 2 March 2003.

Dillman, Don A., Michael D. Sinclair, and Jon R. Clark. "Effects of Questionnaire Length, Respondent-Friendly Design, and a Difficult Question on Response Rates for Occupant-Addressed Census Mail Surveys." *Public Opinion Quarterly* Vol. 57 Iss. 3 (Fall 1993): 289-304.

Dowden, Craig. *Quality of Life in the Canadian Forces: Results from the National Survey Sponsor Research Report 01-13*. Report prepared for Director Human Resources Research and Evaluation. Ottawa: DND Canada, October 2001.

Ekos Research Associates Inc. *Survey for the Office of the Ombudsman*. Survey developed for the Office of the Ombudsman, Department of National Defence. Ottawa: DND Canada, May 2000.

Ewins, Captain J.E.M. *CF Household Survey: Reaction Research Report 00-1*. Report prepared for Director Human Resources Research and Evaluation. Ottawa: DND Canada, 2000.

Fowler, Floyd J., Jr. *Improving Survey Questions.* Thousand Oaks: Sage Publications, 1995.

Fowler, Floyd J., Jr. *Survey Research Methods*, Applied Social Research Methods Series Volume 1. Newbury Park: Sage Publications, 1988.

Hill, Sarah A., Douglas Bland, and Capt(N) Al Okros. *Armed Forces and Society Questionnaire.* Survey implemented at CFC Toronto. Ottawa: DND Canada, 14 August 02.

Jackson, Winston. *ns24004Tw 12 0 0 14.8Rul05 72. 72.000Design5.361A802ysisnd Society Ques-31 Tm(s. Tj/TT0*

Natural Sciences and Engineering Research Council of Canada. *Tri-Council Policy Statement: Ethical Conduct for Research Involving Humans.* Web-site on-line; available from http://www.nserc.ca/programs/ethics/english/policy.htm; Internet; accessed 6 May 2003.

Parten, Mildred B. *Surveys, Polls and Samples.* New York: Cooper Square Publishers, 1966.

Paul, Karen B. and David W. Bracken. "Everything you always wanted to know about employee surveys." *Training & Development* Vol. 49 Issue 1 (Jan 95): 45-49.

Peterson, Robert A. *Constructing Effective Questionnaires.* Thousand Oaks: Sage Publications, 2000.

Pike, H. and R.N. MacLennan. *Canadian Forces Diversity Climate Project: 1999 Survey: Contractor's Report (CR) 00-01*. Report prepared for Director Human Resources Research and Evaluation. Ottawa: DND Canada, March 2000.

Professional Marketing Research Society. *PMRS Code of Conduct.* Web-site on-line; available from http://www.pmrs-aprm.com/What/Code.pdf; Internet; accessed 6 May 2003.

"Public-Opinion Polling." *Encyclopædia Britannica*.
Encyclopedia on-line: available from
http://search.eb.com/eb/article?eu=117356;
Internet; accessed August 25 2002.

Ratneshwar, Srinivasan and David W. Stewart. "Nonresponse in Mail Surveys: An Integrative Review." *Applied Marketing Research* 29, no. 3 (Summer 1989): 37-46.

Schonlau, Matthias, Ronald D. Fricker Jr., and Marc N. Elliott. *Conducting Research Surveys via E-mail and the Web*. Santa Monica: RAND, 2002.

Tourangeau, Roger, Lance J. Rips, and Kenneth Rasinski. *The Psychology of Survey Response.* Cambridge: Cambridge University Press, 2000.

Veterans Affairs Canada. *Fall 1999 Veterans Affairs Canada Survey*. Survey developed for the, Department of Veterans Affairs. Ottawa: VAC Canada, 1999.

Wanke, Michaela, Norbert Schwarz and Elisabeth Noelle-Neumann. "Asking Comparative Questions: the Impact of the Direction of Comparison." *Public Opinion Quarterly* Vol. 59 Iss. 3 (Fall 1995): 347-372.

Weisberg, Herbert F., Jon A. Krosnick and Bruce D. Bowen. *An Introduction to Survey Research, Polling and Data Analysis.* 3rd ed. Thousand Oaks: SAGE Publications, 1996.

