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SURVEY METHODOLOGY

An Innovative Technique for Estimating Sensitive Survey Items

GAO

Accountability * Integrity * Reliability

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Preface

This staff study provides information on an innovative technique for collecting data on sensitive policy-relevant topics.[1] If successful, this technique might eventually help fill key data gaps and improve statistical information relevant to the national decision-making process. Our main goal is to stimulate interest in—and where appropriate, encourage further development and testing of—this promising, but as yet not fully validated, technique.

The "three-card method" is designed to collect sensitive data in large-scale surveys; it is intended to allow estimation of the needed statistics while maximizing response privacy and reducing "question threat."[2] We originally devised this technique to collect data on immigration, but we believe it might also prove useful in a variety of other sensitive policy areas where the collection of relevant information has, thus far, proved elusive. We encourage readers to consider whether developing a new application of the three-card method might prove worthwhile.

For questions about the material contained in this staff study, please contact me at (202) 512-4128 or Judith A. Droitcour, who served as project director, at (202) 512-7997. Other key contributors to this assignment were Eric M. Larson, Ruth B. McKay, and Maria P. Vargas.

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[1]GAO staff studies are typically prepared to present background information and intended to contribute to a specific body of knowledge.

[2]"Question threat" refers to questions the respondent may perceive as threatening or incriminating. In such cases, the respondent may not answer the question or may provide distorted answers (Rossi et al., 1983; and Bradburn and Sudman, 1979).

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Abbreviations

ACASI	Audio computer-assisted self-interviewing
EWI	Entered without inspection
INS	Immigration and Naturalization Service
NAWS	National Agricultural Workers Survey
OMB	Office of Management and Budget

Overview

In some areas of public policy, there has been repeated evidence that statistics to inform key debates are lacking or inadequate. When a sensitive topic area is at issue, the reason for the information gap may simply be that relevant questions are deemed too threatening to ask in large-scale surveys.

The purpose of this staff study is to report on an innovative questionnaire survey technique: the "three-card method." Though not yet fully validated, the new technique may prove to be applicable across a range of policy-relevant topics.

Background

We originally devised the three-card method as a way to survey foreign-born respondents about their immigration status. As summarized below, we were motivated by data gaps that are highly relevant to immigration policy. During the early to mid-1990s, immigration laws were debated and changed.[1] More recently, proposals for revisions have continued to be put forward.[2] But as the U.S. Commission on Immigration Reform recognized in 1994, without reliable data, it is difficult to assess the impact of immigration policies—or of immigration itself—on American society.

Our 1998 report on the quality of immigration statistics (GAO/GGD-98-164, July 1998) found that to be relevant to current laws and debates, information on foreign-born residents of the United States should be broken out by legal status. Five key legal statuses[3] are

- legal permanent residents (persons with official green cards);
- refugees and asylees (persons granted asylum);
- persons admitted temporarily who stay (legally) for more than a year;

[1]Major legislation includes the Immigration Act of 1990 (P.L. 101-649), Violent Crime Control and Law Enforcement Act of 1994 (P.L. 103-322), Personal Responsibility and Work Opportunity Reconciliation Act of 1996 (P.L. 104-193), and the Illegal Immigration Reform and Immigrant Responsibility Act of 1996 (P.L. 104-208).

[2]Bills introduced in the 106th Congress that would amend current immigration law include H.R. 1399, Fairness for Legal Immigrants Act of 1999; S. 1227, Immigrant Children's Health Improvement Act of 1999; H.R. 2698, New Workers for Economic Growth Act; and S. 455, Nursing Relief for Disadvantaged Areas Act of 1999. Other proposals have involved rules for the admission of temporary workers, including temporary agricultural workers (see GAO/HEHS-98-20, Dec. 1997) and temporary skilled workers (see Hearing before the House Subcommittee on Immigration and Claims, Committee on the Judiciary, Aug. 5, 1999).

[3]Virtually all laws regarding foreign-born persons apply to these five major legal statuses (or to subcategories of these statuses). Legal categories of foreign-born persons are defined under the Immigration and Nationality Act of 1952, as amended (8 U.S.C. 1101 et seq.). The terms and length of their admission to the United States, entitlements, rights, and benefits are addressed in the act and other legislation.

- illegal immigrants who remain for more than a year;[4] and
- naturalized U.S. citizens.

The same 1998 report found that neither records from the Immigration and Naturalization Service (INS) nor data from current surveys provide reliable estimates of these legal status groups. Naturalized citizens (only) can be identified in some current surveys, although even here we found there may be some problems (GAO/GGD-98-164, July 1998).[5]

Surveys of the general population do provide information on foreign-born persons—but not by legal status. The reason is that questions on legal status have been deemed too threatening to ask.[6] As a result, policy researchers cannot track trends in employment for legal immigrants, illegal aliens, or persons in other immigration statuses. Similar gaps occur for other important outcomes.[7] Immigration status is also important for policy-related studies of immigrant health.[8] As a first step toward filling these gaps, we devised a new survey technique that was described briefly in our 1998 report.[9]

This staff study reviews the logic of the three-card method and describes key procedures of the technique. It also provides more complete information on our development and testing efforts than was previously reported, indicates possibilities for future applications of the three-card method in a variety of sensitive areas, and discusses challenges in fielding a national survey using this innovative technique.

[4]Illegal immigrants include persons who entered without inspection (EWI)—that is, entered the United States surreptitiously—and overstays. Overstays (also called nonimmigrant overstays and visa overstays) are persons who entered the United States legally for a temporary period, but illegally stayed beyond the required departure date.

[5]INS has provided some composite estimates of the size of certain other legal status groups, but these estimates rely on major assumptions and may not be statistically reliable.

[6]For other problems with census and survey data on the foreign-born, including undercount and nonresponse, see GAO/GGD-98-164, July 1998.

[7]Other important outcomes that follow legal and illegal immigrants' entry into the United States include educational attainments, poverty status, and family formation.

[8]The implementation of the Personal Responsibility and Work Opportunity Reconciliation Act of 1996 (P.L. 104-193) and the Health Insurance Portability and Accountability Act of 1996 (P.L. 104-191) requires the reassessment of national survey questions that obtain information on citizenship status, as well as welfare programs and health insurance coverage (Loue and Bunde, 1999).

[9]Earlier indirect survey-based estimation techniques, including "randomized response" (Warner, 1965) and the "item count" (Droitcour et al., 1991), seemed inappropriate for the foreign-born population or for asking about legal status. The three-card method builds on these earlier survey techniques as well as demographic methods of residual estimation (see Schryock and Siegel and Associates, 1980).

The Logic of the Three-Card Method

A scientific survey involves a representative sample of the population of interest. Our technique extends this approach to select three independent representative samples, each composed of completely different persons.

All persons are asked the same potentially sensitive question. All are presented with answer alternatives printed on an 8-1/2" by 11" card, using a design that arranges the answer alternatives in different boxes on the card. As explained below, this avoids zeroing in on the sensitive answer category. The logic of the technique involves

- a three-box answer format, which is used on each card;
- three slightly different cards (cards 1, 2, and 3)—one for each sample; and
- indirect estimation of the sensitive category.

No respondent is ever directly asked whether he or she is in the sensitive category. Each sample provides a different piece of less sensitive information—a different piece of the puzzle. The outlines of the missing sensitive piece are apparent for the population as a whole when all other pieces are in place.

The Three-Box Answer Format

The key to asking respondents a potentially sensitive question, without zeroing in on the sensitive answer category, is the three-box format. For example, figure 1 shows a card that has three boxes: Box A, Box B, and Box C. Box A contains one of the less sensitive answer categories. Box B combines the sensitive category with a number of other less sensitive categories. Box C is all other categories—that is, any answer category not covered in Box A or Box B. Each box is an answer alternative.

Using the example of immigration status, the boxes might be

- Box A: Legal permanent resident with a valid and official green card issued to me by the U.S. government;
- Box B: U.S. citizen; student, work, or tourist visa; undocumented[10] (do not have my own valid official green card); and refugee or asylee (without a green card); and
- Box C: Some other category not in Box A or Box B (specify).

Respondents are asked to report which Box applies to them. They are told that if it is Box B, we do not want to know which specific category applies to them.

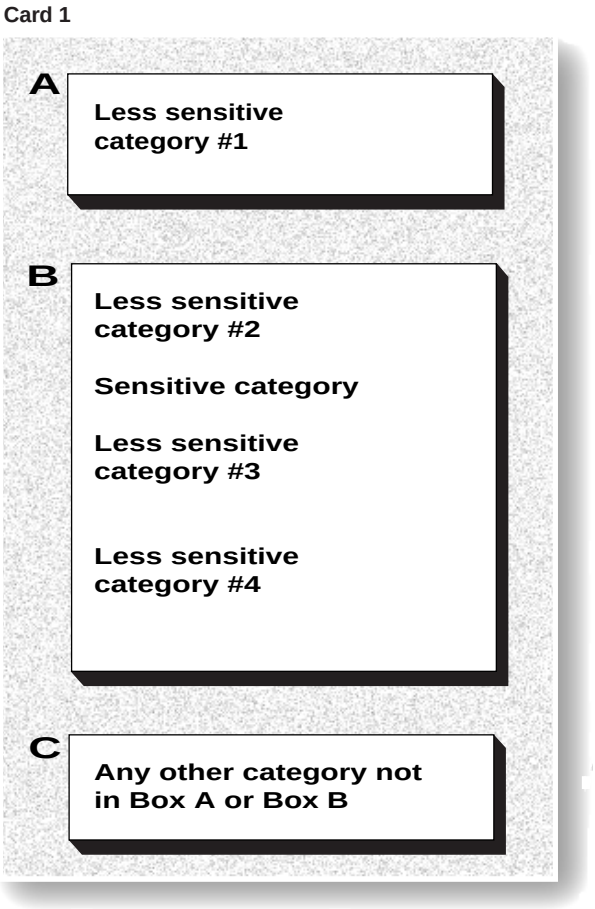
[10]Undocumented refers to illegal immigrants. This is the sensitive category.

Cards 1, 2, and 3 Yield Direct Estimates for Less Sensitive Categories

Respondents in sample 1 are shown a card like that in figure 1 (card 1). The purpose of gathering information with card 1 is to estimate the percent of persons in the first "less sensitive" category. Cards 2 and 3 are illustrated in figure 2. These cards are for samples 2 and 3, respectively.

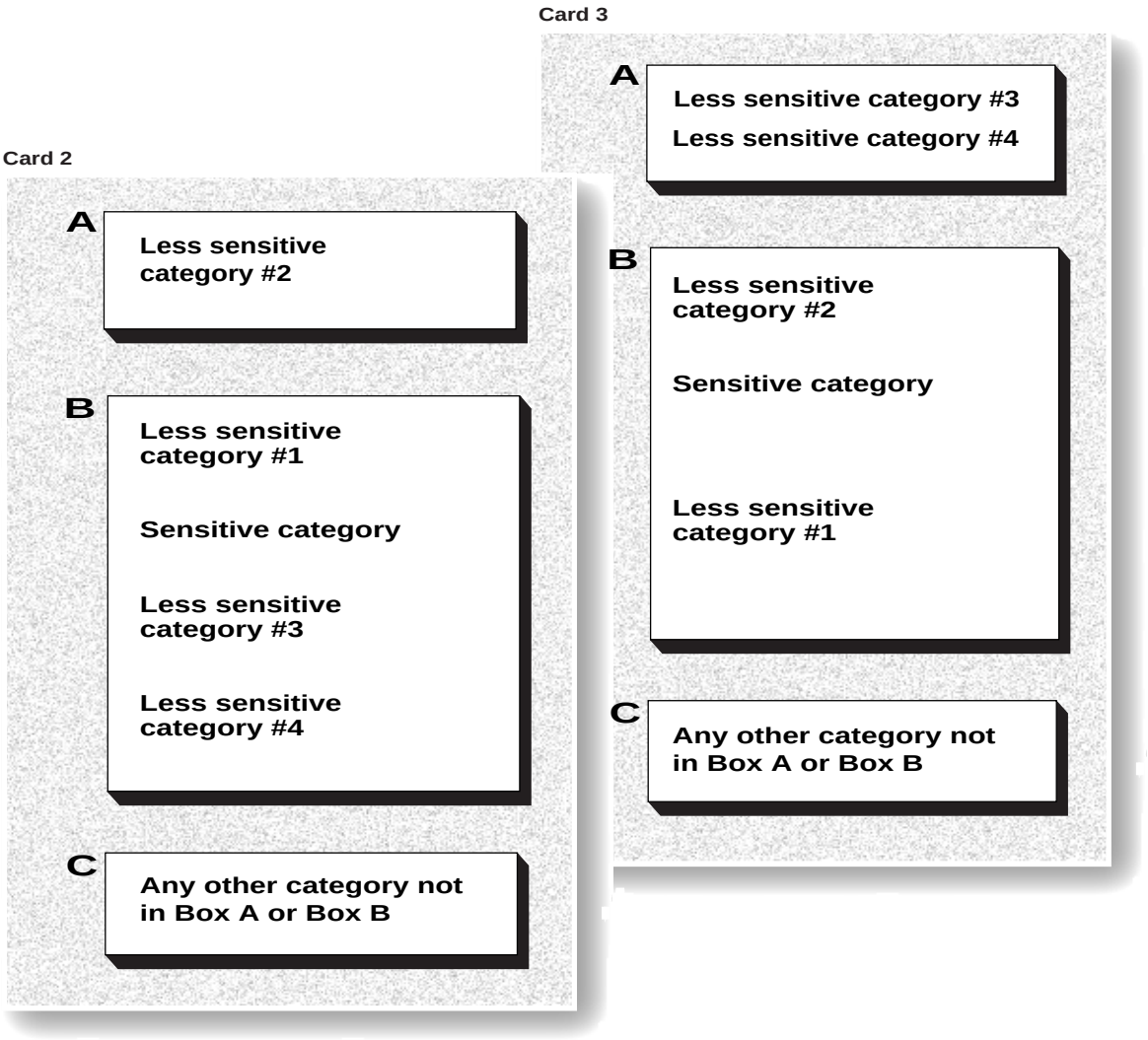
Comparison of the three cards shown in figures 1 and 2 indicates that the less sensitive categories are rotated between Box A and Box B. When a category appears in Box A, direct estimation is possible. Thus, the percentages of the population in each less sensitive (Box A) category are estimated directly by separate samples. The sensitive category always remains in Box B, together with other less sensitive categories. The sensitive category is not estimated directly.

Figure 1: Illustration of Card 1 for Estimating a Less Sensitive Category Using the Three-Card Method



Source: GAO. (The actual size of the card is 8-1/2" by 11.")

Figure 2: Illustration of Cards 2 and 3 for Estimating Less Sensitive Categories Using the Three-Card Method



Source: GAO. (The actual size of each card is 8-1/2" by 11.")

The Sensitive Category

Although the sensitive category always appears together with other less sensitive categories in Box B, an indirect (and unbiased) estimate of the sensitive category can be obtained by putting together the various pieces of less sensitive information. The size of the missing piece is calculated by subtraction. If the categories listed in Box A, B, and C are mutually exclusive and, taken together, are exhaustive, they should total 100 percent. Subtracting the percentage estimates of the less sensitive

categories from 100 percent yields a remainder that represents an indirect estimate of the percentage in the sensitive category. (Note: This procedure is appropriate only when the sensitive item is not too rare. Attempting to obtain an indirect estimate of a rare category would be like trying to find a "needle in a haystack.")

Detailed Information

Detailed information on Box A categories is obtained with follow-up questions for only the respondents who choose Box A. Because the sensitive category is never asked about directly, there are no follow-up questions for those who choose Box B. (The purpose of the technique is to avoid zeroing in the sensitive category.)

If respondents are asked other policy-relevant questions (e.g., questions about employment and income), then correlates for each less sensitive category may be obtained directly. The logic of estimating correlates of the sensitive category (indirectly) is explained in appendix III. Briefly, separate indirect estimates can be obtained for major (broad) subgroups defined, for example, by income category.

Introductory Material

We used introductory or training cards to familiarize respondents with the three-box answer format when we applied the technique to legal status. These training cards dealt with relatively innocuous topics. They were intended to cue respondents to the fact that the interviewer would not zero in on any specific Box B category. (See ch. 1 for examples of training cards.)

The early portions of the interview—even before presenting respondents with the training cards—can focus on obtaining various kinds of general and potentially policy-relevant information, such as household size, age, employment, income, and so forth.

Preliminary Testing on Legal Status

We conducted a series of development and testing efforts in which the three-card method was used to ask foreign-born respondents about their legal status. These efforts consisted of three main phases, each of which focused on foreign-born Hispanic respondents: pretests (27 respondents),[11] a field test with 81 farmworkers,[12] and cognitive interviews (8

[11]By "pretesting" we mean trying out questions on a relatively small number of respondents and making corrections and revisions on the basis of problems that surface in those interviews. Pretests include (1) asking the interview questions and (2) asking respondents about problems they had in understanding the questions or in answering them.

[12]A field test is a small-scale preliminary survey, typically conducted under conditions as similar as possible to those to be used in an eventual full-scale survey.

respondents).[13] We were only able to test in one foreign language, and we selected Spanish because it is the most prevalent foreign language in the United States. Respondents were selected from groups, such as farmworkers and those seeking help from legal clinics, that are thought to overrepresent illegal immigrants.

Instrument Development

There were iterative revisions of the survey instruments based on each set of results. The cards featured icons to illustrate the categories (e.g., a picture of a green card was used to illustrate the legal permanent resident category.) However, we found that some field test respondents and interviewers reacted negatively to the early version of the icons; that is, field test respondents perceived at least some of the icons as childish or indicated that some seemed ambiguous.[14] One of the main reasons for conducting the subsequent cognitive interviews was to improve the icons. By the conclusion of the cognitive interviews, respondents viewed each card as appropriate for adults, and most thought each icon was recognizable without seeing its label.

Sensitivity and Willingness to Answer

All 116 respondents in the three phases of testing answered the legal status question using a three-box card; there were no refusals. Overall, two-thirds of respondents chose Box B, which contained the sensitive category. In the cognitive interviewing phase only, respondents were specifically asked about the sensitivity of the legal status question. The majority of these respondents (five of eight) thought the legal status card would be regarded as sensitive by some persons, even when using the three-box format; however, all eight respondents chose Box B.

It is important to note that a validity study, conducted under conditions similar to that of a large-scale survey, would be needed to determine whether—or to what extent—respondents actually chose the appropriate boxes.

Other Potential Applications

We believe that the three-card method might be applied to a variety of sensitive subject areas other than immigration. To judge whether the technique might be appropriate for a specific question area, one should consider three requirements:

[13]Cognitive interviewing focuses on the mental processes of the respondent while he or she is answering survey questions. (See ch. 2 for a fuller discussion of this method.)

[14]Icons are drawings we used to illustrate the categories in Box A and Box B, as shown in ch. 1, figs. 1.1-1.3. The U.S. citizen category, e.g., is accompanied by a drawing of a U.S. flag.

- Potential answers to the key question must be organized in a set of mutually exclusive and exhaustive categories. (For some applications, drafting an appropriate set of categories might require some creativity.)
- Only one of the answer categories can be sensitive.
- Most important, the sensitive item should not be rare within the population surveyed. Some items that appear to be rare at first glance may not be rare within certain definable populations. Thus, in some cases, one must first define a population or group at risk, then screen for that population, and finally survey its members.[15]

With these considerations in mind, we brainstormed potential applications ranging from violence (e.g., road rage among young male drivers) and sensitive personal choices (abortion, drug use) to organizational actions (such as the ways manufacturers in key industries dispose of hazardous waste). Chapter 4 discusses these and other examples—providing possible approaches to wording sensitive and less sensitive categories.[16]

Using the Method in a Large-Scale Survey

Assuming that a specific application of the three-card method is deemed appropriate for use in a large-scale survey, there would be a number of challenges. Some of these involve efficiency. For example, the cards rule out the option of telephone interviews, and fielding a large-scale personal interview survey would be costly. Low-cost options that might be feasible in some instances include (1) "piggyback" insertion of items in an ongoing in-person survey; (2) group administration (e.g., a survey of high school students); and (3) an Internet survey, in which the cards are shown on the computer screen.[17]

Other challenges include finding cost-effective ways to screen for the relevant subpopulation and keeping the margin of error at an acceptably low level (see ch. 5). Still other challenges may occur, depending on the context of the particular application. A number of special challenges pertain when planning a survey of the foreign-born population. For example, our 1998 report discussed the issue of possible undercoverage of

[15]Otherwise, the indirect-estimation effort could amount to "looking for a needle in a haystack." (See app. I for a discussion of the variance of the indirect estimate.)

