

DESIGNING A QUESTIONNAIRE ON THE CONFIDENTIALITY PERCEPTIONS OF BUSINESS RESPONDENTS¹

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ABSTRACT

Very little is known about the perceptions of business data providers regarding the confidentiality pledges of statistical agencies. This paper describes the steps we took to operationalize the complex, multi-dimensional concept of confidentiality to develop a brief, self-administered questionnaire, keeping in mind practical differences between businesses and households relative to survey requests. The paper will demonstrate how collaboration in the questionnaire development process can result in improved quality.

KEY WORDS: Questionnaire Design; Establishment Surveys; Data Quality

1. INTRODUCTION

Survey questionnaires do not spontaneously drop from the sky, ready to send out to respondents, who await their arrival with breathless anticipation and sharpened pencils. Questionnaires are intended to collect high quality data. Good questionnaires combine wording, order, format and layout in such a way that they ease the answering process for the respondent, reduce variation due to respondents' cognitive processes and minimize respondent error. That is, a good questionnaire is respondent friendly and results in minimal measurement and nonresponse error.

Better questionnaires result from a collaborative effort between those with knowledge of survey design and subject area experts or survey sponsors. This paper demonstrates the collaborative nature of the questionnaire development process, which is often taken for granted.

This paper describes the questionnaire development process for a survey on the confidentiality perceptions of business respondents. The Survey of Businesses' Perceptions of Confidentiality was designed to provide some of the first empirical evidence describing the attitudes of business respondents on a variety of topics, including the sensitivity of business data, respondents' understanding of statistical agencies' confidentiality pledges and trust in the government's ability to uphold them, their knowledge of legal penalties for breaching data confidentiality, and their concerns about and support for data sharing for statistical purposes (Greenia, Jensen & Lane., 2001a). Other papers present detailed summaries and analyses (Greenia, et al, 2001a, 2001b, Greenia and Willimack, 2001).

2. MODEL OF COLLABORATIVE QUESTIONNAIRE DEVELOPMENT PROCESS IN ESTABLISHMENT SURVEYS

Figure 1 presents our proposed model of the collaborative questionnaire development process in establishment surveys.

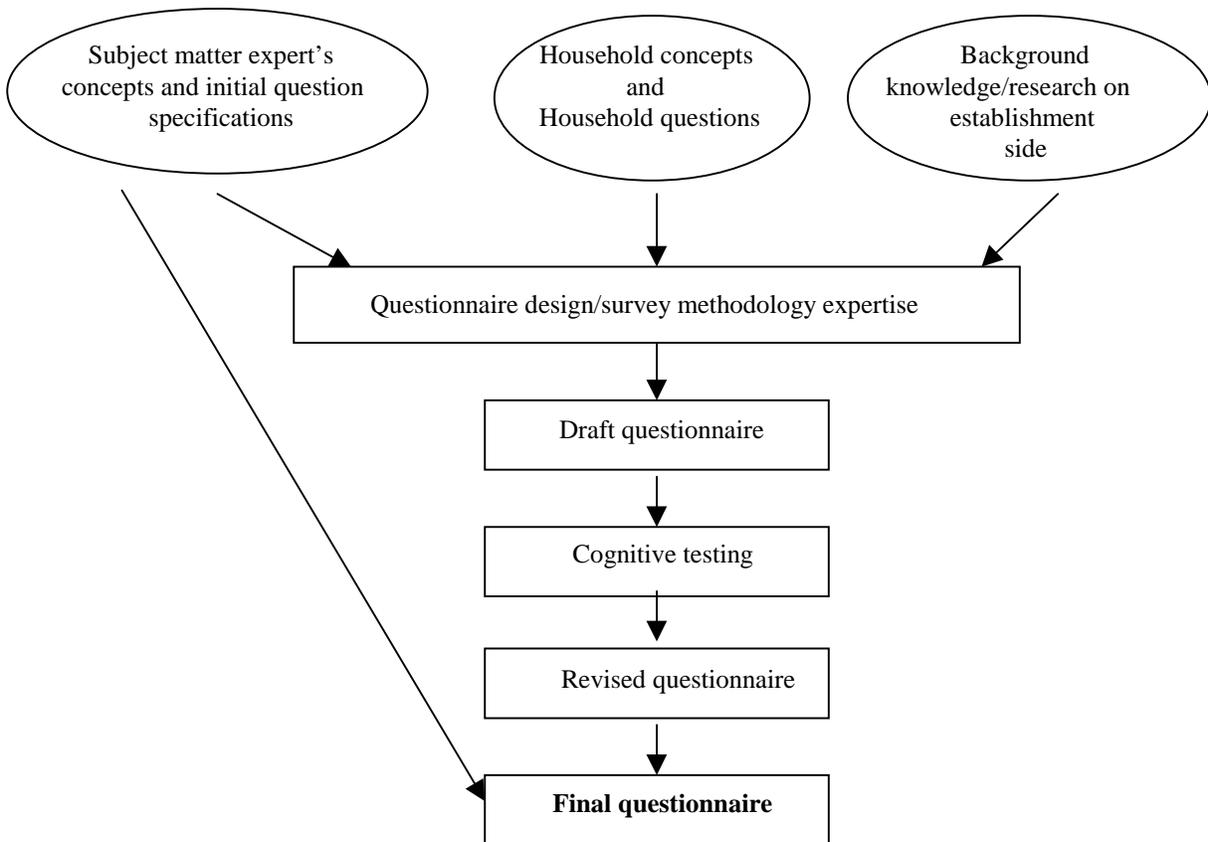
As survey methodologists specializing in questionnaire development, we began by reviewing the concepts and initial question specifications provided by the subject matter experts. Since documentation and literature is sparse on best practices for establishment survey design, we considered what has been learned on the household side (concepts, and actual questions asked) and evaluated its relevance to the establishment setting. In addition,

