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**Methodology for Cognitive Testing
of Translations in Multiple Languages**

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Abstract

With the growth of multinational and multilingual surveys, pre-contact letters and informational brochures are translated from the source language into target languages to convey legally required information and to encourage survey participation. Due to variations in linguistic conventions and communication styles across cultures, translated materials may have different effects on target populations. In order to ensure that translated documents convey the same messages and have the equivalent communicative effect as original texts, survey researchers need to develop sound methods to pretest translations in target languages.

This paper reports a study conducted by the U.S. Census Bureau that cognitively pretested translations of survey letters and brochures in multiple languages (Spanish, Chinese, Korean, and Russian). The study was designed to include the following steps: organize a panel of experts in each language consisting of survey methodologists and language experts; adopt the committee approach in translating interview protocols from English into target languages; train language experts for cognitive interviews; conduct cognitive interviews in multiple languages; and recommend changes for translations through the panel of experts. Using this approach and design, we successfully identified a set of issues that are not normally informed by the traditional translation-review process. In addition to translation issues, we identified problems caused by differences in preferred norms of communication or presentation styles, and variations in culturally-driven expectations regarding certain topics. These issues affect respondents' reaction to and interpretation of the messages conveyed in the translated materials.

Findings from this project demonstrate the importance of pretesting translation in the target language, the effectiveness of the committee approach in survey translations, and the value of pairing survey methodologists with language experts for cognitive testing in non-English languages. This study thus aims to explore methodologies and best practices for pretesting the appropriateness and adequacy of survey translations in multiple languages.

KEY WORDS: methodology for cognitive testing, translation, multilingual, cultural issues

1. Introduction

With the growth of multinational and multilingual surveys, it is increasingly important that pre-contact or advance letters and informational brochures be translated from the source language into the languages that respondents speak to convey legally required information and to encourage survey participation. There is increasing demand for translated survey documents to ensure that linguistically isolated populations are reached. Due to variations in linguistic conventions and communication styles across cultures, translated materials may have different effects on target populations. While the translation-review procedure traditionally adopted in the translation process can identify problems and errors in

translated materials, we are not sure if these translations deliver the messages as intended. In order to ensure that translated documents convey the same messages and have the equivalent communicative effect as original texts, survey researchers need to develop sound methods to pretest translations in target languages.

This paper reports a study conducted by the U.S. Census Bureau that cognitively pretested translations of survey letters and brochures in multiple languages (Spanish, Chinese, Korean, and Russian). The study was designed to combine the expertise of survey methodologists and the knowledge of language and culture experts. For each language group, the study included a consistent series of steps systematically implemented throughout the

pretesting process designed to evaluate the accuracy of the translations. Using this approach and design, we successfully identified a set of issues that are not normally informed by the traditional translation-review process. In addition to translation issues, we identified problems caused by differences in preferred norms of communication or rhetorical styles, and variations in culturally-driven expectations regarding certain topics. We found that these issues affect respondents' reaction to and interpretation of the messages conveyed in the translated materials.

In the sections to follow, we will provide the background information about the project, with a brief discussion of general issues with survey translation practice. We will describe our approach and methodology for cognitive testing translations in multiple languages and the steps for carrying out the research. We will conclude with a brief discussion of the types of issues in survey translation this approach and methodology can identify. The goal of the paper is to explore methodologies and best practices for pretesting the appropriateness and adequacy of survey translations in multiple languages.

2. Survey translation

It has been a research topic among survey methodologists to establish the goals of survey translation. Some cross-cultural survey researchers believe that quality survey translation should achieve three kinds of equivalence between the source and target documents: *semantic*, *conceptual*, and *normative* equivalence (Behling and Law, 2000). *Semantic equivalence* refers to the extent to which the terms and sentence structures that give meaning to the information presented in the source language are maintained in the translated text. *Conceptual equivalence* concerns the degree to which a given concept is present in both the source and target cultures, regardless of the words used to express the concept. That is, a survey question measures the same thing in two languages. *Normative equivalence* means that the translated text successfully addresses differences in societal rules between the source and target culture, and that the effect of the intended message is the same in the source and target language. Others in the field, however, believe that the quality of a translation is best assessed in terms of its appropriateness or adequacy for a given task. In the case of surveys, this means "that the translated instrument successfully fulfills the stipulated goals for the translation" (Harkness & Schoua-Glusberg, 1998).

