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The Influence of Topic Interest and Interactive Probing on Responses to Open-Ended Questions in Web Surveys

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Web surveys offer new opportunities for achieving high-quality responses to open-ended questions because the interactive nature of the web allows questions to be tailored to individual respondents. This article explores how respondents' level of interest in the topic of the question can influence whether they provide a response and the quality of their answers. In addition, we examine whether an interactive follow-up probe, asked after people submit their initial response to the open-ended question, can improve the quality of responses. We find that respondents' interest in the question topic significantly affects the responses to open-ended questions, and interactively probing responses to open-ended questions in web surveys can improve the quality of responses for some respondents, particularly for those very interested in the question topic. Nonresponse remains a significant problem for open-ended questions; we found high item nonresponse rates for the initial question and even higher nonresponse to the probe, especially for those less interested in the topic of the question. Consequently, interactive probing should only be used for a few key open-ended questions within a survey where high-quality responses are essential and may be more effective for respondents who are already motivated to provide a response.

Keywords: *Internet surveys; interactivity; open-ends; questionnaire design; leverage-saliency; item nonresponse*

Web surveys offer new opportunities for improving the quality of responses to open-ended questions because of the enhanced design capabilities that can be programmed, including audio, visual, and interactive features that allow for increased interaction with the respondents while they are taking the survey (Conrad, Couper, & Tourangeau, 2003). However, regardless of the features that are available, responses to open-ended questions may not be affected as positively by motivational tactics as the respondent's own interest in the topic of the survey (Groves, Presser, & Dipko, 2004). Respondents' level of interest can affect the mix of participants and individual characteristics represented in the group of respondents measured.

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Open-ended questions are important measures because they allow respondents to answer in their own words without being influenced by the response categories provided. However, they require more effort than selecting from a list of options, so additional design features are often needed to improve the quality of responses. Specifically, researchers have found that probing, using motivational instructions, and visual design features can improve the quality of responses to open-ended questions. Item nonresponse remains a significant issue in self-administered surveys because there is no interviewer present to motivate people to answer; however, those who do respond seem more willing to write longer answers when they have more time to develop a response and can type their responses rather than write them on paper (Schaefer & Dillman, 1998; Ramirez, Sharp, & Foster, 2000).

One of the main benefits of Internet surveys is the ability to tailor the survey to individual respondents. Follow-up questions can be asked based on people's responses to previous questions and respondents can easily skip questions that do not apply to them. The interactivity of the web can provide the benefits of both self-administered surveys and interviewer surveys: respondents are able to complete the survey at their own pace without an interviewer present to influence their responses while also being engaged in the survey, as they are guided and motivated by the interactive features embedded in the questionnaire.

We discuss how the interactive nature of web surveys can be used to help improve the quality of responses to open-ended questions by investigating how tailoring items based on respondents' level of interest in the question topic and asking follow-up probes may influence responses to open-ended questions. Specifically, we discuss the results of two experiments embedded in a survey of undergraduate students, where we used the interactivity of web surveys to ask a follow-up probe after people's initial response to an open-ended question. The probe screen presented their initial response to the question and then asked for additional information. We focus our analysis on discussing how respondents' level of interest in the question topic influences whether people respond and the quality of responses provided to the initial question and the probe.

Theoretical Background

Open-ended questions are important tools for survey researchers because respondents are able to report rich and detailed information in their own words rather than being limited by a set of answer choices (Tourangeau, Rips, & Rasinski, 2000). Although open-ended questions often yield descriptive information about the topic, they are more burdensome because they take more time to answer and require respondents to formulate their own response rather than simply selecting from a list of potential answers. Krosnick (1999) says that respondents often satisfice and provide an answer that fulfills the requirements of the question, but do so at the least possible expense of effort. Thus, because of the extra burden associated with open-ended questions, some people seem either unwilling to answer them or do not provide the high-quality responses that are most desired by the surveyors.

Open-Ended Questions in Web Surveys

Web surveys have renewed interest in asking open-ended questions in self-administered surveys. Early research has shown that open-ended questions in web surveys can produce comparable and sometimes even higher quality responses than paper surveys; people are more likely to provide a response and provide longer, more thoughtful answers when responding by web or e-mail than by paper (Ramirez et al., 2000; Schaefer & Dillman, 1998; Smyth, Dillman, Christian, & McBride, in press). In addition, because respondents are able to respond at their own pace and are potentially less distracted when answering web surveys, they may be motivated to provide more complete responses to open-ended questions (Fricker, Galesic, Tourangeau, & Yan, 2005).

