

The Effects of Acculturation on Survey Question Comprehension among Latino Respondents in the U.S

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Abstract

Respondents' culture may influence comprehension and interpretation of survey questions. This poses an important problem for researchers who are interested in studying differences among groups that vary in their cultures (i.e., different racial or ethnic groups) because differences in survey responses among these groups could be due either to substantive differences or to artifacts of group differences in comprehension or interpretation of survey questions (or some combination of the two). If cultural differences in comprehension or interpretation of survey questions are at least partly responsible for observed racial/ethnic differences in survey responses, acculturation to the dominant culture may lead to the minimization of racial/ethnic differences. Although research has documented cultural variability in respondent comprehension and interpretation of survey questions, little information is currently available on the role that acculturation might play in minimizing cross-cultural differences in the comprehension or interpretation of survey questions. To investigate this problem, we examine the potential effects of acculturation to host culture on respondent comprehension of survey questions among two distinct Latino populations on the U.S. mainland: Mexican Americans and Puerto Ricans. Specifically, comprehension-related respondent behaviors coded from 345 face-to-face interviews conducted with Mexican American, Puerto Rican, African American and non-Latino White adults living in Chicago are examined. Employing survey responses as the unit of analysis, nested within respondents, hierarchical linear modeling (HLM) is employed to examine the degree to which level of acculturation among Latino respondents accounts for group differences in question comprehension difficulties, net of individual and question level characteristics. Findings indicate that Latino respondents who were born outside of the U.S. and who have a preference for communicating in Spanish, relative to English, were more likely to express comprehension difficulties. These findings suggest that pretest survey instruments with immigrant populations may be a useful strategy for identifying problematic questions.

Keywords: Acculturation, behavior coding, multi-level modeling, question comprehension.

1. Introduction

In recent years, a growing body of research has begun to document cultural variability in a variety of survey response behaviors in the United States. With race and/or ethnicity serving as proxy indicators of culture, group differences have been identified in both acquiescent and extreme response styles (Bachman & O'Malley, 1984; Clarke, 2000; Hui & Triandis, 1989; Ross & Mirowsky, 1984), social desirability effects (Ross & Mirowsky, 1983; Warnecke et al., 1997), reporting validity (Johnson & Bowman, 2003), and the comprehension and/or interpretation of survey questionnaires (Jenkins, 1988; Johnson et al., 1997; Johnson et al., 2006; Meredith & Siu, 1995; Morse & Morse, 1988). Systematic variability of the types documented in these studies suggests the possibility that empirical findings of cultural differences in substantive, survey-based measures in some cases may actually be a consequence of cultural variability in how individuals behave when asked to participate in a survey. It has been speculated, for example, that variations in the comprehension of survey questionnaires may underlie some of the evidence for health disparities within the U.S. that have been documented in recent years (Johnson et al., 2006). If differences in substantive survey responses across racial or ethnic groups can be accounted for by cultural differences, these racial/ethnic differences are likely to be minimized to the extent to which members of different cultures are integrated into the dominant culture (or acculturated). In this paper, we contribute to the research on culture and survey research by exploring the role of acculturation among U.S. Latino respondents in survey question comprehension.

1.1 Acculturation

There are numerous definitions of acculturation. Smith and Bond (1999) define it broadly as being concerned with "the changes that result in both people and groups of people as a result of contact among people of different cultures." Abraído-Lanza, Chao, and Florez (2005) refer more specifically to acculturation as "the process by which immigrants adopt the attitudes, values, customs, beliefs, and behaviors of a new culture." Considerable research is now available that examines acculturation processes among Latino and other immigrants to the U.S. For example, recent studies have investigated the relationships between acculturation and health behaviors (Abraído-Lanza et al., 2005; Jurkowski & Johnson, 2005), health outcomes (Mainous et al., 2006), interpersonal relations (Tardif & Geva, 2006), self-esteem (Meyler, Stimpson, & Peek, 2006), help-seeking

(Lipsky, Caetano, Field, & Larkin, 2006), voting behavior (Xu, 2005), and sexual behavior (Rojas-Guyler, Ellis, & Sanders, 2005).