Despite vigorous discussion of the goals of survey translation over the years, there is a lack of systematic analysis of what constitutes the three types of equivalence or what are the goals of a survey translation, or what steps

should be followed to ensure that a translation achieves these goals.

We believe sociolinguistic principles can provide insights as well as concrete steps to achieve three kinds of equivalence for survey translation. From a sociolinguistic point of view, a good translation should be accurate and appropriate at three levels:

- (1) Lexical level: This means the translation should have accurate wording and use the correct words to convey the meaning of each individual word in the source text.
- (2) Syntactic level: The translation should follow the grammatical structure, including the syntactic rule and word order of the target language. It should be free of grammatical errors and should sound natural in the target language.
- (3) Pragmatic level: The translated text should be culturally appropriate. It must reflect and fit the sociocultural context in which the translated text is to be used.

Traditionally in survey research, translations consist of the following steps: initial translation, review, revision, and finalizing. The translation is conducted by bilinguals, mainly translators and reviewers. They aim for a complete and accurate rendition of the source text into the target language. The review process strictly focuses on an assessment of the translated text, and not on how that text is interpreted by respondents. The traditional translation process does not involve the end-user's interpretation of the translated text. It usually resolves translation issues at the lexical and syntactic level.

The pragmatic level of translation means the language should be presented in a manner that is appropriate to the target culture. At the pragmatic level, we want to ask the following questions: How do respondents of the target language interpret the translated text? How do respondents of the target language react to the translated text? Does the translated text have the equivalent communicative effect as the original text? Issues occurring at the pragmatic level are more subtle and difficult to overcome, and they are usually not identifiable in the traditional translation-review process. But they are critical for survey researchers because issues at the pragmatic level may hinder survey participation and affect data quality if respondents have negative reactions to the intended messages.

3. Our study

We believe it is important to cognitively test the translations in target languages in order to resolve issues at all three levels of lexicon, syntax, and pragmatics. Thus we designed and implemented a cognitive testing project

to evaluate translations of selected survey documents for the American Community Survey (ACS), a multimode survey conducted by the U.S Census Bureau. The ACS researchers developed letters and brochures to provide information about the ACS for participants. These supporting documents include an Introduction Letter that introduces the survey and includes important informed consent messages (i.e., legally required), a Thank You letter, a short informational brochure and a detailed brochure that includes questions and answers about the survey.

These documents are used by field interviewers for personal visit follow-up interviews. Field interviewers frequently encounter households that do not speak English and they find it helpful to have these materials available in languages other than English. The Census Bureau identified five non-English languages that have the highest number of speakers in the United States. The ACS supporting documents were then translated into those five languages: Spanish, Chinese, Korean, Russian, and Vietnamese. The Census Bureau, in collaboration with Research Triangle Institute International (RTI), and Research Support Services (RSS), conducted cognitive testing of these translations in four of these five target languages (all, but Vietnamese).

The objectives of the cognitive testing project were to: 1) evaluate whether respondents who use translated documents have a similar understanding of the intended communication as English-speaking respondents, 2) identify what informed consent messages were conceptually difficult to translate, and 3) ensure that translated documents convey the same messages and have the equivalent communicative effect as the original messages intended.

Both the English language materials and the translated materials were cognitively tested in the target languages. A total of 112 cognitive interviews were conducted across the four languages as well as English. The interviews were conducted in the greater Washington, DC area, Chicago, Illinois, and Raleigh, North Carolina. Sites were selected specifically because they are close to the research teams geographically and because these sites have sufficient concentrations of Hispanic, Chinese, Korean, and Russian populations to represent the target language groups.