Smyth et al. (in press) found that high-quality responses to open-ended questions can be obtained on the web. Specifically, they found that motivating introductory statements and the size of the answer spaces can help improve the quality of responses people provide. Other studies have also found that larger answer spaces on paper surveys encourage longer responses (Christian & Dillman, 2004; Israel, 2006). However, item nonresponse remains an important issue on the web. In a survey of university students, item nonresponse rates for the open-ended question ranged from 1% to 33% (Smyth, Dillman, Christian, & McBride, 2006).

Leverage-Saliency

Leverage-saliency theory suggests that whether potential participants respond to a survey request depends on the importance placed on an element of the request by the individual and the prominence of any particular element in the survey request (Groves, Singer, & Corning, 2000). Saliency can be manipulated by the amount of importance the researcher places on a feature when contacting people to respond to the survey. The theory suggests that the features that influence response rates may also affect the representativeness of the sample that is measured (Groves et al., 2000).

Groves et al. (2004) found that respondents who are more interested in the topic are 40% more likely to respond to a survey and are also more likely to provide responses to individual questions than those who are less interested in the topic of the survey. They find that respondents who “possess characteristics that predispose them to be interested in a particular topic” are more likely to participate in the survey when that topic is referenced in the introduction (Groves et al., 2004, p. 16). Nonresponse error results when respondents with more interest in the topic share key attributes that are different from those with less interest (Groves et al., 2004).

In web surveys, topic saliency has shown to have similar effects as in other survey modes (Marcus, Bosnjak, Lindner, Pilischenko, & Schutz, 2007). Studies in web surveys have also shown that people’s interest in the survey topic has a greater impact on response rates than other features, including incentives provided to respondents (Cook, Heath, & Thompson, 2000.). Very little research has explored how leverage-saliency theory can be extended beyond responding to an entire survey to explaining why people respond to individual questions and the quality of responses they provide.

Improving Responses to Open-Ended Questions

Interviewers can help motivate participants to provide a response to open-ended questions and can also clarify information and ask follow-up probes to help ensure quality responses (Groves, Fowler, Lepkowski, Singer, & Tourangeau, 2005). Probing in interview-administered surveys is often used to encourage responses from participants who may not provide an answer or who provide a very short answer. However, probing is also important in helping respondents comprehend the question as the researcher intends (Conrad & Schober, 2005) and clarifying respondents' answers (Billiet & Loosveldt, 1988). Thus, probing can help to ensure more accurate and complete responses than were initially given. Although probing can improve responses to that question, feedback at one point in a survey can influence responses for the remainder of a survey, so probing should be used carefully and not lead respondents by giving any indication of a "correct" answer (Cannell, Miller, & Oksenberg, 1981; Groves et al., 2005; Miller & Cannell, 1982).

Because web surveys allow for interaction with the respondent, probing could be used to help obtain high-quality responses to open-ended questions. Similar to how interviewers probe for additional information in telephone and face-to-face surveys, follow-up probes can be asked in web surveys after participants provide a response to an open-ended question. In addition, specific follow-up probes could also be asked of participants who do not provide a response to open-ended questions or those who do not provide a response in an acceptable form. Probing open-ended responses on the web shows promise for producing rich and quality open-ended responses; however, currently many surveyors face limitations on the flexibility of programming in web surveys, which influences the types of probes that can be asked.

The design of follow-up probes to open-ended questions should consider previous research on interactive features in web surveys so that probing can be designed effectively to help produce higher quality responses, without increasing respondent burden or frustration. Research conducted with hyperlinks that can provide definitions or examples and error messages have found that the more steps required to access the feature, the less it gets used (Best & Krueger, 2004; Conrad, Couper, Tourangeau, & Peytchev, 2006; Conrad et al., 2003). The studies on progress indicators have shown that they seem to be effective only for short surveys, where respondents are instructed that the survey will be short (Conrad et al., 2003; Couper, Traugott, & Lamias, 2001). Probing open-ended questions effectively should be built into the navigation and design of the web questionnaire, so respondents perceive the probe as part of the question sequence and do not have to expend additional effort beyond responding to the probe.