There are two studies currently available that have examined the association between acculturation and survey response behaviors among Latinos. Based on secondary analyses of four survey data sets, Marín, Gamba, and Marín (1992) demonstrated that propensities to both acquiesce and select extreme responses decreased with acculturation. They suggested that both extreme responding and acquiescence are consistent with important elements of Latino culture, including emphases on *simpatía*, a cultural script that encourages positive interpersonal interactions (Triandis et al., 1984) and (in the case of extreme responding) sincerity (Hui & Triandis, 1989). As Latinos in the U.S. become more acculturated, the use of these response styles can be expected to decrease, an outcome that is consistent with Marín et al.'s (1992) findings. Another study by Johnson et al. (1997) briefly examined the associations between acculturation among Latinos and three response behaviors (extreme responding, acquiescence, and socially desirable responding). In contrast to Marín et al.'s (1992) findings, they reported no independent associations between acculturation and these measures.

In this paper, we conduct a preliminary investigation of the relationship between Latino acculturation in the U.S. and survey question comprehension. In doing so, we examine two intuitive but untested hypotheses regarding the association between acculturation to host culture and question comprehension:

Hypothesis #1: Greater acculturation will be associated with fewer differences in comprehension *between* Latino and non-Latino respondents.

Hypothesis #2: Greater acculturation will be associated with increased comprehension of survey questions *among* Latino respondents.

Each of these hypotheses will be tested while controlling for both respondent- and question-level characteristics previously found to be associated with question comprehension difficulties. As referenced earlier, prior research by our study team has documented variability in question comprehension between non-Latino white respondents and members of several other racial/ethnic groups, including Mexican Americans, Puerto Ricans, and African Americans (Johnson et al., 2006). That study found that members of each minority population had greater comprehension difficulties, relative to majority whites. Here, we extend that research by testing these hypotheses regarding the association between acculturation and respondent comprehension.

2. Methods

2.1 Data Source

With respondent consent, 345 in-person laboratory interviews were tape-recorded. Using race/ethnicity as a proxy measure of respondent culture, the four most common population groups residing in the Chicago Metropolitan Area were examined: African Americans ($n=86$), Mexican Americans ($n=101$), Puerto Ricans ($n=74$), and non-Hispanic Whites ($n=84$). Respondents were recruited via advertisements in local media and ranged in age from 18–53. Interviews averaged approximately an hour in length and were conducted in English. The survey instrument included 42 substantive health-related questions selected from national health surveys conducted in the U.S. Among the surveys from which items were selected were the National Health Interview Survey (NHIS), the Behavioral Risk Factor and Surveillance Survey (BRFSS) and the former National Household Survey of Drug Abuse (NHSDA). Items were selected to represent a variety of topics, question types, and formats.

2.2 Respondent-Level Measures

Following each interview, respondents completed a brief self-report inventory of demographic questions that included gender, age, and educational attainment. We included these variables in our analyses in order to be able to partial out the effects of ethnicity. Latino respondents were additionally asked to complete several measures of acculturation. These included place of birth (Mexico, Puerto Rico, the U.S., or someplace else) and the Marín, Sabogal, Marín, Otero-Sabogal, Perez-Stable (1987) Short Acculturation Scale for Latinos. Eight items from this scale were employed to construct an index of language preference. Examples of these items include “In general, what language(s) do you read and speak?,” “In what language(s) do you usually think?,” and “In what language(s) are the T.V. programs you usually watch?” Each item employed a 5-option response scale that ranged from 1=Only Spanish to 5=Only English. Higher scores on this index represent greater degrees of preference for English over Spanish language for communicating with others. Coefficient alphas for the language preference index were 0.88 for Mexican American respondents and 0.85 for Puerto Rican respondents. General preference for Spanish vs. English communications was determined for each Latino respondent by analysis of mean responses to these eight language preference questions. Using this information, respondents were stratified into the following cultural groups for analyses of our hypotheses: (1) non-Latino Whites, (2) African Americans, (3) Latinos born in the U.S., (4) Latinos born elsewhere who prefer to communicate in English, and (5) Latinos born elsewhere who prefer to communicate in Spanish. Mexican American and Puerto Rican respondents were pooled, as

additional analyses not reported here indicated no differences in comprehension difficulties between these two groups.