The 2004 ACS data were used to identify the characteristics of the persons who would most likely need to use these materials. These characteristics were used to develop recruiting profiles. Our recruiting was directed toward monolingual speakers of the target languages because they were the intended audience for the translated materials. We considered the following demographic characteristics: education (less than high school, high

school graduate, college graduate), year of entry to the United States (since 2000, 1990-1999, 1980-1989, before 1980), age (18-24, 25-34, 35-44, 45-54, 55-64, 65+), and gender. We also considered the dialect variety for the Chinese respondents to make sure we included speakers of Mandarin, Cantonese, and Fukanese (three major dialects of China). For Spanish respondents, we recruited Spanish speakers from different countries of origin in numbers that represent their respective populations in the U.S.

4. Methodology

The study was designed to combine the expertise of survey methodologists and of language and culture experts and to include a series of steps systematically implemented throughout the pretesting process. There were five main steps in our methodology:

- (1) organize a panel of experts in each language consisting of survey methodologists and language experts;
- (2) adopt the committee approach in translating interview protocols from English into target languages;
- (3) train language experts to conduct cognitive interviews;
- (4) conduct cognitive interviews in multiple languages;
- (5) recommend changes for translations through the panel of experts.

4.1 Panel of Language Experts

Because all steps in the project required extensive knowledge of the targeted languages, the first step was to organize a panel of experts for each language group.

The qualifications and experience considered in assembling the language teams included: native-speaker language competence, education and work experience in the target culture, and knowledge of and experience with translation work. Preference was also given to individuals who had committee translation or survey translation experience. Each language team was comprised of one lead language expert who was also a survey methodologist and two other language experts.

Once the language teams were formed, the members of the panel of experts began by reviewing the translated ACS materials. Because all the ACS documents had been translated previously (through another Census Bureau contract), the only step left for this task was to review the documents and determine if there were any modifications required before the documents were used for the cognitive interviews. Each language expert reviewed the documents individually and made recommendations for revisions. The language team leads reviewed the recommendations and submitted a list of modifications that included corrections to errors in typing, omission, or meaning. Any other revisions that were suggested were included as issues to be reviewed during the cognitive

interviewing. For example, the panel members also identified potentially problematic language that should be included in the cognitive interview to determine if the translation was effective and accurate.

The cognitive interview protocols were translated to the target languages using a committee approach. In addition to participating in committee reviews of the translations, the panel members also participated in the conduct of the cognitive interviews, preparation of interview summaries, review of the cognitive findings and identification of alternative wording of translations. They also made recommendations for changes to translated materials after two rounds of cognitive interviews.

4.2 Development of cognitive interview protocols and forms

Census Bureau staff identified key terms and messages to focus on for cognitive testing. Scripted cognitive interview protocols were developed in English and reviewed by staff at the U.S. Census Bureau, including members of the ACS language team.

The cognitive interview protocol documented the administration details, consent forms, and materials required for the cognitive interviewing, including a list of standard probes and special instructions to be used, and a guide for the interviewers to follow during interviews and reporting. The protocol was designed to test the translated materials to ensure that they met the Census Bureau's translation requirements for reliability, fluency, and appropriateness. Because the protocol included scripted instructions to be read to the respondent, it also served as a guide for the administration of consent forms and to confirm the point in time when the tape recording was to begin.

The protocol was designed to uniformly facilitate the two rounds of cognitive interviews in English as well as the four targeted languages. Each of the four ACS documents was assessed by having respondents go through two readings. There were two protocol guides. One protocol guide was for testing the Introduction Letter and the Informational Brochure; and another protocol was for testing the Thank You Letter and Question and Answer Brochure. Respondents were first asked to read an entire document silently. They were then asked to read specified segments aloud in the second reading. Scripted cognitive interview probes were developed to determine general impression and comprehension after the initial reading. Following the second reading, probes focused on the reaction to the information and message as well as understanding of specific terms and phrases. For round 2 interviews, a debriefing section was added to the interview protocol, in which respondents were asked to evaluate alternative wordings of translation developed by

the expert panel after their review of the ACS CAPI translated materials and review of the findings from the first round of cognitive interviews.

The English interview protocols were tested and timed before they were submitted to the language teams for translation. As part of the protocol guide development, language teams contemplated the impact of the statements included in the ACS materials and the possible impact of such statements for each targeted ethnic/cultural population. If any specific issues needed to be addressed for that language, additional protocol guide questions were added.