Wenek, K.W.J. *The Canadian Forces Terms of Service Survey*. Survey developed for the Director of Policy Analysis and Development, Department of National Defence. Ottawa: DND Canada, February 2000.

ANNEX A

ABBREVIATIONS

ABBREVIATION	*DEFINITION*
ADM HR (Mil)	Assistant Deputy Minister Human Resources (Military)
CANFORGEN	Canadian Forces General Message sent throughout the DND
Capt(N)	Captain (Navy)
CF	Canadian Forces
Civ	Civilian
Col	Colonel
DHRRE	Director of Human Resources Research and Evaluation
DND	Department of National Defence
DQOL	Director Quality of Life
HLIS	Health and Lifestyle Information Survey
LCol	Lieutenant Colonel
Maj	Major
N/A	Not Applicable
Q	Question
Reg	Regular Force Canadian Forces Member
Res	Reserve Force Canadian Forces Member
Rx 2000	CF Medical Services Review Project
VAC	Veteran's Affairs Canada
UNK	Unknown

ANNEX B

SURVEY REVIEW PROTOCOL

1. Survey Title

2. Design the questionnaire

    a. Write the questions

        1. Are questions as brief as possible? (<20 words, no more than 3 commas) Is the sentence structure complicated?
        2. Question design. Are loaded or sensitive words used? Is clear language used?
        3. Are there important words used in a question that may have a range of meanings to respondents?
        4. Are potential responses balanced? If numbered, do they use a positive number scale?
        5. Do questions provide a neutral, 'don't know' or 'no opinion' option where appropriate?

    b. Review questions for errors

        1. Are there questions that might be difficult for respondents (i.e. requiring mathematics or research)?
        2. Is there a potential for 'response set' phenomena to arise (i.e. long lists of similar responses or layouts)?

    c. Construct the questionnaire

        1. Is the questionnaire layout functional (attractive)?
        2. Does the questionnaire layout permit easy alignment of responses with relevant question?
        3. Are questions and pages numbered?
        4. Does it crowd too many items onto a page?
        5. Are questions split onto two pages?
        6. Does it include clear, concise instructions?
        7. Do the instructions include definitions or explanations that might increase respondent understanding of a question's intent?
        8. Do the questionnaire instructions specify what to do with the completed questionnaire?
        9. Does the form, its instructions or cover letter include a completion deadline?
        10. Are questions grouped logically?
        11. Does it begin with some easy questions?

12. Are sensitive, difficult or important items located at the beginning or the very end of a long questionnaire?
13. Is the questionnaire as short as possible?
14. Length
15. Does it leave sufficient space for open-ended questions?
16. Does the questionnaire provide space for comments from respondents?
17. Does the questionnaire provide some variety in the types of questions?

d. Test the questionnaire

1. Were DND survey questionnaires subjected to testing?

3. Conducting the Survey

1. Interview or self-administered survey? Telephone, mail or web based survey?
2. Did non-delivery of surveys or the mobility of CF members affect response rates?

4. Sampling

1. Are there any concerns about the sampling method used?
2. Is the sample size large enough to produce statistically significant results?

5. Error.

1. Does the survey report discuss non-response as well as accuracy and confidence levels?
2. Were reminders used to improve the response rate?

Ethical Concerns

1. Does the cover letter/instruction set reassure potential respondents of the confidentiality of their responses and express thanks for the respondent's participation?
2. Are DND regulations and guidelines mentioned and/or discussed?

ANNEX C

DND SURVEY TOPICS

	SURVEY TITLE				
SUBJECT/KEYWORD	**ARMED FORCES AND SOCIETY**	**D2000 CHANGE AND RENEWAL SURVEY**	**1999 DIVERSITY CLIMATE SURVEY**	**ETHICS SURVEY**	**HARASSMENT QUESTIONNAIRE**
	Biographical info	Biographical	Attitudes	Coworkers ethics	Abuse of authority
	Canadian security	Change	Biographical	Organizational ethics	Attitudes towards harassment
	Domestic issues	Communication	Employment environment	Own ethics	Consequences
	Ethics	Downsizing	Harassment	Scenarios	Discrimination
	Family	Innovation	Racism	Supervisors ethics	Personal harassment
	Foreign policy	Leadership	Social Policies	Unit ethics	Responses to harassment
	Gender roles	Learning	Work climate		Satisfaction
	Leadership	Management	Work Satisfaction		Sexual harassment
	Media	Media			Stress
	Military perceptions	Morale			Work environment
	Military roles	Planning			
	Social issues	Renewal			
		Resources			
		Stress			
		Satisfaction			
		Teamwork			
		Well-being			