2.3 Question-Level Measures

We also examined five survey question characteristics that have been previously found to be associated with question comprehension (Holbrook et al., in press). The 42 survey questions were classified along the following dimensions: question length, reading difficulty level, response format, abstraction level and use of qualified judgments. *Question length* was measured by total number of words. The *reading level* of each question was graded using Flesch-Kincaid scores (Flesch, 1979). Three *response formats* were included: those asking for numeric values (e.g., number of times exercise/week, age first drank alcohol) ($n=13$); those for which the respondent could answer “yes” or “no” ($n=9$); and those employing vague quantifiers as response categories (e.g., “excellent-good-fair-poor,” “strongly agree-agree-disagree-strongly disagree”) ($n=20$). Three levels of *abstraction* were identified. Two researchers independently classified each question as “most abstract,” “somewhat abstract,” or “least abstract.” Results were subsequently compared and differences discussed and reconciled. Abstract items were defined a priori as those for which the major concept introduced by the question was not grounded in physical reality ($n=11$ of the questions examined). Those items classified as “least abstract” were those for which the major concept introduced in the question was grounded in physical reality ($n=17$ questions). The remaining 14 items were classified as “somewhat abstract.” Questions were also categorized as to whether or not they involved *qualified judgments*. Those that involved a specified time frame (e.g., in the past year) or excluded items from a category (e.g., “servings of vegetables, not counting salads or potatoes”) were classified as using qualified judgments. Initial rating agreement was high and differences were discussed and reconciled. The specific wording of each survey question and coding for each dimension are available from the authors.

2.4 Response Level Measures of Comprehension Difficulties

Audiotapes were reviewed and respondent reactions to each of the 42 substantive survey questions were coded using a behavioral coding scheme previously reported (Oksenberg, Cannell, & Kalton, 1991) and modified for this study. Behavior coding is a methodology that involves the systematic review and coding of respondent and/or interviewer behaviors and interactions during survey interviews (Fowler, 1995). A total of 13,514 respondent answers were coded by a graduate assistant who was trained and supervised by one of the authors. A random sample of 24 taped interviews were coded by both persons, revealing an inter-rater agreement of

98.1% across the approximately 1,000 responses contained in these interviews. Table 1 defines five specific respondent behavior codes that were classified as indicative of comprehension difficulty. A confirmatory factor analysis was conducted to verify the dimensionality of these five behavior codes (Bollen, 1979). All five loaded strongly on a single factor ($\chi^2=5.85, df=5, ns$). Survey questions that elicited one or more of these behavior codes subsequently were defined as producing comprehension difficulty for the respondent in question. Table 2 presents descriptive information for each question-level and respondent-level variable.

Table 1. Respondent Behavior Codes Used to Represent Comprehension Difficulties

Clarification (Unspecified): respondent indicates uncertainty about question, but it is unclear as to whether the problem is related to the construct or the context.

Clarification (Construct): respondent asks for repeat or clarification of question, or makes a statement indicating uncertainty about question meaning (i.e., “what do you mean by depressed?”).

Clarification (Context): respondent indicates s/he understands the meaning of the construct, but indicates uncertainty about question meaning within the context of the question as stated (i.e., “what do you want to know about being depressed?”).

Clarification (time frame): respondent indicates uncertainty about the question's time frame.

Clarification (rewording): respondent rephrases the question before answering.

2.5 Analyses

Both hypotheses were examined using a two-level hierarchical linear model that was estimated via HLM6 software (Raudenbush, Bryk, Cheong, & Congdon, 2004). With comprehension difficulties with each question serving as the dependent variable, this multi-level strategy adjusted for the variance attributed to individual differences (i.e., question responses are nested within subjects), as well as factors associated with individuals (gender, age and education), in the first equation. Binary indicators representing four of the five cultural groups described earlier were also included as independent variables in models designed to test each hypothesis. Hypothesis #1 was examined by alternatively contrasting white and African-American respondents with each Latino group. Hypothesis #2 was examined by contrasting U.S.-born Latinos with the two non-U.S.-born Latino groups. This analysis was subsequently replicated in a second equation that

additionally examined the main effects of questionnaire characteristics. The question level variables examined were question length, reading level, response format, abstraction level and the use of qualified judgments. Prior analyses of these data (Holbrook et al., in press) have revealed that the level of reading difficulty of each item is most appropriately associated with comprehension problems in a nonlinear manner. Hence, the squared version of this measure was also included in this model.

3. Results

We first examine equation 1 in Table 3. This model represents the analysis of 13,514 behavior-coded answers to survey questions that were provided by the 345 Latino and non-Latino survey respondents. After adjusting for respondent gender, age and education, this model revealed lower levels of comprehension difficulty among whites, compared to African Americans and each of the three Latino groups examined. A replication of this model (not shown) in which African Americans served as the reference group found no differences in comprehension difficulties between this group and Latinos born in the U.S. and those who were foreign-born but preferred to communicate in English. Latinos born outside the U.S. who preferred to communicate in Spanish, however, were found to have more

comprehension problems than African Americans. These findings supported hypothesis #1, as more acculturated Latinos (i.e., those born in the U.S. and those born in other countries but preferred to communicate in English) were more similar to native-born white and African American respondents than were non-U.S.-born Latinos who preferred to communicate in Spanish.