4.3 Translation Methodology for the Cognitive Interview Protocols

The translation task for this project was to translate the cognitive interview protocols and interview materials including the consent form and respondent incentive receipt. To translate the cognitive interview protocols into each of the four target languages, a committee approach was followed. The four language teams were engaged in committee review of the translated materials before the testing began, and then engaged in translating the cognitive interview protocols and forms. Based on findings from previous studies on cognitive interviews with non-English-speaking respondents (e.g., Pan 2004, Pan, Craig and Scollon 2005, Goerman 2005), special attention was paid to probing questions that may be potential problems for the target language.

Team or committee approaches to translation have been used since the 1960s (Nida 1964), and more recently in the translation of data collection instruments (Brislin, 1976; Schoua-Glusberg, 1992; Guillemin, Bombardier and Beaton, 1993; Acquadro, Jambon, Ellis and Marquis, 1996). In recent years, survey researchers' and survey translators' dissatisfaction with traditional translation and assessment methods (such as back translation) has led to the wider adoption of team approaches. The U.S. Census Bureau Expert Panel on Translation and the Translation Task Force for the European Social Survey have indicated that back translation is not a satisfactory approach. Recently issued Census Bureau Guidelines for Survey Translation recommend following a team or committee approach (Pan and de la Puente, 2005).

The specific type of team or committee approach we used for the translation of the cognitive interview protocol was the Modified Committee Approach (Schoua-Glusberg, 1992). For each language, a team of three language experts worked simultaneously and independently, each translating one third of the protocol. In addition to translating the cognitive interview protocols, the language teams also translated the interview consent forms and incentive receipts into the target languages. After they

completed their translations, a meeting was held to review the translated items, one by one, as a group. Each translator contributed to the discussion with the aim of improving and refining the first translation, making sure that it reflected the intent of the English original and flowed well in the target language. This “reconciliation” meeting was chaired in each case by one of the authors (Schoua-Glusberg), who is an expert of team translation with twenty years of experience acting as a referee in translation team discussions. Team discussions were generally held in English, and each member had to articulate the reasons for suggesting changes or improvements to the original translation.

The strength of the committee approach lies in the fact that consensus among bilinguals produces more accurate text than the subjective opinion of a single translator. Additionally, by striving for consensus, problems of personal idiosyncrasies, culture, and uneven skill in either language are overcome (Schoua, 1985). The group process in the reconciliation meeting is somewhat akin to a brainstorming session in which the team looks together for alternative translations and selects by consensus.

4.4 Cognitive Interview Training

After finalizing the cognitive testing protocols with the Census Bureau, a comprehensive cognitive interviewing training session was held with all of the language team members. Some of the language experts trained to be cognitive interviewers were also experienced social scientists with graduate degrees. Some of them worked with the Census Bureau before on language-related projects.

This training session consisted of both methodological and substantive issues and provided the basic context on the specific cognitive interviewing methodologies to be used in this research. The following topics were covered in sequence during the one-day training.

- Welcome and introductions
- Background of ACS and the specific task order
- General cognitive interviewing training
- Administering culturally appropriate probes
- Review of protocol guides
- Demonstration of probing
- Break-out into language groups for practice (mock interviews) and language-specific discussions
- Final gathering/questions and answers

The training was designed to outline the research goals and objectives, to review the correct administration of the prepared probes as documented in the protocol guides, as well as to cover the specific language/culture wording and translations to the target languages. An important part of

the training for the language experts involved negotiating appropriate questions and probes for each language and culture. Team members with direct experience conducting cognitive interviews specifically targeted toward translation issues were critical members of each language team. Throughout the training, discussions of specific questions and probes were raised as language experts contemplated possible difficulties or concerns that respondents might raise or have. As possible, solutions were discussed during the training; however, some issues were tabled for later discussion and resolution among the language teams.

During the language team break-out sessions, each team member practiced administering the protocol guides in both English and the targeted language. Teams also had an opportunity to discuss the impact of culturally-driven perceptions of surveys and topics in the ACS CAPI materials for their particular ethnic/cultural population. This was a critical step in the process and had to be completed by the language teams individually because presenting the messages in culturally appropriate ways facilitated the communication of the intended message in different languages.