[16]When choosing these examples, we tried to keep all three considerations in mind. However, it was not always clear to us how prevalent or rare a particular sensitive behavior might be within a defined population.

[17]Some surveys are already conducted entirely on the Internet; e.g., we used e-mail to administer a questionnaire to some 350 EPA cleanup managers responsible for the 609 sites where cleanups are still under way (see GAO/RECD-99-245, July 1999). We also reported the results of the survey for each site on the Internet at http://www.gao.gov/RCED-99-245/.

the foreign-born in censuses and surveys and suggested ways of estimating the foreign-born undercount.[18]

Organization of This Study

The logic and procedures of the three-card method are discussed in detail in chapter 1, using the example of legal status for foreign-born respondents. The methods we used for the preliminary development and testing and the results we obtained are presented in chapters 2 and 3. Examples of potential applications in a variety of sensitive topic areas are explored in chapter 4. Lastly, in chapter 5, challenges in fielding the three-card method in a national survey and potential solutions are discussed.

Appendixes I through IV provide details on a variety of relevant technical topics. These include estimating the variance, procedures for estimating sensitive characteristics for demographic subgroups, the questionnaire used in the field test, and detailed data from the cognitive interviews. Lastly, we have included a bibliography listing the major sources we used.

[18]See GAO/GGD-98-164, July 1998, pp. 57-58.

The Three-Card Method: Its Logic and Key Features

The three-card method is designed to encourage more truthful responses to sensitive questions while protecting respondent privacy. In its first application, the technique was used to ask foreign-born respondents about their legal status in such a way that a truthful response would not reveal whether the respondent (or anyone else) is here illegally.[1]

No one could ever discover, on the basis of these survey data—not even through a series of deductions—that any respondent is an illegal immigrant. But when all data are combined, survey-based estimates can be achieved for all legal status groups—including the sensitive illegal immigrant category. The logic of the three-card method involves

- a three-box answer format,
- selection of three random samples of foreign-born persons, and
- three different cards—one for each sample.

Key features of the method include

- the ability to ask some respondents detailed follow-up questions to estimate length of stay and to obtain trend data;
- introductory "trainer" cards, which familiarize respondents with the three-box answer format and with the use of icons to identify specific categories; and
- the inclusion of different details on different legal status cards, to maximize effective and efficient communication.

Answer Format, Samples, and Cards

The "three-box answer format" groups various answer categories in three boxes (Box A, Box B, and Box C). The respondent answers by picking one of the boxes. Categories are arranged so that the sensitive category (here, illegal or "undocumented" status) appears in a box that includes several less sensitive categories (such as refugee or asylee, naturalized citizen, etc.).[2] Icons are used to help identify the various legal status categories.

[1]This extends our earlier work on the three-card method, which was introduced in our report on the quality of immigration statistics available to policymakers (GAO/GGD-98-164, Jul. 1998). Our other work in this area includes evaluating the quality of data available to evaluate the effects of immigration (GAO/PEMD-89-8, Dec. 1988), projecting future legal immigration (GAO/PEMD-88-7, Jan. 1988; GAO/T-PEMD-89-1, Mar. 1989; GAO/PEMD-89-12, Apr. 1989; GAO/PEMD-90-5, Nov. 1989), nonimmigrant alien workers in the United States (GAO/PEMD-92-17, Apr. 1992), and problems with INS' overstay estimation methods (GAO/PEMD-95-20, Sept. 1995).

[2]Each sample is shown only one of these three-box legal status cards. The categories on the cards must be mutually exclusive and exhaustive (i.e., each person belongs in one and only one category).

Each of the three samples consists of different foreign-born persons. The three legal status cards differ only in terms of which categories are grouped in which box.[3] Each card is shown to respondents in **one** sample only. Thus, each respondent sees only one legal status card.

The key to the new method is that respondents in each sample provide partial information (a different "piece of the puzzle"). By accessing data from all three samples (all three legal status cards), direct estimates can be made for most categories. The sensitive category is estimated indirectly, utilizing data from all three samples. The following section describes how this is accomplished.

Logic of the Basic Three-Card Method

The logic of the basic three-card method can be explained using a hypothetical example that is carried through to explain each of three samples. Respondents in the first sample of foreign-born respondents are shown a legal status card (card 1) with categories arranged in a three-box format, as shown in figure 1.1.[4] The card is shown in Spanish because all testing to date has been conducted in Spanish. The English translation of card 1 is

- Box A: Legal permanent resident with a valid and official green card issued to me by the U.S. government;
- Box B: U.S. citizen; student, work, or tourist visa; undocumented[5] (do not have my own valid official green card); and refugee or asylee (without a green card); and
- Box C: Some other category not in Box A or Box B (specify).

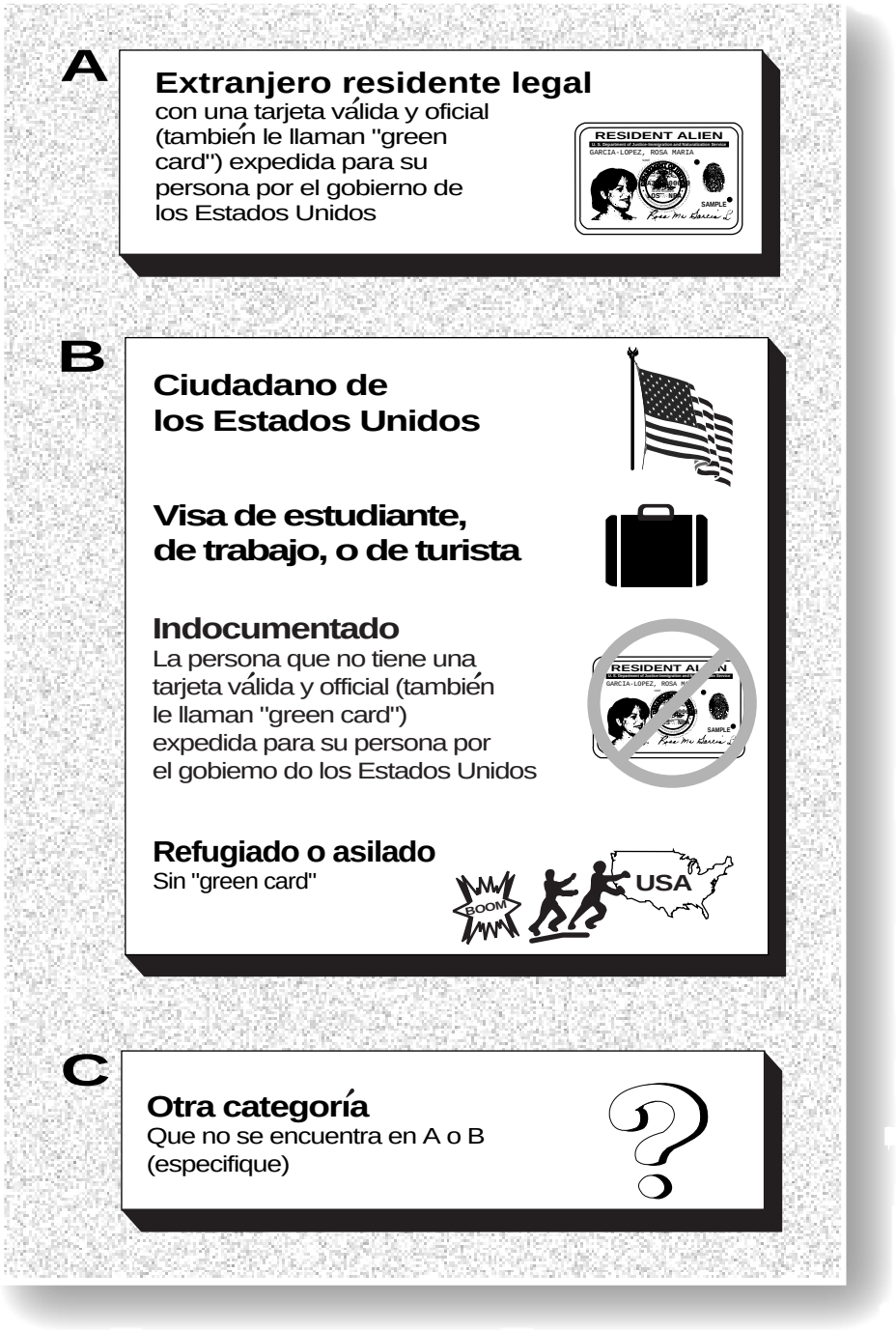
Respondents are asked to report which box applies to them and are told that if it is Box B, we do **not** want to know which specific category applies to them. The purpose of interviews with this first sample is to obtain a valid estimate of the percent of foreign-born who have officially obtained green cards. (Hypothetical example: 35 percent of the resident foreign-born population have officially obtained green cards.)

[3]Each of the three legal status cards must be individually developed and pretested, as explained later in this chapter.

[4]The legal status card shown in fig.1.1 is a revised version we developed after the 1998 report was released. The various development and testing efforts completed to date are discussed in ch. 2.

[5]Undocumented refers to illegal immigrants. This is the sensitive category.

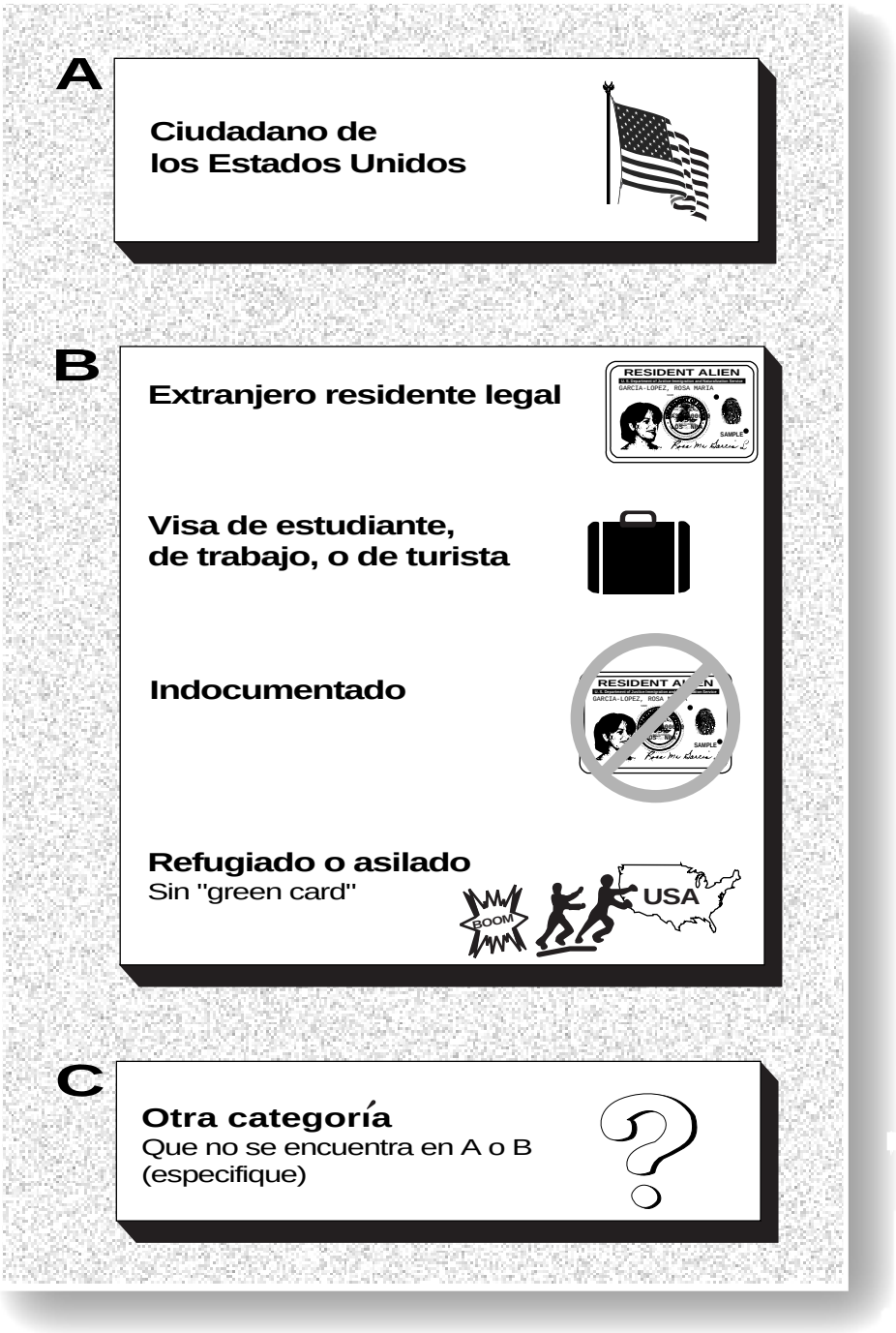
Figure 1.1: Legal Status Card 1



Source: GAO. (The actual size of the card is 8-1/2" by 11.")

Respondents in the second sample (completely different individuals) are shown a legal status card (card 2) with a different arrangement of the categories in the same three-box format (see fig. 1.2). This time, Box A contains the status of a naturalized U.S. citizen, whereas Box B includes legal permanent resident along with other immigration statuses. Respondents are asked to pick the box that applies to them and are told that if it is Box B, we do **not** want to know which category in Box B applies to them. The purpose of interviewing this sample with this card is to obtain a valid estimate of the percentage of the foreign-born who are naturalized citizens. (Hypothetical example: 30 percent are naturalized citizens.)

Figure 1.2: Legal Status Card 2

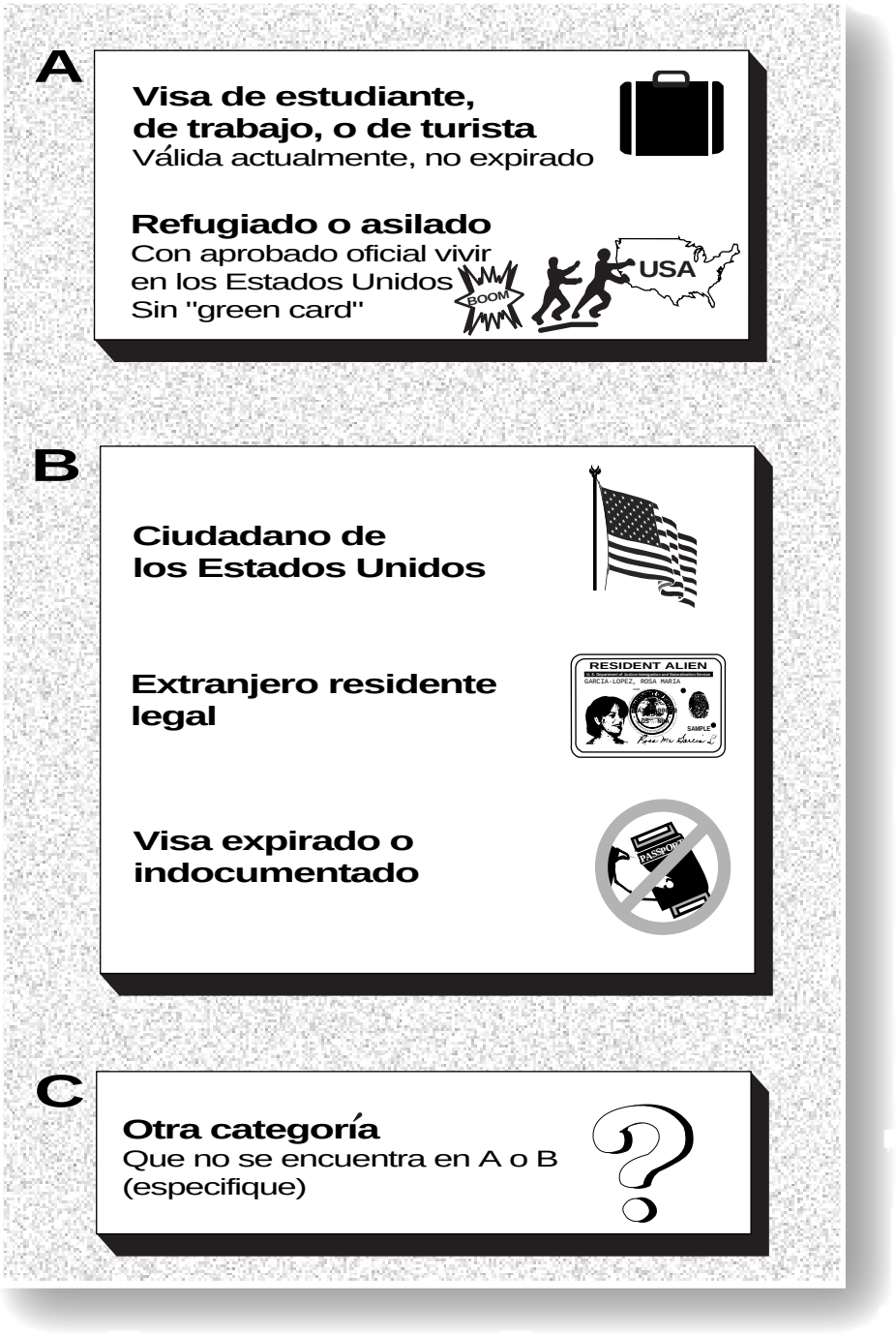


Source: GAO. (The actual size of card is 8-1/2” by 11.”)

Respondents in the third sample (again, different persons) are shown a legal status card (card 3) with yet another arrangement of the categories in the three-box format (see fig. 1.3). This time, Box A features refugees and persons granted asylum as well as those here legally with temporary visas.[6] Respondents are told that if they are in Box B, we do not want to know which category in Box B applies to them. The purpose of interviewing this sample is to get an estimate of the percentage in Box A categories—refugees, asylees, and persons here on a legal temporary basis. (Hypothetical example: 10 percent pick Box A.)

[6]Using two categories in Box A lowers variance costs because three, rather than four, samples would be required. Those who pick Box A would be asked follow-up questions to determine their exact legal status, which is also the case with the other two legal status cards.

Figure 1.3: Legal Status Card 3



Source: GAO. (The actual size of card is 8-1/2" by 11.")

Thus, each of the legal status categories—except for the sensitive category (illegal status)—alternatively appears in Box A. Assuming that the estimates for the legal status categories are mutually exclusive and that these categories together with Box C represent an exhaustive set of possible legal statuses, it is possible to obtain an **indirect** estimate of illegal immigrants. That is, extending the hypothetical examples above, we would estimate that 75 percent of the foreign-born are here legally in the four major statuses (35% with green card + 30% naturalized U.S. citizens + 10% refugees, asylees, and persons here on a legal temporary basis[7] = 75%). Suppose also that 1 percent picked Box C (some other category). Subtracting these hypothetical estimates from 100 percent yields 24 percent (100% - 75% - 1% = 24%). Thus, our estimate would be that 24 percent are here illegally.

The three-card method also allows detailed information to be gathered on subcategories of legal statuses. As described in the following section, this is accomplished through a special strategy for follow-up questions that is designed to avoid increasing question threat.[8]

Follow-up Questions

Respondents who choose Box B on the legal status card shown to them are not asked any further questions because Box B always contains the sensitive category. However, respondents who choose Box A can be asked a set of follow-up questions about the details of their (Box A) legal status.[9]

Follow-up questions are essential for sample 3 respondents who choose box A, because these respondents are shown legal status card 3, which includes two categories in Box A. Follow-up questions can determine which of the two legal status categories applies to the respondent.