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we incorporated the background knowledge and survey experience from the business side. All three of these were pulled together, incorporating questionnaire design and survey methodology expertise, to create a draft questionnaire. At that point, we conducted cognitive interviews using the draft questionnaire to obtain respondent feedback. Based on the findings, we prepared a revised questionnaire. Finally, we revisited the basic concepts and goals to create a final questionnaire. Throughout this process, we worked closely with the clients, to incorporate their knowledge, experience and wisdom, as well as to keep them informed of our direction. The result was, we believe, an effective collaboration between subject area experts and survey methodologists that ensured the development of a quality data collection instrument and met the conceptual and measurement needs of the data users.

Figure 1: Proposed Model of Collaborative Questionnaire Development Process



3. APPLICATION OF THE MODEL TO SURVEY OF BUSINESSES' PERCEPTIONS OF CONFIDENTIALITY

During our participation in the questionnaire development process for the Survey of Businesses' Perceptions of Confidentiality, we followed the model described briefly in the previous section. In this section, we describe the steps in more detail, using examples from the survey.

3.1 Subject Matter Expertise

Our clients for this survey included economists from American University, the Internal Revenue Service/Statistics of Income Division and the Census Bureau Center for Economic Studies. The goal of the project was to begin to fill the dearth of knowledge on perceptions of business respondents on the topic of confidentiality.

These subject area experts brought to the table a very multi-dimensional concept of confidentiality that was

difficult to define succinctly. According to the President's Commission on Federal Statistics (1971), it is difficult for most people to "... distinguish between the concepts of confidentiality and privacy. Not only is there confusion about the meaning of each word, there is also a tendency to use the two words interchangeably."

Gates and Bolton (1998) point out that "confidentiality is the legal status that indicates that some body of data or information is sensitive and must be protected against loss, misuse, destruction or unintended change." Greenia, Jensen & Lane (2001a) add that "the protection of confidentiality . . . is defined as the restriction of access to information about the individual party/entity once it has been provided – for statistical or administrative purposes – to a second party charged with the collection responsibility."

Our clients focused on the following dimensions of confidentiality:

- Data cannot be released in a way that permits identification of the respondent
- Data provided to statistical agencies are immune from legal process
- Data provided to statistical agencies are restricted from being shared with the public, competitors, or other government agencies

In addition, our clients were interested in measuring business respondent's knowledge of penalties, how changes to penalties/enforcement would affect response, and respondents' attitudes towards data sharing.