Following the one-day training, the language teams reviewed and finalized the translated protocols and then kept in contact (via conference call) as needed to review or confirm plans for final modifications to the materials.

4.5 Conducting the cognitive interviews

Cognitive testing of the English versions of the ACS materials was undertaken in order to help determine if problems found in the translated versions were simply a reflection of problems already present in the original English version.

Because in-depth cognitive testing of the ACS materials was a cognitively-demanding task for respondents, the four documents were divided into two sets, with two documents in each set. Only one set of documents was tested in each cognitive interview. The interviews were conducted in two rounds for each language, with 12 interviews in each round for the target languages and 8 interviews in each round for English. In each round, half of these interviews were done with each set of materials.

Prior to beginning the interview, each participant was assigned to one of the two protocols. The protocol began by providing the participant with an explanation of the research and having the participant review and sign the informed consent document. If the participant agreed, the interviewer tape recorded the interview. The interview protocols involved both silent reading and the reading aloud of specified statements in the ACS letters and

statements. Interviewers observed the participants while they read, noting any specific signs of difficulty, confusion, hesitation, or annoyance. Interviewers asked probing questions to determine the cause of any observed or spoken confusion or concern on the part of the participants. For some sections, interviewers followed scripted probes to discuss meanings of specific statements or terms. Sometimes, the protocol guide inquired about specific meanings or alternative wordings that would have been more effective. Overall, the interview process worked well. But we encountered some challenges and issues in conducting cognitive interviews in non-English languages, including administering translated probing questions. We are currently conducting additional research to look into these challenges and issues (Pan et al. 2008).

4.6 Reviewing findings

After all first round cognitive interviews were completed and documented in summary reports, the language teams met to reassess the language used for problematic statements in the letters and brochures. They developed alternative translations, as needed, to be included in the second round of interviewing. In order to try to meet the targeted one-hour time period for the interview, the teams reviewed the probing questions in the interview protocol that elicited universally consistent responses among round 1 participants and determined which of those questions could be excluded for round 2 interviews. The language teams also drafted additional debriefing questions appropriate to the target language to test the alternative translations. The proposed changes made by the language teams were submitted to the Census Bureau for approval. All the proposed alternative translations were tested in the second round of interviews. Thus, in addition to testing the same materials as in round 1 interviews, round 2 interviews also tested the suggested changes by presenting to the round 2 interview respondents a showcard comparing the original translations with the alternative translations, and by asking for their assessment of the two versions of translations. In this way, the alternative translations were tested with respondents. Evidence was thus gathered from round 2 interviews to assess if the proposed changes worked better than the original translations.

After the completion of two rounds of interviews, the language teams met one more time to review the results and to make recommendations to improve the translations in the target languages.

5. General Findings

Using the approach and method described above, we identified translation problems at the lexical, syntactic, and pragmatic level.

At the lexical and syntactic level, while language specific problems were identified, most of these problems could be grouped under three categories: inaccurately translated terms, high-level vocabulary choices and difficult words, and overly complex sentence structures. These translation problems hindered, to some degree, respondents' understanding of the translated materials.

In addition to lexical and syntactic problems found in the translations, we also identified issues at the pragmatic level. We found in some instances that the translation can be correct at the lexical and syntactic level yet have problems at the pragmatic level. That is, it is grammatically correct and it uses the corresponding terminology, but the communicative effect is different from the intended effect in the English original. Here is a brief summary of translation issues at the pragmatic level.

(1) For some words, even when they are correctly translated, they may send out a different message or different meaning in the target language. For example, the greeting term of the ACS introduction letter "Dear resident" was correctly translated into Spanish. Many Spanish-speaking respondents interpreted it as referring to someone who has legal and permanent residence status in the U.S., and concluded that the ACS is for legal permanent "residents" or citizens of the United States. This was not the intended message and could cause people with other types of residency status not to participate in the ACS.