Follow-up questions might also help confirm the validity of answers for respondents choosing Box A or, alternatively, provide the information needed to reclassify certain respondents into Box B or Box C. For example, suppose a person in sample 1 chooses Box A, apparently claiming to have a green card. If follow-up questions reveal that although

[7]Refugees, asylees, and persons here on a legal temporary basis could be further disaggregated by using follow-up questions to determine their status.

[8]"Question threat" refers to questions the respondent may perceive as threatening or incriminating. In such cases, the respondent may not answer the question or may provide distorted answers (Rossi et al., 1983; and Bradburn and Sudman, 1979).

[9]This could include, for example, a question about when the Box A legal status was officially obtained (e.g., green card status) and the basis upon which the respondent applied for the green card (e.g., as the spouse of a citizen, relative of a permanent resident alien, and so forth). In this way, detailed information on legal status can be attained for most legal status subcategories.

the respondent had **applied** for green card status, he or she has not actually received that status yet, then this sample 1 respondent would be recoded out of Box A. Specific follow-up questions used for legal status card 1 are shown in appendix II.[10]

For sample 3 (legal status card 3), follow-up questions could help clarify whether a respondent chose Box A incorrectly.[11]

Estimating Length of Stay

We defined two of the five major legal status categories of foreign-born persons, in part, by length of stay.[12] The reason is that they reflect temporary admissions or illegal presence in the United States, and these conditions are different from an admission that is intended to be permanent, such as for legal permanent residence. The two length-of-stay statuses are (1) persons who were legally admitted here on a temporary basis who remain (legally) longer than 1 year and (2) persons here illegally who remain longer than 1 year.

We based the foregoing length-of-stay criterion on the U.N.-recommended definition of "permanent" immigration and on the Immigration and Naturalization Service's (INS) practices regarding its overstay estimates.[13]

Estimates of foreign-born persons here for any time period can be made by isolating the data for foreign-born respondents who have been here for a specific length of time, and then using these data to derive the relevant estimate. This is especially important for two categories—illegals and persons here on temporary visas.[14]

[10]However, as described in ch. 3, in a field test with 81 respondents, no one was reclassified on the basis of these follow-up questions.

[11]For example, some persons who entered as refugees may still self-identify generally as refugees even if they later obtained green cards or became naturalized U.S. citizens. Such errors could, in some cases, then be recoded to the correct box (B).

[12]The other three are legal permanent residents, refugees and asylees, and naturalized U.S. citizens. The term "asylees" refers to persons granted asylum, without legal permanent resident status.

[13]The U.N. definition (Shryock and Siegel and Associates, 1980), has been applied to INS data on arrivals of foreign-born persons to the United States (Kraly and Warren, 1992); also, INS' definition of overstays counts only those who resided illegally in the United States for more than 1 year.

[14]Some foreign-born workers who are here on temporary visas are currently of particular policy interest, in part because of their length of stay. (See GAO/PEMD-92-17, Apr. 1992, and "Hearing on the H-1B Temporary Professional Worker Visa Program and Information Technology Workforce Issues," hearing before the Committee on the Judiciary, Subcommittee on Immigration and Claims, House of Representatives, Aug. 5, 1999.)

Estimates for demographic subgroups can be obtained in a similar manner (see app. III).

Tracking Trends Across Time

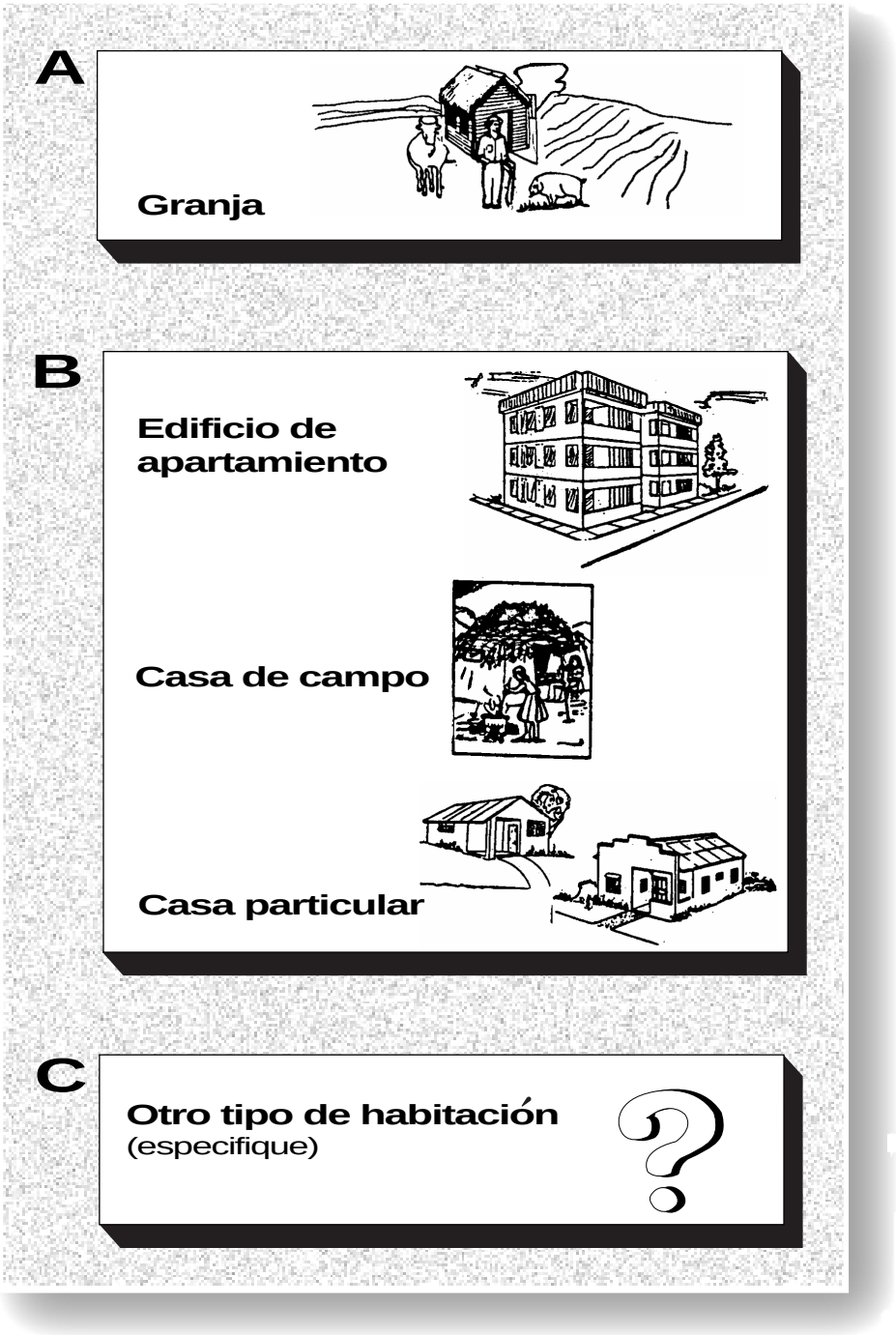
Through repeatedly applying the three-card method in subsequent surveys, it would be possible to track trends across time for various legal status groups. For example, trends in the number of foreign-born persons here on temporary visas—or the number illegally residing here—could be tracked for all such persons or separately for males and for females or for other major demographic groups (e.g., Mexican origin). To illustrate, the analyst would first isolate data on Mexican-born respondents, then follow the estimation and subtraction process previously described.

Using "Trainer" Cards Is Key

Introductory or "trainer" cards are a key feature of the three-card method. Before showing a respondent the legal status card assigned to his or her sample, the interviewer asks questions on less sensitive topics using cards that also have words, icons, and boxes. The purpose of these introductory trainer cards is to familiarize respondents with the general format—including the task of answering by choosing a box—before they are shown the legal status card. Figures 1.4 and 1.5 show introductory cards, each of which has a three-box format and icons to help identify each category.

The first introductory card (fig. 1.4) shows different categories of houses or dwellings. Box A shows a farmhouse, whereas Box B includes various categories—apartments, single-family houses, and so forth. Box C refers to other types of housing (not shown in Box A or Box B). This card is used with a question such as: "In what kind of house do you think most of the people in your home country live?" Before respondents actually voice an answer, they are instructed to answer by just picking a box—and are also told that if the answer is Box B, we **do not** want to know which specific category applies to them.

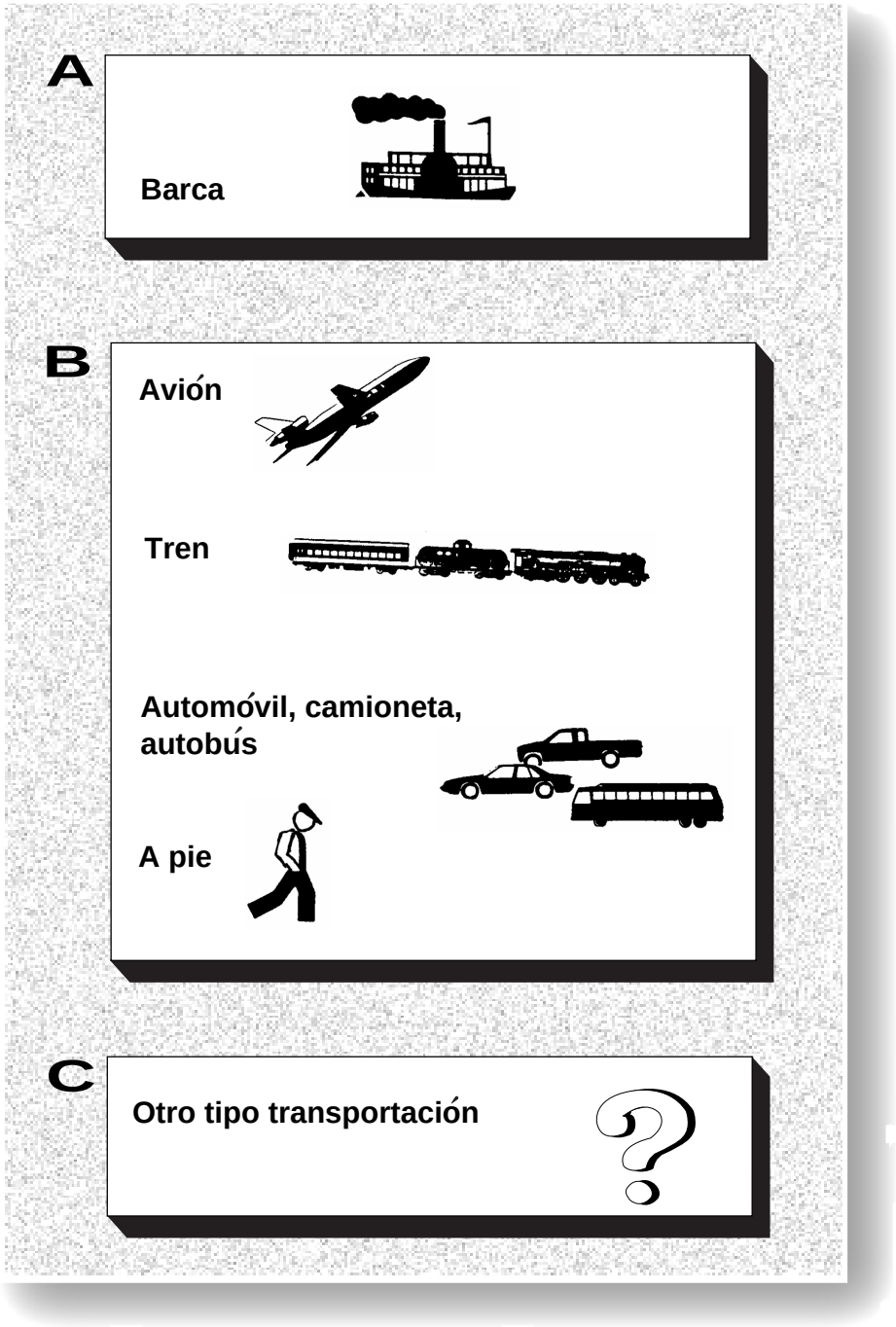
Figure 1.4: Introductory Flashcard With Types of Houses



Source: GAO. (The actual size of card is 8-1/2” by 11.”)

The second introductory card (fig. 1.5) also has three boxes. It presents various modes of transportation: Box A contains a boat; Box B contains four other modes of transportation—plane, train, auto, or on foot; and Box C refers to any type of transportation not shown in either Box A or Box B. This card is used together with questions such as: "What kind of transportation did you use the most recent time you traveled from your home country to the United States?" Or, "If you were to travel to your home country sometime within the next 12 months, what kind of transportation do you think you would use?" Again, before the respondent answers, he or she is asked to just pick a box and is told that if the answer is in Box B, we **do not** want to know which specific category applies.

Figure 1.5: Introductory Flashcard With Types of Transportation



Source: GAO. (The actual size of card is 8-1/2" by 11.")

We recommend using both of these introductory cards so that respondents will be thoroughly familiar with the three-box format before they are shown a legal status card. The logic is that respondents can freely ask questions about how the format works on the more innocuous introductory trainer cards and will know, in advance of seeing the legal status card, that they will not have to identify a specific category in Box B.

Separately Develop Each Legal Status Card

Each legal status card must be separately developed and tested before being used in a survey. It may be necessary to develop specific instructions for each card to enable a better presentation by the interviewer and to facilitate more accurate answers by the respondent. In such a case, we believe only those detailed instructions needed for a particular card should be included on that card. The reason is that instructions relevant to other cards would clutter the card and make it more difficult to take in at a glance.

Because Box A of each card features a different category (or categories), the cards differ in terms of the key instructions and explanatory details needed to help respondents determine whether they belong in Box A, Box B, or Box C. It is not necessary for respondents to distinguish between categories listed within Box B.

For example, a respondent with an expired visa who is shown legal status card 1 should know that he or she belongs in Box B. The reason is that on legal status card 1, Box B contains both the temporary visa category and the undocumented category. The respondent need only choose Box B; he or she does not have to distinguish between categories within Box B. But a similar respondent in sample 3 would be shown legal status card 3, which includes the temporary visa category in Box A and the undocumented category in Box B. A respondent with an expired visa might be unsure which box to choose—unless legal status card 3 has language making it clear that persons with expired visas belong in Box B.

It is important to note that all three legal status cards are shown in here to illustrate the logic of the three-card method. However, only one of those cards—legal status card 1—was subjected to development and testing.[15]

[15]As described in the following chapter, the developmental testing consisted of three phases: initial pretesting by our staff who are fluent in Spanish, a field test, and formal cognitive interviewing. Results are presented in ch. 3.

Phases of Development and Testing

Our preliminary development and testing effort was conducted in three phases:[1] (1) initial pretesting of instruments, (2) a field test with farmworkers, and (3) subsequent cognitive interviews.[2] This three-phase effort covered two introductory cards as well as legal status card 1. The third phase was designed, in large part, to address problems that surfaced in the field test.

Each phase built on the results of the previous phase. That is, on the basis of phase 1 results, instruments were revised before beginning phase 2; and on the basis of phase 2, instruments were revised at the outset of phase 3.[3] Revisions were also made during phase 3.

In each phase, foreign-born Hispanic respondents were selected in such a way that illegal residents would likely be heavily represented. Generally, Hispanics in professional and semiprofessional occupations were not included, and it is likely that long-term Hispanic residents were underrepresented. We did not attempt to interview non-Hispanic foreign-born residents (Asian, African, or European).

The end of this chapter describes important limitations on the results of this effort.

Survey Instruments

Throughout the development and testing of the three-card method, the following survey instruments were used:

- introductory trainer cards intended to familiarize respondents with icons and train them in the use of the three-box answer format before exposing them to a legal status card and
- legal status card 1, in which Box A features the legal permanent resident category.[4]

[1]The development and testing was conducted between July 1997 and September 1998: initial pretesting of instruments (Jul.-Aug., 1997), application in a field test with farmworkers (Nov. 1997-Feb. 1998), and cognitive interviewing (Sept. 1998).

[2]Cognitive interviewing involves examining mental processes of respondents as they answer key questions; i.e., questioning them about what the question meant to them and about how they arrived at their answer.

[3]Problems clearly observable to the interviewers, given the normal question asking-and-answering process, were identified in the field test.

[4]We did not test the alternative legal status cards—i.e., legal status cards 2 and 3, which show different categories in Box A. (See figs. 1.2 and 1.3 in ch. 1.)

All respondents also answered a lead-in questionnaire that obtained demographic information and provided context for the specific questions and cards we were testing. Additionally, the lead-in questionnaire may help establish rapport and motivate respondents to provide accurate answers on the legal status card.[5]

Respondents who picked Box A on legal status card 1 (i.e., those who claimed legal permanent resident or green card status) were also asked follow-up questions concerning details of their legal status.[6]

At various points during our work on the three-card method, we asked experts to review legal status card 1. These included GAO colleagues; officials and staff at the Immigration and Naturalization Service (INS), the Bureau of the Census, and the Office of Refugee Resettlement at the Department of Health and Human Services; and private-sector experts in immigration, statistics, and survey methods.[7] Revisions were made, as needed.

All survey materials were available in Spanish. All interviewers were fluent in both Spanish and English, and almost all interviews were conducted in Spanish.[8]

Methodology for Phase 1: Initial Pretests

Phase 1 of the development and testing consisted of a series of pretests and iterative revision of survey instruments. Four bilingual GAO staff members conducted 27 pretest interviews with foreign-born Hispanics at four locations. These included a Los Angeles "drop-in" center frequented by young Hispanic males and operated by a charitable Catholic group; a legal aid clinic in Arlington, Virginia, that specializes in helping Hispanic

[5]In the field test with farmworkers, the lead-in questionnaire covered work-related health issues, such as injuries at work, use of pesticides in the fields, drinking water, etc.

[6]A copy of the three-card segment of the questionnaire used in the field test is shown in app. II.

[7]Our nonagency reviewers included included Norman Bradburn, Senior Vice President for Research, National Opinion Research Center, Chicago, IL; Robert Groves, Director, Joint Program for Survey Methodology, University of Maryland and University of Michigan; Professor David M. Heer, Population Research Laboratory, University of Southern California, Los Angeles, CA; Graham Kalton, Senior Vice President, Westat, Inc., Rockville, MD; Charles B. Keely, Chairman, Department of Demography, Georgetown University, Washington, D.C.; Mary Grace Kovar, National Opinion Research Center, Washington, D.C.; Demetrios G. Papademetriou, Senior Associate and Director, International Migration Policy Program, Carnegie Endowment for International Peace, Washington, D.C.; Jeffrey S. Passel, The Urban Institute, Washington, D.C.; Donald B. Rubin, Chairman, Department of Statistics, Harvard University, Cambridge, MA; Fritz Scheuren, The Urban Institute, Washington, D.C.; Michael S. Teitelbaum, Co-Chair, U.S. Commission on Immigration Reform; and Professor Alan Zaslavsky, Department of Health Care Policy, Harvard Medical School, Cambridge, MA.

[8]One respondent requested to be interviewed in English; although Spanish was his native language, he wanted to practice his English.

immigrants; and various facilities in farm areas in Colorado and Pennsylvania during the harvest of labor-intensive crops, such as apples and peaches. Most of the pretest respondents were from Mexico, and most were males.

At each location, we first met with and explained our project to directors or owners of the facility we wished to enter. Subsequently, we introduced ourselves to prospective respondents (foreign-born Hispanics) and gained their cooperation. The support of the directors or owners was critical for gaining access to the facilities, and in some cases, but not all, the directors or owners also served as "opinion leaders," who validated our activities to prospective respondents.