3.2 Contributions from Household Surveys

There is a great deal of research on the privacy and confidentiality attitudes of individuals and households. Mayer (2000) prepared a draft annotated bibliography which lists 150 citations. We reviewed this annotated bibliography with much interest and delved further into those documents which seemed helpful or relevant to our project. We checked the survey research literature to learn not only about the results of previous studies on the topic, but also the questions previously asked.

In particular, we studied several publications which described two related surveys done in the mid-1990: one conducted by the Joint Program in Survey Methodology (JPSM), the other by Westat. They questioned the public on: understanding of the Census Bureau's pledge of confidentiality, confidence in that pledge, data sharing among Federal agencies, attitudes toward government, and privacy in general (Gates, 1996; Singer, Presser & VanHoewyk, undated; Singer and Presser, 1996, Kerwin & Edwards, 1996).

We reviewed these summaries, which included copies of the questionnaire items. These provided a rich resource for questions on the topics we were interested in, along with some evaluation of the questions themselves. Survey designers want to look for questions that have worked for someone else. In examples presented in Section 4, we describe how we used question ideas, structure, order and formatting from this previous work, while adapting telephone survey questions to our self-administered format.

3.3 Background from Establishment Surveys

In order to understand the background relevant for establishment surveys, we drew heavily from two Census Bureau sources: 1) qualitative research described in Nichols and Willimack (2001); and 2) a draft questionnaire for data providers on disclosure and data sharing prepared by Zayatz and Sigman (1994).

Nichols and Willimack (2001) identified three dimensions of business data sensitivity – the type of data, the level of detail/aggregation (e.g., establishment versus company) and the time period, or duration, during which the data retain strategic value. We attempted to develop questions that would address these dimensions as well as provide answers for testing hypotheses they suggested.

Zayatz and Sigman (1994) drafted a questionnaire to obtain business data-provider views about confidentiality.

Questions covered topics such as level of sensitivity by data type, "too close for comfort percentage" for data user estimation, number of years to maintain firm and data confidentiality, number of years after issue date for microdata file release, data sharing by agency, and list sharing by agency.

4. SURVEY METHODOLOGY EXPERTISE: PULLING IT ALL TOGETHER

The goal of our project was to create a brief, self-administered paper questionnaire to be collected by mail using the Total Design Method (Dillman, 1978). A stratified random sample of 5,000 businesses was obtained from Dun & Bradstreet. The target respondent was an executive decision-maker who would likely be the one authorizing survey response.

In collaboration with the subject area experts, we:

- parsed out the dimensions of confidentiality
- developed context from past establishment work
- wrote questions
- negotiated wording and order.

The following sections provide examples of how we synthesized material from three primary sources – 1) subject matter experts, 2) household surveys / literature, 3) establishment surveys – and illustrate the collaborative process.

4.1 The Overall Questionnaire Strategy

We were guided by the basic question strategy and topic ordering found in the previous household surveys on confidentiality conducted by the Joint Program in Survey Methodology (JPSM) and Westat (Gates, 1996; Singer, Presser & VanHoewyk, undated; Singer and Presser, 1996; Kerwin & Edwards, 1996). They set a context for questions on confidentiality by priming respondents to think about basic data that would be collected on the decennial census. They then proceeded to ask respondents about how they believed these data were used/protected and built to a climax ending with questions about data sharing. While we did not collect specific data, we began by asking respondents to evaluate the sensitivity of typical business data items. We then followed a strategy similar to that used for the household surveys.

The result was a questionnaire with the following outline:

1. the sensitivity of different types and levels of business data and the duration of their sensitivity;
2. the level of concern about providing business data to various government and non-government entities;
3. attitudes about government competence in collecting and protecting data;
4. beliefs regarding the confidentiality pledges of Federal statistical agencies;
5. knowledge of legal penalties associated with unauthorized disclosure of business data by Federal statistical agencies or their employees;
6. opinions about the enforcement of confidentiality laws relative to respondents' willingness to respond;
7. willingness to allow data sharing among Federal statistical agencies, and, if willing, the identification of agencies allowed to share data, selecting from among the Census Bureau, the Bureau of Labor Statistics (BLS), the Bureau of Economic Analysis (BEA), the Statistics of Income Division of IRS (SOI/IRS), or any others.
- 8.

For a copy of the entire questionnaire, see Greenia, Jensen & Lane (2001a). The following examples illustrate the collaborative process.