Our research study focuses on testing the influence of topic interest and interactive probing on responses to open-ended questions in web surveys. Specifically, we analyze the response and nonresponse to the open-ended questions and the probe as well as response quality. In addition, we test whether leverage-salience theory may also be useful in understanding why people respond to individual questions. Our results are organized around the following three research questions: (a) Who responds to the initial open-ended questions? (b) Who responds to the probes and what is the quality of responses to the probe? and (c) How does the probe and interest in the subject influence overall response quality?

Methods

This experiment was included in a survey of University of Georgia (UGA) students about their interest in Latin American and Caribbean studies and a new undergraduate major that is being offered at the university. Students were asked up to 27 questions depending on skip patterns, and the survey took approximately 10 min to complete. We received completed surveys from 1,222 of the 13,391 students we surveyed, for a response rate of 9% when the number of completed surveys is divided by the total number of students in the sample. In an effort to analyze how many respondents actually received the e-mail requests, we categorized the e-mails based on why they were bounced back. We determined that 29 of the e-mail addresses were invalid. In addition, 80 students did not receive one of the e-mails, 28 students did not receive two of the e-mails, and 49 students did not receive any of the three contact e-mails because their inboxes were over quota. We did not remove these students from the total number in the sample reported above.

We received incomplete surveys from 122 people who began the survey. Of these respondents who did not complete the survey, 18 did not even respond to the first question, another 38 dropped out between the first question and the first open-ended question. Of the remaining 66 respondents, 11 dropped after the first open-ended question and another 17 after the second open-ended question. Overall, there were no significant differences between these two versions in the number of respondents who dropped out before or after the open-ended questions. We conducted the analysis on the total sample including the incomplete surveys; however it did not change any of the results, so we report results only for those who completed the entire survey.

An invitation to participate in the survey was e-mailed to UGA students on February 20, 2007. This initial e-mail described the purpose of the survey, the approximate amount of time it would take to complete the survey, and explained that participation in the survey was voluntary. This e-mail also provided the participants with a link to the web survey and a personal access code required to gain entrance to the survey. On February 26th and March 8th, follow-up e-mail notifications were sent to students who had not yet responded, and on March 19th the survey was closed.

When respondents entered the survey, they were randomly assigned to one of the two versions of the survey. Half of the respondents did not receive the additional probe screen, whereas the other half received the follow-up probe screens after their initial response to the two open-ended questions. Each question in the survey appeared on its own screen, and all screens had the same overall design (see Figure 1A). The two open-ended questions were asked more than halfway through the survey. Before the first open-ended question, students were asked an initial closed-ended question "How interested are you in Latin America or the Caribbean region?" Only respondents who answered that they were "very" or "somewhat" interested were asked the open-ended question "What countries and topics are you most interested in within Latin America and/or the Caribbean region?" These respondents were provided a text box with five rows of visible text, where the area would expand to allow respondents to type more than five lines (see Figure 1A). At this point, respondents to the version without the additional probe moved to the next question,

Figure 1a
Example question screen for first open-ended question

The University of Georgia
Latin American and Caribbean Studies Survey

What countries and topics are you most interested in within Latin America and/or the Caribbean region?

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whereas respondents to the version with the probe were sent to a screen displaying the respondent's verbatim response and asking "Are there any other countries or topics that you are interested in within Latin America and/or the Caribbean region?," followed by another open-ended text box of the same size (see Figure 1B).

The second open-ended question appeared immediately after the first and was also preceded by a closed-ended question: "How interested are you in issues concerning Latinos in the United States?" Similar to the previous question, respondents who answered very or somewhat interested were then asked the open-ended question, "What specific issues are you most interested in related to Latinos within the U.S.?" and provided the same size expandable text box as in the first open-ended question (see Figure 2A). Respondents to the version with the probe were sent to a screen displaying the respondent's verbatim response and asking "Are there any other issues that you are interested in related to Latinos within the U.S.?" followed by another open-ended text box of the same size (see Figure 2B).

When analyzing responses to the open-ended questions, we only include eligible respondents who were asked the open-ended question because they reported being very or somewhat interested in the initial close-ended question that preceded each of the two open-ended questions (those who were "not at all interested" were not asked the open-ended question). Respondents who gave a nonsubstantive response (i.e., "don't know," "NA," "nothing") in the open-ended answer space were considered having not responded to the item along with those who left the item blank. For each open-ended question, we coded (a) whether the respondent provided a substantive response, (b) the number

Figure 1b
Example probe screen for first open-ended question



The University of Georgia

Latin American and Caribbean Studies Survey

Here are the countries and topics that you wrote are most interesting to you.