Methodology for Phase 2: Field Test With Farmworkers

Phase 2, following the initial pretests, consisted of a field test in which a contractor (Aguirre International) conducted survey interviews with 81 farmworkers in six states. As a first step, the questionnaires and cards we developed were submitted to the contractor for review. The contractor suggested minor changes, and we revised the questionnaires as needed.[9] The interviewers employed by the contractor were subsequently debriefed by our staff.

The contractor conducted our 81 interviews as an add-on to the National Agricultural Workers Survey (NAWS).[10] The NAWS is an annual survey, and the Aguirre interviewers are experienced in developing rapport and communicating with Hispanic farmworkers.

We chose the NAWS population because it contains a high percentage of foreign-born workers, almost all foreign-born respondents are Hispanic and speak Spanish, and a high percentage are believed to be illegal immigrants. Specifically, our expectation was that most foreign-born farmworkers would either be working here illegally or would have obtained, as a result of the amnesty period authorized by the Immigration Reform and Control Act of 1986, a valid green card.[11] The majority of farmworkers were male, and nearly all were from Mexico.

[9]Nine forms of this questionnaire were developed (see app. II), so that each could be administered to nine respondents.

[10]Data from our interviews were not included as part of the regular NAWS survey data.

[11]The Immigration Reform and Control Act was passed Nov. 6, 1986, in order to control and deter illegal immigration to the United States. Its major provisions stipulate legalization of undocumented aliens, legalization of certain agricultural workers, sanctions for employers who knowingly hire undocumented workers, and increased enforcement at U.S. borders.

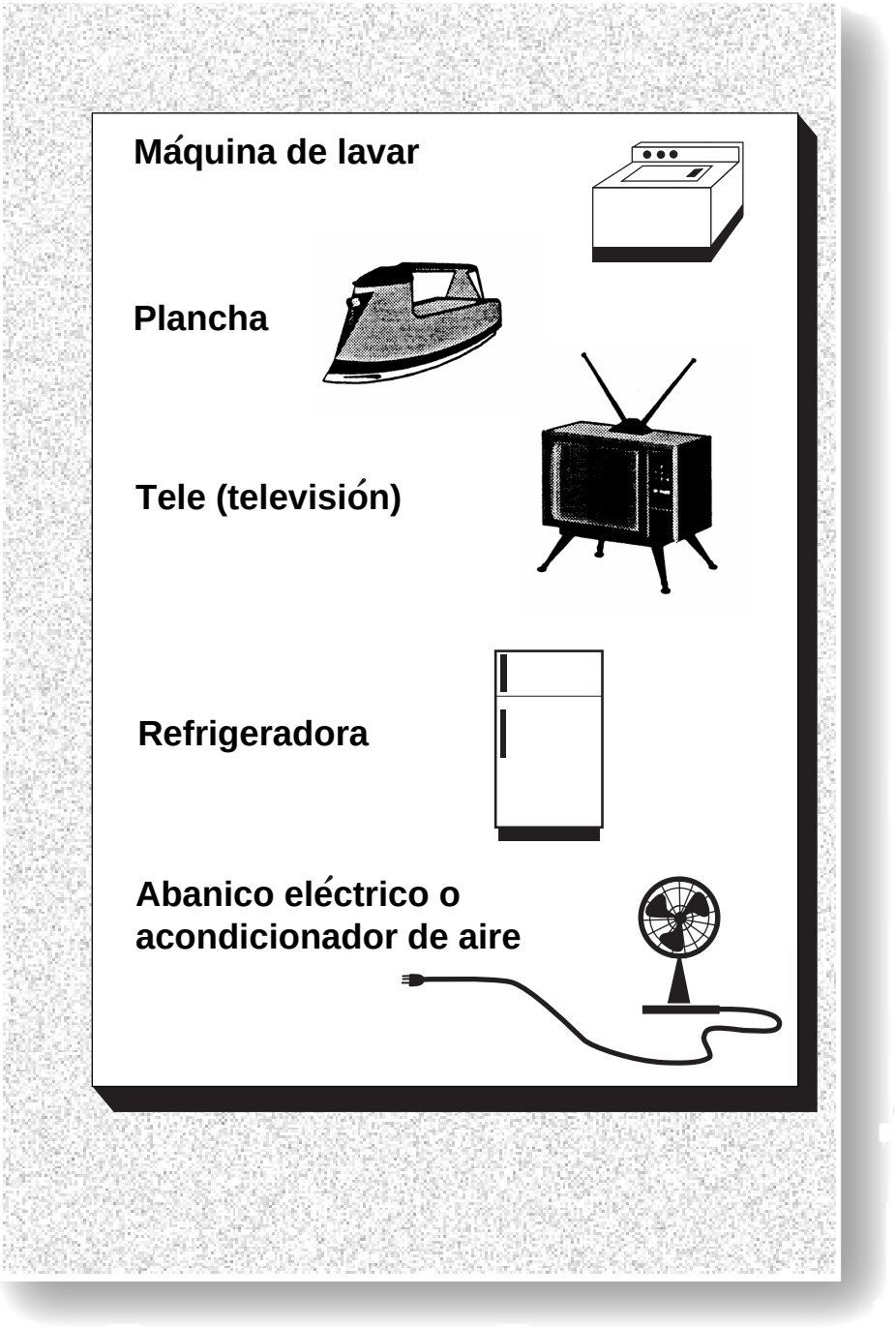
The cards used to interview 81 Hispanic farmworkers were as follows:

- The first introductory card featured household appliances (see fig. 2.1) and was intended to familiarize respondents with the use of cards showing words and pictures.[12]
- The second introductory card featured types of transportation shown in a three-box format (fig. 2.2, which is the same as the card shown in ch. 1, fig. 1.5).
- Legal status card 1 featured the legal permanent resident category in Box A—specifically, the early version of that card (see fig. 2.3).[13]

[12]We eliminated this card following the field test.

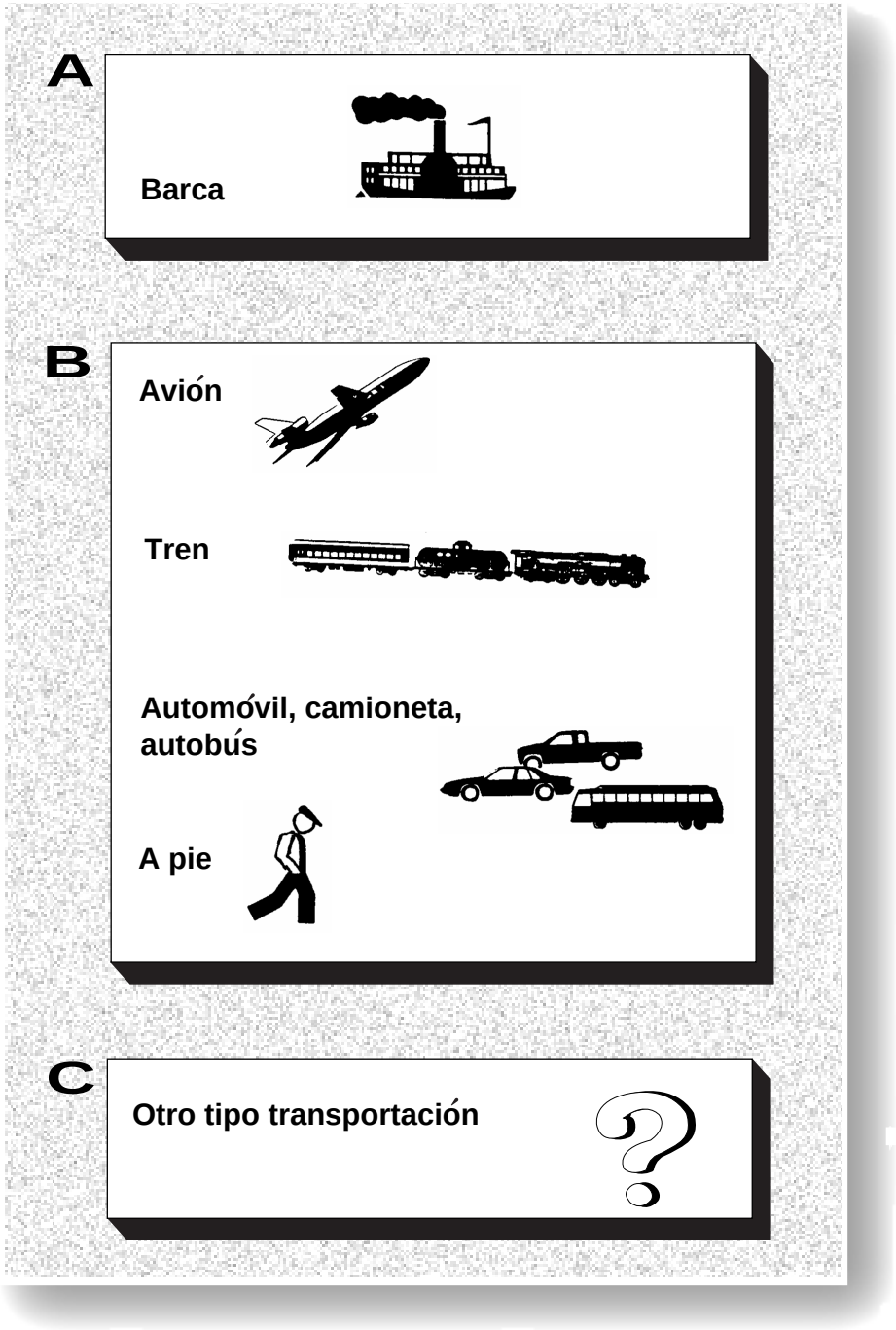
[13]We modified this card in the cognitive testing phase, which addressed problems with the icons that were encountered by the contractor during the field test. The most recent version is shown in ch. 1.

Figure 2.1: Introductory Card With Household Appliances



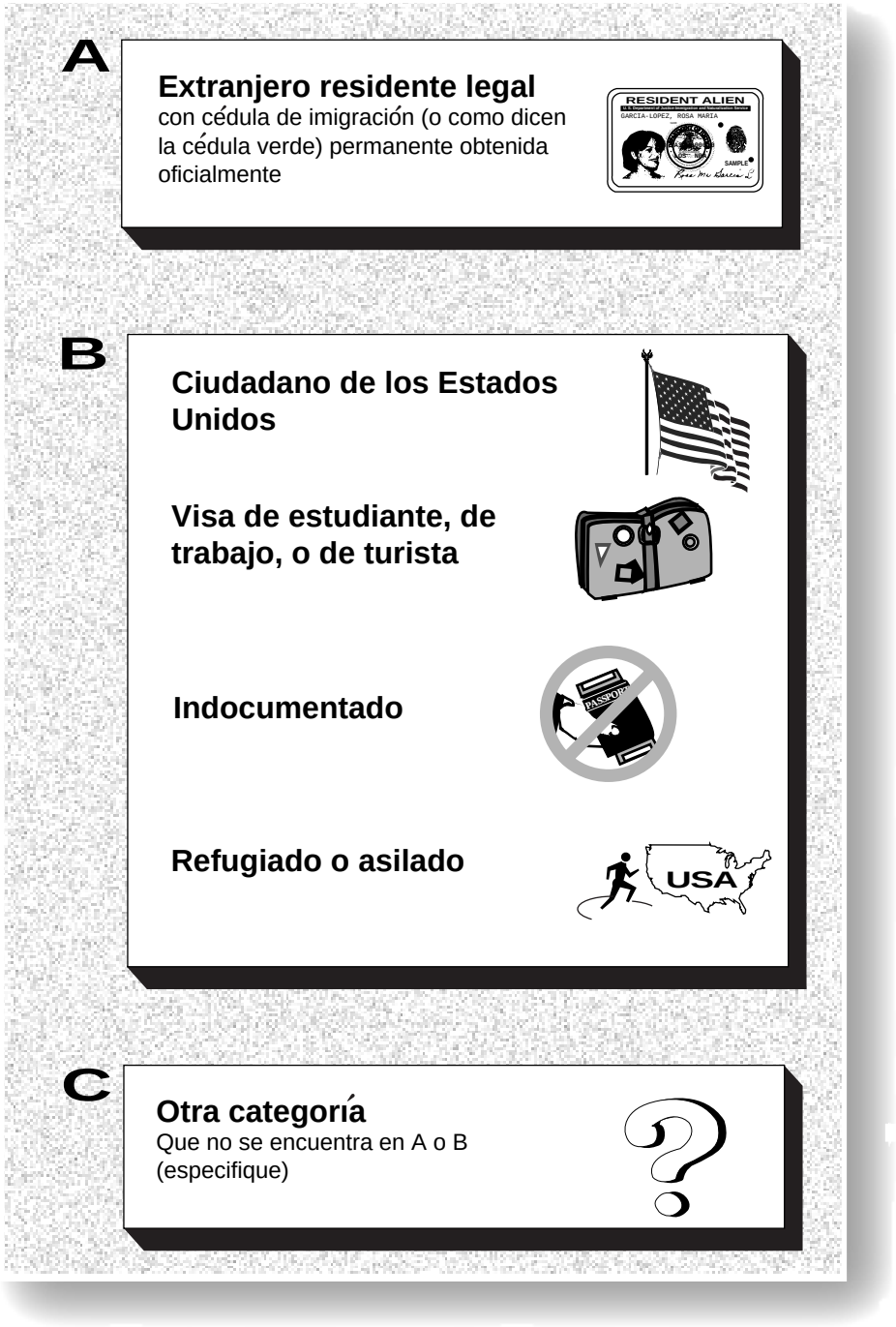
Source: GAO. (The actual size of card is 8-1/2” by 11.”)

Figure 2.2: Introductory Card With Modes of Transportation



Source: GAO. (The actual size of card is 8-1/2" by 11.")

Figure 2.3: Early Version of Legal Status Card



Source: GAO. (The actual size of card is 8-1/2” by 11.”)

The contractor field-tested these cards and related questions from November 1997 to February 1998.[14] The 81 interviews by four interviewers were conducted at multiple sites in six states (Arizona, California, Florida, Georgia, Kentucky, and Texas). All respondents were interviewed in Spanish. The final portion of the field test consisted of our debriefing the Aguirre interviewers.

The reaction of some respondents to specific icons suggested there was a need for focus groups or other qualitative work aimed at evaluating and possibly revising the icons. For example, interviewers reported that some respondents thought the icons were childish and unnecessary, and even that the card was unnecessary because they had understood the verbal instructions and felt that they did not need help.

Methodology for Phase 3: Cognitive Interviews

Phase 3 consisted of two sets of formal cognitive interviews with small samples of respondents. Cognitive interviewing is a method that focuses on the mental processes of the respondent while he or she is answering the survey questions.[15] The cognitive model asks

- What does the respondent think the question is asking?
- What do specific words and phrases in the question mean to the respondent?

For the three-card research, the model also asks

- What do the icons in the survey material mean to the respondent?

A variety of methods are used in cognitive interviews. The research protocol we developed included scripted retrospective probes (questions) and a vignette. In the former, the respondent is asked standardized questions about the difficulty and sensitivity of survey items in a debriefing session following completion of the formal questionnaire. The vignette is designed to provide information about the respondent's decision-making process in making a judgment about a hypothetical situation.

The respondent is asked several scripted questions during a debriefing at the conclusion of the survey questionnaire. Three questions were

[14]Nine slightly different forms of the three-card question series were tested. The contractor tested each form using nine different respondents—for a total of 81 interviews. Consistent with the NAWS procedures, farmworker respondents were paid $10 cash as an incentive to participate.

[15]The source materials upon which we based our work include DeMaio, et al., 1993; Polivka and Rothgeb, 1993; and Willis, n.d.

developed for each icon, as follows. First, the interviewer asked: "Do you think that anyone would have difficulty recognizing the (first, second, etc.) category in (Box A, B)?" Next, the interviewer covered the written label for each icon on the card and asked, "What does this icon mean to you?"[16] Lastly, if the icon did not convey the intended meaning, the interviewer asked, "How can we change the icon to make the intended meaning more clear?"

Cognitive interview research is an iterative process in which the findings on problems identified in each set of interviews are used to modify the questions to be tested in the next set of interviews. Because each research interview provides a great deal of information about the mental processes utilized by the respondent, a relatively small number of cognitive interviews is required in this type of research.

One of our pretest interviewers, who is bilingual in English and Spanish, conducted the cognitive interviews after training by another of our staff, who is a cognitive interviewing expert with knowledge of Spanish and who also participated in the actual interviews. The cognitive interviews were conducted in two sets: The first four respondents were adult males from El Salvador, Bolivia, Mexico, and the Dominican Republic.[17] Following these interviews, materials were revised. The second set of four cognitive interviews, using the revised survey materials, was conducted with four additional respondents in the same location. Two of these respondents, one female and one male, were Salvadoran; the other two, one female and one male, were from Peru and Nicaragua, respectively.

All of these interviews were conducted at an employment and training facility sponsored by a local, church-based organization (Hispanic Outreach Center). The center has a reputation in the community as being supportive of immigrants, offering legal and material assistance (e.g., food) to local residents.

[16]The need for icons that convey the conceptual categories without written labels is because not all Hispanic adults are literate in Spanish. Results of the March 1995 Current Population Survey showed that about 11 percent of Hispanics age 25 or older had less than a 5th grade education.

[17]App. IV contains a chart that includes demographic characteristics of the Hispanic respondents interviewed at the suburban Maryland Employment Center between Sept. 1 and 3, 1998.

Limitations of Results

The results of this work are, by definition, limited to the Hispanic groups we interviewed.[18] We also note that it is particularly difficult to generalize about respondent perceptions of question sensitivity, as such perceptions logically depend on many variables. (These would include the setting of the interview, the level of trust inspired by the particular interviewer, the social or political climate prevailing at the time a survey is conducted, and possibly other factors.) Finally, levels of respondent comprehension, acceptance, and sensitivity all depend on the specific instruments used, and it is possible that future developmental work can yield improvement. Moreover, results may vary depending on whether the method is used to estimate legal status among foreign-born persons or whether it is used to estimate a different sensitive item in a different population.

For all these reasons, as stated in our 1998 report (GAO/GGD-98-164), additional development and testing would be needed before using the three-card method in a large-scale national survey.

[18]As noted at the outset of this chapter, we did not attempt to cover Asian, African, or European immigrants. Moreover, the Hispanics we interviewed generally did not include professionals or semiprofessionals, and they probably overrepresented new arrivals and undocumented workers.

Results of Preliminary Development and Testing

As explained in the previous chapter, our development and testing effort consisted of three forms of research—pretests, a field test with farmworkers, and subsequent cognitive interviewing to correct problems identified in the field test. We recognize that these forms of research cannot indicate whether respondents provide accurate answers. A validity study would be needed for such an assessment, and none has been conducted.[1] However, preliminary development and testing has provided some relevant information.

Logically, the three-card method's potential to elicit accurate responses on legal status depends on whether respondents

- comprehend and accept the three-box format for answering a question;
- generally view the icons as appropriate (because we believe the icons are essential aids to some respondents' comprehension);
- comprehend the various legal status categories, as represented by words and icons; and
- perceive the three-box question on legal status as sensitive—and if so, whether they are nevertheless willing to answer the question and, indeed, choose a box containing the sensitive item.[2]

Our preliminary development and testing has provided some information on each of these four points.

As detailed below, most respondents appeared to comprehend the three-box format for answering; and they also appeared to accept this answer format at face value. Respondents found the final version of the icons to be appropriate for adults. With respect to comprehension of the legal status categories and related icons, the final version of the instruments seemed to communicate effectively—although some further improvement of specific icons may be possible.

Over the three phases of research, perceptions of the sensitivity of the legal status question were mixed, but no respondent refused to answer it, and two-thirds picked Box B (which includes the sensitive item). In the cognitive interviewing phase, five of eight respondents identified the legal

[1]One possibility for a validity study would be to survey the clients of legal aid clinics that specialize in immigration law, with the cooperation of clinic administrators. The administrators (who are bound by confidentiality) could determine whether each client had chosen the correct box. To safeguard client privacy, the clinic administrators would disclose the percentage of clients who incorrectly chose Box A—and also the percentage who incorrectly chose Box B (if any)—but no specific individual results.