4.2 Example 1: Data Sensitivity

In the original specifications from the client, the first topic proposed was:

Different types of administrative data are used by the Federal government in providing statistical information. These data are used to reduce costs, reduce respondent burden and add value to surveys. Please indicate the degree to which your company would be damaged if the following information were disclosed.

	Very damaging	Somewhat damaging	No effect
Company sales data	1	2	3
Company profit data	1	2	3
Company tax data	1	2	3
Number of businesses your Company operates	1	2	3
Type of business your company Operates	1	2	3
Number of employees	1	2	3
Number of managers	1	2	3
Name, address and phone number Of company	1	2	3
Name, address and phone number Of employees	1	2	3

While it seemed appropriate to begin a questionnaire on confidentiality perceptions of businesses by setting the context for the respondent in terms of determining the relative importance of different types of data, this particular introduction seemed to be loaded with multiple concepts and potentially biasing language, such as

“damaged,” “disclosed” and “unauthorized disclosure”. Respondents’ varying interpretations of these terms were likely to affect their answers to the questions, making it difficult to analyze and interpret survey results.

It seemed of great importance to our client that the questionnaire build to the topic of “unauthorized disclosure.” This seemed, however, a very complex notion to introduce so early in the questionnaire. We therefore identified the underlying concept to be data “sensitivity” – what data are sensitive. We felt we needed to get at sensitivity first, before getting into “disclosure” and “damage.” So we began to clarify these issues and parse out the distinct parts of the question, which ultimately became multiple questions.

In addition, every good questionnaire design textbook says to begin with questions that engage the respondent and are easy to answer (see for example, Sudman and Bradburn (1989) and Fowler (1995)). Thus, we decided to begin by focusing on the topic of sensitivity and asking respondents to identify data items they considered to be sensitive. Initially, we were concerned that the word “sensitive” might in itself be “sensitive” or have multiple meanings. We were, however, reassured by colleagues with experience in the confidentiality area that respondents do seem to understand the concept and are able to interpret it relatively consistently. In addition, sensitivity has a relative dimension to it, and depends on the purpose of the data. This too had to be integrated into the question.

To get at types of data that are sensitive, we adapted a question from the Zayatz and Sigman (1994) draft questionnaire on business data-provider views about confidentiality. Because our client was interested in finding out if business respondents were aware of the confidentiality provisions of Federal statistical agencies, we decided not to begin with that much detail. We did, however, use the basic format of the rest of the question.

Title 13 of the US Code prohibits the Census Bureau from making “any publication whereby the data furnished by any particular establishment or individual ... can be identified.” That is, the Census Bureau cannot disclose any individual information that is reported by respondents. Individual respondent’s information is combined and released in statistical tables. Although we do not publish exact values reported, data users can estimate values for particular variables. Some respondents consider certain variables they report to be less sensitive than others. For example, less sensitive variables may be variables that are considered public knowledge, or variables that are non-production related.

For each of the following variables, please indicate the sensitivity level of your firm’s data. (On each line circle only one rating from 1 being not sensitive to 5 being very sensitive. If your firm does not report a particular variable, please circle NA.)

	Not Sensitive			Very Sensitive		
Monthly reports						
- value of shipments, sales, receipts	1	2	3	4	5	NA
- quantity of shipments	1	2	3	4	5	NA
- monthly inventories	1	2	3	4	5	NA
- new orders	1	2	3	4	5	NA

[List continued with detailed data items for Quarterly, Annual and Quinquennial Reports.]

The list of categories in the original specification seemed reasonable, given our previous qualitative experience. We chose to label all the numerical response sets. Research on attitudinal surveys has shown that labeling the points in a response scale anchors them, reducing variation in respondent interpretation (Krosnick and Berent, 1993).

Our draft version of this question did not change much after we conducted cognitive interviews. We only made slight wording changes in the initial sentence and some minor revisions to the category list. Our final question was:

Some types of business data may be considered more sensitive than other types of data. The sensitivity of data may be related to its strategic, legal or security importance to the business or to whether it is released to those without authority to have it.