I am most interested in the culture and history of Brazil and Peru. I would love to learn more about the language, food, art, and music of these two countries.

Are there any other countries or topics that you are as interested in within Latin America and/or the Caribbean region?

Move to Next Question »
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of words in their response, (c) the number of unique themes or topics in their response, and (d) whether they provided additional descriptive elaboration. For those who received the probe, responses were coded both at the question screen and again at the probe screen. For the respondents who did not receive the probe, the responses were coded at just the questions screen.

The following is a response to the first open-ended question in the experiment regarding countries and topics of interest in Latin America and the Caribbean region: “Latin American literature—particularly Argentinian—and the relationship between the literatures of Latin America, Spain, and the US. I’m also interested in the role of religion in Latin America.” This response was coded as having 29 words, 2 themes, and elaboration. The identified themes were literature and religion, where the respondents provided additional descriptive explanation about the literature theme.

Chi-square tests were calculated to determine the significant differences for categorical variables (e.g., percentage responding/not responding by version or interest in the topic and percentage elaborating by version). The *t* tests were used to compare differences in the mean number of words or themes provided in the response. Two-tailed *t* tests were used when we expected no differences (e.g., between the question screen in both versions) and one-tailed *t* tests were used where we expected to see differences (e.g., between the versions after the responses to the probe were included).

Figure 2a
Example question screen for second open-ended question



The University of Georgia Latin American and Caribbean Studies Survey


What specific issues are you most interested in related to Latinos within the US?

I'm interested in the assimilation and acculturation trends among Latinos in the US. How much pressure do they receive from the US to assimilate/acculturate and how much pressure do they receive from their own culture to assimilate/acculturate?

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Figure 2b
Example probe screen for second open-ended question



The University of Georgia Latin American and Caribbean Studies Survey

Here are the issues that you wrote are most interesting to you.

I'm interested in the assimilation and acculturation trends among Latinos in the US. How much pressure do they receive from the US to assimilate/acculturate and how much pressure do they receive from their own culture to assimilate/acculturate?

Are there any other issues that you are as interested in related to Latinos within the US?

Move to Next Question » **« Back**

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Table 1
Comparing Response and Nonresponse for the Version Without the Probe to the Version With the Probe and Comparing Response by Level of Interest

	What Countries and Topics Are You Most Interested in Within Latin American and/or the Caribbean region?		What Specific Issues Are You Interested in Related to Latinos Within the U.S.?	
	<i>No probe</i> (<i>n</i> = 484)	<i>Probe</i> (<i>n</i> = 491)	<i>No probe</i> (<i>n</i> = 464)	<i>Probe</i> (<i>n</i> = 458)
Response (%)	70.3	71.7	70.7	66.2
Nonresponse (%)	29.8	28.3	29.3	33.8
Chi-square	$\chi^2 = 0.25$		$\chi^2 = 2.19$	
Response by level of interest	<i>Very interested</i> (<i>n</i> = 362) 86.2%	<i>Somewhat interested</i> (<i>n</i> = 613) 62.0%	<i>Very interested</i> (<i>n</i> = 273) 88.3%	<i>Somewhat interested</i> (<i>n</i> = 649) 60.1%
Chi-square	$\chi^2 = 64.69$		$\chi^2 = 70.68$	

Note: Bold typeface indicates $p \leq .05$.

Results

Who Responded to the Initial Open-Ended Questions?

To analyze responses to the open-ended questions, we first discuss the overall response rates and compare the response rates to the version without the probe with those for the version with the probe. Overall, 70% of respondents provided a response to the first open-ended question, "What countries and topics are you most interested in within Latin America and/or the Caribbean region?" However, 29% of the respondents did not respond to the question at all. As shown in Table 1, there is not a significant difference in item nonresponse between those who received the version with the probe and those respondents who received the version without the probe ($\chi^2 = 0.25, p = .620$). This speaks to the evenness of the independent samples on the test criterion, as we would not expect any differences between the two versions before the probe was asked. Of those who did not receive the probe, 30% did not respond to the open-ended question, and of those respondents who received the version with the probe, 28% did not respond to the open-ended question.