These findings remained after additional controls for questionnaire characteristics were introduced in equation 2. In this second model, all five questionnaire features were found to be independently associated with comprehension problems. Consistent with prior findings (Holbrook et al., in press), comprehension difficulties were more common when responding to the most abstract questions, relative to those that were least abstract, those that employed numeric response formats, relative to those that employed yes-no and verbal label formats, and those that required qualified judgments, relative to those that did not. Also consistent with prior findings, a nonlinear effect of reading difficulty was found, with those questions at the lowest reading level, and those at the highest, eliciting the fewest expressions of comprehension problems. Question length was also associated with comprehension difficulty: longer questions were found to produce greater problems.

Table 2. Question and Respondent Variables

VARIABLES	Mean	SD	Minimum	Maximum
Respondent Characteristics				
Level 2 (N=348)				
Education (1=less than 8 yrs; 6=graduate training)	3.57	1.17	1	6
Age	32.05	8.25	18	53
Gender (Male)	0.51	0.5	0	1
Ethnicity-Place of Birth-Language Preference				
White	0.24	0.43	0	1
African American	0.25	0.43	0	1
No Language Preference—US Born	0.25	0.44	0	1
No Language Preference—Foreign Born	0.12	0.32	0	1
Spanish Preferred—US Born	0.02	0.13	0	1
Spanish Preferred—Foreign Born	0.12	0.32	0	1
Question Characteristics				
Level 1 (N=13,633)				
Comprehension Difficulty	0.09	0.29	0	1
Abstraction Level				
Most Abstract	0.27	0.45	0	1
Somewhat Abstract	0.35	0.48	0	1
Least Abstract	0.38	0.49	0	1
Question Length (# of words)	21.80	10.52	5	46
Reading Difficulty Level	6.84	2.81	1.5	12
Response Format				
Numeric	0.28	0.45	0	1
Yes/No	0.22	0.41	0	1
Verbal Labels	0.50	0.50	0	1
Qualified Judgment	0.58	0.49	0	1

Table 3. HLM Estimates of Individual and Question-Level Characteristics on Comprehension Difficulty among Latinos

	Equation 1		Equation 2	
	Odds Ratio	(SE)	Odds Ratio	(SE)
Effects of the individual characteristics				
Intercept	0.101	(0.093,0.111)	0.089	(0.081,0.098)
Education	0.919	(0.842,1.002)	0.915	(0.836,1.002)
Age	1.006	(0.995,1.016)	1.006	(0.995,1.017)
Gender (Male)	1.102	(0.921,1.318)	1.090	(0.907,1.310)
Ethnicity/Language Preference/Place of Birth				
White (Ref)				
African American	1.310*	(1.027,1.670)	1.328*	(1.036,1.703)
No Language Preference—US Born	1.396**	(1.088,1.791)	1.412**	(1.095,1.821)
No Language Preference—Foreign Born	1.421*	(1.023,1.973)	1.436*	(1.024,2.013)
Spanish Preferred—US Born	0.842	(0.403,1.759)	0.850	(0.405,1.787)
Spanish Preferred—Foreign Born	2.272***	(1.608,3.209)	2.359***	(1.647,3.378)
Effects of questionnaire characteristics				
Abstraction Level (Ref=Least Abstract)				
Most Abstract			2.003***	(1.600,2.509)
Somewhat Abstract			1.114	(0.955,1.298)
Question Length			1.008*	(1.001,1.015)
Reading Difficulty Level			1.551***	(1.368,1.759)
Reading Difficulty Level-Squared			0.976***	(0.968,0.984)
Response Format (Ref=Numeric)				
Yes/No			0.287***	(0.235,0.350)
Verbal Labels			0.367***	(0.299,0.450)
Qualified Judgment			1.291*	(1.103,1.511)