[2]Sensitivity is also of interest from a survey planning point of view. For example, sensitive questions would probably not be "piggybacked" onto a general purpose survey.

status question as sensitive but all picked Box B. Based on these results, we believe that further development and testing efforts are justified.

Results on the Three-Box Answer Format

In the pretests and the field test with farmworkers, the three-box format was used for the second introductory card (modes of transportation) and for legal status card 1. In the third phase, the three-box format was used for both introductory cards and for legal status card 1.

In the initial pretests, most respondents appeared to understand the three-box answer format. But two needed more specific instructions. One respondent, in particular, alerted us to the need for improved instructions: When using the transportation card, she did not seem to understand the logic of the boxes. We therefore revised the instructions for the three-box transportation card to more specifically describe the logic of the three-box format and to emphasize to the respondent that we were interested only in **which box** he or she was in—not any specific category. We also added assurances, just before asking about legal status card 1, that our purpose was **not** to identify any individual person who may be an illegal immigrant.

Subsequently, in another pretest location, two respondents, who were administered the questionnaire together, appeared to understand the logic of the three-box cards, but falsely claimed to be in Box A of legal status card 1. Box A contains the green card category, and in debriefing, both respondents admitted to being illegal aliens. They explained that they had picked Box A because they wanted to have a green card. We therefore revised the instructions for the legal status card by adding the following statement: "We are only interested in **which BOX** you are in **right now**—and **not** a box you **want** to be in, or have applied to be in, in the future. So . . . are you actually in Box A, B, or C right now?" The revised wording also emphasized (even more strongly than before) that we did not intend to identify any particular category in Box B.[3]

In the field test, no problems surfaced with respect to comprehension of the instructions for the three-box answer format (phase 2). That is, interviewers did not report problems of this type in the debriefing sessions.

In the cognitive interviewing (phase 3), the first introductory card (showing types of houses) used a three-box format, and most respondents

[3]Also, on six of the nine forms of the field-test instrument, we added a follow-up question that provided respondents who chose Box A on the legal status flashcard with an opportunity to change their answers, asking them to "Please recheck Box B carefully, because some people pick Box A by mistake" (see app. II).

answered by pointing to a specific type of house within Box B. However, by the third card (on legal status), one respondent appeared not to understand the task; he pointed to the specific undocumented category, instead of just indicating Box B. But before being asked about his legal status, this respondent had volunteered to the interviewer that he was undocumented.[4] Thus, there is some question as to whether he misunderstood the task or not. It may be that some further testing or revision of the instructions is needed to ensure that every respondent fully comprehends the task.

Interviewers in the initial pretests did not report any respondent questions about why three boxes were being used. Similarly, in the in-depth debriefing sessions following the farmworker field test, interviewers did not report having to provide special explanations about why the three-box format was used.[5] Because respondents did not raise questions about the use of the three-box answer format, they did not appear to have a problem with it. Therefore, specific questions on acceptance of the three-box format were not included in the cognitive interviewing. However, future cognitive work might be designed to learn how respondents perceive the three-box format.

Results on the Appropriateness of Icons

The initial pretests did not indicate problems with the appropriateness of the icons. However, the field test with farmworkers produced mixed results. Some interviewers had positive comments about the icons,[6] but others reported that some respondents viewed the icons as childish and unnecessary—and even that the cards were unnecessary because the respondents felt they had understood the verbal instructions and thus did not need help.

Some field-test interviewers indicated that the major problem seemed to be the first introductory card, which featured appliances. (The appliance card is a simple card that was intended to familiarize respondents with

[4]If this respondent did not understand, he may not be typical because his first language was neither Spanish nor English, but was a South American Indian language, and the interviewer believed that this respondent had not been paying careful attention.

[5]The debriefing sessions did not include a question that specifically asked whether respondents had asked about why the three-box format was used. However, repeated questions asked interviewers to report problems that respondents had or other information on respondent reactions to the cards.

[6]The Florida interviewer in the field test reported that some respondents said they found the icons (pictures) on the cards useful. The California interviewer indicated that respondents with less education tended to like the card more than those with more education—perhaps reflecting reactions to the icons.

icons and cards before introducing the three-box format. The appliance card is shown as fig. 2.1. in ch. 2.)

To improve the appropriateness of the icons, we decided to change the subject matter and design of the first introductory card. In preparation for the first set of cognitive interviews, we developed a new introductory card to replace the appliance card. The new card showed different housing categories; the housing categories and icons were grouped into three boxes. (The final version of the new introductory card featuring types of homes is shown in fig. 1.4 of ch. 1.) The respondent was asked to indicate which box contained the type of house he or she lived in at age five.[7]

Changing the first introductory card meant that now both introductory cards would be training cards, in which respondents could practice answering by selecting a box, rather than by indicating individual items or categories.[8] The transportation card was retained in the same form as in the field test (see fig. 1.5 in ch. 1). The icons on the legal status card were revised as described in the following sections.

In our debriefing we asked about icons for each card, taken as a whole, as follows: "Do you think that the icons on this card are appropriate for adults?" All considered the icons appropriate for use with adults.

Results on Legal Status Categories

From the outset, icons were used to aid respondents' comprehension of legal status categories. In phase 3, to further enhance comprehension of these categories, we added a more detailed introduction to legal status card 1, in which the interviewer gave a verbal summary of the written descriptions of the various immigration categories represented by the icons. This was to ensure that respondents with limited Spanish literacy would be provided with the information written under the various immigration categories.

[7]One respondent pointed out that some respondents who, as children, had lived in a "campo" (hut) might find the housing question sensitive or embarrassing. An alternative would be to ask instead about the type of house that the respondent believes is most typical for families in their home country.

[8]The new introductory card, on house types, was pretested for acceptability of the icons before being used in the formal cognitive interviewing. On Aug. 25, 1998, interviews on this card were conducted in Spanish with four Hispanic respondents, one Nicaraguan and three Salvadoran, at a Hispanic Community Center in Silver Spring, MD. All four found the icons on this card appropriate for adults, and all could recognize the type of house from the icon alone. They suggested changing the name for the rural dwelling category from "casa de compagña" to "casa de campo." Respondents also suggested adding a thatch roof to the rustic house. We drew a thatch roof on the rural house icon and changed the name of this house type from "casa de compagña" to "casa de campo."

The Green Card Category: Box A, Legal Status Card 1

Box A of legal status card 1 contains the category "legal permanent resident" with an icon consisting of a picture of a green card. The respondent's crucial task in picking a box is determining whether or not he or she belongs in Box A. Problems in the wording of Box A cropped up in the field test and were addressed in the cognitive interviews.

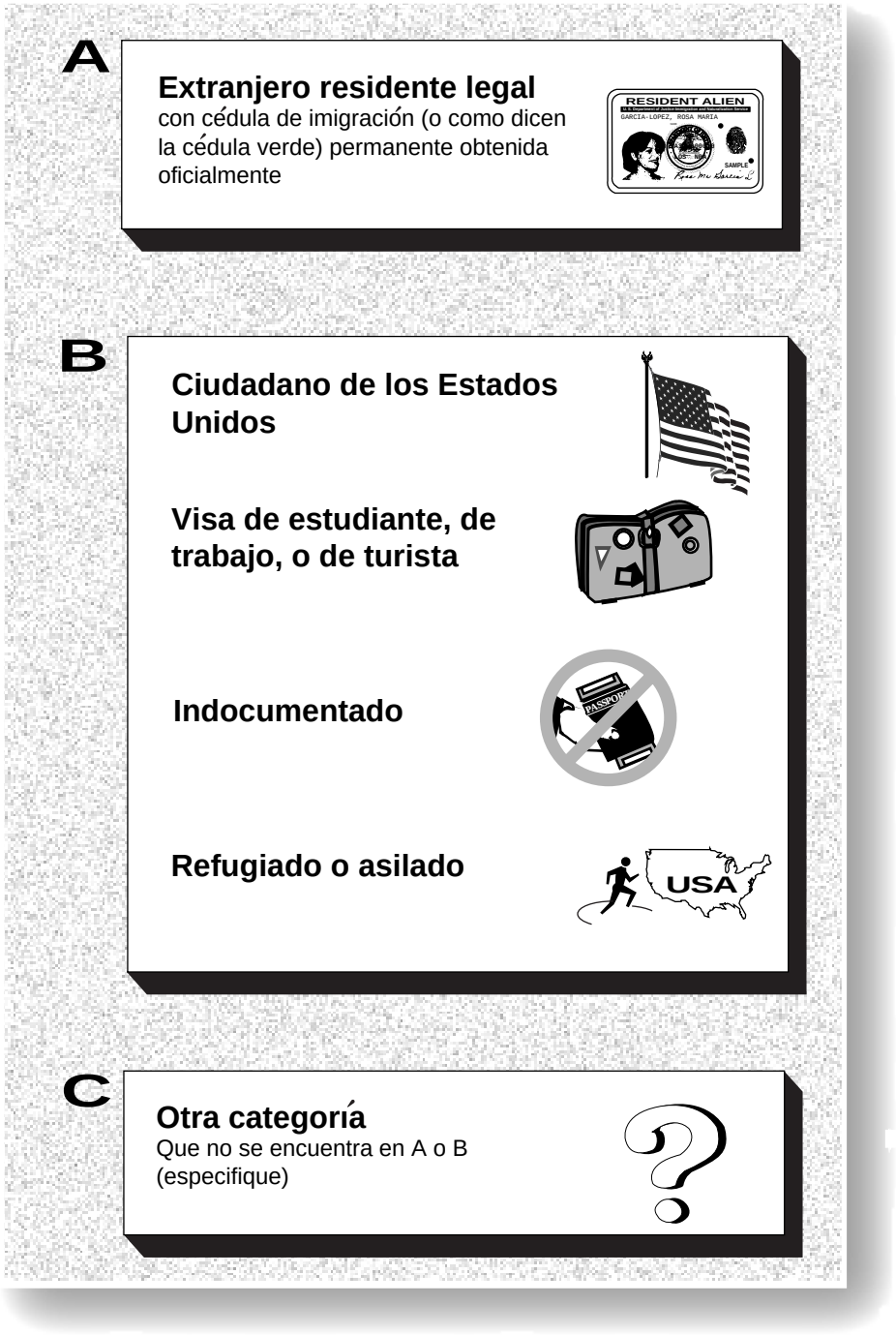
Specifically, in the field test with farmworkers, most respondents did not appear to be confused about which box to choose, but a few respondents were uncertain—at least initially. These respondents told interviewers that they had fake green cards or had borrowed a green card from someone—or had "border-crossing cards"[9]—and that they were unsure whether or not Box A might apply to them.[10] (Fig. 3.1 shows the version of legal status card 1 that was used in the cognitive interviews. This is the same card that was used in the field test.)

Interviewers had been trained to help respondents, when necessary, by restating or paraphrasing questions and providing explanations. With help from interviewers, all 81 field-test respondents were able to pick a box. No respondent was coded "not sure." In fact, all chose either Box A or Box B. None were coded Box C. Nevertheless, it was unclear whether every respondent who selected Box A was indicating that he or she actually possessed a green card issued in his or her name.

[9]The term "border crossing identification card" means "a document of identity bearing that designation issued to an alien who is lawfully admitted for permanent residence, or to an alien who is a resident in foreign contiguous territory, by a consular officer or an immigration officer for the purpose of crossing over the borders between the United States and foreign contiguous territory in accordance with such conditions for its issuance and use as may be prescribed by regulations." 8 U.S.C. 1101(a)(6).

[10]In addition, one farmworker who could not read English or Spanish had a difficult time deciding in which box he belonged; he repeatedly stated that he had married a U.S. citizen and finally chose Box A.

Figure 3.1: Legal Status Card Used in the Cognitive Interviews



Source: GAO. (The actual size of card is 8-1/2” by 11.”)

Rewording the Green Card Item

In the field test instruments, the green card category in Box A was labeled (translating from the Spanish that appeared on the card): "Legal foreign resident with a certificate of permanent immigration (also known as the green card) obtained officially." This definition allowed some ambiguity, and therefore, before conducting the cognitive interviews, we reworded it as follows (again translating from the Spanish that appeared on the card): "Legal foreign resident with a valid and official card (also called green card) issued for this person by the U. S. Government." The cognitive interviewing then tested whether this version communicated effectively.

Testing the Reworded Item

Specifically, the cognitive interview included a vignette designed to provide information on the decision-making process used by respondents for including an individual in the revised green card category in Box A. Respondents were asked their opinion about whether a person who possessed an official green card that he or she had borrowed from a friend or relative belonged in that category.

In the first set of interviews, the wording of the one-sentence vignette proved to be awkward to read and difficult for the respondents to understand. But after the interviewer paraphrased the vignette, each of the respondents understood and answered the vignette without difficulty. All four stated that an immigrant who possessed a **borrowed** official green card did **not** belong in the legal permanent resident category in Box A.

With respect to the icon for this category (picture of a green card), one respondent suggested enlarging it somewhat for greater visibility. We made this change. We also reworded the vignette for the second set of cognitive interviews.

The revised vignette was readily understood. As was found in the first day's interviews, all four respondents stated that an immigrant with a borrowed official green card did not belong in the more explicitly defined Box A green card category.

Other Categories: Box B on Legal Status Card 1

The farmworker field test yielded criticisms of some of the legal status icons in Box B. More importantly, some field-test respondents told interviewers that the icon for refugees (which shows a person running toward the United States) appeared to them to represent an undocumented worker running away from U.S. Border Patrol or other law enforcement officers. The icon for student, worker, or tourist visa—a suitcase with various stickers—was also viewed as problematic. Additionally, one of the interviewers recommended replacing the icon for

the undocumented category with a picture of a green card with a diagonal line through the card.

We changed each of these Box B icons as part of the preparation for cognitive interviewing. To better represent the idea of someone fleeing danger by coming to the United States, we added a symbol for an explosion behind the running figure and had the figure's arms stretch forward with his hands touching the map of the United States. We also developed a new icon for the undocumented category using the same green card image as appears in Box A, but drawing a circle around it and a diagonal line through it. In addition, the original icon showing a suitcase with stickers was replaced by the plainer suitcase icon that is routinely used in transportation terminals.

In the first set of cognitive interviews, the new icon for a suitcase was identified as such by the respondents, as was the new icon for the undocumented category. But only one of the four recognized the refugee or asylee category from the icon alone. Two respondents perceived the figure either as a refugee being pushed away by the map of the United States or holding the map up—or as a terrorist.[11] One respondent recommended that the arms of the fleeing figure in the refugee or asylee icon extend into the map of the United States, thereby dispelling the perception that the figure was either holding up the map, or was a terrorist being forced away from the country. One respondent did not interpret the drawing as showing an explosion.

Before the next set of cognitive interviews, we made a number of changes to the cards. The size of the green card was increased in the two icons using this image. The fleeing figure in the refugee or asylee icon was changed to two fleeing figures, thereby increasing the suggestion of many persons fleeing to safety. The drawing of the explosion was enlarged and the word "Boom" added to the middle of the image. This style of drawing is used in *fotonovelas*, vividly illustrated pictorial storybooks similar to U.S. comic books, which are popular among Hispanic adults.

In the second set of cognitive interviews, all four respondents recognized the concept of refugee or asylee from the icon alone.

Cognitive debriefing revealed that, although the respondents understood the concepts symbolized by the flag (citizen) and suitcase (temporary visa

[11]Two U.S. embassies had been bombed by terrorists in the previous week, making headlines in the news media.

status), there was nothing inherent in the flag or the suitcase to represent citizenship or temporary visa status. While it is true that interviewers can explain the icons for respondents who still experience some uncertainty, further cognitive work might improve the recognizability of the icons without the interviewer's help.

Results on Sensitivity of the Legal Status Question

None of the 116 foreign-born Hispanics interviewed across all three phases, refused to answer when using the three-box format, and 81 (about 70 percent) chose the box (Box B) that included a sensitive category. However, a number of respondents perceived the question as sensitive.

In the field test with 81 farmworkers, 30 picked Box A—that is, claimed to have a valid green card.[12] The remaining 51 respondents (63 percent) selected Box B, which contained the undocumented worker category. The population of foreign-born farmworkers is thought to contain few naturalized citizens, few refugees, and very few workers here with temporary work visas.[13] Thus, we believe that most of the farmworkers who selected Box B were probably working without legal authorization.

There were apparent differences in how sensitive the legal-status question appeared to various respondents.[14] Although the field test did not include specific questions on sensitivity, interviewers reported their impressions, and these showed considerable variation, as follows:

- At some locations, there were instances where respondents voiced hostility, seemed to identify the survey with INS, or initially mistook the interviewer for a tax collector. Notably, in Florida, where the interviewer's impression was that all respondents were illegal, respondents reportedly appeared fearful of INS and nervous about the survey, and some respondents at first hesitated to select a box. Nevertheless, all Florida respondents picked Box B.

[12]Each field-test respondent who selected Box A was able to identify a specific category or program under which he or she obtained a green card. Most of these (19 out of 30, or about 63 percent) said they had obtained their green cards through the amnesty under the Immigration Reform and Control Act of 1986 (P.L. 99-603), which included provisions for Seasonal Agricultural Workers.

[13]During 1994-95, only about 3 percent of this population claimed to be naturalized citizens (Mines et al., 1997), and very few are here on legal temporary farmworker visas. For additional related work in this area, see GAO/HEHS-98-20, Dec. 1997. About one million farmworkers acquired valid green cards through the amnesty under the Immigration Reform and Control Act of 1986, although many of them have now moved to other types of work.

[14]We believe the fact that respondents were not afraid to pick a box containing the sensitive item justifies further development and testing. In particular, a validity study would address the issue of possible systematic bias in the responses.

- At other locations, respondents appeared to be relaxed, and some even volunteered to the interviewer that they were here illegally. In Arizona, California, and Kentucky, interviewers reported that respondents did not appear to find the question on legal status intrusive.

By contrast to the field test, the cognitive interviews specifically asked each respondent about the sensitivity of the legal status question. That is, a two-part question on the sensitivity of each three-box card was asked at the end of the cognitive interview, as follows: "Do you think that anyone would find the question for this flashcard to be sensitive? If yes, why is that?"

In the first set of cognitive interviews, two of the four respondents stated that the question on immigration status was not sensitive because the question was asked in an indirect manner. The other two indicated that some would find the question sensitive. One said this was because legal status is confidential information, and some people would not want to be asked about it. The other respondent said that people do not want to tell the truth about their legal status. (Yet this respondent had volunteered that he was "undocumented" early in the interview.) All four respondents in this set of interviews chose Box B, which includes the sensitive item.

In the second set of interviews, one of the four respondents did not find the question about immigration status sensitive; the other three did report sensitivity associated with this question. One respondent said that people would be fearful of being turned in to the INS. Another said the question is sensitive because the majority of foreigners he knows are undocumented, and they would not want to answer this question. A third respondent reported that it is not a bad question, but there are some people who would find it sensitive.[15] Again, however, all four respondents chose Box B.

[15]The interviewer's impression is that this respondent was a U.S. citizen who believed that undocumented persons would find the question sensitive.

Estimating Other Sensitive Items With the Three-Card Method

The three-card method was originally applied to a personal characteristic (immigration status). This chapter explores whether the technique might also be applied to various sensitive behaviors and practices. These include

- violence;
- sensitive personal choices;
- business and tax issues; and possibly,
- government workers' noncompliance with important reporting requirements or with certain other laws and regulations.

Logically, the three-card method is relevant to any sensitive topic where (1) answers can be categorized in a set of mutually exclusive and exhaustive categories, (2) one of the answer categories is sensitive, and (3) the sensitive category is not too rare—at least not within a defined survey population.