We found similar item nonresponse rates for the second question "What specific issues are you interested in related to Latinos in the US?" that had an overall item nonresponse rate of 32%. Again, there is not a significant difference in item nonresponse between the two versions ($\chi^2 = 2.19, p = .139$); however, more respondents to the version with the probe did not respond to the question (34%) compared with respondents who did not receive the probe (29%). For both questions, asking the probe did not result in a significant change in item nonresponse (see top of Table 1). Although these item nonresponse rates seem high, similar rates of nonresponse have been found to open-ended questions in web surveys of university students.

Respondents who reported being very interested in the initial closed-ended question that preceded the open-ended question "How interested are you in Latin America and/or the

Caribbean region?" were significantly more likely to provide a response than those who reported being only somewhat interested ($\chi^2 = 64.69, p \leq .001$). As shown in the bottom of Table 1, 86% of respondents who reported being very interested in Latin America and/or the Caribbean region responded to the open-ended question, whereas only 62% of those who reported being somewhat interested provided a response

A similar pattern emerges for the second open-ended question where those who are very interested are significantly more likely to provide a response than those who are only somewhat interested in issues related to Latinos within the United States ($\chi^2 = 70.68, p \leq .001$). Of those who reported being very interested, 88% responded to the subsequent open-ended question compared with 60% of those who reported being somewhat interested (also shown in the bottom of Table 1). There are no differences in response between versions of questions either after the question screen only or after the question and probe screen combined for those who reported being very or somewhat interested ($\chi^2 = 0.65, p = .418$ for the first question and $\chi^2 = 0.14, p = .709$ for the second question). Overall, there were significantly more responses to the open-ended question from respondents who reported being very interested in the subject compared with those who reported being only somewhat interested in both versions (those who received the probe and those who did not).

Who Responded to the Probes and What is the Quality of the Responses to the Probe?

Next, we examine just the effect of the probe on the percentage of people who responded and did not respond to the open-ended question, and the effect of the probe on the quality of people's responses. None of the respondents who did not answer the initial open-ended question went on to provide a response at the probe screen. Overall, only 25% of respondents responded to the probe in the first open-ended question and only 9% responded to the probe after the second open-ended question (see the top of Table 2).

As shown in the middle of Table 2, 34% of the respondents who reported being very interested in the topic responded to the probe after the first question compared with only 17% of those who reported being somewhat interested ($\chi^2 = 12.64, p \leq .001$). Similarly, 16% of those who reported being very interested responded to the probe after the second question compared with 5% of those who reported being somewhat interested ($\chi^2 = 11.59, p \leq .001$). Overall, significantly more respondents who are very interested in the topic provide a response to the open-ended question at both the question screen and the probe screen compared with those who reported they were only somewhat interested in the topic. Therefore, interest is playing a key role in whether people respond to both the question and the follow-up probe.

Although we analyzed the quality of responses for all stages of the study (i.e., question screen only, question screen and probe screen, probe screen only), we will first consider the quality of responses to the probe screen alone. Of those who responded to the probe for the first open-ended question, their responses averaged 7.8 words and 1.6 themes, and 23% of respondents provided additional descriptive elaboration about the themes mentioned in their response (see bottom of Table 2). For the second open-ended question, the responses to the probe averaged 13.6 words and 1.4 themes, and 32% of respondents elaborated about the themes mentioned in their response.

Table 2
Analyzing the Effects of the Probe on Response and Response Quality

	What Countries and Topics Are You Most Interested in Within Latin American and/or the Caribbean Region?		What Specific Issues Are You Interested in Related to Latinos Within the U.S.?	
	<i>n</i> = 351		<i>n</i> = 310	
Response to the probe (%)	24.8		9.0	
Nonresponse to the probe (%)	75.2		91.0	
Response to the probe by level of interest	<i>Very interested</i> (<i>n</i> = 164) 33.5%	<i>Somewhat interested</i> (<i>n</i> = 187) 17.1%	<i>Very interested</i> (<i>n</i> = 118) 16.1%	<i>Somewhat interested</i> (<i>n</i> = 192) 4.7%
Chi-square	$\chi^2 = 12.64$		$\chi^2 = 11.59$	
<i>Response quality</i>				
Mean number of words	7.8		13.6	
Mean number of themes	1.6		1.4	
Percentage elaborating	23.0		32.1	

Note: Bold typeface indicates $p \leq .05$.