For your company, please indicate the sensitivity for each of the following types of data. *Circle one response for each line. DK = Don't Know. NA = Not Applicable.*

	Not at all <u>Sensitive</u>	Somewhat <u>Sensitive</u>	Very <u>Sensitive</u>	Extremely <u>Sensitive</u>	
a. Name, address and phone number of your company	1	2	3	4	DK/NA
b. Type of industry/business operated by your company	1	2	3	4	DK/NA
c. Name, home address and phone number of employees	1	2	3	4	DK/NA
d. Number of establishments (locations/stores/plants) operated by your company	1	2	3	4	DK/NA
e. Number of managers and executives	1	2	3	4	DK/NA
f. Number of non-managerial employees	1	2	3	4	DK/NA
g. Your company's total payroll	1	2	3	4	DK/NA
h. Your company's total sales	1	2	3	4	DK/NA
i. Your company's total operating costs	1	2	3	4	DK/NA
j. Your company's total profits	1	2	3	4	DK/NA
k. Your company's total tax liability	1	2	3	4	DK/NA

4.3 Example 2: Duration of Sensitivity

As mentioned previously, we had identified three aspects of sensitivity – type, level and duration – from qualitative work with large companies (Nichols, Willimack & Sudman, 1999). The original survey specifications from our clients queried the duration of sensitivity in terms of “the passage of time” in the following question:

Please let us know your reactions to the following statements. Disclosure of sensitive corporate data would be justified by:

	Strongly Agree	Agree	Disagree	Strongly Disagree	Don't Know
The passage of time	1	2	3	4	5
The public good, e.g. National security	1	2	3	4	5
Termination of the Corporation	1	2	3	4	5
State/Federal tax needs	1	2	3	4	5
State/Federal data collection	1	2	3	4	5

Since duration is definitely more of an issue for business data, we were unable to draw from the household literature or questionnaires. The original specification, which identified the passage of time as one reason for disclosure of sensitive data, recognized that time might be related to sensitivity. We thought the question too vague for respondents to answer consistently. For example, one respondent might be thinking of the lapse of a month, while another one was thinking 30 years, depending on the type and level of data.

Results from the large company visits suggested that the passage of time needed to be better specified, by number of months or years. To get at duration of sensitivity, we adapted a question from the Zayatz and Sigman (1994) draft questionnaire on data-provider views about confidentiality.

Currently, the Census Bureau is obligated by law to keep your reported data (and firm's identity) confidential for 30 years. For each of the following variables, please specify the number of years your firm feels its establishment level data (along with your firm's identity) should be kept confidential. . . ."

	Number of Years for Firm and Data Confidentiality
Monthly reports	
- value of shipments, sales, receipts	_____
- quantity of shipments	_____
- monthly inventories	_____
- new orders	_____

[List continued with detailed data items for Quarterly, Annual and Quinquennial Reports.]

We revised this question in several ways: 1) we provided respondents with categories indicating alternative durations of sensitivity for each type/level of data and 2) we did not ask about as many types of data, or in as much detail. Our cognitive interviews indicated respondents were able to answer this question easily, we obtained a variety of responses, and it met our client's specifications, and so this seemed to be a reasonable approach. The final question used in the questionnaire was:

For each of the following types of data, please indicate the time period after which they are no longer sensitive to the operation of your business. *Circle one response for each line.*

	<u>After 1 year</u>	<u>After 5 years</u>	<u>After 10 years</u>	<u>After 30 years</u>	
a. Number of employees at each establishment	1	2	3	4	DK/NA
b. Establishment-level payroll	1	2	3	4	DK/NA
c. Establishment-level sales	1	2	3	4	DK/NA
d. Establishment-level profits	1	2	3	4	DK/NA
e. Number of employees at the company	1	2	3	4	DK/NA
f. Company-level payroll	1	2	3	4	DK/NA
g. Company-level sales	1	2	3	4	DK/NA
h. Company-level profits	1	2	3	4	DK/NA

4.4 Example 3: Unauthorized Disclosure

As mentioned previously, it was important to our client that the questionnaire build to the topic of unauthorized disclosure. Our goal was to use terminology that respondents easily understood to operationalize the concept of unauthorized disclosure of confidential information in. Realizing that respondents would likely not give much thought about these topics, we attempted to find ways to communicate these technical and legalistic concepts in a way that would not bias the response to the questions.