This chapter provides illustrations of how the three-card method might be applied in each of the areas listed above. However, we caution the reader that these illustrations are, for the most part, the result of brainstorming. They have not been subjected to empirical development or testing and are merely intended to be suggestive of possibilities.

Some of the areas discussed are more sensitive than others, and we also note that, logically, the more sensitive the topic, the greater the need to couple the three-card method with assurances of anonymity—such as administering the technique via pen-and-pencil "secret ballots" rather than in a personal interview situation.

Violence

Violent behaviors that the three-card method might be used to estimate include road rage and other "anger responses," such as spouse abuse.

Road Rage

A survey of road rage among young male drivers might first ask drivers about incidents (e.g., being cut off) that angered them during a specified period (past year, past 5 years) and then ask how they reacted the time they expressed the most anger.[1]

[1]For the driving population as a whole, road rage expressed in "physical confrontation" within the past 5 years is estimated at 4 percent. (This statistic is from a 1997 Gallup poll, in which respondents who drive were asked if they had "honked horn," "shouted," "slowed down," "flashed high-beams," or engaged in "verbal exchange" or "physical confrontation." See Gallup Poll Monthly, No. 383 (Aug. 1997), p. 60). We would anticipate that levels of physical confrontation would be considerably higher among young male drivers than in the driving population as a whole.

The sensitive answer category would involve physical actions by the respondent—such as attempting to force the other driver off the road; getting out of the car to accost the other driver at a stop light; brandishing a weapon; or becoming involved in actual physical contact, such as shoving. The less sensitive categories might include

- did nothing, muttered under one's breath, or made remarks to passengers in one's car;
- honked horn or flashed lights at the other car (but did not yell or gesture); and
- yelled or gestured angrily at the other driver.

Drivers would specifically be told that we are interested in the category that represents their most extreme anger response. The categories could be arranged on a card with one of the less sensitive categories in Box A and the rest of the categories in Box B. Box C would represent some other response (not included in Box A or Box B).

Using a multicard, multisample approach, direct data would be separately collected on each of the less sensitive categories; then an indirect estimate of the most sensitive category would be obtained by subtraction.

Other Violent Behaviors

Spouse abuse and child abuse—as well as police brutality and elder abuse in nursing homes—are areas where survey questions might be framed in a similar fashion to the road rage questions described above. For example, a survey of police officers might ask them about suspects or perpetrators who angered them during the past year and ask about their most extreme anger response. Less sensitive categories would include ignoring the provocation, going by the strictest rules, speaking harshly to the suspect, and so on. The sensitive category would involve some form of physical abuse.

It also might be possible to use this approach to study high school students' responses to other students who anger them.

Sensitive Personal Choices

Sensitive personal behavior choices—such as abortion or drug use—might also be studied using the three-card method.

Abortion

Though legal, abortion is a sensitive topic for many women. Some who have chosen to terminate a recent pregnancy might deny ever having been

pregnant—or might report on the outcome of an earlier pregnancy.[2] A three-card approach might be used to make the question less threatening.

For example, in asking about the outcome of the respondent's most recent pregnancy, one option would be to define answer categories such as hospital birth, home birth, miscarriage, unavoidable termination for medical reasons, and abortion (for nonmedical reasons).[3] The less sensitive categories would appear in Box A of alternate cards, and the percent whose most recent pregnancy ended with an abortion would be calculated indirectly.

Marijuana Use

A simple direct question on current (past month) marijuana use is potentially sensitive.[4] One alternative would be to use the three-card method to estimate past-month marijuana use—in conjunction with estimating use of less sensitive substances (such as beer, wine, and hard liquor).

Here, the less sensitive categories might be

- drank beer or wine but no hard liquor and no marijuana,
- drank hard liquor (with or without beer or wine), and
- no use of alcohol or marijuana.

Each of the less sensitive categories would appear in Box A on alternative cards and the sensitive category—marijuana use (with or without alcohol use)—would be estimated indirectly.

Business and Tax Issues

There are many illegal, disapproved, or sensitive business and tax practices. Examples include manufacturers' disposal of hazardous wastes and the failure to file tax returns.

Disposal of Hazardous Wastes

It might be possible to develop a survey of manufacturers in an industry that routinely deals with hazardous materials. The sensitive category would be the illegal disposal of specific hazardous wastes. The less

[2]Researchers have found that underreporting abortion "is a persistent problem in studies conducted in the United States and elsewhere, irrespective of the research design or study population" (Udry et al., 1996). These same researchers point out that the underreporting of abortion also causes biased estimates of contraceptive failure, miscarriage, and reproductive histories that rely on self-reports.

[3]A different set of categories would be birth of a girl, birth of a boy, multiple birth, miscarriage, unavoidable termination for medical reasons, and abortion (for nonmedical reasons).

[4]This potential sensitivity may be heightened in certain circumstances, such as a workplace survey of employees or a survey of military personnel, or, students at the service academies.

sensitive answer categories might include disposal of the specific hazardous wastes

- in all instances using a contractor;
- partly using a contractor and partly self-disposal in accordance with EPA guidelines; and
- in all instances, self-disposal in accordance with EPA guidelines.

The sensitive category would encompass all direct forms of illegal dumping by the manufacturer. An actual application of the method would have to be developed by working with persons knowledgeable in this area.[5]

Failure to File Tax Return

Tax nonfiling is difficult to estimate for self-employed persons. To create a number of less sensitive categories, the act of filing or not filing might be combined with asking about the type of return filed and who prepared the return. The less sensitive categories might be

- my spouse prepared a joint return for us, which has been filed;
- I prepared a joint return for myself and my spouse, and it has been filed;
- I prepared my own return, and filed it as an individual; and
- a tax preparer prepared the return (individual or joint), and it has been filed.

The sensitive category would be: I have not sent in a return for last year.

Government Workers' Noncompliance

The extent to which certain government employees—at federal, state, and local levels—fail to comply with reporting requirements or various other laws or regulations is of interest from a managerial or oversight point of view. For example, it would be desirable to monitor whether certain types of noncompliance rise above threshold levels, thereby signaling the need for remedies such as agency-wide ethics training.

In more serious instances, prevalence data might—if available—help define the kinds of investigative approaches that would be most appropriate. (For example, in defense-related work, such data might help determine whether or not widespread polygraph tests should be required for scientists working at government laboratories.)

[5]Separately developed cards—with different categories—might be used for surveys of trucking companies that remove hazardous wastes from manufacturers in the relevant industry and landfill, incinerator, or other companies that receive and dispose of the relevant wastes.

In the following sections, two examples explore whether noncompliance might be asked about by using the three-card method in anonymous surveys of government workers.

Failure to Report Offers of Bribes

Police officers and certain other government workers (for example, at the federal level, e.g., those working for the Customs Service, the Border Patrol, or the Postal Service) may be expected or required to report offers of bribes or incentives that might be offered in hope that the official would overlook certain occurrences (such as illegal imports or the possession of illegal substances). At some agencies or departments, regulations or laws require employees to report all bribery attempts.[6]

It might be that a technique such as the three-card method would facilitate asking about government workers' compliance or noncompliance with these reporting requirements. One possibility might be to define the sensitive category as having failed to report an offer of an inducement—within a specified time period. The less sensitive categories might refer to

- having been offered inducements both on duty and off duty, and reporting all cases;
- having experienced one or more such occurrences while on official duty **only** (no similar occurrences while off duty), and reporting all cases; and
- having experienced one or more such occurrences while off duty **only,** and reporting all cases.

Violations of National Security

Turning to the area of defense-related government work, in the fall of 1999, concerns surfaced about U.S. scientists' contacts with foreign agents and the possibly unauthorized passing of information by federal employees. These concerns were aired before Congress (Loeb, 1999; and Pincus and Loeb, 1999).[7] Currently, the charged atmosphere might prevent any attempt to conduct a survey of unauthorized exchanges of information—even if perceived as minor or as justified in the particular instance. However, in the future, if a technique such as the three-card method were used to survey these workers, the sensitive category might be defined as "gave some unauthorized information to a foreign national—**not** as part of an authorized U.S. counterintelligence operation."

The less sensitive categories might indicate whether the employee

[6]For example, U.S. Postal Service employees are required to report any bribe or attempted bribe, "undue influence or coercion to induce or attempt to induce the employee to act or neglect to act in regard to his official responsibilities." 39 C.F.R. 447.61.

[7]These issues concerned certain Department of Energy national laboratories.

- had been approached by a foreign national seeking unauthorized information, but did not provide it;
- had been approached by a foreign national, and—as part of an authorized operation—gave out information provided by U.S. counterintelligence; or
- had not been approached by a member of a foreign intelligence service.

Again, all categories would be linked to a specific time frame (e.g., within the past 5 years).

Challenges and Potential Solutions in Using the Three-Card Method in a Large-Scale Survey

Often, surveying a new subject or topical area or using a new method requires considerable development and cost—as well as ingenuity—but the payoff can be improved information for the policy-making process. Assuming that a specific application of the three-card method is fully tested, validated, and deemed appropriate for use in a large-scale survey, a number of challenges would apply. These challenges include

- obtaining reasonably low-cost (efficient) interviews that include flashcards;
- efficiently screening for members of key populations (e.g., foreign-born persons, young male drivers);
- efficiently estimating three-card items despite the need to draw three different samples and to estimate the sensitive item indirectly;
- avoiding nonresponse bias across the three samples; and
- dealing effectively with issues involved in surveying special groups, such as the foreign-born.

Interviews Using Flashcards

Thus far, all development and testing of the new method has been conducted in person, in face-to-face interviews. Personal interviews are considerably more expensive than telephone interviews. But we believe the flashcards are essential, and therefore that the three-card method is not appropriate for a telephone survey.[1]

Adding a three-card format to an ongoing, in-person survey could be much less expensive than conducting a new in-person survey.[2] The three samples could be selected for the three-card portion of the interview only. But because piggybacking onto an existing in-person survey may not always be an option,[3] other potential low-cost alternatives should be considered. Three alternative strategies are as follows:

- group administration, which has been used to survey high school students, for example;[4]

[1]We believe that the visual display of the boxes and the combination of categories in Box B is essential. The reason is that this helps convey the privacy protection to respondents ("If you're in Box B, we **do not** want to know which category applies to you.")

[2]Some existing national surveys are conducted exclusively face-to-face. One example is the National Health Interview Survey, which involves about 100,000 in-person interviews each year. Certain other large-scale surveys conduct only a portion of their interviews face-to-face, and this creates a problem for the use of cards.

[3]Sponsors of the ongoing survey might not wish to add a somewhat sensitive question series.

[4]See "The Monitoring The Future Study, 1975-1997," a survey of drug use among secondary school students (Johnston, O'Malley, and Bachman, 1998).

- mail surveys; and
- Internet surveys where a computer screen displays the equivalent of a three-box card, have been conducted with certain populations. Of course, many households are not connected to the Internet, so for general population surveys a feasible option could be a dual-frame or dual-mode survey involving the use of personal interviews where computers are not available.[5]

Applications such as these—which do not involve answering aloud—might have an added advantage in encouraging more truthful responses to sensitive items.[6]

It seems likely, however, that many applications **would** require a new in-person survey, because the cards are essential and the options outlined above may not be feasible. In these instances, the cost of a new large-scale in-person survey would be considerable.

Screening for the Relevant Subpopulation

Some sensitive items are relevant only to a specific subpopulation; e.g., legal status is relevant only to the foreign-born. Other sensitive items may be of most interest in a subpopulation—and rare in other groups; for example, road rage could be more relevant to young male drivers than others—possibly it might be most relevant to young males who have been ticketed for moving violations in the past 5 years.

In some cases, the subpopulation of interest might be concentrated in one specific location or a number of specific locations.[7] This could allow reasonably efficient direct sampling. In other cases, it would be necessary to first screen more general populations to identify members of the relevant group.[8]

[5]Some segments of the foreign-born population may be unlikely to own computers with an Internet connection, but other segments may be likely to have them. The Wall Street Journal recently published an article that discusses the pros and cons of doing surveys using the Internet, including methodological issues (Simons, 1999).

[6]Self-administered questionnaires and answer sheets have been associated with more accurate responses because interviewers need not know the sensitive reply. Moreover, if certain kinds of interviews are conducted in a household, answering aloud may be sensitive because other members of the household may overhear the response (see, e.g., Gfroerer, 1985, p. 22).

[7]To cite one example, a population of farmworkers with a large subpopulation of foreign-born individuals would probably be located on farms.

[8]For a discussion of alternative "sampling strategies and sources of recruitment" in surveying the foreign-born population, see Loue and Bunce (1999).

A main option here is to use an ongoing survey as a "screener" (even if that survey cannot be used to ask the three-card questions themselves). It may be necessary to "piggyback" screening questions onto the existing survey. But a special purpose—or even a general purpose—survey may already include questions that could serve to screen for the subpopulation in question.[9] For purposes of screening, a telephone survey is often as appropriate as an in-person survey. Once members of the subpopulation of interest are identified, a "linked survey" could be conducted. That is, interviewers would revisit identified households within 1 to 3 months after the main survey to ask a short set of additional questions using the three-box format.

Another option that might be relevant in certain circumstances is to use existing records. For example, it might be possible to use drivers' license records to sample young male drivers (for a survey of road rage)—or even to use records of moving violations to sample only those with moving violations in recent years.

Efficient Estimation

The direct estimate of each less sensitive category that is featured in Box A is based on just one sample (i.e., only those respondents answering the card that features that particular category in Box A). Obviously, the number of respondents in a particular sample is less than the total number of respondents in all three samples. All else being equal, the fewer respondents answering a specific item, the higher is the variance—or the margin of error—for the resulting estimate.

Variance is further increased for the indirect estimate of the sensitive item (which never appears in Box A). This is because the indirect estimate is obtained by a linear combination of the three direct estimates—and the variance is increased by **each** additional estimate (see app. I). Finally, as always, subgroup estimates (e.g., illegal residents who are male or those who are female) have a higher variance than total estimates (e.g., all illegals) because of the reduced number of qualifying respondents.

The most direct way to reduce the variance of an estimate is to increase the sample size; however, the dollars needed for additional interviews increase costs. Four efficiency-minded options—that is, strategies to reduce variance without the added cost of increasing the sample size—can potentially be used. These strategies, some of which can be used in tandem with each other, are:

[9]For example, the Current Population Survey asks about nativity; this represents a screen for foreign-born.

- using information about the subpopulation (if it is known) to stratify the subpopulation in advance;
- using a principle of "optimal allocation" to determine the relative sizes of the three samples (see app. II);
- setting sample sizes from every block or cluster in proportion to counts of the relevant subpopulations in these "blocks" or clusters; and
- obtaining some of the three-card information by inserting one of the cards in an ongoing survey.

Using a Principle of Optimal Allocation

The variance can be reduced by setting or choosing the relative sizes of the three samples based on one of the principles of optimal allocation. As background, we note that, given three samples of the same size, the variances associated with the direct estimates of Box A categories will very likely **not** be the same. (To illustrate this for legal status, the percentage of foreign-born who possess a green card is probably not the same as the percentage who are naturalized citizens.[10] This is important because, as explained in standard statistical texts, a very low or very high percentage is associated with lower variance than is one near 50 percent.) Depending on the population being surveyed, it seems likely that with equal sample sizes, some cards would be "high variance" cards and others would be "low variance" cards.

To minimize the variance associated with the indirect estimate of illegals, which is based on three direct estimates, the principle of optimal allocation we are using suggests that larger number(s) of sample cases be allocated to estimate the proportion of the population represented by the high variance cards and fewer numbers of sample cases be assigned to estimate the proportion of the population represented by the lower variance cards (see Cochran, 1977, pp. 96ff).

Setting Sample Sizes Proportional to Block Sizes

To ensure that the sampling rates of the relevant subpopulation are equal across small clusters (i.e., blocks), the sample sizes for the three surveys can be allocated proportionally to the number of people in the relevant subpopulation in each block. For example, suppose that, by using the principle of optimal allocation, the sizes of the three samples are 500, 300, and 200, respectively. Also, assume that the sample area has two blocks, the first of which has four times as many members of the relevant subpopulation as the second. Then the allocation of the three samples would be 400, 240, and 160, respectively, in the first block, and 100, 60, and 40, respectively, in the second block.

[10]For example, it may be that 40 percent of foreign-born farmworkers have green cards, whereas less than 5 percent are naturalized citizens.

Obtaining Information From Respondents in an Ongoing Survey

Even where it is not possible to use the three-card method in an ongoing survey, it may still be possible to insert a question on **one** of the cards (e.g., a portion of foreign-born respondents in a general purpose survey might be asked whether they are U.S. citizens, using a three-box card).[11] These data could be combined with the full set of three-card responses separately obtained in a different survey (perhaps a linked follow-back survey as discussed above), thus lowering the variance. Ideally, there would be tests for possible response differences between various survey modes.

Minimizing the Bias of Nonresponse

Person (unit) nonresponse could vary across the three samples, raising the possibility of noncomparability and biased estimates. This might be the case, for example, if interviewers perceived a particular legal status card as more sensitive than the others; that is, they might not try as hard to "get the interview" when assigned the card perceived as more sensitive. This possibility can be avoided by utilizing a "blind" randomization procedure, such as a sealed envelope that is opened only after contacting the respondent or after cooperation has been obtained.

If a linked "screener" survey is used, the impact of person nonresponse might be minimized through imputations based on results from the initial survey.[12] It also seems advisable to sample households that were coded as nonresponses in the initial survey; screen for target-population residents in those households; and conduct three-card interviews, as appropriate.

Turning to **item** question nonresponse among survey participants, we have thus far not encountered **any** instances of item nonresponse to the three-card questions—whether in our pretests, the field test, or the cognitive interviews. Moreover, although we have only tested one card, we believe it is the most sensitive of the three because it asks whether a respondent has a green card or not.

[11]Some national surveys currently include a question on citizenship. Chip Alexander, Assistant Division Chief for Longitudinal and Expenditure Surveys Design, Bureau of the Census, pointed out a technique of drawing the sample ("double sampling") that would minimize the variance. Essentially, this would involve piggybacking the least sensitive card onto the "screener" survey, for a subsample of relevant respondents; a follow-on survey, using all three cards in alternate samples, would be limited to those not shown a card in the screener survey.

[12]Suppose, e.g., that of 500 Mexican males who participated in the initial survey, 480 responded in the follow-up. The responses of the 20 Mexican male nonrespondents might be imputed based on (1) characteristics reported by all 500 in the initial survey, such as occupation, age, and time residing in the United States and (2) the three-card responses of the 480 Mexican males who did participate in the follow-up survey.

If a small amount of item nonresponse were to occur, it might be possible to minimize its impact by using imputation methods. However, substantial amounts of item nonresponse would affect the usability of the results.

Issues in Surveying Special Populations

There are special challenges in surveying various special populations—foreign-born persons, teens, the elderly, or other specialized groups. The foreign-born population is of special interest in this report because the initial application of the three-card method applies to that population. The problem of combating incomplete coverage of this subpopulation was discussed in our 1998 report (GAO/GGD-98-164). The following section discusses challenges in interviewing members of the foreign-born population.

Interviewing the Foreign-Born

Efforts to survey foreign-born individuals necessarily involve (1) building trust and communicating with foreign-born groups and, if using the three-card method, (2) selecting icons that are effective across diverse groups.

Building Trust and Communicating With Diverse Groups

Trust and communication are important in all surveys, and in all cases, the ability of the interviewer to establish rapport is essential. However, building trust and communicating accurately may be more challenging in surveys that focus on a special population—such as teens, the elderly, or the foreign-born. In particular, the foreign-born population seems to present a unique set of challenges because, for example, respondents and interviewers may be from very different cultures and might not speak the same language.