How Does the Probe and Interest in the Subject Influence Overall Response Quality to the Open-Ended Questions?

We compare the overall response quality between the two versions after the question screen only and find that there are no significant differences between the two versions at the first question screen for either of the two open-ended questions (see Table 3). We expect there should be no differences in the quality of respondents' answers to the open-ended questions at the first question screen because all respondents had received the same stimulus at this point, except in the second question (because some respondents received the probe after the earlier open-ended question).

Comparing the version without the probe to the version with the probe, responses to the first question had the same mean number of words (10.0 vs. 10.0; $t = 0.04$, $p = .971$), similar mean number of themes (2.3 vs. 2.4; $t = 0.86$, $p = .388$), and nonsignificant differences in the percentage elaborating (27.1% vs. 21.6%; $\chi^2 = 0.65$, $p = .089$). No differences were found between versions for the second question; they had a similar mean number of words (9.0 vs. 9.7; $t = 0.55$, $p = .582$), identical mean number of themes (1.7 vs. 1.7; $t = 0.11$, $p = .915$), and no difference in the percentage elaborating (15.2% vs. 18.5%; $\chi^2 = 1.18$, $p = .277$). These results confirm that there were no differences in responses between the two groups at the first question screen regardless of whether they were selected to receive the follow-up probe.

Next, we compared response quality between respondents who reported being very interested and those who reported being somewhat interested in the subject of the question at the question screen only. We found significant differences at all three measures of response

Table 3
Comparing Data Quality for Version 1 to Version 2 and Very Interested to Somewhat Interested After the Question Screen Only

	What Countries and Topics Are You Most Interested in Within Latin American and/or the Caribbean Region?		What Specific Issues Are You Interested in Related to Latinos Within the U.S.?	
	<i>No probe</i> (<i>n</i> = 339)	<i>Probe</i> (<i>n</i> = 352)	<i>No probe</i> (<i>n</i> = 328)	<i>Probe</i> (<i>n</i> = 303)
Mean number of words	10.0	10.0	9.0	9.7
	<i>t</i> = 0.04		<i>t</i> = 0.55	
By level of interest	<i>Very interested</i> (<i>n</i> = 312)	<i>Somewhat interested</i> (<i>n</i> = 379)	<i>Very interested</i> (<i>n</i> = 390)	<i>Somewhat interested</i> (<i>n</i> = 241)
	11.8	8.5	11.1	8.2
	<i>t</i> = 3.03		<i>t</i> = 2.08	
Mean number of themes	2.3	2.4	1.7	1.7
	<i>t</i> = 0.86		<i>t</i> = 0.11	
By level of interest	<i>Very interested</i> , 2.7	<i>Somewhat interested</i> , 2.1	<i>Very interested</i> , 2.0	<i>Somewhat interested</i> , 1.5
	<i>t</i> = 4.74		<i>t</i> = 5.99	
Percentage elaborated	27.1	21.6	15.2	18.5
Chi-square	$\chi^2 = 2.89$		$\chi^2 = 1.18$	
By level of interest	<i>Very interested</i> , 32.1%	<i>Somewhat interested</i> , 17.9%	<i>Very interested</i> , 21.6%	<i>Somewhat interested</i> , 13.9%
Chi-square	$\chi^2 = 18.51$		$\chi^2 = 6.34$	

Note: Bold typeface indicates $p \leq .05$.

quality between respondents who are very interested and somewhat interested for both questions (see Table 3). Being more interested in the question topic affects the number of words provided to the first question (11.8 vs. 8.5; $t = 3.03$; $p = .003$) and the second question (11.1 vs. 8.2; $t = 2.08$; $p = .038$). The relationship between interest and providing more themes is especially strong for both questions (2.7 vs. 2.1, $t = 4.74$ for the first question; 2.0 vs. 1.5, $t = 5.99$ for the second question; $p \leq .001$ for both questions). Finally, elaboration is also related to interest in the topic. In the first question, significantly more people who were very interested provided elaboration compared with those who were only somewhat interested (32.1% vs. 17.9%; $\chi^2 = 18.51$; $p \leq .001$). The relationship remains the same in the second question (21.6% vs. 13.9%; $\chi^2 = 6.34$; $p = .012$).