(2) The translation could have a different communicative effect because of the differences in communication and rhetorical styles between the American English and the target languages. For example, through the cognitive interviews, we found that Korean-speaking respondents felt that the ACS letters were written in an overly direct and impolite tone. This is different from what they expected to see in a formal letter. The Russian-speaking respondents found that too many explanations made the ACS brochures sound repetitive and wordy. This style is different from standard Russian government materials, which are much more terse and brief.

Another example is that Chinese-speaking and Korean-speaking respondents were not familiar with the English letter-writing style. For the English language and most Western languages, the preferred letter-writing style is to state the main message first, followed by background or detailed information to back up the main message. The ACS introductory letter starts with the main message of requesting respondents' participation in the survey. For Asian languages, the preferred letter-writing style is to attend to the politeness aspect of communication and to

establish common ground first. Letters in Chinese and Korean languages usually begin with a greeting, introduction of the sender (if he/she is a stranger), introduction of the letter—all of which warm up and lead to the main message, followed by good-bye and sender's signature. As a result, Chinese and Korean readers expect to see the main idea towards the end of the letter, after comfortable atmosphere and the common ground are established. Thus, those who are accustomed to this style can easily miss the earlier messages presented in the ACS introductory letter. Because many Chinese and Korean respondents were not familiar with the ACS or with surveys in general, this was a particularly serious problem that they did not understand the main point of the letter. The Introductory Letter requests participation in the ACS without giving any explanation of the ACS itself or surveys in general. These two factors made it difficult for respondents to grasp the intended message. They failed to get the main message of requesting for survey participation in the ACS introduction letter.

(3) Respondents of the target languages may have different interpretations of the translated messages due to variations in sociocultural contexts and culturally-driven expectations. For example, the survey name of the "American Community Survey" was correctly translated into Chinese at the lexical and syntactic level. It went through an internal and external review process (both of which were undertaken by bilingual language experts, but no problems were detected. We found out from the cognitive interviews that monolingual Chinese-speaking respondents all interpreted it as "American social investigation," because of their lack of survey experience in their home country. Since Chinese-speaking respondents do not have much prior knowledge of a survey, they relied on their cultural knowledge to interpret the word "survey." Many of them used the word "social investigation" to interpret "survey." Social investigation in China refers to a process in which citizens of a community make a complaint about an issue to a local or a higher level authority. When the complaint is received, authorities at different government levels send out representatives to investigate the issue by asking people questions concerning the complaint. This is very different from the concept or practice of a survey. When Chinese-speaking respondents interpreted the ACS as "American social investigation," their reaction is far from what we expected. They tended to say "I don't need to participate because I have nothing to complain about" or "I don't know about the community I live in and the issues they have. I don't need to participate in this social investigation." Consequently, this translation fails to achieve the intended effect at the pragmatic level.

6. Conclusion

Survey documents in English are written from the perspective of English-speakers and Western culture. When translated into a target language, readers will read it from their linguistic and cultural perspective. Traditional translation-review process draws heavily on the perspective of bilingual translator and reviewer. However, the translation-review process, does not always detect comprehension and interpretation issues. This is because the translator and the reviewer have two sets of information systems to call upon for interpreting the message. Being bilinguals, the translator and the reviewer can draw on their bicultural and bilingual knowledge to interpret the text. They have more tools and resources to make the missing link connect. Monolingual respondents only have one frame of reference to interpret translated messages. If the translation is not done properly, the monolinguals will have more difficulties in understanding the intended messages of a translated document.

Cognitive testing of translations with monolinguals brings in the perspective of the end-user of the translated documents. Using the cognitive interview as a translation pretesting method, we were able to detect translation issues at all three levels. Research results from this project led to recommendations for changes in the English original materials as well as in the translations. Findings from this project demonstrate the importance of pretesting translation in the target language and the value of pairing survey methodologists with language experts for cognitive testing in non-English languages.

Based on these results, one can easily make the argument for the parallel between good practice of survey questionnaire design and good practice of survey translation. In good practice of survey questionnaire design, survey questions are drafted and then vigorously pretested to check if the questions function as intended. By the same token, translated survey materials need to be pretested to check if the translated documents have the same effect as the source documents. Therefore, cognitive testing is a critical part of the survey translation process.

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