Logically, matching interviewers to respondents on foreign-born status and "home country" is one method of maximizing trust and communication. In Los Angeles, surveys that targeted residents from selected nations—Mexico, El Salvador, and the Philippines (DaVanzo et al., 1994; Heer, 1990, pp. 88-97; Bustamante et al., 1996)—were generally able to employ and assign interviewers to match respondents' home countries.[13] (In our field test of one Salvadoran and 80 Mexican farmworkers, the interviewers were all fluent in Spanish. Although not all were from Mexico, they were experienced in interviewing this population.)

A strategy of "matching on home country" might not be feasible for a nationwide survey covering immigrant groups from all nations of the globe. A national effort to approach the matching condition might be possible using three different tactics, as follows.

[13]These surveys apparently had some success in asking direct questions about immigration status.

- If a linked survey is used,[14] and if the initial survey identifies the respondent's home country, then recontact could begin with an explanatory telephone call, and the survey workers placing those calls from a central phone bank could be immigrants who are matched to each respondent on home country. Subsequently, an interviewer would make a personal visit. If it is known that language assistance will be required, the interviewer might carry a cell-phone and contact headquarters for help from a survey worker from the respondent's home country.
- Even if a linked survey is not used, it is possible to identify areas according to ethnic settlements and to try to provide appropriate bilingual interviewers to the extent possible. Cards and interview materials can be translated and tested in as many languages as possible.[15] All interviewers could carry cell-phones and contact a central phone-bank for help from an interviewer who speaks the respondents' home language.
- Alternatively, it might be possible to develop a self-administered version of the immigration status question. That is, instead of showing the respondent a card, the interviewer would give the respondent an "answer sheet" that looks like one of the legal status cards shown at the outset of this report. Instructions at the top of the answer sheet would tell the respondent, in his or her own language, to circle the letter beside the box that applies to him or her. The instructions would also make clear that if it is Box B, we do **not** want to know which specific category applies. This approach might be useful for immigrants who are literate in the language of their home country.

Technology can also help overcome communication barriers. Audio computer-assisted self-interviewing (ACASI) is a technology that allows for the administration of questionnaires in multiple languages—even when survey field staff are monolingual. It has been used successfully to interview older Korean immigrants who do not speak English. With this technology, "Subjects hear the questions through headphones and enter responses directly into the computer using the keyboard" (Hendershot et al., 1996, p. 165). With the latest system, the field interviewer simply plugs headphones directly into a port on the laptop (Turner et al., 1996, p. 174). Additional benefits of ACASI are that visuals can be provided and that the respondent's privacy is enhanced vis-à-vis interviewers and other members

[14]That is, if, as discussed above, foreign-born respondents are identified in an initial general purpose survey and then recontacted for questions about immigration.

[15]The pilot for the "new immigrant survey" (in which new green-card holders from various countries are interviewed) included questionnaire translations for 6 languages; interviewers speaking 11 other languages were hired (Jasso, 1999).

of the household. This can further increase the accurate reporting of sensitive items (Turner et al., 1998).

Selection of Icons That Are Effective Across Diverse Groups

Finally, the icons used on the cards deserve special attention. The cards and icons shown in earlier chapters were pilot-tested with Hispanic respondents. It may be necessary to identify icons that are more appropriate or effective for other cultures (e.g., Asian) or to identify icons that transcend cultural barriers. Only cross-cultural testing can determine this.

Challenges Differ Across Targeted Subpopulations

Because potential applications of the three-card method may involve different subpopulations (see ch. 4), it can be reasonably expected that there may be a variety of different challenges in fielding a specific survey. Interviewing a nationwide sample of foreign-born persons about their legal status, for example, might be considerably more difficult than interviewing young male drivers about "road rage." The reason is that for young male drivers, a language barrier may occur in relatively few cases. For this reason, generalizations in this area are difficult at best.

Variance of the Estimates

The statistical expression of the three-card estimator of the percent of foreign-born who are here illegally, the variance of this estimator, and the "technique effect" are shown in figure I.1. (See also GAO/GGD-98-164, July 1998.) Clearly, there are variance costs associated with using an indirect method. First, each estimate of legal status is based on one sample, rather than all three samples. Second, the indirect estimate of illegal immigrants is affected by the variance of each of the estimates that is included in its calculation. Assuming that the three samples are of equal size and that for each card 25 percent of respondents belong in Box A, the confidence interval for a three-card method estimate of illegal immigrants would be three times as large as a corresponding direct estimate. Keep in mind, however, that variance costs depend heavily upon the distribution of immigration status groups in the population surveyed and the relative sizes of the three samples.

Two examples are presented below to give the reader a flavor of what real-world precision might be.

- Example 1: In a population of foreign-born agricultural workers, the distribution of immigration status might be 55 percent illegal; 36 percent legal permanent residents; 3 percent U.S. citizens; and 6 percent temporary workers, refugees, or asylees. Assuming this distribution and a total sample size of only 1,000, allocated with 100 respondents to answer the card with U.S. citizen in Box A; 200 to answer the card with temporary visas, refugees, or asylees in Box A; and 700 to answer the card with legal permanent resident in Box A, the 95-percent confidence interval for an estimate of 55 percent illegal would be 49 to 61 percent.

- Example 2: In the residential foreign-born population of the United States, taken as a whole, the distribution might be 22 percent illegal; 30 percent U.S. citizens; 38 percent legal permanent residents; and 10 percent temporary workers, refugees, or asylees (without green cards). Assuming this distribution and a total sample size of 13,000—the approximate number of foreign-born in the Current Population Survey supplement—with 6,000 respondents allocated to answer the card with legal permanent resident in Box A; 5,550 allocated to answer the card with U.S. citizen in Box A; and 1,500 to answer the card with temporary workers, refugees, or asylees in Box A, the 95-percent confidence interval for an estimate of 22 percent illegal would be 20 to 24 percent.

We note that in the foregoing examples, the sizes of the three samples were chosen by adapting one of the principles of optimal allocation.[1] The confidence intervals in the examples would have been larger if three equal-sized samples had been used.

The formula for calculating the variance of the estimates is shown in figure I.1. To estimate the percentage of a foreign-born subgroup who are here illegally (e.g., percent of foreign-born California residents who are here illegally), calculations identical to those shown in the formula would be performed using only the relevant data (e.g., the data for all foreign-born residents of California). The variance of such a subgroup estimate would depend on the size of the sample for that subgroup and the distribution of legal status in that group.

However, to derive an estimate such as the percentage of illegal immigrants living in California implies a ratio estimate. That is, both the numerator and the denominator would involve indirect estimates of illegal immigrants (the numerator, illegal immigrants in California; the denominator, illegal immigrants in the United States). Specifically, the numerator would consist of the number of foreign-born Californians times the estimated percentage of that group who are here illegally. The denominator would consist of the number of foreign-born residents of the United States times the estimated percentage who are here illegally. Assuming that the number of foreign-born residents is known (e.g., from the census), the percentage of illegal immigrants living in California reduces to the product of two factors:

- a constant, consisting of the number of foreign-born living in California divided by the number of foreign-born living in the United States; and
- a ratio estimate—specifically, the ratio of the estimate of the percent of foreign-born California residents who are here illegally to the estimate of the percentage of foreign-born U.S. residents who are here illegally.

Deriving the variance of such an estimate is complex and beyond the scope of this paper. However, with respect to the first factor, it is clear that the constant factor tends to reduce the variance for states with relatively few foreign-born. With respect to the second factor, a formula is available (see Hansen, Hurwitz, and Madow, 1953, vol. II, p. 107). The overall variance of such a ratio may be substantial because the two estimates

[1]The key guideline of optimal allocation that we followed minimizes the variance of an estimate by assigning a somewhat greater proportion of the sample where the variance is highest—and a somewhat smaller proportion where the variance is lowest. (Optimal allocation is usually used to determine sample size for strata rather than for subsamples.)

involved in the ratio both carry variance costs. Special designs to minimize variance costs may be feasible, however, depending on the application.

Figure I.1: Statistical Expression of the Three-Card Estimator, Its Variance, and Technique Effect

Let

P_x = the proportion of foreign-born persons with illegal status

P_1 = the proportion of foreign-born persons who are U.S. citizens

P_2 = the proportion of foreign-born persons who are resident aliens

P_3 = the proportion of foreign-born persons here legally with a temporary work/study visa or as a refugee or asylee

P_1', P_2', P_3', and P_x' = direct-question estimates of P_1, P_2, P_3, and P_x, respectively

n_1, n_2, and n_3 = sample sizes chosen for estimating P_1, P_2, and P_3, respectively

$EST(P_x)$ = the indirect estimator of the proportion with illegal status

Assuming that P_x, P_1, P_2, and P_3 sum to 1.00 (i.e., that taken together, the legal categories asked about plus the illegal category are exhaustive), the indirect estimator of P_x and its variance are defined as follows:

$$EST(P_x) = 1.00 - (P_1' + P_2' + P_3')$$

$$VAR(EST(P_x)) = 0 + VAR(P_1') + VAR(P_2') + VAR(P_3') = VAR(P_1') + VAR(P_2') + VAR(P_3')$$

Further assuming, for purposes of simplicity, that $n_1 = n_2 = n_3 = 1/3\ n$ (where n is the total sample size):

$$VAR(EST(P_x)) = [(P_1Q_1)/((1/3)n)] + [(P_2Q_2)/((1/3)n)] + [(P_3Q_3)/((1/3)n)]$$

$$= (P_1Q_1 + P_2Q_2 + P_3Q_3)/((1/3)n)$$

$$= 3(P_1Q_1 + P_2Q_2 + P_3Q_3)/n$$

where Q is the complement of P

And assuming, again for purposes of simplicity, that $P_x = P_1 = P_2 = P_3$:

$$VAR(EST(P_x)) = 3[(3)(P_xQ_x)]/n = 9(P_xQ_x)/n$$

$$TECH\text{-}EFF = VAR\ (EST(P_X))/VAR(P_X') = 9(P_xQ_x/n)/(P_xQ_x/n) = 9$$

A technique effect of 9 implies a tripling of the standard error; a 95% confidence interval for $EST(P_x)$ would be 3 times as wide as for a direct estimate based on the same total n.

Source: GAO/GGD-98-164, July 1998, p. 75.

Different Forms of the Questionnaire Used in the Field Test

The 81 interviews were conducted as an add-on to the National Agricultural Workers Survey (NAWS). We used nine different forms of the three-card segment in the field test. The purposes included (1) varying certain questions used as structured probes to obtain additional information and (2) conforming to Office of Management and Budget (OMB) policy, which applies to the NAWS survey. Specifically, OMB requires a survey form to be formally reviewed if it is to be used to survey 10 or more people. We developed different forms because the review time would have exceeded our available time.

The NAWS is a survey that gathers information about farmworkers in the United States by asking them questions about their basic demographics, legal status, education, family size and household composition, and wages and working conditions in agricultural jobs. Demographic characteristics include their ethnic composition, their age and gender distribution, and the division among immigration and citizenship categories. Our 81 interviews were conducted using an abridged version of the NAWS questionnaire, with our three-card series added on.

Form 1 of the three-card question series has been reproduced in figure II.1. The differences among the nine forms are explained in table II.1

Table II.1: Variations in Wording of Survey Questions in the Nine Questionnaires We Field-Tested

	The structured probe portion of question GAO-4[a]		
	Included as shown on form 1 (fig. II.1)	Not included	Included with additional explanation[b]
Contains all questions	Form 1	Form 2	Form 3
Omits question GAO-1b only[c]	Form 4	Form 5	Form 6
Omits question GAO-3b only[d]	Form 7	Form 8	Form 9

[a]See p. 8, fig. II.1. The multi-paragraph structured probe follows the instruction, "If respondent chooses Box A, ask: . . . ."

[b]Interviewer instructed to provide ad hoc explanations if respondent does not understand question.

[c]As shown on p. 2, fig. II.1, question GAO-1b asks about household appliances not present at the location where the respondent is living or staying now.

[d]As shown on p. 5, fig. II.1, question GAO-3b asks if the respondent lives permanently in the United States or just works here temporarily.

Source: GAO.

Figure II.1: Form 1 of the Questionnaire

Final Survey Revision, 7 Nov 1997, for Aguirre International: Form 1

1-GAO-1. Now for a change of pace. In a moment, I will hand you a card showing some household appliances. Some people think these appliances are essential for adequate living conditions. **HAND CARD 1 TO RESPONDENT** We want to know which of these— if any— you agree are essential. If you think other appliances are also essential, we'll talk about that later. Which ones *on the card* do you agree are essential for adequate living conditions? ***Interviewer, check all that apply*** ☐ 1 washing machine ☐ 2 iron ☐ 3 TV (television) ☐ 4 refrigerator ☐ 5 electric fan or air-conditioner	1-GAO-1. Ahora para cambiar el tema. En un momento, le enseñaré una tarjeta que muestra aparatos caseros. Alguna gente considera estos aparatos esenciales para vivir en condiciones cómodas. **DELE LA TARJETA 1 AL ENCUESTADO** Nos gustaría saber (si hay algunos) de éstos que cree Ud. que son esenciales. Si piensa que otros aparatos también son esenciales hablaremos de eso más tarde. ¿Cuál de estos en la tarjeta piensa Ud. que son esenciales para vivir en condiciones cómodas? ***Entrevistador: marque todas las que correspondan*** ☐ 1 máquina de lavar (lavadora) ☐ 2 plancha ☐ 3 televisor ☐ 4 refrigerador (nevera) ☐ 5 abanico eléctrico o acondicionador de aire/ventilador
1-GAO-1a. Is there anything else— *not* on this card— that you consider essential for adequate living conditions? ***Interviewer, please write down exactly what respondent says.*** _____ _____	1-GAO-1a. ¿Hay algún otro aparato— que no aparece en esta tarjeta— que Ud. piensa que es esencial para vivir cómodamente? ***Entrevistador: por favor anote exactamente lo que diga el encuestado.*** _____ _____

1

1-GAO-1b. Are there any items on the card that you *do not have* where you are living or staying right now? ☐ 1 Yes. **If yes, ask: which ones?** ***Interviewer, check all that apply.*** ☐ 2 washing machine ☐ 3 iron ☐ 4 TV (television) ☐ 5 refrigerator ☐ 6 electric fan or air-conditioner ☐ 7 No **(TAKE BACK CARD)**	1-GAO-1b. ¿Hay algún aparato en esta tarjeta que Ud. *no tiene* donde está viviendo ahorita? ☐ 1 Sí. **Si responde que Sí, pregunte: ¿Cuáles?** ***Entrevistador: marque todas Las que correspondan.*** ☐ 2 máquina de lavar (lavadora) ☐ 3 plancha ☐ 4 televisor ☐ 5 refrigerador (nevera) ☐ 6 abanico eléctrico o acondicionador de aire ☐ 7 No **(RETIRE LA TARJETA)**
1-GAO-2. Thank you. Now for the last few questions. I want you to know that some of these questions deal with personal information, but so far just about everyone we've talked to thinks the questions are OK. Of course, if there's any question you don't want to answer, you don't have to. OK? **NOTE: If respondent does not want to continue, terminate the interview, otherwise:** **GO TO PAGE 3**	1-GAO-2. Gracias. Ahora para las últimas preguntas. Quiero que sepa que algunas de estas preguntas tratan temas de información personal, pero hasta ahora, estas preguntas no han molestado a ningunos de los encuestados. Por supuesto, si hay alguna pregunta que Ud. No quiera contestar, no tiene que contestarla. ¿Está bien? **NOTA: Si el encuestado no quiere continuar, termine la entrevista; si acepta, entonces:** **CONTINÚE CON LA PÁGINA 3**

2

1-GAO-3. In a moment, I will show you a card about traveling. It has three boxes— Box A, Box B, and Box C. There's one thing I want to explain before I show you the card. We *just* want you to choose ONE BOX. We do *not* need to know anything specific about what's inside the boxes.	1-GAO-3. En un momento, le mostraré una tarjeta que contiene diferentes modos de viajar. La tarjeta contiene tres casillas— la casilla A, la casilla B, y la casilla C. Hay algo que quiero explicarle antes de mostrarle la tarjeta. *Sólamente* queremos que Ud. escoja UNA CASILLA. *No* necesitamos ninguna información específica sobre los contenidos de las casillas.
HAND RESPONDENT CARD 2	***DELE AL ENCUESTADO LA TARJETA 2***
Now, thinking about the *most recent* time you traveled to the United States from another country, please tell me *which box* shows the kind of transportation you took: A, B, or C? We only want you to choose one box.	Por favor piense en la última vez que llegó a los Estados Unidos, y dígame *cuál de las casillas* muestra el medio de transporte que Ud. usó: ¿A, B o C? Sólo queremos que Ud. escoja una casilla.
IF RESPONDENT DOES NOT ANSWER IMMEDIATELY OR CALLS OUT AN ITEM IN BOX B, SAY:	**SI EL ENCUESTADO NO RESPONDE INMEDIATAMENTE, O DICE UNA CATEGORÍA EN LA CASILLA B, DIGA:**
If you're in Box B, it doesn't matter which of the four categories applies to you, because we don't need to know this information.	Si le corresponde la casilla B, no importa cuál de las cuatro categorías dentro la casilla le corresponde a Ud., porque no necesitamos saber esa información.
IF STILL HESITATES, SAY:	**SI TODAVÍA TITUBEA, DIGA:**
Box C is for any kind of transportation not shown in Box A or Box B.	La casilla C es para cualquier otro medio de transporte que no está incluído en las casillas A o B.
☐ 1 Box A	☐ 1 casilla A
☐ 2 Box B	☐ 2 casilla B
☐ 3 Box C **ASK:** Just so we know what's missing on the card, could you tell me the type of transportation you took?	☐ 3 casilla C **PREGUNTE**: Sólamente para saber lo que falta en la tarjeta, ¿Podría Ud. decirme cuál fue el medio de transporte que Ud. usó?
Specify:_____	Especifique:_____
☐ 4 Other answer: **Please write down exactly what respondent says.**	☐ 4 Otra respuesta: **Por favor anote exactamente lo que diga el encuestado.**
_____	_____

3

1-GAO-3a. Still looking at this card, please think about the future. If you decide to go to your home country, would you use a method of transportation in Box A, Box B, or Box C? ☐ 1 Box A ☐ 2 Box B ☐ 3 Box C **ASK:** Just so we know what's missing on the card, could you tell me the type of transportation you would take? Specify:_____ ☐ 4 Other answer: **Please write down exactly what respondent says.** _____ **TAKE BACK CARD 2**	1-GAO-3a. Por favor, mire la tarjeta otra vez y dígame si Ud. decide viajar a su país, qué medio de transporte usaría: ¿A, B, o C? ☐ 1 casilla A ☐ 2 casilla B ☐ 3 casilla C **PREGUNTE**: Sólamente para saber lo que falta en la tarjeta, ¿Podría Ud. decirme que medio de transporte usaría Ud.? Especifique:_____ ☐ 4 Otra respuesta: **Por favor anote exactamente lo que diga el encuestado.** _____ **RETIRE LA TARJETA 2**

4

1-GAO-3b. Do you (1) live permanently in the United States, or (2) do you come to the United States only to work here seasonally and then return to your home country?	1-GAO-3b. ¿Vive Ud. (1) permanentemente en los Estados Unidos?, o (2) ¿Viene Ud. a los Estados Unidos anualmente a trabajar la temporada y luego se regresa a su país natal?
☐ 1 I live permanently in the United States	☐ 1 Vivo permanentemente en los Estados Unidos
If respondent answers (1), ask:	**Si la respuesta es (1), pregunte:**
Do you think you will go to your home country within the next 12 months?	¿Piensa Ud. que va a viajar a su país natal durante los próximos 12 meses?
Please write down Exactly what respondent says.	**Por favor anote exactamente lo que diga el encuestado.**
☐ 2 I come to the United States only to work here seasonally, then return to my home country	☐ 2 Vengo a los Estados Unidos sólamente a trabajar la temporada, y luego me regreso a mi país natal
If respondent answers (2), ask:	**Si la respuesta es (2), pregunte:**
During the past 12 months (since last fall), how many months have you lived in the United States?	En los últimos 12 meses (desde el otoño pasado), ¿Cuántos meses ha vivido Ud. en los Estados Unidos?
☐☐ (number of months)	☐☐ (número de meses)
☐ 7 Not sure/don't know/refused	☐ 7 No está seguro/no sabe/rehusa