After respondents received the probe, we expected to see differences in the quality of responses to the open-ended questions between versions. For the first question, there are significant differences in the mean number of words and themes respondents provide. As shown in Table 4, respondents to the version with the probe provided 12.1 words compared

Table 4
Comparing Data Quality for Version 1 to Version 2 and Very Interested to Somewhat Interested After Both the Question and Probe Screens

	What Countries and Topics Are You Most Interested in Within Latin American and/or the Caribbean Region?			What Specific Issues Are You Interested in Related to Latinos Within the U.S.?			
	<i>No probe</i> (<i>n</i> = 339) 10.0	<i>Probe</i> (<i>n</i> = 352) 12.1		<i>No probe</i> (<i>n</i> = 328) 9.0	<i>Probe</i> (<i>n</i> = 303) 11.2		
Mean number of words			<i>t</i> = 1.69			<i>t</i> = 1.55	
By level of interest	<i>Very interested</i> (<i>n</i> = 148) 12.1	<i>Somewhat interested</i> (<i>n</i> = 191) 8.4	<i>Very interested</i> (<i>n</i> = 164) 14.1	<i>Very interested</i> (<i>n</i> = 123) 12.4	<i>Somewhat interested</i> (<i>n</i> = 188) 10.4	<i>Very interested</i> (<i>n</i> = 118) 11.7	<i>Somewhat interested</i> (<i>n</i> = 185) 10.9
Mean number of themes	<i>t</i> = 2.19	<i>t</i> = 2.10	<i>t</i> = 2.9	<i>t</i> = 3.72	<i>t</i> = 0.29	<i>t</i> = 1.77	1.8
By level of interest	<i>Very interested</i> 2.5	<i>Somewhat interested</i> 2.1	<i>Very interested</i> 3.4	<i>Very interested</i> 2.0	<i>Somewhat interested</i> 2.5	<i>Very interested</i> 2.1	<i>Somewhat interested</i> 1.6
Percentage elaborated	27.1	25.9		15.2	20.5		20.5
Chi-square			<i>t</i> = 2.22	<i>t</i> = 3.92	<i>t</i> = 4.54	<i>t</i> = 4.49	<i>t</i> = 4.01
by level of interest	<i>Very interested</i> 36.5	<i>Somewhat interested</i> 19.9	<i>Very interested</i> 32.9	<i>Very interested</i> 20.3	<i>Somewhat interested</i> 19.8	<i>Very interested</i> 26.2	<i>Somewhat interested</i> 16.8
Chi-square	$\chi^2 = 11.61$	$\chi^2 = 7.86$	$\chi^2 = 0.13$	$\chi^2 = 3.93$	$\chi^2 = 3.94$	$\chi^2 = 2.94$	$\chi^2 = 4.01$

Note: Bold typeface indicates $p \leq .05$.

with only 10.0 words for respondents who did not receive the probe ($t = -1.69, p = .046$) and provided more themes or topics in their responses (2.9 vs. 2.3; $t = -4.14, p \leq .001$). However, there are no significant differences in the percentage of respondents elaborating on their response between the two versions ($\chi^2 = 0.13, p = .718$). This may be because the question asks for specific countries and topics within Latin America and/or the Caribbean region of interest to the respondent.

When responding to the second question, respondents who received the probe also provided more words than respondents who did not (9.0 vs. 11.2), and a greater percentage of respondents elaborated on their response (15.2% vs. 20.5%); however, these differences only approach significance at the .05 level ($t = -1.55, p = .060$ for mean number of words; $\chi^2 = 2.94, p = .087$ for percentage elaborating). Significantly, more respondents to the version with the probe provided more themes (1.8 vs. 1.7; $t = -1.77, p = .039$). Overall, the probe is only affecting a small percentage of respondents; however, those whom it is affecting are providing more words and themes in their responses, which are reflected in the overall differences between versions (see Table 4).

Finally, we analyzed the role of interest in the question topic on response quality. We expected that those with greater interest would have higher quality responses to the open-ended questions even when holding version of the survey constant. The data confirm our expectations (see Table 4). For the first question, looking at the version without the probe, respondents who were very interested in the subject of the question provided significantly more words (12.1 vs. 8.4; $t = 2.19; p = .030$) and themes (2.5 vs. 2.1; $t = 2.22; p = .027$) and were more likely to elaborate (36.5% vs. 19.9%; $\chi^2 = 11.61; p \leq .001$) than those who were just somewhat interested. Results for those who received the version with the probe are similar. Respondents who were very interested provided more words (13.1 vs. 10.4; $t = 2.10; p = .036$) and more themes (3.4 vs. 2.5; $t = 3.92; p \leq .001$) and were more likely to elaborate (32.9% vs. 19.8%; $\chi^2 = 7.86; p = .005$) than those who were somewhat interested in the question topic.