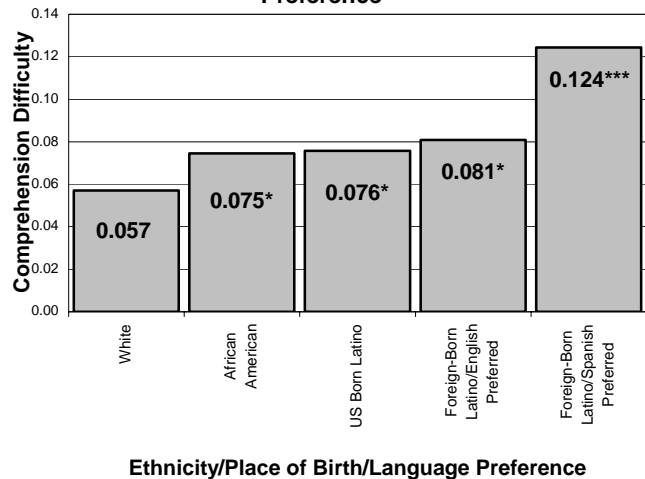
* $p < .05$; ** $p < .01$; *** $p < .001$.

The models presented in Table 3 were next respecified in order to designate U.S.-born Latinos as the contrast group for an assessment of Hypothesis #2. This analysis (not shown) revealed no differences in comprehension between Latinos born in the U.S. and those born elsewhere but who preferred to communicate in English. Differences were found, however, between U.S.-born Latinos and Latinos born in other countries who preferred to communicate in Spanish. These findings supported hypothesis #2, as more acculturated Latinos (i.e., those born in the U.S.) were found to have fewer comprehension difficulties than were less acculturated Latinos (i.e., those born in other countries who had a preference for communicating in Spanish).

These findings are summarized in Figure 1, which compares mean levels of comprehension difficulty across groups after first adjusting for other demographic and question characteristics. As this figure indicates, white respondents were found to have comprehension difficulties when responding to 5.7% of all questions. This proportion was significantly lower than the proportion of comprehension difficulties expressed by U.S.-born Latinos (7.6%), foreign-born Latinos who preferred to communicate using English (8.1%) and foreign-born Latinos who preferred to communicate in Spanish (12.4%). No differences, though, were seen between African American, U.S.-born Latinos, and those born elsewhere who prefer English. Each of these

groups, though, reported significantly fewer comprehension problems, compared to Latinos who were born outside the U.S. and who preferred to communicate in Spanish.

Figure 1. Probability of Comprehension Difficulty by Ethnicity and Language Preference[†]



[†]Controlling for education, age, gender and question characteristics; * $p < .05$; *** $p < .001$ (Ref=White).

4. Discussion

Our first hypothesis was confirmed in models that documented greater similarity in comprehension problems between U.S.-born whites and African Americans with Latinos who were more acculturated (i.e., those born in the U.S. and those preferring to communicate in English). Among Latinos, our second hypothesis was also supported. Specifically, being born in the U.S. and/or having a greater preference for English usage was associated with fewer observed comprehension problems among Latinos. Hence, less acculturated Latinos experience more problems of comprehension when answering English language questionnaires.

These findings are consistent with an acculturative model that associates greater exposure to a host culture with reduced disparities in survey question comprehension, relative to the native-born population. Although intuitive, these associations between acculturation and survey comprehension have not been previously reported. They further demonstrate that acculturation may be an important mediator of some survey response behaviors among minority and immigrant populations. In addition to its role in mediating question comprehension, as suggested by these analyses, other research has also associated acculturation with acquiescent and extreme response behaviors (Marín et al., 1992).

These findings further suggest a potentially valuable strategy for questionnaire pretesting. It would seem useful to insure that some portion of pilot interviews, particularly of think-aloud interviews, could be represented by relatively unacculturated immigrant populations (assuming such groups are eligible for participation in a given survey) in order to insure that individuals most likely to have comprehension problems have an opportunity to contribute to instrument refinement.

We acknowledge several limitations of this research. Most importantly, there is no consensus regarding how to measure or conceptualize acculturation (Berry, 2003). The analyses presented in this paper rely on fairly crude measures of this complex construct (place of birth and language preferences) and do not consider psychological, behavioral and other dimensions of acculturation that have been explored by other researchers (Zane and Mak, 2003). Additional research into the relationship between acculturation and respondent survey behavior should explore other measures of acculturation.

A related issue is the fact that all interviews were conducted in English. Consequently, our measure of acculturation is likely truncated in that highly unacculturated Latinos unable to participate in an

English language interview were excluded. Additional investigations that include interviews conducted in Spanish as well as English will be needed to verify the findings reported here. It would also be valuable to see this work replicated in other contexts. Many western nations, for example, continue to experience considerable in-migration. The acculturative model of survey comprehension demonstrated in this paper could be further generalized if similar findings could be documented in social and cultural contexts outside of the United States.

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