To get at the concept of unauthorized disclosure, we utilized a question structure from the household side (JPSM survey, Singer, Presser & VanHoewyk, undated). That is, we provided multiple statements and asked respondents to indicate if they strongly agreed, somewhat agreed, somewhat disagreed or strongly disagreed with each. Our final question had multiple statements, each of which asked about a different dimension of the concept of unauthorized disclosure. In addition, as in the household surveys, we included a question with a hot-button topic. In the JPSM study, one example of a hot-button topic was "Do you think the Internal Revenue Service keeps your name and the information about you confidential, or do you think it gives your name and information about you to other government agencies?" In our case, we asked whether the respondent believed that any Federal agency could access business data their company has provided to other Federal agencies whenever they want.

Finally, one of the major findings in the household literature on confidentiality is that a large percentage of respondents believe that Federal statistical agencies do share data (Kerwin & Edwards, 1996; Gates, 1996). The following series of questions allowed us to provide some comparable data for businesses.

For each statement below, please indicate if you strongly agree, somewhat agree, somewhat disagree or strongly disagree. . *Circle one response for each line.*

	<u>Strongly Agree</u>	<u>Somewhat Agree</u>	<u>Somewhat Disagree</u>	<u>Strongly Disagree</u>	
a. I believe that Federal statistical agencies (e.g., Census Bureau, Bureau of Labor Statistics and Bureau of Economic Analysis) keep data provided by businesses confidential.	1	2	3	4	DK/NA
b. I believe that Federal statistical agencies do not release information by which a company or its data can be identified.	1	2	3	4	DK/NA
c. I believe that Federal statistical agencies do not share data provided by businesses with other government agencies.	1	2	3	4	DK/NA
d. I believe that Federal statistical agencies do not release data provided by businesses to people outside the government.	1	2	3	4	DK/NA
e. I believe that any Federal agency, such as the Internal Revenue Service, Small Business Administration and Federal Trade Commission, can access business data my company has provided to other Federal agencies whenever it wants.	1	2	3	4	DK/NA

The above version reflects changes from the preliminary draft. Based on our cognitive interviews, we made multiple changes to the statements in the draft version of the questionnaire:

- We removed the word “sensitive” before “data” in items a and d.
- We changed “provide sensitive business data” to “share data provided by businesses” in item c.
- We changed “can access my company’s business data whenever it wants” to “can access business data my company has provided to other Federal agencies whenever it wants” in item e.

These changes were made to more clearly indicate that the business data being asked about are the type supplied to Federal statistical agencies. In addition, we deleted a statement specifying “other Federal statistical agencies” before “other government agencies” as respondents in the cognitive interviews indicated they did not differentiate between the two. This modification was made in other survey questions as well, and required re-negotiation with subject area experts, since this revision broadened the context and interpretation of the questions.

4.5 Finalizing the questionnaire

Our clients were anxious to hear the results from the cognitive interviews. Only a few major changes to the questionnaire resulted and subject area experts helped resolve the few issues raised. In addition, as a team, we revisited the specifications and goals to ensure that data needs were met by the final questionnaire. This was an important step in bringing closure to the questionnaire development process and ensuring data quality.

5. CONCLUSION

Questionnaire designers cannot produce a high quality an instrument in isolation. In this paper, we attempted to demonstrate how collaboration in the questionnaire development process can result in improved quality. One key element was continued, close collaboration with clients and subject area experts. Another key element was the use of multiple resources – not only survey methodology literature, but also content-specific literature and previous questionnaires on similar topics.

To recap the steps of our proposed model of the collaborative questionnaire development process in establishment surveys:

- Review the concepts and initial question specifications provided by the subject matter experts.
- Consider what has been learned on the household side and evaluate its relevance to the establishment setting.
- Incorporate background knowledge and survey experience from the business side.
- Pull these together, incorporating questionnaire design and survey methodology expertise, to create a draft questionnaire.
- Conduct cognitive interviews using the draft questionnaire to obtain respondent feedback.

- Based on the findings, prepare a revised questionnaire.
- Revisit the basic concepts and goals to create a final questionnaire.

While these steps seem obvious, oftentimes they are ignored in practice. We hope that by documenting our successful use of this process, we can inspire others to consider its use.

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