We found similar results for the second question (see Table 4). Respondents who were very interested and received the version without the probe provided more words (12.4 vs. 6.9; $t = 3.72; p \leq .001$) and more themes (2.0 vs. 1.5; $t = 4.54; p \leq .001$), and they elaborated more often (20.3% vs. 12.2%; $\chi^2 = 3.93; p = .047$) than those who were only somewhat interested. Respondents who were very interested and received the version with the probe provided more words, but not significantly so, and more themes (2.1 vs. 1.6; $t = 4.49; p \leq .001$), and they elaborated more often (26.2% vs. 16.8%; $\chi^2 = 4.01; p = .045$). Controlling for version, respondents who were very interested in the subject provided more words in three of the four tests and provided more themes and elaborated more often in four of the four tests.

Summary and Discussion

We found that item nonresponse to open-ended questions is still an issue in web surveys, given that many people did not respond to these two questions. In addition, asking the probe did not improve item nonresponse; it does not encourage more people to respond who did not provide an answer to the initial open-ended question. Thus, it appears that this probe is

not providing respondents with motivation to respond, merely another opportunity to do so. Given that the probe is not necessarily eliciting a response and that it is not necessarily neutral as it implies that the respondent did not provide a complete answer, it could be argued that probes that are currently within web programming capability are not probes at all. However, we believe that giving respondents a second opportunity to consider the question in light of their response offers respondents an opportunity to provide clarification to their answer and therefore is considered a probe. The neutrality issue is a limitation of this study, and future research could examine the impact of using different interactive features available on the web.

The probe only affected a small portion of the eligible respondent (25% responded in the first open-ended question and 9% in the second open-ended question). Although the probe does not appear to be affecting the number of people responding, it is affecting the quality of responses for those respondents who do respond. For both questions, there is a significant difference between versions in the number of themes provided, and there is a significant difference in the number of words provided for the first question. These results suggest that probing should only be used for a few key open-ended questions and should probably not be used in contiguous open-ended questions (as our response to the second probe was much lower).

Our study extends leverage-salience theory to help understand why people respond to individual questions and the quality of responses provided. We find that interest in the subject of a specific question is influencing people's decisions to respond to the open-ended questions. Respondents who are more interested in the topic are also more likely to provide a response to the open-ended questions and the follow-up probes, whereas those who are less interested have higher rates of item nonresponse. Interest is also affecting response quality in general, controlling for what version of the survey the respondent received. Those who are more interested consistently provide significantly more themes and elaborate significantly more often. They also provide significantly more words most of the time. Thus, respondents' interest in the topic is a powerful predictor, not just of respondents' decisions to participate in a survey but also of whether respondents choose to answer a particular question and the quality of the response provided.

More research is needed to address nonresponse bias to individual questions and determine who is not responding to the open-ended questions and to the probes. Our study shows that being more interested in the subject of an open-ended question affects the likelihood of responding; however, people's interest could be related to their knowledge of the topic. Further research could examine the relative effects of interest and knowledge on responses to open-ended questions. In addition, future research could explore what other factors, such as education, literacy, knowledge of the topic, and computer literacy and hardware, might be affecting people's decisions to respond to individual survey questions and the quality of responses provided to open-ended questions in web surveys.

In general, we think that the interactivity of the web can further be explored to find the best ways to motivate respondents. In addition, the interactive nature of the Internet should be used to tailor questions to respondents when possible. Further research should be conducted on the influence of different kinds of probes in different situations. For example, web surveys could use an error message probe if the respondent has left the open-ended question blank, or probes encouraging respondents to elaborate on their responses could

be used with open-ended questions looking for description. Other studies could examine the effects of using motivational language in an interactive probe. Finally, research could examine how visual cues work together with interactive features in web surveys. For example, perhaps a smaller text box should be used with the probe compared with the size of the text box for the original open-ended question, conveying to respondents that less information needs to be provided after the probe. No matter what interactive feature future studies test, using interactive feedback in web surveys to motivate respondents and improve responses must be balanced with the potential negative impact of increased respondent burden.

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