	SURVEY TITLE				
SUBJECT/KEYWORD	**HEALTH AND LIFESTYLE INFORMATION SURVEY**	**HOUSEHOLD SURVEY**	**MENTAL HEALTH SURVEY**	**OFFICER CHALLENGES IN LEADERSHIP SURVEY**	**OFFICE OF THE OMBUDSMAN SURVEY**
	Biographical	Accommodation	2 Week Disability	Biographical	Rights and freedoms
	Gender health issues	Biographical	Alcohol Dependence	Ethics	Office of the ombudsman awareness
	Health	Income	Alcohol Use	In-theatre considerations	
	Health and well being	Spending	Canadian Forces Labour Force	Leadership	
	Health behaviour	Spouse	Childhood And Adult Stressors	Pre-deployment training	
	Lifestyle		Deployment	Skills and abilities	
	Nutrition		Depression		
	Occupational health and safety		Distress		
	Social support		Dysthymia		
			Eating Troubles		
			General Health		
			Generalized Anxiety Disorder		
			Household Contact And Demographics		
			Income		
			Medication Use		
			Panic Disorder		

	SURVEY TITLE				
SUBJECT/KEYWORD	**HEALTH AND LIFESTYLE INFORMATION SURVEY**	**HOUSEHOLD SURVEY**	**MENTAL HEALTH SURVEY**	**OFFICER CHALLENGES IN LEADERSHIP SURVEY**	**OFFICE OF THE OMBUDSMAN SURVEY**
			Post-Traumatic Stress Disorder.		
			Restriction Of Activities		
			Screening Section		
			Services		
			Social Phobia		
			Social Support		
			Socio-Demographic Characteristics		
			Spirituality		
			Stress		
			Work Stress		

	SURVEY TITLE				
SUBJECT/KEYWORD	**QUALITY OF LIFE SURVEY**	**SELF-IDENTIFICATION CENSUS**	**SERVICE IN CF SUBMARINES SURVEY**	**CF TERMS OF SERVICE SURVEY**	**FALL 1999 VETERANS AFFAIRS CANADA SURVEY**
	Biographical info	Biographical info	Biographical	Biographical info	Biographical info
	Career	Disability	Service in submarines	Compulsory retirement age	Career
	CF/Civ comparison	Gender		Conversion of terms of service	Employment status
	Compensation and benefits	Race		Relationships and obligations	Finances
	Family violence			Short-term engagement issues	Health
	Friends and friendship			Terminal benefits	Mobility & transitions
	Health			Terms of service periods	Release and retirement
	Health care			Terms of service policies	Service
	Health care Satisfaction				
	Honours and awards				
	Income and standard of living				
	Initiatives				
	Integrated relocation program				
	Job				

	SURVEY TITLE				
SUBJECT/KEYWORD	**QUALITY OF LIFE SURVEY**	**SELF-IDENTIFICATION CENSUS**	**SERVICE IN CF SUBMARINES SURVEY**	**CF TERMS OF SERVICE SURVEY**	**FALL 1999 VETERANS AFFAIRS CANADA SURVEY**
	Leisure time				
	Moves				
	Neighbourhood				
	Official languages				
	Operational clothing				
	Operational trauma and stress support center				
	Post traumatic stress disorder				
	Postings				
	Quality of life initiatives				
	Relationship - Marriage/partner				
	Relationship with child care				
	Residence				
	Satisfaction with children				
	Self				
	Treatment of injured and retired personnel				

	SURVEY TITLE				
SUBJECT/KEYWORD	**WORK CONDITIONS SURVEY**				
	Compensatory time off				
	Hours of work				