5

1-GAO-4. In a moment, I am going to show you another card with three boxes. It works the same as the 3-box transportation card you just saw. Again, we just want you to choose ONE BOX. This is important, because this time the question is about immigration. Using the boxes allows us to obtain the information we need, without asking you to give us information that you may not want to. Now, here is the card. ***HAND RESPONDENT CARD 3*** Because we're using the boxes—we WON'T "zero in" on anything somebody might not want to tell us. That is, if you pick Box B, I will not ask any questions about the categories inside Box B. Please let me take a moment to explain this card to you.	1-GAO-4. En un momento, le voy a enseñar otra tarjeta con tres casillas. Es similar a la tarjeta con los medios de transporte que le enseñé anteriormente. Como antes, solamente queremos que Ud. escoja UNA CASILLA. Esto es importante porque esta vez, la pregunta es sobre la inmigración. El uso de las casillas nos permite obtener la información que necesitamos sin que usted tenga que darnos alguna información que no quiera dar. Ahora, aquí está la tarjeta. ***DELE AL ENCUESTADO LA TARJETA 3*** Como estamos usando las casillas, no vamos a insistir en algo que alguien no quiera decirnos. Es decir, si Ud. escoge la casilla B, *no* queremos saber cuál de las categorías le pertenece a Ud. Por favor, permítame un momento para explicarle esta tarjeta.
Box A at the top shows the immigration card for permanent legal residence in the United States. It is also called a "green card." It is an official valid card issued by and obtained from the United States government. Box B shows some drawings indicating other immigration categories. Box C is for categories not listed in A or B. We are only interested in *which BOX* you are in *right now*—and *not* a box you *want* to be in, or have applied to be in, in the future. So...are you actually in Box A, B, or C right now? **IF RESPONDENT IMMEDIATELY PICKS BOX A, B, OR C, GO TO PAGE 8;** **IF RESPONDENT HESITATES, CONTINUE ON PAGE 7**	La casilla A muestra una "tarjeta de inmigración" para la residencia legal permanente en los Estados Unidos. También le dicen la "green card." Es una tarjeta válida y oficial, expedida por el gobierno de los Estados Unidos y obtenida através de éste. La casilla B muestra algunos otros dibujos que indican otras categorías de inmigración. La casilla C es para las categorías que no están incluidas en las casillas A o B. Sólamente, nos interesa saber a *cuál CASILLA* pertenence Ud. *actualmente—no* la que a Ud. le gustaría pertenecer, o ha aplicado. Entonces...¿A cuál casilla le corresponde ahorita: A, B o C? **SI EL ENCUESTADO ESCOGE LA CASILLA A, B, O C INMEDIATAMENTE, SIGA A LA PÁGINA 8;** **SI EL ENCUESTADO TITUBEA, CONTINÚE CON LA PÁGINA 7**

6

Let me go over the items in Box B:	Permítame explicarle las categorías en la casilla B:
■ the flag indicates a citizen of the United States	■ la bandera indica un ciudadano de los Estados Unidos
■ the suitcase indicates a temporary legal visitor, such as on a student visa, temporary worker visa (for example, under the "bracero" H-2A program); or on a tourist visa	■ la maleta indica un visitante legal temporal: Por ejemplo, con visa de estudiante; con visa de trabajador temporal (como `el programa de "bracero" (H-2A)); ó con visa de turista
■ the circle with a line through it indicates undocumented — that is, no currently valid, officially obtained papers from the United States government authorizing a temporary visit or permanent residency here.	■ el círculo cruzado con una línea indica indocumentado — es decir, sin documentos válidos otorgados por el gobierno de los Estados Unidos que autorizan residencia permanente o visitas temporales.
■ the silhouette fleeing to the United States indicates a refugee or person granted political asylum. This includes persons specially legally admitted here because of civil war or dangerous conditions in their native countries (such as Guatemala, El Salvador, Bosnia and others, including persons in the ABC group.)	■ la silueta huyendo hacia los Estados Unidos indica un refugiado o persona con asilo político. Esta categoría incluye personas con admisión o entrada legal especial por razón de guerras civiles o condiciones peligrosas en sus países natales (como Guatemala, El Salvador, Bosnia y otros, incluyendo personas en el grupo ABC).
Box C is for categories not listed in A or B.	La casilla C es para las categorías que no están incluídas en las casillas A o B.
OK: Which BOX are you in *right now*?	Ahora: ¿Cúal es la CASILLA que le corresponde a Ud. *ahorita mismo*?

7

☐ 1 Box A **IF RESPONDENT CHOOSES BOX A, ASK:**

OK. We have some follow-up questions about immigration for people who are in Box A. But before I ask you those questions, please look at the card again.

Looking at Box B, you can see we have mixed "undocumented" with U.S. citizen, refugee or person who was granted asylum, and persons here on a work visa, student visa, or a tourist visa.

This is so that no one will know anything specific about anyone who picks Box B. Please re-check Box B carefully, because some people pick Box A by mistake.

So, having re-checked carefully, tell me again— are you in Box A, Box B, or Box C?

☐ 2 Still in Box A **GO TO PAGE 11**

☐ 3 Not in Box A— mark appropriate Box below

☐ 4 Box B **GO TO THE VERY LAST PAGE OF THE SURVEY, AND OBTAIN RESPONDENT'S SIGNATURE**

☐ 5 Box C **GO TO PAGE 9 (TOP)**

☐ 6 Not sure which box. **GO TO PAGE 9 (NEAR BOTTOM)**

☐ 9 Refused to answer **(WRITE EXACTLY WHAT RESPONDENT SAYS WHEN REFUSING)**

_____

☐ 1 Casilla A **SI ENCUESTADO ESCOJE LA CASILLA A, PREGUNTE:**

Ahora. Tenemos algunas preguntas para las personas que están en la casilla A. Pero antes de hacerle estas preguntas, por favor mire la tarjeta otra vez.

Mire la casilla B, y note que hemos mezclado la categoría de "indocumentado" con las de ciudadano de los Estados Unidos, refugiado o asilado, y personas aquí con visa de estudiante, de trabajo o de turista.

Esto es para proteger a las personas que escojen la casilla B. Por favor, revise la casilla B con cuidado, porque algunas personas se equivocan y escojen la casilla A por error. Ahora, despues de haber revisado las categorías con cuidado, dígame otra vez— ¿le corresponde la casilla A, B, o C?

☐ 2 Si todavía escoge la casilla A **SIGA A LA PÁGINA 11**

☐ 3 No está en la casilla A— marque la casilla appropriada abajo

☐ 4 Casilla B **SIGA A LA ÚLTIMA PÁGINA DE LA ENCUESTA PARA OBTENER LA FIRMA DEL ENCUESTADO**

☐ 5 Casilla C **CONTINÚE CON LA PÁGINA 9 (ARRIBA)**

☐ 6 No está seguro cuál casilla que le corresponde **CONTINÚE CON LA PÁGINA 9 (CASI AL FINAL)**

☐ 9 Si no responde **(ESCRIBA EXACTAMENTE LO QUE DIGA EL ENCUESTADO CUANDO SE NIEGUA A RESPONDER)**

_____

8

☐ 7 **FOR PERSONS WHO PICKED BOX C ONLY:**

SAY: Please look back at Box B to make sure you didn't miss anything there. Box B goes from United States citizen to undocumented.

IF STILL IN BOX C, SAY:
OK, just so we know what we missed putting on this card, could you tell me what your immigration status is?

Write down whatever respondent says; then go to question E41, near end of survey

☐ 8 **FOR PERSONS WHO SAID NOT SURE WHICH BOX THEY BELONG IN:**

(offer to go back over the categories —if you think respondent was not listening, or cannot read, etc.)

SAY: Maybe I can help—remember this is the Box you belong in right now.

(CONTINUE ON PAGE 10)

☐ 7 **PARA LAS PERSONAS QUE ESCOGIERON SÓLAMENTE LA CASILLA C:**

DIGA: Por favor mire la casilla B otra vez para asegurarse de que se fijó en todas las categorías. La casilla B incluye desde un ciudadano de los Estados Unidos hasta un indocumentado.

SI TODAVÍA LE CORRESPONDE LA CASILLA C, DIGA:
Bueno, sólamente para saber lo que nos falta en esta tarjeta, ¿Podría Ud. decirme cúal es su estado actual de inmigración?

Anote todos los comentarios del encuestado; entonces, siga a la pregunta E41, casi al final de la encuesta

☐ 8 **PARA LAS PERSONAS QUE NO ESTÁN SEGURAS DE LA CASILLA QUE LES CORRESPONDE:**

(ofrezca revisar la categorías—si piensa que el encuestado no estaba escuchando, o no puede leer, etc.)

DIGA: Quizás le pueda ayudar—recuerde que ésta es la casilla que le corresponde actualmente

(CONTINÚE CON LA PÁGINA 10)

9

IF STILL NOT SURE, PROBE:	**SI TODAVÍA NO ESTÁ SEGURO, TRATE DE INDAGAR:**
Some people have applied for a green card but don't actually have it yet, those "pendientes" should not pick Box A **(pause to see if this helps respondent make up his mind)**	Algunas personas han solicitado la tarjeta de inmigración pero no la han recibido. Debido a que sus solicitudes están "pendientes" esas personas no deben escoger la casilla A **(espere a ver si esto le ayuda al encuestado a tomar su decisión).**
Or: other people had a green card at one time but now they have been sworn in as citizens of the United States, so they should pick Box B **(again pause to see if this helps make up his mind).**	Otras personas tuvieron una tarjeta de inmigración en un época pero ahora ya son ciudadanos de los Estados Unidos; por lo tanto, ellos deben de escoger la casilla B **(nuevamente espere a ver si esto le ayuda al encuestado a tomar su decisión).**
Still other people came into the United States as refugees, persons granted political asylum, or special admission because of civil wars (such as in Guatemala, El Salvador, and other Central American countries). But now they have applied for and received their green cards, so those people should go in Box A. Does any of this help?	Además, otros vinieron a los Estados Unidos como refugiados, personas a quienes les dieron asilo político, o permiso especial por causa de las guerras civiles (como Guatemala, El Salvador u otros países de la América Central). Pero ya solicitaron y recibieron sus tarjetas de inmigración, por lo tanto a ellos les corresponde la casilla A. ¿Le ayuda esta explicación?
Remember if you can't find your category in Box A or Box B, you should pick Box C.	Recuerde que si a Ud. no le corresponden las categorías en las casillas A o B, debería escoger la casilla C.
IF "NOT SURE" RESPONDENT PICKS BOX A, BOX B, OR BOX C, GO BACK AND MARK APPROPRIATE BOX ON PAGE 8.	**SI EL ESCUESTADO QUE "NO ESTÁ SEGURO" ESCOGE LA CASILLA A, B Ó C, REGRESE Y MARQUE LA CASILLA APROPIADA EN LA PÁGINA 8.**
Do not erase the 6.	No tache el número 6.

10

FOR RESPONDENTS WHO PICKED BOX A:	PARA LOS ENCUESTADOS QUE ESCOGIERON LA CASILLA A:
1-GAO-4a. Under which program did you apply to the United States government for your green card? **(DO NOT READ ANSWERS BELOW)**	1-GAO-4a. ¿A través de que programa solicitó su tarjeta de inmigración de los Estados Unidos? **(NO LEA LAS RESPUESTAS QUE SIGUEN)**
☐ 1 Amnesty (IRCA) under the 5-year program (entered United States before 1982)	☐ 1 Amnistía (IRCA) bajo el programa de 5 años (entró a los Estados Unidos antes de 1982)
☐ 2 Amnesty (IRCA) under the SAW (90-day) program (as a farmworker)	☐ 2 Amnistía (IRCA) bajo el programa de 90 días (trabajador de campo)
☐ 3 Family Unity/Deferred Enforced Departure	☐ 3 Unidad de Familia/Salida Voluntaria
☐ 4 Family preference	☐ 4 Visa legal de preferencia de familia
☐ 5 Immediate relative (parent/spouse/child of U.S. citizen)	☐ 5 Pariente inmediato (padre/cónyuge/hijo de un ciudadano de los Estados Unidos)
☐ 6 Employer, through work	☐ 6 Patrón, visa legal a través del trabajo
☐ 7 Registry program	☐ 7 Programa de registro
☐ 8 As a refugee, asylee or similar person who applied for a green card	☐ 8 Como refugiado, asilo político o persona similar que aplicó por una tarjeta de inmigración
☐ 9 Other; **EXPLAIN**	☐ 9 Otro; **EXPLIQUE**
(Obtain as much information as possible, and write down what the respondent says)	**(Obtenga toda la información posible, y anote lo que el encuestado diga)**
_____	_____
_____	_____
☐ 10 Not sure which program	☐ 10 No está seguro de que programa le pertenece
☐ 11 Refused to answer	☐ 11 Se negó a contestar

11

1-GAO-4b. When did you receive your card? 19 ☐☐ Year ☐ 6 Did not actually receive my card yet. ☐ 7 Not sure **PROBE:** e.g., Was it less than ten years ago? **If yes, ask:** was it Within the past 5 years? **If within the past 5 years, ask:** was it within the past 12 months? (etc.). **Try to estimate the year.** 19 ☐☐ estimated year	1-GAO-4b. ¿Cuándo recibió su tarjeta? 19 ☐☐ año ☐ 6 En realidad, no he recibido mi tarjeta todavía ☐ 7 No está seguro **PREGUNTE:** ¿Hace menos de diez años ? **Si responde que Sí, pregunte:** ¿Fue durante los últimos 5 años? **Si durante los últimos 5 años, pregunte:** ¿Fue durante los últimos 12 meses? (etc.) **Trate de estimar el año.** 19 ☐☐ año estimado
IF DURING 1995, 1996, OR 1997: 1-GAO-4b(i). Did someone from the U.S. government personally hand you a green card—or did they mail it to you? ☐ 1 Yes, someone handed it to me personally ☐ 2 They mailed it to me ☐ 3 Other **(write exactly what respondent says)** _____ _____	**SI DURANTE 1995, 1996, O 1997:** 1-GAO-4b(i). Su tarjeta de inmigración, ¿se la entregó un empleado de los Estados Unidos personalmente o se la enviaron por correo? ☐ 1 Sí, un empleado del gobierno me la entregó personalmente ☐ 2 Me la enviaron por correo ☐ 3 Otra **(escriba exactamente lo que diga el encuestado)** _____ _____

12

IF IN 1994 OR EARLIER:	SI EN 1994 O ANTES:
1-GAO-4b(ii). As you may know, people who have a green card for 5 years—sometimes less—can apply for U.S. citizenship. Did you ever apply for United States citizenship?	1-GAO-4(ii). Como Ud. puede saber, la gente que tiene tarjeta de inmigración por 5 años—y a veces por menos tiempo—puede solicitar la ciudadanía de los Estados Unidos. ¿Ha solicitado Ud. alguna vez la ciudadanía en los Estados Unidos?
☐ 1 Yes **If YES:** Did you actually receive it—and were you sworn in?	☐ 1 Sí **Si responde que sí:** ¿Recibió Ud. el certificado y tomó el juramento?
☐ 1 Yes, was sworn in	☐ 1 Sí, tomó el juramento
If sworn in, check (1) above and mark Box B on page 8.	**Si tomó el juramento, marque (1) arriba, y marque la casilla B en la página 8.**
☐ 2 No, was not sworn in	☐ 2 No, no tomó el juramento
☐ 2 No, never applied	☐ 2 No, nunca la solicitó
☐ 3 No, have not applied, but want to apply.	☐ 3 No, nunca la solicitó, pero quiere solicitarla
GO TO QUESTION E41	**CONTINÚE CON LA PREGUNTA E41**

INTERVIEWER: Write comments (observations or criticisms) here:

ENTREVISTADOR: Escribe comentos (observaciones o críticas) aqui:

13

Estimates for Demographic Subgroups

Estimates of legal permanent residents (Box A for legal status card 1) can be directly obtained for demographic subgroups, such as male or female; residents of various geographic areas (e.g., California); and age or income groups.

The only proviso is that demographic information must be obtained for all respondents earlier in the questionnaire. Subgroup estimates can be obtained simply by isolating, for example, male respondents in sample 1 and then calculating the percentage who chose Box A. Then, perform the same procedures separately for female respondents in sample 1. Of course, how refined a subgroup can be reliably estimated would depend on the size of the sample and other aspects of sample design.

Estimates of foreign-born U.S. citizens in different subgroups can be obtained in a similar fashion, using data for sample 2 respondents. The situation is analogous for the legal statuses that appear in Box A of the legal status card shown to sample 3.

The three-card method can also be used to indirectly obtain separate subgroup estimates for illegal immigrants—at least for sizable subgroups of illegals, such as males and females, or California residents. This can be done by isolating the data for foreign-born respondents in the first subgroup of interest (e.g., foreign-born males), obtaining separate estimates for Box A in each of the three samples, and then subtracting percents estimated from each legal status from 100 percent. The procedure would then be repeated for the next subgroup of interest (e.g., isolate data for foreign-born females and repeat calculations). Such procedures work best for large subgroups within the foreign-born population.

Given a large enough sample, indirect estimates of illegals could be obtained for several key geographic areas—for example, key immigration states like New York and Texas. In some cases, it may be desirable to produce estimates for smaller areas, such as a county (e.g., Los Angeles County) or a group of counties (i.e., the counties of Texas that border Mexico). Similarly, a separate estimate of illegal immigrants might be obtained for a particular demographic subgroup (such as women of childbearing age or persons below the poverty line). Of course, whether a subgroup of illegals could be reliably estimated would depend on the size of the sample and other aspects of sample design.

Data From Respondents Who Participated in the Cognitive Interviews

Gender	Age	Nativity	U.S. job experience	Primary language	Understood refugee icon?	Found card 3 sensitive?	Respondent comments
Male	38	El Salvador	Auto factory assembly, cleaning, bus driver	Spanish	No	No	Use bigger green card icon. It looks like the person in the refugee icon is holding up a map, and the explosion looks like a hole in the paper. Immigration question is good because it is not personalized.
Male	49	Bolivia	Lawn care, carpet cleaner, electrician	Quechua	Yes	Yes	Add a fake green card to the undocumented icon. Some would find the immigration question sensitive because they do not want to tell the truth about their status.
Male	60	Mexico	Construction, milking cows	Spanish	No	Yes	Immigration question is sensitive because some do not want to be asked about that. That is confidential information.
Male	30	Dominican Republic	Mowing lawns	Spanish	No	No	Refugee icon is confusing. It looks like a terrorist being pushed out of the United States.
Female	20	Peru	Cleaning and child care	Spanish	Yes	No	The respondent said that she recognized the icons for “Undocumented,” suitcase/visa, and the Refugee categories. Change diagonal line to crossed lines in the “ undocumented” icon.
Female	34	El Salvador	Factory machine operator, cleaning	Spanish	Yes and no	Yes	Use an additional line to cross out the undocumented icon. Change the refugee symbol to a thatch roof without walls; that’s the symbol for refugee in my country. The immigration question is not bad, I do not find it sensitive, but some people would.
Male	34	Nicaragua	Painter	Spanish	Yes and no	Yes	Add visa to suitcase icon. Add U.S. seal to citizen icon. Immigration question is sensitive because many people are undocumented and would not want to answer.
Male	22	El Salvador	Painter, carpet installer, commercial cleaning	Spanish	Yes	Yes	Some compesinos (rural people) wouldn’t recognize the undocumented icon. Add trees and a “danger” sign to the refugee icon. Some would find the immigration question sensitive because they would fear being turned in to INS.

Source: GAO compilation of data from cognitive interviews.

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